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Analysis of the Current Market Situation of China's Sea Wind Power Industry at Home and Abroad - Taking Sinoma Technology Company as an Example

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ABSTRACT: With the continuous growth of global demand for renewable energy, tidal wind power is gradually emerging as a key sector in the energy transition as a form of clean energy. This paper aims to conduct a comprehensive study and analysis of China's tidal wind power industry, exploring its development process, status, and future trends. The paper first reviews the developmental trajectory of China's sea wind power industry, outlining its evolution from initial stages to rapid expansion and subsequent adjustment and upgrade. This narrative highlights the industry's progression in terms of policies, technology, and market dynamics. Subsequently, through an in-depth analysis of the industry's status, the paper reveals both the positive aspects and challenges faced by China's sea wind power sector. In summary, the Chinese sea wind power industry has made significant strides in recent years but is not without its challenges. Through thorough research and comprehensive analysis, this paper aims to provide valuable insights for policymakers, businesses, and the academic community to facilitate the industry's movement towards a more sustainable and efficient direction.
KEYWORDS: *Offshore wind power; Wind energy; Sinoma Technology;*

I. INTRODUCTION

Since the outbreak of the conflict between Russia and Ukraine, the geopolitical risk in the Middle East region has risen sharply, which has not only made the region extremely unstable, but also caused global concerns about energy supply. The volatility of the oil and gas market has drawn urgent attention from the EU, Asia and other regions to energy substitutes. As political support for renewable energy development has increased significantly, future policies and funding may be more towards renewable energy. Rising oil and gas prices have also made renewable energy investments more attractive.

In recent years, people gradually realize that Haili Wind Power has great potential as a new clean energy. As a manufacturing exporter, China plays an indispensable role in the global Haili wind power industry. An in-depth exploration of the prospects and development of China's wind power industry and a comprehensive analysis of the domestic and foreign market conditions will not only help China's wind power industry to better pursue its development, but also help promote the refinement and efficiency of export business, thus enhancing the overall market competitiveness. This study aims to reveal the key role of China's wind power industry in the global new energy pattern and provide strong support for the sustainable development of renewable energy in the future.

II. LITERATURE REVIEW

2.1 Analysis on Current Situation of Domestic Market of China Sea Wind Power Industry

The wind power industry in China has become the core industry in the new energy era and is also an important force to promote the development of marine economy in China's coastal provinces. Today, China has rapidly emerged as the world's largest offshore wind power market. China's exploration of offshore wind power began in 2007, when the first project was completed on November 8 in Suizhong Oilfield of Bohai Sea, which lasted only 7 years. The project has installed 1 1.5 MW wind turbine generator set of Jinfeng Technology. This success marks a major breakthrough in the field of Haili wind power and provides a strong guarantee for the subsequent development of sea wind power.

During the 12th Five-Year Plan period, the development of China's Haili wind power industry was relatively slow and the installed capacity did not meet the expected target. Among them, intertidal zone projects accounted for 50.35% of the total installed capacity in the whole year, mainly 4 MW. Although the project is concentrated in the intertidal zone, the exploration at this stage provides an effective solution to the major problems in the development of

Haili Wind Power.

The cost of offshore wind power has always been a major challenge for its development because the particularity of the offshore environment results in the cost of offshore wind power equipment and operation and maintenance is usually 1.5 to 2 times higher than that of onshore wind power. To overcome this obstacle, in June 2014, the National Development and Reform Commission (NDRC) issued the Notice on the Policy of Offshore Wind Power Tariff, specifying the pricing policy of offshore wind power, which has promoted the market's activity and the rapid development of the industry.

During the 13th Five-Year Plan period, relying on the accumulation of early technology, offshore wind power in China ushered in a golden period. At the end of 2020, about 11 million kilowatts of projects were under construction. In 2020 alone, offshore wind power will be added to the grid. The capacity reached 3.06 million kilowatts, with an accumulated installed capacity of about 9 million kilowatts. From the stage of an exploratory project with only one wind turbine generator set, China has carried out experiments in the demonstration area, and then promoted the orderly construction of coastal areas to promote the upgrading of Haili wind power technology and the development of equipment manufacturing industry. Under the leadership of national policies, the "14th Five-Year Plan" phase will become a key period for the development of China's sea wind power and a driving force for the growth of installed sea wind power. It is conducive to the realization of the "30.60" two-carbon target and lays a solid foundation for the sustainable development of China's clean energy sector.

China’s sea wind power has taken the initial stage in the development of offshore wind power at the beginning. Through the exploratory project of a single wind turbine, it gradually evolved into a demonstration project, and orderly promoted the construction of the pilot demonstration project, which promoted the upgrading of offshore wind power technology and the development of equipment manufacturing industry. Under the guidance of national planning and policies, China has gradually and cautiously expanded the scale of offshore wind power construction, actively promoted the large-scale development and construction of offshore wind power, and finally achieved the development of high-quality offshore wind power.

2.2 Analysis on Current Situation of the Foreign Market of China’s Sea Wind Power Industry

According to the Wood Mackenzie Report, western wind turbine manufacturers have suffered heavy losses in the past two years. Due to the unstable energy prices, soaring labor costs, supply chain and electricity price bidding problems caused by the COVID-19 epidemic and other factors, in the first quarter of 2022 alone, overseas wind turbine manufacturers lost more than 3.4 billion euros. In this regard, the relevant enterprises generally adopt a price increase strategy. According to Bloomberg New Energy Financial Data, the price of the fan agreement signed in the first half of 2022 increased by 18% compared with that before the COVID-19 epidemic. However, the price of fans in the China market has not increased but has shown a downward trend with intensified competition and technological progress. In this case, the price advantage of China Fan in the global market is beginning to show. However, the Wood Mackenzie Report points out that although the overall financial performance of China's complete machine manufacturers is bright, profits have been eroded to some extent in the past five years, with EBIT (earnings before interest and tax) in 2021 being 32% lower than in 2016. For China wind turbine manufacturers, overseas markets have become new profit growth points.

The Global Wind Energy Report 2022 released by the Global Wind Energy Council (GWEC) points out that the average annual compound growth rate of the global sea power wind power is expected to reach 8.3% in the next five years, and the cumulative installed capacity from 2022 to 2026 will exceed 90 GW. For decades, Europe has been the world's largest regional market for accumulated sea power wind power installed capacity. However, Europe was overtaken by the Asia-Pacific region in 2022 due to China's strong growth over the past five years.

However, starting from 2030, Europe is likely to become the market with the largest newly installed capacity again. Europe's dual objective is to achieve independence from Russia's energy supply of oil and natural gas and to cope with climate change, which is likely to push Europe's annual installed capacity of sea power wind power to over 10 GW in 2027 and 25 GW in 2030.

For a long time, Europe has been the world's largest regional market with accumulated sea power wind power installed capacity. However, Europe was overtaken by the Asia-Pacific region in 2022 due to China's strong growth over the past five years. It is expected that in the next ten years, the Asia-Pacific region will maintain its leading position in terms of accumulated installed capacity of marine wind power. But from 2030 onwards, Europe is likely to return to being the market with the largest new installed capacity. Europe's twin goals are to achieve independence from Russia's energy supply of oil and natural gas, and to tackle climate change at the same time. This target may push Europe's annual sea power wind power installed capacity to exceed 10 GW in 2027 and reach 25 GW in 2030. With the vigorous development of China Haili Wind Power Market, its competitiveness and influence in foreign markets will also continue to increase.

III. SWOT ANALYSIS OF SINOMA TECHNOLOGY IN SEA WIND POWER INDUSTRY

3.1 Brief Analysis of Sinoma Technology's Sea Wind Power Business

Sinoma Technology is mainly engaged in the production of fiberglass blades in the wind power industry. Currently, its products have covered 39 countries and regions in the world. The enterprise has made remarkable achievements in research and development, joint development and commissioned design, forming 6 series ranging from 1MW to 7MW, with a total of more than 50 product models. In the nine years since the establishment of the Company, the market has covered 12 countries in the world, with more than 16,000 sets of exports and a total installed capacity of 27.9GW, accounting for 7.0% of the world's total installed capacity in the same period. Since 2015, Sinoma Technology has ranked first in the global market share of wind turbine blades.

The wind turbine blade is one of the core components of the wind turbine, accounting for approximately 22% of the total cost of the wind turbine. Secondly, the components with higher cost include gear box, wheel hub, engine room, converter, bearing, generator and base, accounting for 13%, 10%, 8%, 6%, 5%, 4% and 3% respectively. These ratios reflect the economic importance of individual components throughout the wind turbine system. Among these components, the cost of blades is relatively high due to their key role, while the tower of sea wind power is due to its special features. Costs are relatively high due to specific environmental requirements. Therefore, for the Haili wind power industry, mastering the absolute market of blades is equivalent to mastering half of the sea wind power.

2.2 Advantage Analysis

2.2.1 Leading Market Share

According to the data of the Global Wind Energy Council, China's blade production capacity will account for 60% of the world's total in 2022. Based on the estimation of market investment, there may be a shortage of blade production capacity in overseas markets around 2024, and China will continue to play an important role in the global supply of wind power components. Especially in the world, fans tend to be large, and the lightweight and large-scale development of fan blades. In late January 2023, Sinoma Technology planned to acquire Zhongfu Lianzhong. Zhongfu Lianzhong is a collection of composite products and a high-tech enterprise integrating development, design, production, and service. Debon Securities Research pointed out that up to the beginning of 2023, China Material Technology had a market share of approximately 30% in the domestic fan blade market, while China Reflex Lianzhong had a market share of approximately 15%. This means that with the completion of the acquisition, China Material Technology's market share has increased significantly. In the announcement, Sinoma Technology made it clear that after the acquisition, Sinoma Blade will become the absolute leading enterprise in the domestic fan blade industry.

2.2.2 Strong independent production and research and development capability

Sinoma Technology has made remarkable achievements in blade design in the field of wind power generation. According to Sinoma Technology, its blade length design is based on market demand and follows the trend of wind

power generation blades becoming longer and longer. In 2018, Sinoma Technology participated in the world's largest wind energy exhibition, when LM Company launched the 107-meter blade, becoming the first 100-meter blade leaves.

Now, China has successfully launched 110-meter blades, and there are three more than 100 meters.

Compared with the European market. What is remarkable is that Sinoma Technology is actively preparing for a

longer 120-meter blade, which demonstrates its leading position in promoting continuous innovation of blade length in the

entire industry. This shows the strong research and development strength of Sinoma Technology and its grasp of the development direction of wind power generation technology in the future, bringing forward-looking solutions for the industry. This strong capability of independent research and development will help to promote technological progress and industrial development in the field of wind power generation.

2.2.3 Manufacturers of raw materials have more cost advantages.

As one of the world's largest manufacturers of building materials and new materials, Sinoma Technology's subsidiary Taishan Glass Fiber occupies a prominent position in the production of glass fiber raw materials. In the field of wind turbine blades, the significant advantages of Sinoma Technology are reflected in various aspects.

Firstly, in terms of technical strength, Sinoma Technology has accumulated rich experience in glass fiber manufacturing technology. Through continuous innovation, its research and development team has improved the product quality and performance and met the strict requirements of high strength and corrosion resistance of wind turbine blades. At the same time, as the world's fourth and second largest manufacturer of glass fibers in China,

Taishan Glass Fiber's high output provides reliable raw material support for wind turbine blade manufacturers.

Secondly, in terms of supply chain reliability, Sinoma Technology, through Taishan Glass Fiber Subsidiary, can ensure a continuous and stable supply of raw materials for the wind turbine blade manufacturing industry. This is crucial for the wind power industry, as large-scale production of wind power blades requires a large amount of high-quality glass fibers. The high production of Taishan fiberglass ensures the effective satisfaction of this demand.

Moreover, cost advantage is another important competitive advantage of Sinoma Technology in the field of wind turbine blades. Through scale effect, independent production, and supply chain integration, CMST can reduce production costs and provide more competitive products. In the wind power industry, such cost advantages can enable manufacturers to reduce production costs and improve market competitiveness while maintaining high quality.

Considering the outstanding performance of Sinoma Technology in terms of technical strength, supply chain reliability and cost advantages, as well as the high production of Taishan Glass Fiber in glass fiber production, Sinoma Technology has all-round advantages in the field of wind turbine blades. By continuously providing high-quality and large-scale glass fiber raw materials, Sinoma Technology has provided strong support for the development of wind turbine blade manufacturing industry, while maintaining a leading position in the global glass fiber market.

2.3 Disadvantage Analysis

2.3.1 The Products Are Single and Lack the Whole Industry Chain.

There are some problems in the simplification of Sinoma's wind turbine blade business, which are mainly reflected in its lack of the ability to cover the whole wind turbine industry chain. Although it has significant advantages in the field of glass fiber raw material production, it only focuses on providing materials such as glass fiber and does not involve in other links of the whole fan industry chain, such as fan design, manufacturing, assembly, sales and services. This limitation brings a series of problems. First, the simplification of the products of Sinoma Technology makes it lack the competitiveness of the complete machine products in the market. In contrast, enterprises that master the whole machine industry chain can provide more complete and integrated solutions to better meet the needs of customers and occupy an advantage in the market competition. Secondly, Sinoma Technology is facing an increase in market risk. As it only focuses on providing raw materials, it is greatly affected by factors such as market demand, price fluctuation and competitive pressure. At the same time, enterprises covering the whole machine industry chain can reduce risks and better cope with market fluctuations through diversified product portfolios and service models. In addition, the lack of participation in the whole machine industry chain of Sinoma Technology may limit its ability in technological innovation and product upgrading. Overall machine manufacturers can better promote technological innovation and product upgrading by integrating research and development resources, strengthening cooperation partnership and improving production efficiency, etc. to meet the changing market demand.

2.3.2 The Carbon Fiber Material Has Large Gap and Strong Import Dependence

In terms of blade materials, Sinoma Technology believes that no revolutionary breakthrough has yet been made. Revolutionary materials are defined as materials that can reduce the weight of wind turbine blades by more than 10% at a time, or by more than 10 tons at a time. Although the performance has been improved to a certain extent through optimization design, special-shaped design and application of carbon fiber materials, revolutionary breakthrough has not yet been achieved. Carbon fiber material is a strong candidate for the next generation of revolutionary materials for wind turbine blades. The international community highly agrees with this view. As one of the core components of wind power generation, blades play a vital role and directly affect the efficiency of the whole wind power system. To realize high-efficiency power generation in the complex and changeable working environment, the wind turbine blades have put forward strict requirements in terms of shape design, light weight, high strength, and strong toughness. In addition to the shape design, the requirements of mechanical properties are directly related to the structure and material selection of wind turbine blades.

The carbon fiber wind turbine blades are made of carbon fiber composite materials. Compared with the traditional glass fiber reinforced material, the carbon fiber wind turbine blade can achieve 20%-30% weight loss effect and is better in rigidity and strength. By adopting the thin airfoil with higher aerodynamic efficiency and increasing the blade length, the carbon fiber wind turbine blade can improve the utilization rate of wind energy and the annual power generation, thus effectively reducing the comprehensive use cost. At present, wind turbines are developing towards the direction of large-scale and lightweight. Ultra-long blades need higher strength and corrosion resistance. Therefore, carbon fiber is the best material choice at present.

In terms of market demand, data from the Global Wind Energy Council (GWEC) show that the global demand for carbon fiber in the field of wind power increased rapidly from 18,000 tons to 33,000 tons from 2015 to 2021, accounting for about 30% of the global total carbon fiber demand in 2021. The core pillar of energy transformation in the new era is also pushing the carbon fiber wind turbine blades to become the largest demand area in the carbon fiber downstream market. In the domestic market, from 2017 to 2021, the demand for carbon fiber wind turbine blades was 3,060 tons, 8,000 tons, 13,800 tons, 20,000 tons and 22,500 tons respectively, with an annual

compound growth rate of 65%. Since 2020, wind power has surpassed sports and leisure to become the largest application area of carbon fiber in China.

Through many data and experiments, it is shown that carbon fiber blades are currently the most suitable material for sea wind power blades compared with glass fiber blades. It has better portability and extensibility, and it also corresponds to high cost. Whether an enterprise can innovate in technology, reduce costs, and increase efficiency, so as to enable carbon fiber blades to obtain a larger market share is a pressing issue for Haili wind power industry.

2.4 Opportunity Analysis

2.4.1 The Market Potential of Global Sea Wind Power

At present, many governments regard offshore wind power projects as the keyway to achieve energy security, promote energy transformation and achieve low-carbon goals. In Europe, Asia, North America and other places, many countries have increased their investment and construction of offshore wind power projects.

In Europe, many countries have adjusted their energy policies and increased the deployment of renewable energy, especially the continued strong demand for photovoltaic and wind power installations. For example, the United Kingdom has released its Energy Security Strategy, which aims to install offshore wind power by 2030.

The target was raised to 50 gigawatts. In addition, the governments of Denmark, Germany, Belgium, and the Netherlands held a "North Sea Offshore Wind Power Summit" Signed a statement promising to increase the offshore wind power installed capacity of these four countries to 150 GW by 2050.

In Asia, China has rapidly emerged as the world's largest offshore wind power market. In addition to China, Japan, South Korea, Vietnam, and other countries have also accelerated the layout of offshore wind power projects, with the total installed capacity planned to exceed 25 GW by 2030.

In North America, the United States has increased its strategic focus on the deployment of offshore wind power and plans to deploy 30 GW by 2030.

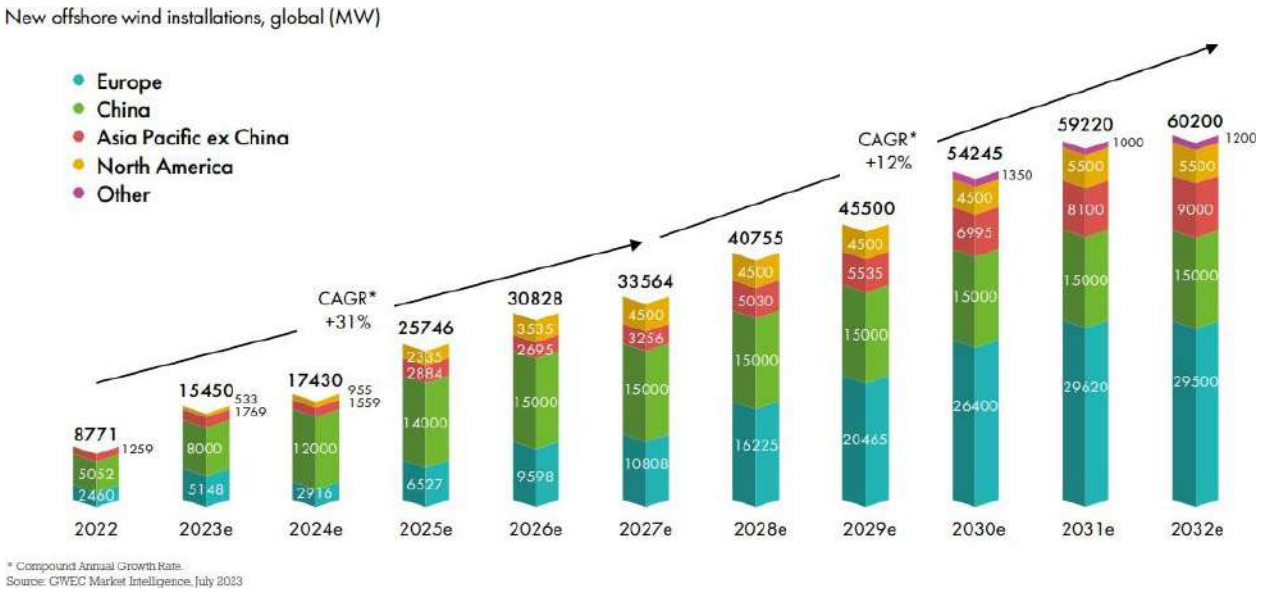

Figure 1. Global New Sea Wind Power Equipment Forecast
Source: GWEC

2.4.2 The Advent of Revolutionary Materials

In terms of blade material selection, Sinoma Technology believes that no revolutionary breakthrough has yet been made. Revolutionary materials are defined as materials that can reduce the weight of wind turbine blades by more than 10% at a time, or by more than 10 tons at a time. Although the performance has been improved to a certain extent through optimization design, special-shaped design and application of carbon fiber materials, revolutionary breakthrough has not yet been achieved. Carbon fiber material is a strong candidate for the next generation of revolutionary materials for wind turbine blades. The international community highly agrees with this view. As one of the core components of wind power generation, blades play a vital role and directly affect the efficiency of the whole wind power system. To realize high-efficiency power generation in the complex and changeable working environment, the wind turbine blades have put forward strict requirements in terms of shape design, light weight, high strength, and strong toughness. In addition to the shape design, the requirements of mechanical properties are directly related to the structure and material selection of wind turbine blades.

Carbon fiber has excellent performance, and its unique carbon backbone structure makes it a high-performance fiber material. Because it is formed by cracking and carbonizing organic fibers at high temperature, the

carbon content of carbon fibers exceeds 90%. Its characteristics include light weight, high strength, high modulus, corrosion resistance, low expansion, and fatigue resistance.

However, despite these excellent properties of carbon fiber, its large-scale application in the short term is limited by cost. Due to the relatively complex production process and relatively high manufacturing cost of carbon fiber, its wide application in some fields is facing challenges. With the continuous progress of technology and the expansion of production scale, it is expected that the cost of carbon fiber will be gradually reduced, thus promoting its wider application in various fields.

The anti-fatigue performance of the blades can be significantly improved by applying the fibers to the marine Wind power blades. There are four kinds of different composites, including pure glass fiber composites, pure carbon fiber composites, and four kinds of carbon-glass hybrid composites with different proportions of carbon and glass. The experimental results show that the composites with higher carbon content have better fatigue resistance and can better adapt to severe weather conditions. This superior performance enables the fiber to be applied in low wind speed regions and sea power wind farms.

In low wind speed areas and Haili wind farms, the diameter of the fan impeller is a crucial competitiveness indicator. The application of carbon fiber effectively increases the blade length, which effectively broadens the application scenario of wind power under the background that the market in wind-rich regions is gradually saturated. In addition, the carbon fiber also has vibration damping characteristics, which can prevent resonance between the natural frequency of the blade and the temporary short frequency of the tower and improve the safety and stability of the wind turbine blade.

2.5 Threat Analysis

2.5.1 The Appearance of New Technology Weakens the Competitiveness of the Original Products.

The carbon fiber wind turbine blades are made of carbon fiber composite materials. Compared with the traditional glass fiber reinforced material, the carbon fiber wind turbine blade can achieve 20%-30% weight loss effect and is better in rigidity and strength. By adopting the thin airfoil with higher aerodynamic efficiency and increasing the blade length, the carbon fiber wind turbine blade can improve the utilization rate of wind energy and the annual power generation, thus effectively reducing the comprehensive use cost.

Through many data and experiments, it is shown that carbon fiber blades are currently the most suitable material for Haili wind turbine blades compared with glass fiber blades. It has better portability and ductility, and the same also corresponds to high cost. Can the enterprise technology innovation, cost reduction and efficiency enhancement, so that carbon fiber blades can gain a larger market share, are the most urgent problems to be solved in the sea wind power industry.

2.5.2 Impact of International Turbulence on Overseas Markets

In recent years, the Palestine-Israel conflict, Russia-Ukraine conflict, and the turbulent international situation on a global scale may cause various risks to the export of wind power blades of Sinoma Technology. First, these regional conflicts have exacerbated the uncertainty in the global economy, making investors and companies more cautious about market expectations. Such caution may lead to a decrease in the willingness to invest in the global wind power industry, thus slowing the business expansion of Sinoma Technology in overseas markets. Secondly, geopolitical tensions may lead to trade barriers and trade restrictions, which will make China Material Science and Technology face more export barriers and market access difficulties. In this case, the enterprise may face the pressure of decreasing orders and sales, which will affect its profitability and competitive position in the market. At the same time, the instability of the international situation may also lead to turmoil in the global financial markets, increasing the risk of capital liquidity and exchange rate fluctuations for enterprises, and causing financial pressure on overseas business of Sinoma Technology. Finally, the turbulent international situation may also lead some countries to reassess their renewable energy policies, reducing the market share and competitive advantage of China Materia Science and Technology in this field. To sum up, these factors work together to make Sinoma Technology face greater uncertainties and risk challenges in the global wind turbine blade export market.

III. CHINA SEA WIND POWER'S COUNTERMEASURES IN DOMESTIC AND FOREIGN MARKETS: A CASE STUDY of SINOMA TECHNOLOGY

3.1 Diversifying Product Lines: An Effective Way to Enhance Market Competitiveness

One of the successes of Sinoma Technology is its diversified product lines. With 6 series from 1MW to 7MW, With the overall layout of over 50 product models, Sinoma Technology has successfully met the diversified demands of the global wind power market. This diversification not only improves the market coverage, but also increases the flexibility and risk resistance of the enterprise. For China Haili Wind Power Enterprise, through diversified product lines, it can not only cater to market changes, but also stand out from the fierce competition.

3.2 Optimizing Export Commodity Structure: Strategic Thinking on Improving Global Competitiveness

For the problem that the commodity structure is too single, China Material Science and Technology puts forward the strategy of reasonably optimizing the export commodity structure to improve the market competitiveness. This strategy is also applicable to China Haili Wind Power Company. By flexibly adjusting and optimizing the

structure of export commodities, enterprises can better adapt to the needs of the international market, improve the global competitiveness of products and realize sustainable development.

3.3 Industry Consolidation and Innovation: The Only Way to Realize Industrial Upgrading

The whole industry chain of the whole machine plays a crucial role in the sea wind power industry. It runs through all aspects from design to operation and provides necessary support to ensure the smooth implementation and long-term operation of the project. First, in the design and manufacturing phase, the industry chain is committed to developing high-performance and high-quality wind turbines, which directly affects the power generation efficiency and reliability of the project. Through continuous innovation and design optimization, the unit is ensured to operate stably in severe offshore environment. Secondly, during the installation phase, professional teams and equipment ensure that the wind turbines are safely and efficiently installed on offshore platforms. The smooth progress of this stage is of great significance to the subsequent operation and maintenance of the project. Finally, in the operation and maintenance link, the whole industry chain of the whole machine provides key support and services, including regular overhaul, maintenance, troubleshooting and other work, to ensure the long-term reliability and economy of the wind power project. Through the synergy, the whole industrial chain of the whole machine not only improves the efficiency and operation level of the project, reduces the cost of wind power generation, but also promotes the healthy development of the sea wind power industry.

Sinoma Technology has made remarkable achievements in the integration and innovation of the industrial chain. By extending its business to areas such as wind farm planning, design, and maintenance, and by enhancing its core competitiveness through technological innovation, Sinoma Technology has successfully upgraded its industrial structure. This has provided a clear guidance for China Haili Wind Power Enterprise, that is, by integrating the upstream and downstream industry chains and focusing on technological innovation, the traditional manufacturing industry will be transformed into a high value-added service industry to achieve sustainable development.

3.4 International Cooperation and Transformation of New Materials: An Important Way to Expand Global Markets

Sinoma Technology proposes a strategy of exploring the development prospects and industrialization opportunities through international cooperation, to win the first opportunity for China sea Wind Power Enterprise in the global market competition. In addition, focusing on the application of new materials, especially revolutionary materials such as carbon fiber, is expected to improve product performance and reduce costs, helping enterprises to become more competitive in the international market.

IV. CONCLUSION

The successful experience of Sinoma Technology in other fields shows that top-level design and system planning are the keys to success. The industry needs to establish a sound macro-planning, considering the spatial layout, industrial chain, technological innovation, and other aspects to ensure the coordinated development of each link. The top-level design experience of Sinoma Technology in other fields can provide reference for Haili Wind Power Industry, helpthe industry to avoid disorderly competition and waste of resources, and realize healthy and orderly development. Secondly, the technological innovation capability of Sinoma Technology provides an important reference for sea wind power Industry. Sea wind power industry needs to continuously improve the key technology level, improve the fan efficiency, reduce the cost, improve the reliability and other aspects. The technological innovation experience of Sinoma Technology in other fields can provide inspiration for Sea wind power industry, encourage enterprises to increase investment in research and development of key technologies and promote the entire industry to a higher level of development.

In addition, the successful practice of China’s Material Science and Technology in the construction of industrial chain is also of referential significance to sea wind power industry. The sea wind power industry needs to establish a complete industrial chain, including fan manufacturing, equipment installation, operation and maintenance services and other aspects, to form a virtuous circle and enhance the competitiveness and sustainability of the entire industry. The industrial chain construction experience of Sinoma Technology in other fields can provide reference for sea wind power Industry and help the industry to realize the perfection and coordinated development of the industrial chain.

In general, the successful experience of Sinoma Technology in the field of wind power has provided valuable inspiration for China’s sea wind power Industry. Through diversification of product lines, optimization of export commodity structure, industry consolidation's cooperation with innovation, internationalization and transformation of new materials, China’s sea wind power enterprises can better adapt to market changes, improve global competitiveness, and realize sustainable development of the industry. The case of Sinoma Technology is not only a successful experience, but also an important reference for China’s sea wind power industry to move towards a healthy and sustainable future.

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