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Optimization Countermeasure of Ginlong Technologies Cost Management Based on Strategic Perspective

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Abstract: Consolidating and enhancing global competitive advantages is an important strategic goal for inverter companies, and strategic cost management is a vital means to improve cost control capabilities and enhance competitive advantages. Based on the theory of strategic cost management, a study was conducted on Ginlong Technologies to explore its strategic positioning, value chain, and cost drivers. It was found that the company faced issues such as unclear strategic positioning and incomplete value chain. Improvement suggestions were proposed, thereby providing valuable insights for both company development and academic research.

Keywords: Strategic cost management, Strategic positioning, Value chain, Cost drivers.

1. Introduction

Inverter is the core equipment of photovoltaic power generation system.Ginlong Technologies, as a leading inverter enterprise, is facing fierce competition in domestic and foreign markets. Optimizing cost management has become an important way to enhance its competitiveness. Such as Wang Man, Wang Yue[1] research shows that strategic cost management theory emphasizes the management of costs from a strategic height, which is an effective way for enterprises to obtain long-term competitive advantage. Strategic cost management model can be divided into the following three types: Robin Cooper model, Cranfield model and Sang Ke model. Among them, such as Xiong Ying[2] research shows that the Sang Ke model from a strategic height comprehensive analysis of enterprise cost management ability, has a stronger explanatory power. Therefore, based on the Sang Ke model, the strategic cost management of Ginlong Technologies is studied.

2. Ginlong Technologies Strategic Cost Management Analysis

2.1. Basic Financial Situation of Ginlong Technologies

Ginlong Technologies is a leading enterprise in the research and development, production and sales of grid-connected photovoltaic inverters. As shown in Table 1, revenue, operating costs and period expenses of Ginlong Technologies increased from 2019 to 2022. Among them, the growth rate of operating income from 2020 to 2021 reached 58%, but the growth rate of operating cost was slightly higher than the growth rate of operating income; In 2022, the growth rate of revenue of Ginlong Technologies was significantly higher than the growth rate of operating cost, which indicated that there was room for optimization of cost management of the enterprise.

Table 1. Operating income, operating costs and period expenses of Ginlong Technologies from 2019 to 2022

	2019	2020	2021	2022
Operating income (RMB100 million)	11.39	20.84	33.12	58.89
Growth rate of operating income (%)	36.99	58.11	58.47	63.02
Operating costs (RMB100 million)	7.45	14.21	23.61	32.08
Operating cost growth (%)	36.09	61.24	62.74	50.77
Period expenses (RMB100 million)	2.33	3.30	5.01	7.73
Period cost growth (%)	52.74	46.97	53.12	49.90

2.2. Analysis of strategic cost management of Ginlong Technologies

The Sang Ke model is mainly analyzed from three perspectives: strategic positioning, value chain and cost drivers.

2.2.1. Strategic Positioning Analysis

Such as Shi Hao[3] research shows that the strategic positioning analysis aims to select an appropriate strategy through the analysis of the competitive environment. At present, the most widely used strategic analysis tool is SWOT analysis. As can be seen from Table 2,Ginlong Technologies has the advantages of global business layout and excellent product performance; Secondly, enterprises are facing opportunities such as increasing demand for photovoltaic equipment and government support policies; However, Ginlong Technologies has the disadvantages of single product and imperfect management system. At the same time, Ginlong Technologies also faces external challenges such as

technical barriers and the return policies of major countries' manufacturing industries. Its SWOT analysis is as follows:

Table 2. SWOT Analysis of Ginlong Technologies

S (1) business layout; (2) product performance; (3) technology; (4) Brand.	O (1) market demand; (2) Photovoltaic support policies.
W (1) Product type; (2) management system.	T (1) research and development capability of competitors; (2) policies such as the return of manufacturing industry.

According to the annual report of Ginlong Technologies, the Company has set up a strategy Committee, formulated a clear development strategy, took the research and development of high-performance inverters as the Company's key development direction, implemented a market expansion strategy, and strived to become an internationally competitive manufacturing enterprise, indicating that Ginlong Technologies is implementing a growth strategy.

2.2.2. Value chain analysis

Such as Li Haijian, Sun Fenge[4] research shows that strategic cost management focuses on the cost management of the entire value chain. The elements of the value chain will affect the operation. By analyzing the value chain activities, we can find out the cost allocation of each link and find an effective way to reduce the cost as a whole. Value chain analysis includes internal and external value chains.

(1) internal value chain analysis

Value chain activities within an enterprise consist of supporting activities and basic activities. Supporting activities include infrastructure construction and human resources management; Basic activities include internal logistics, production and operation, etc.

In terms of supporting activities, the board of directors of Ginlong Technologies has set up different departments, established a standardized management system and established an ERP system covering all production and operation activities. However, the performance appraisal standard and incentive system of Ginlong Technologies for key management personnel are still in the stage of improvement. Secondly, photovoltaic inverter is a high technology-intensive product, therefore, research and development is the core link of the internal value chain. As can be seen from Table 3,Ginlong Technologies attaches importance to product research and development investment, which increased from RMB42 million in 2019 to RMB301 million in 2022, supporting the enhancement of product competitiveness.

Table 3. Proportion of research and development investment of the Company to operating income from 2019 to 2022

	2019	2020	2021	2022
Research and development investment amount (RMB100 million)	0.42	0.94	1.73	3.01
Research and development investment as a percentage of operating income (%)	3.71	4.53	5.22	5.1

In terms of basic activities,Ginlong Technologies conducts procurement based on production plan, inventory situation and raw material market situation, and determines the procurement plan on the basis of considering safety inventory. At the same time, the enterprise's raw material handling and vehicle dispatching systems are improved; Each department has a clear division of labor with high production efficiency, and the enterprise has its own sales model.

(2) external value chain analysis

Enterprise external value chain refers to the value activities of external actors closely related to the enterprise. As the raw material cost of inverter accounts for more than 85% of the product cost, the raw material price has a significant impact on the procurement cost of the enterprise. The sales segment is the key to brand building, revenue generation and market share improvement. Therefore, procurement and sales are the core links of the inverter enterprise's external value chain. Based on the ratio of the total purchase amount of the top five suppliers of Ginlong Technologies to the total annual purchase amount (concentration of the top five suppliers) and the total sales amount of the top five customers to the total annual sales amount (concentration of the top five customers) from 2019 to 2022, as shown in Table 4, the concentration of customers and suppliers of Ginlong Technologies fluctuates greatly.

Table 4. Procurement and sales of the Company with suppliers and customers from 2019 to 2022

	2019	2020	2021	2022
Concentration of Top Five Suppliers	34.33%	27.40%	19.45%	36.10%
Top five customer concentrations	37.14%	23.12%	15.04%	20.67%

Comparing with related enterprises in terms of operating cost rate and sales cost rate, we can find out the advantages and disadvantages of cost management in the value chain of Ginlong Technologies. Therefore, we choose Goodwe, which is similar to Ginlong Technologies in scale, product structure and cost structure, as the comparative object.

As shown in Table 5, the operating cost rate of Ginlong Technologies from 2019 to 2021 was higher than that of Goodwe, while the operating cost rate of Ginlong Technologies in 2022 was lower, indicating that the cost paid by Ginlong Technologies to obtain the same income was decreasing, which indicated that Ginlong Technologies's ability to control the cost was gradually improving.

Table 5. Operating cost rates of Ginlong Technologies and Goodwe from 2019 to 2022

	2019	2020	2021	2022
Operating cost rate ofGinlong Technologies	65%	68%	71%	66%
Goodwe operating cost rate	60%	62%	68%	67%

As can be seen from Table 6,Ginlong Technologies has high profit margin and strong profitability. Its sales expense rate and management fee rate decreased year by year, which was lower than that of Goodwe from 2021 to 2022. In terms of research and development expenses, the research and development expense rate of Ginlong Technologies is smaller than that of Goodwe from 2019 to 2022. In terms of financial expense rate, the overall financial expense rate of Ginlong Technologies from 2019 to 2022 is relatively large.

Table 6. Cost Rate for the Period of Ginlong Technologies and Goodwe from 2019 to 2022 (Unit:%)

project	Enterprise name	2019	2020	2021	2022
Sales expense rate	Jin lang technology	11.93	5.93	4.66	4.30
	Goodwe	14.16	8.23	7.84	7.2
management fee rate	Jin lang technology	6.16	5.49	3.83	3.09
	Goodwe	4.87	3.5	3.95	4.17
Research and development expense rate	Jin lang technology	3.71	4.53	5.22	5.11
	Goodwe	6.15	5.79	7.03	7.38
Finance charge rate	Jin lang technology	1.32	0.11	1.41	0.62
	Goodwe	-0.28	0.38	1.55	-2.01
profit/cost ratio	Jin lang technology	0.15	0.21	0.18	0.22
	Goodwe	0.18	0.16	0.15	0.16

2.2.3. Cost driver analysis

Cost drivers are the causes of costs, which include structural cost drivers and executive cost drivers. The structural cost drivers include the application of technology, staff's centripetal force towards the enterprise, total quality management, contact relationship, etc. Executive cost drivers include enterprise size, geographical location, environmental responsibility, etc.

As for the technology of structural cost drivers,Ginlong Technologies attaches great importance to the investment in technology and the construction of research and development team. In 2022, the enterprise's research and development investment amounted to 301 million yuan, and accumulated more than 100 patents.Ginlong Technologies has advantages in technology research and development, but there is still room for improvement when compared with the leading enterprises in the industry. From the perspective of staff centripetal force, the enterprise promotes multi-cultural integration, strives to solve the problems most concerned by the staff, improves the salary distribution system, and provides multi-level welfare guarantee for the staff. But for key management personnel, the enterprise is still improving the incentive and assessment system. In terms of total quality management, the enterprise has a perfect testing system, a team of high-quality testing personnel, a reasonable allocation of equipment resources, and a life-cycle testing management. Its testing technology capability has reached an international advanced level, providing high-quality assurance for the quality control of enterprise products, inverter research and development, etc. In terms of contact relationship, the Company has established a standardized internal management system, which can better control the operation activities and strengthen the contact between various departments. However, there are still risks in the procurement and sales links of Ginlong Technologies in the external value chain: affected by the price restrictions of raw materials from upstream suppliers and the policies of manufacturing return implemented by European and American countries, enterprises are facing challenges such as the increase in procurement costs and the decrease in the number of customers.

In terms of the enterprise scale of the executive cost drivers, as can be seen from Table 7, while the scale of Ginlong Technologies continues to expand, the unit product cost shows a downward trend, which is beneficial to the sustainable development of the enterprise. However, the unit product cost of Ginlong Technologies is fluctuating and there is still room for decline.

Table 7. Shipment and Unit Product Cost of Ginlong Technologies from 2019 to 2022

	2019	2020	2021	2022
Inverter shipments (10,000 units)	29.79	48.17	70.53	94.23
Operating costs (RMB100 million)	10.90	14.21	23.60	39.15
Unit product cost (RMB 10,000/set)	0.36	0.29	0.33	0.42

Geographically, Ginlong Technologies is located in Shanghai. As a high-tech enterprise, Ginlong Technologies is supported by the government and enjoys preferential tax policies. At the same time,Ginlong Technologies actively distributes overseas markets through the establishment of overseas subsidiaries, making cost management more complicated. From the perspective of environmental protection responsibility, with the continuous improvement of environmental protection requirements, the environmental cost of Ginlong Technologies accounts for an increasing

proportion of the total cost. Therefore,Ginlong Technologies has optimized the production organization and process technology through innovation-driven, and implemented the responsibility of energy conservation and environmental protection for all levels of personnel.

3. Ginlong Technologies Issues

Based on the analysis of the strategic positioning, value chain and cost drivers of Ginlong Technologies, the following problems are found in its strategic cost management:

3.1. Unclear strategic positioning

Ginlong Technologies has formulated a clear strategy, and its strategic choice belongs to the growth strategy. Although the strategic choice is in line with the industry development background in the growth period, it cannot fully meet the current industry competition situation. At present, the market supply of inverters is far higher than the market demand and the market competition is more intense. Compared with head companies such as Huawei and Sungrow,Ginlong Technologies does not have obvious advantages in technology and other aspects, and may even have gaps. Moreover, its international business faces threats such as trade barriers and manufacturing return policies, and a single growth-oriented strategy is already difficult to adapt to the development trend of enterprises and industries. To this end,Ginlong Technologies strives to explore new markets and expand new energy power production business, so as to realize the diversified distribution of the Company's business and the extension of the industrial chain. The operating revenue of this business from 2019 to 2022 was RMB6,627,000, RMB38,184,000, RMB86,843,000 and RMB134,800,000 respectively, but its revenue was less than 3% of the total operating revenue, indicating that the diversification strategy has made slow progress. Besides, the competition in the new energy and electricity market is fierce, with the state-owned central enterprises taking the lead.Ginlong Technologies lags far behind the state-owned enterprises and the central enterprises in terms of financing ability and market development, which may affect the diversification strategy of the enterprises.

3.2. The enterprise value chain is not perfect

Judging from the research and development link, the research and development investment intensity of Ginlong Technologies from 2020 to 2022 was approximately 5%, and the research and development investment in 2022 was 301 million yuan. Meanwhile,Ginlong Technologies has accumulated 191 technology patents, and the research and development investment and achievements were the first, but still lagged far behind the head enterprise. For example, in 2022, the research and development investment of Sungrow reached RMB1,692 million, while the research and development investment of Huawei in the photovoltaic industry significantly exceeded that of Sungrow, and the number of inverter patents of both companies exceeded 1,000. It can be seen that Ginlong Technologies still has a disadvantage in research and development compared with the head enterprise.

In the procurement and sales segment, as the major material suppliers of Ginlong Technologies are from Europe and the United States such as Germany and the United States; Meanwhile, most of Ginlong Technologies products are sold to various countries and regions in Europe, America and Asia. In 2022, the business income of the enterprise in foreign markets reached 55% of the total business income. Therefore, with the changes in the international situation and the return policies of manufacturing industries in major foreign markets,Ginlong Technologies is vulnerable to greater impact on the external value chain, and may face challenges such as rising prices of raw materials, unstable supply chains, and a decrease in the number of customers.

3.3. Cost drivers to be optimized

By analyzing the R&D, procurement and sales links of Ginlong Technologies, it is found that the enterprise is facing challenges in cost management of key links in the value chain.

In the research and development segment of the internal value chain, the research and development investment amount of Ginlong Technologies is relatively small; Secondly, there is an important correlation between the number of patented technologies and research and development investment. It is precisely because of the gap in research and development investment that the number of patented technologies in enterprises lags far behind those in enterprises such as Sungrow, which is not conducive to enhancing the core competitiveness of enterprises.

In terms of external value chains, as procurement costs accounted for more than 85% of product costs, the increase in procurement costs led to a 27% increase in unit product costs of Ginlong Technologies in 2022. The main reason is that the price of key components or raw materials has increased. First, the cost pressure of IGBT suppliers represented by Infineon has increased due to the increase in the cost of raw materials and energy, which is transmitted downstream. Second, due to the strong demand in the downstream areas including photovoltaic, wind power, new energy vehicles and other fields in recent years, chips are out of stock periodically, and the gap between supply and demand will drive up the cost of raw materials procurement. Secondly, from the perspective of market and customers, due to the trade protection policies such as the return of manufacturing industries in major foreign markets,Ginlong Technologies will face market risks such as loss of customers and slow sales of products.

4. Ginlong Technologies Strategic Cost Management Optimization Suggestions

4.1. Clear strategic positioning

Although Ginlong Technologies has implemented a growth-oriented strategy around high-performance inverters and has advantages such as global business layout, it should actively promote business diversification and product differentiation strategies when facing challenges such as competitors with strong research and development capabilities and localization of manufacturing industry in international markets.

The implementation of business diversification strategy can help Ginlong Technologies to diversify risks and establish new profit growth points. At the same time, the existing brand advantages of Ginlong Technologies can help enterprises to lay a solid foundation for development in new business areas. For example, in the new energy and power market,Ginlong Technologies can actively cooperate with large state-owned enterprises in the industry to establish long-term strategic alliances and realize the sharing of resources such as capital, sales channels, talents and brands between the two parties,

thus improving the product innovation ability and competitiveness.

Product differentiation strategy is an effective choice to avoid price war and improve competitive advantage. Changes in the international market environment have led to more intense competition in the inverter market, which may lead to price wars. The implementation of differentiation strategy, the introduction of products with unique functions through technological innovation to meet the personalized needs of customers, can continuously enhance the competitiveness of enterprises in the differentiated competition pattern.

4.2. Improve the enterprise value chain

In order to successfully promote the growth strategy, the first task is to enhance the core competitiveness of enterprises through technological innovation. Therefore, in the internal value chain, it is necessary to optimize research and development links, increase research and development investment, moderately increase the intensity of research and development investment, increase research and development of core technologies such as modular design, integration of optical storage and charging, MPPT, and enhance the competitive advantage of core technologies; At the same time, it can establish strategic cooperation relationship with relevant enterprises and establish an industry innovation platform.

In terms of external value chains, the first step is to optimize the procurement process, seek cooperation with domestic material companies, further realize domestic substitution, and mitigate the risk of chain breakage and supply fluctuation of key raw materials. At the same time,Ginlong Technologies can also establish strategic alliances with other enterprises to jointly research core components. Secondly, we should optimize the sales process, strengthen customer relationship management and incorporate it into the enterprise strategy; In the face of policies such as the return of manufacturing industries from European and American countries, we should open up new markets in a timely manner and strengthen cooperation with relevant national enterprises in the belt and road initiative and RCEP.

4.3. Optimization of cost structure

Reasonable optimization of cost structure is the key to improve the efficiency of enterprise cost utilization. The efficiency can be improved by optimizing the key links of the value chain and the cost of each link can be controlled.

In the research and development phase, enterprises need to optimize the cost structure of the research and development phase as they increase their investment in research and development, such as integrating research and development resources, increasing their investment in product design and sharing research and development costs with leading enterprises. Secondly, in the research and development testing stage, the testing plan is reasonably planned to improve the success rate and reduce the material cost.

In the procurement phase, in order to control the procurement cost, the enterprise can cooperate with domestic suppliers to reduce the transportation cost, finance cost, etc. At the same time, it should evaluate the key cost and other related long-term potential costs according to the requirements of the product's technical function, quality and delivery date, and select the supplier reasonably.

In the sales link, the enterprise should optimize the cost structure when making sales layout and opening up international markets. First, enterprises should strengthen the contact with key customers through customer relationship management to improve customer value. Secondly, when developing the international market, enterprises should optimize their marketing methods and flexibly adopt a combination of direct selling, cooperation or entrustment with overseas institutions to reduce the maintenance and promotion costs of the international market.

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