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Analysis on Sustainable Development Capacity of New Energy Enterprises: A Case Study of CATL

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Abstract: The ability of sustainable development is the core ability of an enterprise. CATL is the leader of new energy enterprises, which is representative in both technology and market. Therefore, this study selects CATL as a case company, uses SWOT analysis method and PEST analysis method to analyze the advantages and disadvantages of internal and external environment, takes Higgins' sustainable growth theory as the support, analyzes its sustainable development ability from four aspects of operating performance, innovation investment, social responsibility and green development from 2017 to 2021, finds out the deficiencies, provides suggestions for the development of enterprises that meet the requirements of the new era, and also provides reference for the sustainable development of other enterprises.

Keywords: New energy enterprises, Sustainable development, Sustainable growth theory, Contemporary Amperex Technology Co., Limited.

1. Introduction

Under the background of "peak carbon dioxide emissions Carbon Neutralization", more and more attention has been paid to the sustainable development strategy of developing renewable energy to replace non-renewable energy. The ability of sustainable development is a comprehensive reflection of the stability of an enterprise's operation, the growth of its performance and the sustainability of its development. It is crucial to the long-term development of an enterprise in the competitive market. Donggen Yu et al. (2022)[1] explored the internal relationship between the quality of internal control, institutional environment and the enterprise's sustainable development ability from the perspective of "internal repair and external environment shaping" by using multiple regression method.

2. Development Status of CATL

Contemporary Amperex Technology Co., Limited (CATL) was established in 2011 and listed on the Growth Enterprise Market of Shenzhen Stock Exchange in 2018. CATL has established 10 battery manufacturing bases in the world, including Yibin in Sichuan, Zhaoqing in Guangdong and Erfort in Germany. It also has subsidiaries in Paris, Japan, Yokohama and Detroit. Ningde Factory was selected by the World Economic Forum (WEF) as the world's first "Lighthouse Factory" in the battery industry. In 2022, Ningde Factory obtained the PAS2060 Carbon Neutralization Certificate issued by SGS, a world-renowned certification body. Yibin Factory became the world's first zero-carbon factory in the new energy industry.

In 2018, CATL established the Sustainable Development Management Committee. In order to fully implement the concept of sustainable development, a number of department management were appointed as sub-area responsible persons, adhering to the sustainable development management policy of "harmony and win-win, innovation and achievement, keeping the right course of operation and green cycle" to ensure the sustainable development of the Company.

In 2019, CATL increased the disclosure of corporate sustainability content on its official website for easy access and monitoring by stakeholders. In 2020, in order to further promote the sustainable development management of the enterprise, a subsidiary sustainable development management Committee was established to take charge of the sustainable development governance of the subsidiary.

In 2021, we will further promote and motivate sustainable development governance by setting reasonable performance appraisal weights, linking the environmental, social and governance performance indicators with the performance of relevant executive departments, and taking rewards and punishment measures based on the annual assessment results to integrate the concept of sustainable development into the business operation philosophy.

3. Analysis on Sustainable Development Capacity of CATL

3.1. Analysis of internal and external environment in CATL

3.1.1. SWOT analysis of CATL

SWOT analysis method is an analysis method that comprehensively considers various factors of internal conditions and external environment of an enterprise.

(1) Advantages: CATL has industry-leading technology, stable equity structure, efficient team management and perfect incentive mechanism; It has a complete technical product line and world-leading production capacity, and its market share has increased year by year; By creating a light asset model for waste battery recycling and integrating upstream resources, supply chain management advantages and economies of scale, cost advantages are maintained in the long run.

(2) Disadvantages: the front-end research and development of power battery system and energy storage system in CATL is heavily invested, with high technical barriers and policy subsidies, making it difficult to further reduce costs; With the liberalization of national policies and the entry of foreign competitors into the domestic market, the market competition

will intensify in the future and the market share of products will decrease; The customers are mainly large and medium-sized automobile companies, with large transaction amount and high balance of receivables at the end of the period, which has a negative impact on the company's results.

(3) Opportunities: Green and low-carbon are the new trends of new materials in the world. The power battery market produced by new energy enterprises has expanded rapidly, and the power battery industry has also entered a golden period of development. With the advancement of the science and technology industry chain, new energy enterprises will usher in the era of dual drive of supply and demand.

(4) Threats: At present, our consumers' acceptance and approval of new energy vehicles are not high. According to the data released by the Ministry of Public Security, the total number of new energy vehicles in the country reached 7.84 million in 2021, accounting for only 2.60% of the total number of vehicles. New energy vehicles are facing problems such as inconsistent standards and weak general compatibility. In addition, affected by factors such as policy adjustment and market competition, the problem of stage-by-stage overcapacity is prone to occur, which brings business risks to the enterprise.

3.1.2. PEST analysis of CATL

PEST method is a comprehensive analysis method for the macro environment of an enterprise.

(1) Political environment: In 2012 and 2020, the General Office of the State Council issued the "Development Plan for Energy Conservation and New Energy Vehicle Industry (2012-2020)" and "Development Plan for New Energy Vehicle Industry (2021-2035)" documents, all of which indicate that the state has given policy support to new energy enterprises at the political level and provided a good economic operation environment for the development of new energy enterprises.

(2) Economic environment: With the current changes in the economic development of China and even the world, the development of new energy enterprises will change from policy-oriented to consumer demand-oriented. Although Contemporary Amperex Technology Co., Limited's business model is relatively mature and it has strong core competitiveness in cost control, technology iteration and many other aspects, it also faces difficulties such as high upfront investment cost of technology research and development, incremental production capacity and unstable market demand.

(3) Social environment: With the proposal of "peak carbon dioxide emissions, carbon neutral" strategy, healthy, green and sustainable development has gradually taken root in people's hearts. With the continuous improvement of residents' material living standard and consumption ability, new energy vehicles are more and more popular, which will further promote the development of new energy enterprises.

(4) Technological environment: The impact of technological environment on enterprises is decisive. Research and development investment in CATL ncreased from RMB1,632 million in 2017 to RMB7,691 million in 2021, representing an increase of 371.26%. Successful and fruitful patented technologies have provided strong support for enterprise development.

3.2. Analysis on the Indicators of CATL's Sustainable Development Capability

3.2.1. Analysis of business performance

Enterprises generally regard sustainable development as an ideal growth state, which can not only make up for the lack of growth, but also prevent excessive growth. This section applies Higgins' sustainable growth model to analyze the growth of CATL's operating performance from 2017 to 2021. The sustainable growth rate = (net sales rate * total assets turnover rate * retained profit rate * equity multiplier) /(1- net sales rate * total assets turnover rate * equity multiplier).

Table 1. Index data of sustainable growth rate in CATL

Indicators	2017	2018	2019	2020	2021
Net sales margin (%)	20.97	12.62	10.95	12.13	13.7
Total asset turnover (times)	0.51	0.48	0.52	0.39	0.56
Equity multiplier	1.95	2.14	2.47	2.52	3.12
Retained earnings rate (%)	100	91.65	90.31	90.84	100
Actual growth rate (%)	34.4	48.08	54.63	9.9	159.06
Sustainable growth rate (%)	26.35	13 .48	14.55	12.14	31.47
	2017	2018	2019	2020	2021

Higgins' model of sustainable growth refers to the fastest growth rate of a company's sales without exhausting financial resources. The actual growth rate refers to the ratio between the increase in sales for the current year and the sales for the previous year. As can be seen from Figure 1, the real growth rate of CATL in 2017-2021 is basically higher than the sustainable growth rate. This situation may lead to the shortage of enterprise resources, which will lead to a series of financial problems. The company should pay enough attention to avoid the false growth trap. The real growth rate in 2021 was as high as 159.06%, which was three times of the sustainable growth rate. This shows that CATL can use various measures such as financial leverage and the sale of equity to increase the benefits beyond corporate liabilities and maintain the effective operation of corporate capital.

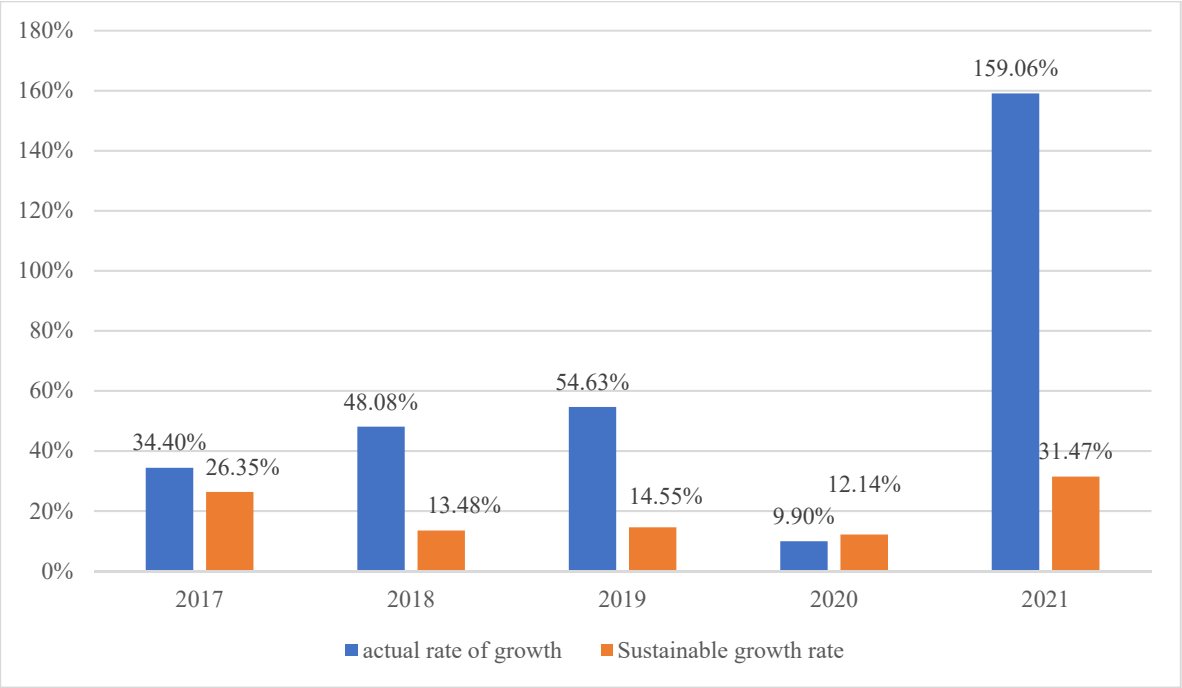

Figure 1. Indicator Chart of Sustainable Growth Rate of CATL

In Figure 2, compared with EVE, a new energy enterprise that has been deeply involved in the lithium battery industry for many years, the net sales interest rate of CATL from 2017 to 2021 generally showed a "U" line change trend of first decrease and then increase, while the net sales interest rate of IBLI showed an overall fluctuating upward trend in the past five years. On the whole, the profitability of CATL was weaker than IBLI, but the gap was gradually narrowing.

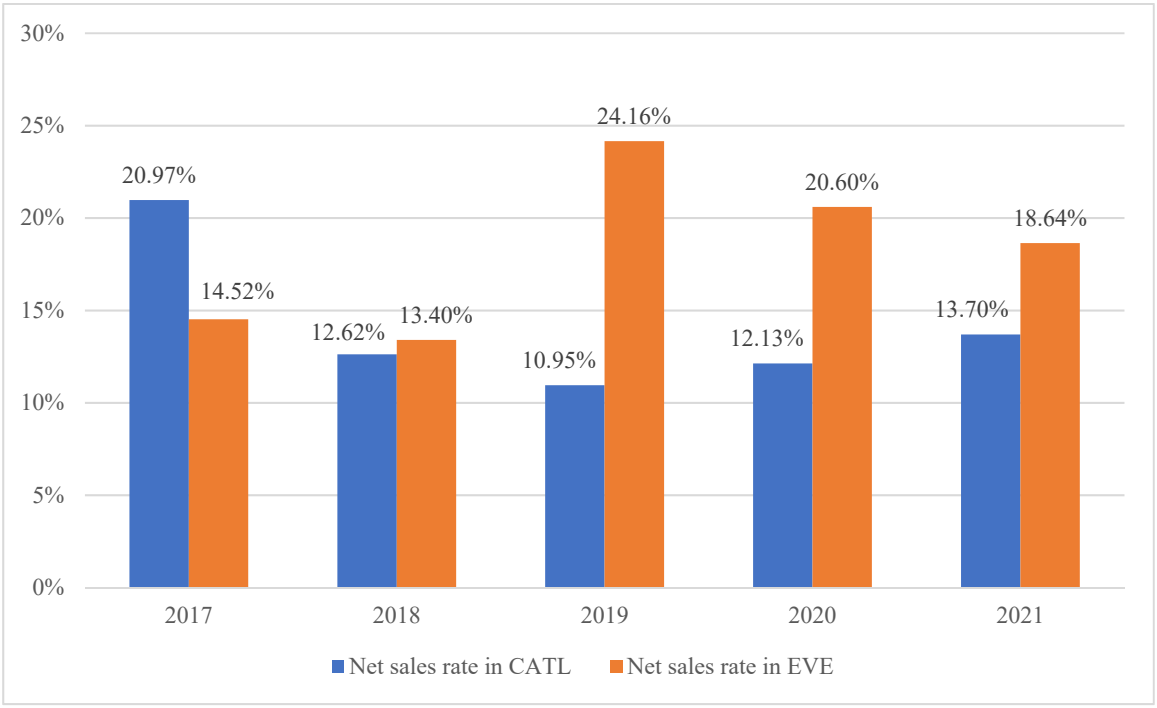

Figure 2. Comparison of net sales interest rates of CATL and EVE

In Figure 3, the sustainable growth rate of CATL from 2017 to 2021 presents a "W" growth trend, which is about 10% higher than EVE in 2017 and 2021, and the average annual growth rate of CATL from 2018 to 2020 is lower than EVE. The reason is that CATL is obviously affected by the policies. With the decrease of government subsidies, the increase of costs, relative overcapacity and the decrease of total assets turnover rate, the sustainable growth rate is affected.

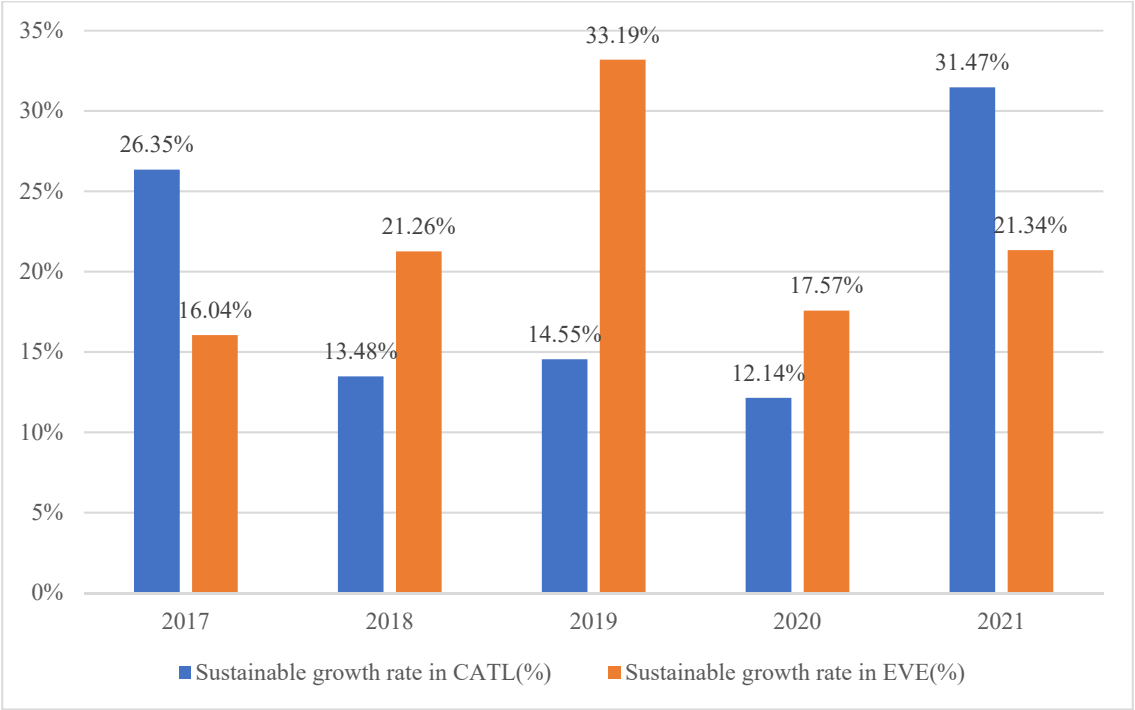

Figure 3. Comparison of sustainable growth rate between CATL and EVE

3.2.2. Analysis of Innovation Investment

Science and technology are the primary productive forces. New energy industry is a technology-intensive and knowledge-intensive industry. Technology and products are the lifeblood of the development of new energy enterprises. Details of CATL's innovation input are shown in Table 2. From 2017 to 2021, CATL's R&D personnel continued to increase, with a growth rate of 194.28%. By the end of 2021, the proportion of high-quality talents such as master's degree and doctor's degree among R&D personnel reached 22.38%. The investment in research and development has been continuously increasing, nearly quadrupled in five years. The number of patents increased by 283.19%. The innovation input of CATL has obtained positive feedback, and the research and development business of the enterprise has shown a good development trend, which also indicates that CATL has good growth performance, and the continuous growth of its research and development input will further stimulate its development potential.

Table 2. CATL innovation input index data for 2017-2021

Indicators	2017	2018	2019	2020	2021
Research and development staff (pcs)	3,425	4,217	5,364	5,592	10,079
R&D investment (billion yuan)	16.32	19.91	29.92	35.69	76.91
Number of patents (pcs)	1,160	1,656	2,484	3,317	4,445

3.2.3. Social responsibility analysis

Corporate social responsibility is a prerequisite for sustainable development. The specific situation of CATL's social responsibility level can be analyzed through indicators such as accurate poverty alleviation fund investment, organization of volunteer activities, number of people taking part in volunteer activities, number of difficult mutual funds used, and amount of difficult mutual funds used.

Table 3. The Social Responsibility of CATL in 2018-2021

Indicators	2018	2019	2020	2021
Precise Poverty Alleviation Fund Investment (million Yuan)	26,218	47,199	30,968	35,958
Organizing volunteer activities (times)	70	106	129	210
Number of participants in volunteer activities	5,600	8,480	5,919	12,175
Number of difficult mutual fund uses	46	79	69	97
Amount of Difficult Mutual Fund Used (Yuan)	414,782	1,289,906	1,017,422	1,513,600

CATL has actively carried out precision poverty alleviation activities in the fields of industrial development poverty alleviation, education poverty alleviation and targeted poverty alleviation. The investment in precision poverty alleviation funds is on the rise. In 2020, 11.266 million yuan was donated for fighting epidemic, in 2021, 25.0918 million yuan was donated for flood relief, and in 2018-2021, 1.404 billion yuan was invested for precision poverty alleviation, see Table 3. CATL established the "CATL Volunteer Service Team" in 2017 to continuously carry out public welfare and

voluntary environmental protection activities. By the end of 2021, a total of 12,175 employees had participated in the "CATL Volunteer Service Team" and organized 210 volunteer activities that year.

CATL established the CATL Mutual Aid Society in 2015. From 2015 to 2021, it provided 330 times of difficult help to the staff in difficulty and paid 4,448,400 yuan of mutual aid funds in difficulty. The number and amount of difficult mutual funds used each year have shown an upward trend, as shown in Table 3. CATL this measure has effectively reduced the economic burden of the difficult staff, provided the safeguard for the staff and their families' lives, and promoted the sustainable development of CATL.

3.2.4. Analysis of Green Development

The original intention of the rise of new energy enterprises is to solve the one-time non-renewable problem of traditional energy and its environmental problems, and then to promote the adjustment of energy structure, protect the environment and promote sustainable development. In this section, the specific situation of CATL's green development level is mainly analyzed through four indicators, namely, hazardous solid waste treatment capacity, general industrial solid waste treatment capacity, photovoltaic power generation capacity and the proportion of recyclable packaging.

Table 4. The green development indicators of CATL in 2018-2021

Indicators	2018	2019	2020	2021
Hazardous Solid Waste Disposal Capacity (Tons)	467	1,238.13	1,376	4,960.38
General industrial solid waste treatment capacity (tons)	81,068.94	134,383.49	146,763	303,727.07
Photovoltaic power generation (million kWh)	950	1,388	2,258	4,765.47
Reusable packaging usage (%)	5.00%	28.00%	60.00%	90.50%

In Table 4, indicators such as CATL hazardous solid waste treatment capacity, general industrial solid waste treatment capacity, photovoltaic power generation capacity and the proportion of recyclable packaging use have all increased year by year. In terms of photovoltaic power generation capacity, it increased by 111.05% in 2021 over the previous year. According to its Environmental, Social and Corporate Governance (ESG) Report 2021, photovoltaic power generation has reduced greenhouse gas emissions by 46,368 tons of carbon dioxide equivalent, and energy-saving projects have reduced a total of 609,630 tons of carbon dioxide equivalent. Overall, CATL has performed well in terms of energy conservation and emission reduction, and the enterprise has a strong capacity for sustainable development.

4. Shortcomings of CATL's Sustainable Development Capability

As a hot research technology, moving target tracking technology has been widely used in various fields. With the help of low cost, low power consumption, self-organization and high error tolerance of wireless sensor networks, moving target tracking based on wireless sensor networks also has broad application prospects.

4.1. The policy is highly dependent and some indicators are not ideal.

The impact of the withdrawal of state subsidy policy on CATL is obvious. For example, the decrease in profit margin of main business and net sales interest rate was affected by the policies to varying degrees. At the beginning of the development of new energy enterprises, the preferential policies given by the state let CATL seize the opportunity to quickly occupy the market. However, facing the reality that the government subsidies for the new energy industry are gradually ending, CATL urgently needs to take corresponding measures to avoid impact on the sustainable development ability.

4.2. The profit margin has been reduced and the production capacity has been overcapacity in stages.

Although the income of CATL's main business grew rapidly, the impact of changes in cost and sales unit price could not be completely offset at present, and the profit margin showed a downward trend year by year. As the domestic power battery market gradually matures, the upstream cost pressure continues to increase. In order to seize the market, the expansion of CATL's production capacity will lead to the phenomenon of stage overcapacity. Its inventory management capability needs to be strengthened and the inventory elimination strategy needs to be implemented.

4.3. The major market is single and the technical direction is uncertain.

In 2021, 78.62% of the major revenue of CATL came from within China and only 21.38% came from overseas. Although the percentage of overseas revenue increased from 15.71% in 2020, the contribution from overseas market was relatively small. With the entry of major international competitors such as Japan's Panasonic and Samsung SDI, CATL's domestic market share is also threatened. Therefore, it is an urgent problem for CATL to resolve the dilemma of single market dependence. At the same time, although the existing technology of CATL can meet the current market demand, many competitors have launched research and development, new technologies emerge in endlessly, and the development of new energy enterprises has gradually become "technology-oriented", which has exacerbated the uncertainty of enterprise technology development.

5. Suggestions on Improving the Sustainable Development Capacity of CATL

5.1. Deepen the layout of the whole industrial chain and seize the global market share

Affected by the policy, the phenomenon of shrinking profit

space of CATL will not disappear in the short term. If you want to maintain a good profit space, you can deepen the layout from upstream raw materials to downstream vehicle business. From the upstream perspective, first-hand acquisition of raw materials can not only reduce the costs incurred in the transportation process, but also accelerate the development of waste battery recycling business and solve the resource problem of insufficient raw materials. From the downstream perspective, the layout of the entire vehicle industry can not only enhance the bargaining power, but also enable enterprises to obtain new profit growth points. In order to enhance the sustainable development capability of the enterprise, CATL also needs to continue to consolidate the covered overseas markets, actively explore more emerging markets and seek new profit growth points, relying on the foundation of foreign capital cooperation laid at present.

5.2. Strengthen the management of technological innovation and build a multi-party cooperation platform

New energy enterprises are technology-intensive enterprises, and technology and products are the lifeblood of enterprise development. Although CATL has invested more in research and development, it still needs to pay attention to technological innovation and continue to increase its investment in technological research and research and development. With a long-term strategic vision, CATL will conduct research and development while producing, and improve and develop in production to promote production through research and development. At the same time, it will form an innovation consortium with the government, schools and enterprises to consolidate the "leading" advantage and enhance the enterprise's voice in the world.

5.3. Actively fulfill social responsibilities and continuously improve social satisfaction

CATL's social responsibility performance is relatively good, but judging from its corporate social responsibility report, the information covered is not particularly sufficient, and the disclosure content is mostly advantageous information. As a leading enterprise of new energy in China, CATL still needs to strengthen the performance of social responsibility, further improve the information disclosure of corporate social responsibility report, set an example for latecomers and improve the satisfaction of all social parties.

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