Profitability analysis of hydropower enterprises - Take GGEP as an example

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Abstract. Profitability is an important part of the business activities of an enterprise. This paper focuses on analyzing the profitability of listed hydropower companies by taking GGEP as an example, and also discusses the environmental factors affecting the profitability of GGEP, and puts forward suggestions to improve the profitability of enterprises.

1. Introduction
In China's energy consumption structure, coal, oil, natural gas and other petrochemical energy occupy a dominant position, but its non-renewable and environmental pollution become social harmonious development constraints, the development of clean renewable energy is imperative. In recent years, the state has issued a series of policies to support the development of renewable energy. Hydropower resources, as a kind of clean energy, have many advantages such as pollution-free, renewable and low cost. It can not only improve China's energy demand structure, but also reduce the serious environmental pollution caused by traditional petrochemical energy, which has long-term strategic significance for China's economic development. With the rapid development of science and technology and economic globalization, the competition among enterprises under the leadership of market economy is becoming increasingly fierce. Enterprise scale and product price are the main competitive factors among enterprises. The increase of labor cost and environmental protection investment directly leads to the increase of production cost and the decline of economic benefits of enterprises, which weakens their competitiveness. How to improve economic efficiency and maintain competitiveness is the key to the development of hydropower enterprises.

Profitability is an important indicator to measure the economic benefits of enterprises. This paper takes the listed company GGEP as an example to analyse the relevant data in the accounting statements from the perspective of financial indicators, such as net profit, operating cost, operating margin and so on, which are closely related to profitability, and to discuss the improvement of economic efficiency and existing problems of enterprises. Profitability refers to the ability of an enterprise to obtain revenue or profit from unit cost within a certain period of time. The strength of profitability determines the subsequent development and competitiveness of enterprises. At present, the development of hydropower enterprises has attracted much attention. Both small and medium-sized hydropower enterprises and large hydropower enterprises are affected by geographical, environmental and climatic factors, and most of them have problems such as single business model and weak profitability to varying degrees.
2. Analysis of the profitability of GGEP

2.1. Profitability analysis indicators and methods

According to the relevant financial indicators analyzed in the financial statement released by the listed company, including cost profit margin, operating gross margin, operating gross margin and financial expense ratio, etc., the index data is used to evaluate the operation and management ability and economic benefit of the enterprise in a certain period.

Carry out profit analysis according to the change range, year-on-year growth or year-on-year decline of net profit, total profit and operating profit related data; Carry out cost analysis according to the fluctuation range and increase or decrease rate of operating cost, other business cost, management cost, financial cost and sales cost data; According to the operating income and other business income data, analyze the income, change range, year-on-year growth or year-on-year decline, and evaluate the fluctuation of gross income.

2.2. GGEP basic overview

Guangxi Guiguan Electric Power Co., Ltd(GGEP) for DaTang Group subsidiary, stock code 600236, main business is the development of hydropower, both electric energy development, thermal power generation, power transmission and transformation project, a small amount of clean energy power generation, the registered capital of 6.06 billion yuan, the company profit growth since it was founded in 1997, 154 million yuan to 2 billion yuan today, operating income increased by 468 million yuan in 2015 to more than 10 billion yuan. At present, the hydropower stations in which GGEP has full ownership include LongTan hydropower plant, DaHua hydropower plant, BaiLongTan hydropower plant, ShanDong wind power and SiGe wind power. In addition, the company owns 70% of the YanTan hydropower plant, 52% of the LeTan hydropower plant, 65% of the YanDu River in HuBei province and 83.24% of the HeShan power station. The LongTan hydropower station is the second largest hydropower station in China after the Three Gorges hydropower station, generating about 18.7 billion kilowatt-hours per year.

2.3. Analysis of financial indicators of GGEP

The enterprise's profitability is directly reflected in the relevant data of the income statement. The following is the analysis of the data of the last six years according to the financial statements released by the listed company.

2.3.1. Analysis of indicators related to net profit and operating income

| Table 1. Indicators of net profit and operating income |
|---------------------------------------------|
| Indicators | 2017 | 2016 | 2015 | 2014 | 2013 | 2012 |
| Earnings per share (Yuan) | 0.41 | 0.43 | 0.54 | 0.26 | 0.10 | 0.13 |
| Net profit(Billion Yuan) | 2.092 | 2.595 | 2.569 | 1.450 | 0.225 | 0.287 |
| Net profit growth rate (%) | -19.38 | -12.07 | 7.718 | 16.308 | -21.38 | 48.61 |
| Total operating cost(Billion Yuan) | 4.079 | 5.397 | 6.398 | 6.966 | 4.594 | 4.844 |
| Gross operating income(Billion Yuan) | 6.508 | 8.565 | 10.311 | 9.314 | 4.944 | 5.198 |
| Growth rate of operating income (%) | -24.02 | -16.93 | 10.71 | 15.36 | 544.44 | -21.60 |

The table 1 shows that GGEP profit for the year after 2013 has a more substantial improvement, mainly because the crown power successful acquisition of LongTan hydropower station, based on the enterprise only 3.3 billion assets, total assets of the acquired by means of equity financing and debt of up to 15 billion of LongTan hydropower station, successfully expanded the scale of the enterprise, make enterprise profit ability to rise to a new level. At the same time, earnings per share also increased significantly, from 0.10 yuan to 0.54 yuan in 2013-2015. After that, in 2015 and 2016, although corporate
profits increased slightly on a stable basis, the earnings per share showed a downward trend, falling to 0.41 yuan per share in 2017, showing a downward trend, but still maintained a relatively high level on the whole.

From the perspective of the indicators of operating income, after the acquisition of LongTan Hydropower Company in 2013, the turnover increased significantly. In 2014, it began to show a process of rising and then falling. In 2017, the operating income dropped by 24.02 percentage points compared with the same period, and the net profit also decreased accordingly.

GGPE's main business is hydropower development, and its total operating profit and net profit are in a positive ratio. In the same year, the value of the first half of the year is lower than that of the second half of the year, that is, there is a significant difference between the profitability of the first half and the second half of the year. But the winter temperature moderate, the rainfall is little, the income reduces. But also has the seasonal difference on the electricity demand, this is also the south hydropower enterprise universal existence phenomenon.

In general, a large enterprise tends to be stable and mature after a period of rapid development, and the growth rate will also decline. The significant decrease of GGEP is mainly due to the decrease of water inflow in the hydropower development basin in 2016 and 2017, resulting in the decrease of power generation. In addition, the reduction of the proportion of tax rebate of the VAT preferential policies for large hydropower enterprises makes the tax rebate income of enterprises less than that of previous years.

2.3.2. Analysis of indicators related to operating costs and period expenses

Table 2. Variation table of laurel power cost analysis

| Indicators                  | 2017     | 2016     | 2015     | 2014     | 2013     | 2012     |
|----------------------------|----------|----------|----------|----------|----------|----------|
| Net profit (Billion Yuan)  | 2.092    | 2.595    | 2.569    | 1.450    | 0.225    | 0.287    |
| Total operating cost       | 4.079    | 5.397    | 6.998    | 6.966    | 4.594    | 4.844    |
| Cost margin (%)            | 51.29    | 48.08    | 36.71    | 20.72    | 4.90     | 5.93     |
| Management fees (Billion Yuan) | 0.335   | 0.318    | 0.324    | 0.320    | 0.289    | 0.246    |
| Finance charges (Billion Yuan) | 0.986  | 1.051    | 1.579    | 1.825    | 0.828    | 0.640    |

Table 3. Changjiang power cost change analysis table

| Indicators                  | 2017     | 2016     | 2015     | 2014     | 2013     | 2012     |
|----------------------------|----------|----------|----------|----------|----------|----------|
| Net profit (Billion Yuan)  | 22.261   | 20.781   | 18.235   | 11.830   | 8.993    | 10.352   |
| Total operating cost       | 27.471   | 27.931   | 28.545   | 14.415   | 14.356   | 15.349   |
| Cost margin (%)            | 51.29    | 74.40    | 63.88    | 82.07    | 62.64    | 69.36    |
| Management fees (Billion Yuan) | 0.840  | 0.825    | 0.878    | 0.534    | 0.542    | 0.559    |
| Cost of sales (Billion Yuan) | 0.019  | 0.0081   | 0.0047   | 0.0075   | 0.0074   | 0.0083   |
| Finance charges (Billion Yuan) | 5.897  | 6.679    | 8.781    | 3.404    | 3.787    | 4.634    |

Yangtze Power is the largest reservoir resource in China. The company's total installed capacity reaches 11.132 million kilowatts. GGEP is worthy to study the power generation technology, process management, installed capacity and sales and power transmission.

The relevant data of cost and profit in the profit statement in table 2 and table 3 are compared to find the problems existing in GGEP enterprises. As a deduction item of profit, cost supervision is of great significance to enterprises. It can be seen from the data of the recent six years that GGEP's cost profit margin is between 53% and 70%, while Yangtze power's cost profit margin is between 51% and 83% in the same period, which is higher than GGEP's overall 10%. Therefore, GGEP has a large room for improvement in cost supervision. It can reduce material shortage, excessive consumption or wastage through the storage of materials and the implementation of personal responsibility in each hydropower construction process. Timely shut down the turbine unit, reduce the speed of the old loss of the machine.
Enhance the sense of responsibility and cost saving of employees, strengthen management, clarify the rights and responsibilities, and effectively reduce costs.

From the financial cost of laurel power in table 2, the financial expense accounts for 24.17% in 2017, 19.47% in 2016, 22.56% in 2015 and 26.32% in 2014, respectively. On the whole, the output proportion of financial expenses is relatively high. The main reason is that GGPE has increased its shareholding proportion in LongTan hydropower enterprises in recent years, and invested hundreds of millions of yuan in other power generation and power sales companies. Merger and acquisition activities have increased the expenditure of financial expenses, especially the interest expense of financing. GGPE financial report shows that the average interest payable in the past three years is between 50 million yuan and 125 million yuan, showing a rising trend. Therefore, it is necessary to make rational financing planning, strengthen fund management, reduce idle funds, effectively manage financing balance and reduce the proportion of financial expenses.

2.3.3. Operating margin related indicators analysis

| Table 4. GGEP operating margin statement |
|-----------------------------------------|
| Indicators                              | 2017  | 2016  | 2015  | 2014  | 2013  | 2012  |
| Operating income (Billion Yuan)         | 87.75 | 85.65 | 103.11| 93.14 | 49.44 | 51.98 |
| Operating cost (Billion Yuan)           | 39.45 | 38.70 | 42.61 | 46.75 | 34.40 | 36.84 |
| Operating margin (Billion Yuan)         | 48.30 | 46.95 | 60.50 | 46.39 | 15.04 | 15.14 |
| Gross Margin (%)                        | 55.05 | 54.82 | 58.68 | 49.81 | 30.42 | 29.18 |

According to the data of the national bureau of statistics, in 2017, the operating cost for each hundred yuan of operating income of industries above the national scale was about 85.69 yuan, so its operating gross profit was (100-85.69)/85.69=16.7%, and the average operating gross profit of industries above the national scale in the recent three years was 16.694%.

GGPE is the representative of the hydropower industry, the average operating gross profit in the past five years is 45.4%, far exceeding the national average. From table 1, table 2 and table 3, it can be seen that operating profit is usually several times of operating cost, and the proportion of sales expenses is also very small, which just reflects the natural advantages of hydropower enterprises. Hydroelectricity "supplier" is nature and steep terrain, raw material supply cost is zero; Located in the Hongshui river valley, the terrain has a large drop; for a long time, most of the hydropower produced was sold to state-owned enterprises, such as China southern power grid, at a low cost.

However, the construction of hydropower enterprises, such as the purchase of turbine units, topography survey, and reservoir construction and so on are huge projects. At the same time, the economic benefits of hydropower enterprises are greatly influenced by the environment, in the drought season or river water, water shortage, less electricity, water and electricity enterprise income will be significantly lower, or with floods, for consideration of the reach of the reservoir dam, and the follow-up of the enterprise having safety measures, etc., are directly affect the profitability of the enterprise.

3. GGEP development environment analysis

3.1. Opportunities for enterprise development

West-east power transmission project provides broad prospects for enterprises. The transmission of electricity from west to east is one of the major projects of the "western development", which drives the economic and employment development of the relatively backward western regions and also alleviates the energy shortage in the eastern coastal areas. The state has invested a large amount of funds and has basically completed the construction of power transmission facilities. The setting of the south line of the west-east power transmission to the south region is precisely to send the power resources of Kangxi and Yunnan to Guangdong, which undoubtedly opens a huge market for GGEP and other enterprises and
brings broad prospects for development. The largest hydropower station under GGEP, LongTan hydropower station, has a 216-meter-high dam with a reservoir capacity of more than 20 billion cubic meters. The generator has a generating capacity of 5.4 million kilowatts. The annual capacity is 18.7 billion kilowatt hours. According to the survey, by the end of December 2016, the hydropower station had delivered nearly 70 percent of the electricity in Guangdong province, which is short of electricity.

Relevant preferential policies of the national government. Hydropower resources are pollution-free and renewable, which are of great significance to the improvement of atmospheric quality. The state has issued a series of policies to support the development of the hydropower industry, giving considerable preferential policies. The policy stipulates that from January 2013 to December 2015, if the value-added tax exceeds the actual tax burden by more than 8%, some of the power products whose installed capacity is 10 million kilowatts and whose assets are sold in large hydropower stations can be collected and refunded immediately. From January 2016 to December 2017, the part of VAT greater than the actual tax burden of more than 12% will be refunded on demand. According to statistics, the YanTan hydropower station under GGEP received 174 million yuan in tax return from 2013 to 2017. GGEP's net profit rose by 120 million yuan in just five years, based on its stake.

3.2. Businesses are under threat
Regional supply and demand contradiction is enlarged. The Guangxi region has plenty of water, steep terrain, large hydropower station, and thermal capacity, can produce more than 30 billion kilowatt-hours of electricity throughout the year, except China send the downtown project, less actual industrial and residential electricity required in Guangxi region, and to generate electricity cannot be the characteristics of mass storage, led to the contradiction between supply and demand within the region of Guangxi region. It is reported that in July 2017, LongTan hydropower station made the decision to abandon the water at the peak of the peak, giving up all the water in the Hongshui river basin level 9 dam. The main reason is that there is no place to sell the output power. Guangxi itself lacks electricity, and excessive production capacity will increase machine losses and labor costs. The water equivalent to give up more than 11 million kilowatts of electricity, the day are reduced by more than 100 million KWH, a profit reduction of 20 million yuan.

Yunnan's power transmission to Guangxi presents challenges. Yunnan's main source of hydropower is the development of the JinSha river basin, which can generate 504.1 billion kilowatt-hours of electricity a year. Due to the shortage of kerosene and natural gas in Guangxi, cloud power transmission to Guangxi may be of great significance for regulating the energy market in Guangxi. However, for local hydropower enterprises in Guangxi, Yunnan's electric power undoubtedly emerges as a challenger, leading to the increasingly saturated electricity market in Guangxi.

4. Recommendations to improve GGEP's profitability

4.1. Dynamic management, optimize scheduling
Due to the climate in Guangxi, there are obvious differences between the wet season and the dry season, but the market demand in winter and summer is different, and the generation capacity also needs reasonable scheduling. When the amount of incoming water is less, when the electricity price can be higher, the dynamic management of the reservoir makes the optimal scheduling very important. The communication with upstream reservoir power station should be done well, the situation of incoming water should be mastered, the sediment content of incoming water should be understood, and the future power generation plan should be made to reduce water abandonment. Pay more attention to weather conditions, according to the dynamic management of rainfall reservoir capacity.

4.2. Expand the fishery of reservoir area, drive travel industry
Hydropower enterprises have the right to use water resources in mountainous areas. The vast and good water resources in the reservoir provide the possibility for the development of fishery. Hongshuihe river basin is a subtropical monsoon climate, hot rain at the same time, suitable for fish growth. The
development of fishery can also promote the development of tourism. Guangxi has beautiful natural scenery. The development of fishery in the reservoir area can activate the reservoir, increase the cultural atmosphere and attract tourists. Learn from the successful experience of others, strengthen management, improve the level of industrialization, and better promote their own development.

4.3. Expand diversified businesses and enhance financial management ability

The hydropower enterprises under GGEP are rich in water resources and wind energy, which are clean, renewable, low-cost and quick to take effect. In terms of external environment, the wind power industry is in a downturn. Clean energy has been strongly advocated by the state and the government. The "three exemptions and three halving" policy has been implemented for the wind power industry, which also provides favorable conditions for the development of wind power. In 2009, GGEP acquired 100% of the equity of Dongyuan wind power and formally entered the wind power industry. In 2013, more than 400 million yuan was invested in the construction of Taiyangping wind farm in Zunyi, Guizhou. These resources should be organically combined to develop diversified businesses in clean energy. In addition, enterprises should improve their financial management ability and reduce their financial operation cost in M&A. As a listed company, it has a relatively large number of financing methods and channels. Therefore, it is necessary for the enterprise to make a capital utilization plan so that the capital can be effectively and reasonably used, and put the temporarily idle capital and fixed assets into production to improve the profitability of the enterprise. At the same time, we should optimize production procedures, smooth production, sales channels and other ways to reduce the cost of enterprises, gradually enhance the financial competitiveness of enterprises, and enhance the core competitiveness.

4.4. Actively participate in the new electricity to adapt to market development

In this way, for hydropower enterprises, the fixed sales link has been broken in the past. As a kind of commodity, power resources are no longer uniformly allocated by the government, but play the role of the market, which not only gives hydropower enterprises the opportunity to develop, but also increases the pressure of making profits. Of course, such a practice is conducive to optimizing the allocation of resources, allocating the relationship between supply and demand in an economic form, and broadening the vitality and space of hydropower development as a clean energy. To facilitate the entry of more private hydropower enterprises; to break up the market monopoly and regional monopoly; It is also conducive to the role of the market. For GGEP, the cost of sales is relatively small, so it is necessary to optimize the sales model, expand market demand and strengthen the improvement of profitability. 

5. Conclusion

With the development of science and technology and Internet technology, hydropower enterprises should strengthen the application of new technologies, conduct hydrological monitoring and fishery breeding with the help of Internet technology, strengthen the technological innovation of hydropower and wind power, and promote the improvement of power generation efficiency. The state attaches importance to and supports environmental protection, and hydropower enterprises will also embrace new development opportunities. Enterprises should improve their competitiveness by optimizing the financial management of production and sales, reducing their financial operation costs, expanding market channels and improving their overall profitability.

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