Research On Investment in The New Energy Vehicle and Power Battery Market Based on Fundamentals and Technologies

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Abstract. The new energy vehicle market and the power battery industry showed steady growth, especially in April, although it was the off-season, the power battery market boomed. The concentration of China's power battery market has increased, led by CATL. The Ministry of Industry and Information Technology (MIIT) issued new specifications aimed at improving the quality and market concentration of battery products. Big technology companies at home and abroad are involved in the new energy vehicle market, indicating that new energy vehicles will be the dominant market in the future. The rise of a number of new energy vehicle brands is beneficial to CATL, and the cooperation may increase revenue and market value. The article analyzes the macro economy, the state of the new energy and lithium battery industries, and the development prospects of CATL. Technicals and stock market sector rotation are also included in the comprehensive analysis, looking forward to market investment opportunities and risks.

Keywords: Fundamentals, technical aspects, new energy vehicles, lithium batteries.

1. Introduction

On March 25, 2024, Zeng Yuqun, chairman of CATL, revealed at the event that it is working with Tesla to develop "batteries with faster charging speeds", and CATL is providing equipment to Tesla's factory in Nevada, USA [1]. Because of its outstanding performance in the capital market, even the media and analysts call it "King Ning". In the past 2021, CATL's share price has climbed to a stage high of 692 yuan, and its total market value has ranked among the top three in the two cities. Undoubtedly, CATL has caught up with the trend of the industry and embarked on a leapfrog road of butterfly change. Focusing on this leading player in the field of new energy vehicle batteries, its growth path and logic, the advantages and position of market competition, as well as its future strategic direction and challenges are all important contents of the industry's focus [2]. This article explains the disadvantages of choosing journals, the direction they point out is basically fundamentals, and their articles describe the fundamentals too microscopicly.CATL is the largest weighted stock on the A-share GEM, accounting for a large part of the market capitalization of the GEM,.At the same time, this paper carefully describes the fundamental analysis method from the macro economy to the new energy industry, and then to the lithium battery industry, from large to small, from macro to micro, and also uses PEST theory analysis in the macro background, which can lead readers to understand CATL more comprehensively and more convincingly.Through these comprehensive aspects, this article gives readers more reliable investment advice.

2. Analysis of fundamental factors in securities investment

2.1. Macroeconomic Analysis

2.1.1 Change in headline CPI

In 2023, the global economy will slowly recover and show resilience from negative factors such as frequent geopolitical conflicts, complex and severe external environment, and rising uncertainty, but growth will remain slow and uneven, which is partly reflected in the fluctuations of CPI in various countries. In the past year, China's economic operation has continued to stabilize and rebound, and the recovery has continued to improve, grain production has been "20 consecutive bumpers,"

industrial production and supply have steadily rebounded, investment and consumption demand has continued to recover, the balance of payments has continued to improve, and the overall price level has risen moderately. [3] In 2024, the fundamentals of economic stability and long-term improvement have not changed, but the external environment is still complex and severe, and there are still many uncertainties and unstable factors. 2024 YoY: CPI increased by 0.1% year-on-year in March, slowing down from previous months. Non-food prices rose 0.7 percent year-on-year, while food prices fell 2.7 percent year-on-year. MoM: CPI fell 1.0% m/m in March, of which food prices fell 3.2% m/m and non-food prices fell 0.5%.

2.1.2 Fiscal and tax policies and financial policies

Fiscal and tax policies:

1. Tax and fee reduction:VAT reform: Reducing the VAT rate from 16% to 13% in manufacturing and other industries to further reduce the tax burden on enterprises and support the development of the real economy.

2. Support scientific and technological innovation:

Additional deduction of R&D expenses: Implement an additional deduction policy for R&D expenses of enterprises, encourage enterprises to increase R&D investment, and enhance technological innovation capabilities.

Preferential treatment for high-tech enterprises: For qualified high-tech enterprises, the enterprise income tax will be levied at a reduced rate of 15% to support the development of high-tech financial policy

Monetary policy:

1.RRR and interest rate cuts: By reducing the reserve requirement ratio and benchmark interest rate, we will increase market liquidity, reduce corporate financing costs, and support economic growth.

Reverse repo operation: Regulate market liquidity and maintain the stability of the financial system through open market operations.

2.Strengthen financial supervision: Strengthen supervision in areas such as shadow banking and internet finance to prevent systemic financial risks and maintain financial stability.

Improve the financial risk prevention and control mechanism: Establish and improve the financial risk early warning and emergency response mechanism and improve the risk management capacity of financial institutions industries.

2.1.3 The impact of Fed rate cut expectations on China

1. In terms of imports and exports, the Federal Reserve's interest rate cut measures have exacerbated the continued depreciation of the US dollar, and the decline in domestic inflation income in the United States has led to a decline in people's demand, which has an impact on China's exports. The renminbi has increased the pressure to appreciate [4].

2. Capital market, promote a large number of dollars to enter China, invest in the capital market, and increase the uncertainty of China's asset market. In the short term, this is a good thing for the capital market, but in the long term, it may not be the case.

2.2. Micro-analysis of industries and companies

2.2.1The current state of the new energy industry

The traditional energy source in our country has been decreasing, so for the new energy.The development of the source has become a matter of concern to the public and government departments Title. At this stage, China's energy and environmental problems have encountered unprecedented[5].Some problems are imminent for the development of new energyAt the beginning of the 21st century, with the increasingly serious global climate problem and the outbreak of energy security problems, the new energy industry has once again been pushed to the forefront, the government's support from the policy perspective and the continuous growth of industry investment, the core technology of the new energy industry has been continuously optimized and improved, and

the production cost has gradually decreased, including wind energy, hydropower, solar energy, geothermal energy, marine energy, biomass energy and other new energy from nature, with renewable and environmentally friendly characteristics, and has gradually become an important component of the global energy structureand gradually realize the product-level landing of commercial and civilian. The development of China's new energy industry can be traced back to the 90s of the last century, the Chinese government has long realized the rapid development of reform and opening up, although it is an opportunity of the times, we have also paid a certain degree of environmental price, in order to improve the quality of sustainable development of the future society, we must closely link the development of new energy with the sustainable development strategy.

Macro analysis of PEST:

Macro factors will affect the development of an industry from a more long-term and comprehensive scope, macro factors will also be closely related to the performance of the securities market, evaluate the macro factors of an enterprise environment, mainly using PEST model, from the policy, economy, society, technology four dimensions to discuss the new energy industry.

1. Policy factors

China's policy support for new energy is very strong, mainly reflected in subsidy policies, tax incentives, market access, technology research and development and other aspects. The following are the key policies in recent years:

In 2023

"Guiding Opinions on Accelerating the Establishment of a Green, Low-Carbon and Circular Development Economic System": Emphasizing the importance of green and low-carbon development and proposing specific measures to accelerate the innovation and promotion and application of new energy technologies.

"Several Opinions on Promoting the High-quality Development of New Energy and Energy Storage Industry": Focus on supporting the development of new energy and energy storage industry and put forward specific measures in terms of financial support, technology research and development, and market application.

These policies reflect the great importance and strong support of the Chinese government for the new energy industry, aiming to promote the progress and market popularization of new energy technology, and help achieve the goals of carbon peak and carbon neutrality. In recent years, there have been many favorable policies for new energy vehicles, and the relationship between the two has been clearly explained above.

2. Economic factors

Analyzing the economic factors and profitability of the new energy industry in combination with China's GDP in 2023 can provide a more comprehensive perspective. In 2023, China's GDP growth will be around 5.2%, reflecting the steady performance of the economy in the post-pandemic recovery and sustained growth.

The impact of economic growth on market demand.With the growth of the economy and the improvement of residents' income level, the public's demand for green energy and environmentally friendly products has increased. This provides a broad market space for the new energy industry. The recovery in manufacturing and other industrial sectors has increased the demand for energy, especially clean energy, to meet environmental regulations and carbon reduction targets.

Economic growth has promoted the vitality of the capital market and attracted more investors to pay attention to the new energy sector. The inflow of capital has helped enterprises to upgrade their technology and expand their production, enhancing their overall competitiveness. With the steady growth of the economy, the government has more financial capacity to support new energy projects and promote the development of the new energy industry through subsidies, tax incentives and direct investment.

3. Cost and price

Economic growth has led to higher commodity prices, which may exert some pressure on the production cost of new energy equipment. However, technological advances and economies of scale

can partially offset the impact of these rising costs. As the economy grows, the government may adjust the electricity price policy to promote the use of renewable energy. This policy orientation can help improve the profitability of new energy power generation projects. At present, in the previous wave of the power sector, there are already rumors that the price of electricity will rise. Increased demand for electricity due to economic recovery: Economic growth has driven an increase in demand for electricity, especially in the industrial and commercial sectors, which has brought more market opportunities and revenue streams for new energy power generation companies. Technological progress has continuously reduced the production cost of new energy sources such as photovoltaic and wind power and increased the profit margin of enterprises. For example, CATL has further reduced the cost of lithium batteries through technological innovation and large-scale production, and improved market competitiveness and profitability.

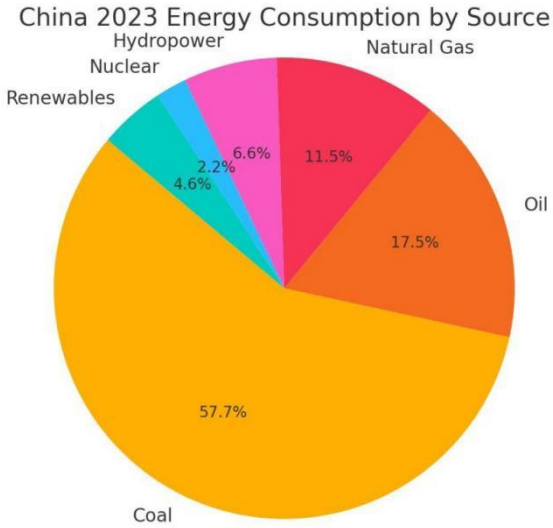

Figure 1. China 2023 Energy Consumption by Source

As shown in Figure 1, coal is still the main source of energy consumption in China, although its share is declining year by year. This is due to the abundant and low cost of coal, but it also brings significant environmental pollution and carbon emission problems.

With economic development and urbanization, the consumption of oil and gas has increased significantly. Natural gas, in particular, is widely used for power generation and heating due to its cleanness.

Renewable Energy Potential:

Although the share of renewable energy is not high at the moment, it is growing at a rapid rate. The strong support of the government and technological progress have promoted the development of wind power and photovoltaic power generation, and their proportion in the energy structure is expected to further increase in the future.

Future Trends:

The Chinese government's 14th Five-Year Plan has set clear targets for reducing carbon emissions and increasing the proportion of renewable energy, and more policies are expected to support the development of new energy sources in the coming years.

Technological progress: With the advancement of technology and the reduction of costs, the application of renewable energy, especially wind power and photovoltaic power, will be more extensive.

Energy structure adjustment: To achieve the goal of carbon neutrality, China will continue to optimize its energy structure, reduce its dependence on coal, and increase the use of clean energy.

2.2.2 The status of lithium batteries in the new energy industry

In March 2024, Premier Li Qiang pointed out in the government work report at the second session of the 14th National People's Congress that in 2023.The annual production and sales of new energy

vehicles account for more than 60% of the world's total, and the export of electric vehicles, lithium batteries, and photovoltaic products has increased by nearly 30%. China" New Three.[6] The excellent performance is the result of China's pursuit of high-quality development, which plays an important role in enhancing the country's economic capacity.New energy vehicle battery refers to the use of non-fossil energy as raw materials.The electrical energy generated after chemical or physical changes is the realization of the work of new energy vehicles. The core component of energy [7]. In 2022, the export volume of lithium-ion batteries will be 3.773 billion, and in 2021, the export volume will be 3.428 billion, an increase of 10.1% year-on-year. The export value of lithium-ion batteries in 2022 is:50.919 billion US dollars, and the export value in 2021 will be 28.428 billion US dollars, an increase of 79.12% year-on-year.[8] This trend is becoming more and more likely for data analysis.

2.2.3 CATL's financial analysis

1.Operational capability analysis

Table 1. CATL's operating capacity from 2019 to 2023

Annual	2019	2020	2021	2022	2023
Accounts receivable turnover ratio	6.29	5.13	7.44	8.04	6.57
Inventory turnover	3.5	2.94	3.60	4.48	5.06
Total Asset Turnover	0.52	0.39	0.56	0.72	0.61

Accounts receivable turnover ratio = total revenue from major operations / average daily balance of accounts payable. The index is mainly used to evaluate the speed of a company's accounts receivable capital turnover. CATL's 2019-2022 index has continued to rise steadily, proving that the company has strong ability to liquidate accounts receivable, fast capital turnover, small bad debt losses, and stable operating conditions [9]. However, As the Table 1 shows,from 2022 to 2023, its index will decline, indicating that some accounts receivable cannot be collected, and the main business will be dragged down by accounts receivable.

Inventory turnover rate = operating costs / average daily inventory amount. As an important indicator reflecting the inventory turnover rate of the enterprise, the inventory turnover rate can measure the stability of the enterprise's inventory and the capital occupation of the inventory, which can help the enterprise to solve the daily production and operation needs at the same time, improve the use of the company's working capital, and also serve as a supplementary description of the enterprise's accounts receivable turnover rate, which is the key data to reflect the capital operation effect of the enterprise in all stages of production and operation and measure its business performance. It can be seen that the inventory turnover rate is increasing year by year, indicating that CATL's inventory is easy to liquidate and circulate, indicating that CATL's capital liquidity capacity is good, and its products are trustworthy.

Net Asset Turnover Ratio = Operating Income / Average Net Asset Balance. The index is usually between 0.8 and 1 is more appropriate, CATL index will gradually increase from 2021 in addition to the initial impact of the new crown epidemic in 2020, considering the continuous rapid rise in its main business income in the past five years, indicating that the sales strength has been further improved, the speed of capital turnover has been improved, and the efficiency of capital use has also been improved. However, it will fall in 2023, probably due to the recent recession in the new energy industry, and there are too many inventories related.

2.Solvency analysis

Table 2. CATL's solvency analysis from 2019 to 2023

Annual	2019	2020	2021	2022	2023
liquidity ratio	1.57	2.05	1.19	1.31	1.56
Quick ratio	1.27	1.77	0.80	0.89	1.19
Cash flow ratio	0.30	0.34	0.29	0.21	0.32

Current Ratio = Current Assets / Current Liabilities. Generally speaking, if the proportion of this index is too large, it means that the current assets are much larger than the current liabilities, and theproportion of liquidity is too large, which reduces the company's capital turnover capacity and profitability, so it is more appropriate to maintain the ratio of 2:1. As the Table 2 shows,Ningde's current ratio was greater than 1 from 2019 to 2023, but it reached its lowest point of 1.19 in 2021, which is a bit dangerous, but it has risen steadily in 2022-2023, indicating that the short-term repayment ability of enterprises has shown signs of bottoming out after the decline

3.Profitability analysis

Table 3. CATL's profitability analysis from 2019 to 2023

Annual	2019	2020	2021	2022	2023
Operating net profit margin	11%	12%	14%	10%	12%
Net profit margin on total assets	6%	5%	8%	7%	7%
Net profit margin on equity	13%	11%	22%	25%	24%

Operating profit margin = net income / operating income. The index is very limited by the nature of the industry, generally speaking, the net operating profit margin of industrial companies ranges from 5% ~ 15%. As the Table 3 shows,in the past five years, the index has remained above 10% for the entire CATL period. After reaching 14% in 2021, it fell to 10% in 2022, indicating that the growth of the company's earnings is far less than the growth of operating income. But 2023 also shows signs of stopping.

Net return on total assets = net profit / debt-to-asset ratio. The net return on total assets reflects the relationship between the input and output of the company's assets in terms of asset management and is the main indicator to evaluate the efficiency of the company's asset operation. In the past five years, the CATL index has hovered between 5%~7% except for more than 8% in 2021, indicating that the ability of enterprises to use capital to create income is not high, the level of input and output has deteriorated, and the comprehensive utilization of capital has also been poor.

Net profit margin on equity = net profit / shareholders' equity. The index reflects the return on a company's capital and reflects the company's own capital gains. It is reasonable to maintain the net profit margin of equity at about 15%~30%, so investors of listed companies also pay more attention to the index, which directly reflects the ability of other shareholders of listed companies to invest in income. It is reasonable that in the past five years, CATL's index has remained above 10%, basically reaching the medium-term income level, and the company's operating conditions are relatively stable. It is growing gradually, but in 2023, the rally is stagnant.

Therefore, to sum up, CATL is currently at the peak of the growth period, and there is still potential for growth in the future through these fundamentals, and the financial valuation is relatively good. We must take a differentiated strategy, refine our own core technology, and master novel camps.Sales model, expand sales, in order to increase sales and operating income[10].

3. Using ichimoku to analyze the CATL

Mainly long:The candlestick is above the clouds.The conversion line crosses the baseline from bottom to top above its clouds.The delay line is located above the clouds.

Mainly short:The candlestick is below the clouds.The transformation line crosses the baseline from top to bottom below its clouds.The delay line is located below the clouds.

Shock wait-and-see:If the candlestick is in the cloud range, it is an oscillation.

Bullish signal, mainly long:The candlestick is above the blue line.Above the K-line clouds.The blue line crosses the red line.

Bearish signal, mainly short:The candlestick is below the blue line.Below the K-line clouds.The blue line crosses the red line.



Figure 2. CATL's ichimoku (from https://cn.tradingview.com/)

The Figure 2 shows in the short term,it is mainly long.If we look at the pressure level, the pressure level is shown by the blue line in the chart, if the stock price can break through the resistance level and effectively stand firm, and it is in line with the long buy point of Ichimoku. This is a double insurance, and there is a chance to break out at any time in the short term.

4. Conclusions

Through the analysis of the macro economy, the analysis of the new energy industry, the analysis of the branch lithium battery, the financial analysis of CATL, and the theory of using the technology of ichimoku,It can be seen that China's economy is recovering, and the policy is also very supportive of the new energy industry and lithium battery industry represented by CATL, and the analysis of the financial indicators of CATL shows that although the growth has begun to slow down in the past two or three years because of the epidemic, the factors of the epidemic have not made his financial thunder directly, indicating that the company can support the disaster of this depression in the epidemic stage through a stable business model. In the short term, it is not clear that there is a signal of a long bullish call, but in the long run, this stock is perfectly suitable for value investing.

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