

Research on Investment Value of Energy Company Based on Traditional Framework

Ziming Wu *

School of management, Qinhuangdao Campus of Northeastern University, Qinhuangdao, China

* Corresponding Author Email: 202211375@stu.neuq.edu.cn

Abstract. With the increasingly serious climate problems, energy transformation, energy efficiency and other issues, more and more attention by countries, and they have begun to find solutions. Under the circumstance, many new energy enterprises have emergences and traditional enterprises have also embarked on the road to reduce costs and increase efficiency, The energy industry has once again become a hot industry. This article first analyzes the GDP and its growth rate in recent years by studying the macroeconomic environment of the United States, and concludes that after the epidemic United States GDP is gradually recovering, but the growth rate is showing a trend of first decreasing and then increasing. At the same time, it also shows the importance of energy in today's world in order to explain why the energy sector has regained its position. In this paper, we use a simple and easy-to-understand indicator comparison and analysis method, collecting the data of three representative enterprises – Valero Energy, Enphase Energy and General Electric, analyzing their risk and solvency, profitability and market position. Then this article draws the conclusion that the Valero Energy is more attractive to different types of investors and it gives investors who are keen on energy investment an enlightening and fundamental analytical direction.

Keywords: Energy transition; macroeconomy; value investment.

1. Introduction

In recent years, under the influence of uncertainties such as extreme weather and geopolitical conflicts, countries have frequently faced challenges in energy supply shortages, encouraging countries to increase the adjustment of energy policies and the degree of industry adaptation. In the meantime, excessive energy harvesting is also causing greater climate change on earth, causing huge damage to the economy. Countries around the world are constantly optimizing their industrial layout and promoting structural transformation of the energy industry under dual pressure of economy and environment, in order to achieve low carbon emissions and sustainable development [1]. As the world's leading energy producer and consumer, the world is watching the energy industry in the US. Like other countries, the U.S. energy industry is undergoing a transition stage from traditional energy sources to low-carbon, clean and sustainable energy sources and it is also constantly trying and improving. In recent years, the US government has introduced a number of policies to support the transition of energy sector. In November 2021, the United States released the "Long-Term Strategy for Net-Zero Emissions by 2050.", outlining the timeline and technological pathways for the country to reach its ultimate goal of carbon neutrality by 2050. In terms of electricity generation, the proportion of coal-fired power in the United States has been declining year by year, replaced by renewable energy sources such as wind and solar. The bipartisan infrastructure bill of 2021 and the Inflation Reduction Act of 2022 (collectively known as IRA-BIL) represent a large-scale investment by the U.S. government in modernizing and decarbonizing the energy system. Meanwhile, in the 2022 Inflation Reduction Act, there is also the content of promoting the localization of the photovoltaic industry chain. In this revolution, the energy industry plays an important role, investing a promising energy company can bring big economic benefits. Hence how to choose the correct energy company to invest is an important issue. This article will analyze some indicators of three representative energy companies, Valero Energy (VLO), Enphase Energy (ENPH) and General Electric (GE) to give some advice to investors.

The first step is the fundamental analysis of this article, studying the macroeconomic environment of the United States in infrastructure, medical investment, consumption and other aspects. Then it brings out the basic fact that energy has always been a major problem facing the American macroeconomy, pointing out that the important position of the energy industry in the industry chain -- not only can the energy industry address the world climate problem, but also stimulate employment and promote economic development. Furthermore, on the basis of reference to other investment value literature, the purpose of this paper is to analyze three representative energy enterprises through the index comparison method and give the conclusion.

The practical significance of this article lies in giving comparison about three aspects of risk and solvency, profitability and market position of three enterprises, directly showing the operation, development potential and investment value, providing an analysis direction and reference for the majority of investors.

2. Literature review

Nowadays, sustainable development continues to be a major issue of global concern and the climate change is one of the most important problems in it. The level of energy security is an important aspect affecting the climate change.

Due to the energy is basic motivation of economic activities, humanity is closely concerned about the risks posed by climate change to its availability, accessibility, and affordability [2]. The energy industry is a key player in tackling climate change [3], so scholars from diversities of field have conducted extensive research on the energy industry. The first is the energy transition. Study shows that non-renewable energy, financial development, and labor force are all important factors driving CO₂ emissions from consumption, at the same time, environmental policies, advancements in green technology, and the utilization of renewable energy can promote carbon reduction [4]. Biological hydrogen production is regarded as one of the solutions for achieving a sustainable energy transition and net-zero emissions by 2050, so the bioenergy, biofuels, and microbial cultivation are the emerging trends in the future [5]. And scholars think that some countries with large carbon emissions, such as China, should pay attention to the reduction of CH₄ and CO₂ in the energy transition, accelerate cost reduction and efficiency increase and achieve carbon neutrality and the Paris Agreement temperature control targets as soon as possible [6]. In terms of energy efficiency, research shows that institutional quality weakens the positive impact of energy efficiency on environmental quality [7]. The European Union (EU) has recently adopted a revised Energy Efficiency Directive, the principle of energy priority referred to in Article 3 of the Directive indicates that energy efficiency solutions include not only traditional end-use energy efficiency, but also demand-side flexibility and efficient energy conversion [8]. In the meantime, green technology innovation is vital for the promotion of the energy efficiency and reduction of the energy production and consumption [9]. When it comes to energy policies, policy makers should prioritize the combination of renewable energy with energy efficiency measures. For example, the U.S. federal government's investment in public renewable energy can reduce the generation of carbon monoxide [10]. The federal government of U.S. also introduced the Inflation Reduction Act in 2020. The bill aims to provide substantial investment in the energy manufacturing industry in the United States, hoping to get rid of energy dependence on other countries, achieving the transition to the clean energy [11].

3. Basic fact analysis

3.1. Macroeconomic environment

In recent 5 years, under the background that all countries in the world are suffering from the downward crisis under the impact of factors such as the new coronavirus, the Russia-Ukraine conflict and the Palestinian-Israeli war, the US economy has shown strong resilience. As can be seen from Figure 1, the GDP of U.S. has basically kept an upward trend except for a decline in 2020 due to the

pandemic, and it reaches a staggering \$27.4 trillion in 2023. In the meantime, in terms of GDP growth rate, as chart 2 shows, although the growth rate was negative in 2020, it rose sharply in 2021 and continued to rise in the following two years. There are three main reasons for America's economic strength. Firstly, the United States implemented easy monetary policy to stimulate consumption. During the pandemic, American has invest 5 trillion dollars approximately to stimulate consumption, trying to lead the service sector to recovery by stimulating business consumption. (Sina Finance)

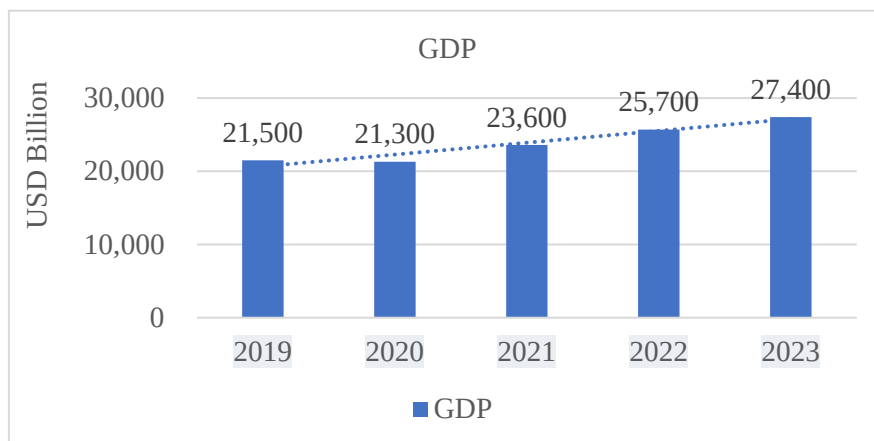


Fig. 1 US GDP in the five years

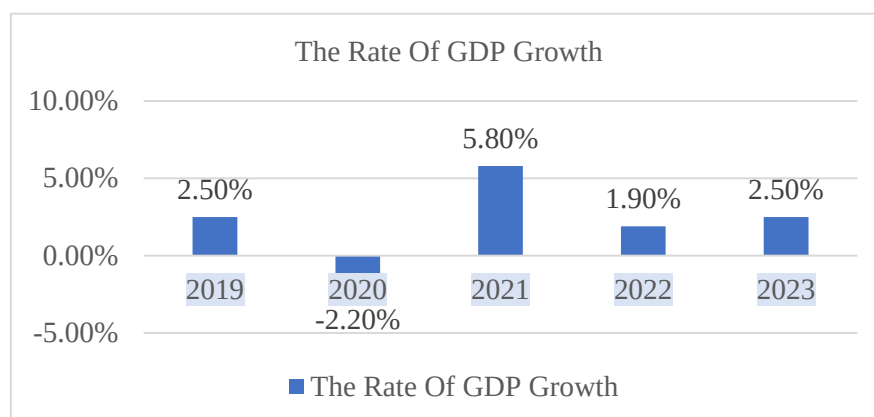


Fig. 2 US GDP growth rate in the past five years

Secondly, the US is a net exporter of energy and is less dependent on Russia. Russia's invasion of Ukraine during the war caused gas prices to skyrocket, some experts saying that European countries have been hit much harder by energy than the United States. Energy prices in Europe have risen by 20%, compared with about 3% in the US. Additionally, the US also has stable employment market. America's employment rate has maintained around 60%, and even at its lowest in April 2020, it still had an employment rate of 51.2% (Figure 2).

3.2. Industry environment:

Energy has always been a big problem plaguing the world, all the countries are striving for the transformation of energy structure, the United States is a good example. The energy structure in the US is undergoing a potential transformation to achieve a cleaner, low-carbon and sustainable energy system. Renewable energy, particularly wind and solar power are becoming the main driver of the new energy system. As of 2022, total energy production in the United States is 98.526 quadrillion British thermal units. The production of the energy in US are keeping an upward trend, the rise is particularly marked in the decade from 2010 to 2020. The U.S. Energy Policy Review for 2024 released recently by International Energy Agency pointed that in the past four years, clean energy investments in the US have seen a significant growth of nearly 60%, directly leading to the creation of over 310,000 jobs in the clean energy sector. U.S. oil and gas exports are expected to continue

to grow in the future in order to cope with the pressures on global energy market due to instability and unfair distribution of resources. In recent years, due to the rapid development of new energy in China, the technology is leading the world, so the United States government has also introduced a series of policies in order to defer China's momentum (Reuters).

The Biden administration plans to approve the application from South Korean solar company Qcells (Hanwha) to cancel the two-year import tariff exemption for bifacial solar panels from China and other countries. In the meantime, the government has promoted clean energy through policies such as the US National Innovation Path. The United States has clear targets for carbon neutrality, planning to decarbonize electricity by 2035, carbon integration by 2050. All in all, the American energy sector is undergoing rapid development and profound changes, this cannot be separated from the support of the government, technology innovation and the growth of market demand.

4. Enterprise's performance analysis

4.1. Company basic information introduction

4.1.1 Valero Energy Corporation (VLO)

VLO is a global energy company headquartered in the United States, Dallas-San Antonio area, founded in 1980. It is an independent refining company primarily engaged in oil refining and marketing. At the same time, Valero is also involved in the production of renewable energy. VLO is one of the largest oil refining companies in North America. The company owns and operates refineries in the United States and Canada, with a combined throughput capacity of approximately two million barrels per day (BPD), making it one of the top domestic petroleum product refiners. Valero is also one of the leading retail operators in the country, running the retail wholesale market under various brands including Diamond Shamrock, Ultramar, Valero, Beacon, and Total in the United States and Canada. VLO has been ranked among the world's top 500 companies for many consecutive years. VLO's revenue grew by 75.6% in 2021 and then increased by 54.8% in 2022, up to \$176.4 billion. Net profit increased by 1.14 billion in 2022 to 11.5 billion.

4.1.2 Enphase Energy Inc (ENPH)

ENPH is a leading American energy technology company that specializes in the design and manufacturing of solar microinverters, energy management technology, and storage systems. Founded in 2006 and headquartered in Fremont, California, Enphase Energy has played a significant role in revolutionizing the solar energy market. ENPH's total revenue is 2.291 billion, lower than 2.331 billion in 2022, but the net income was 439 million, higher than 397 million in 2022. ENPH's sales locations are all over the world. With the global micro inverse market set off an innovation storm, its leading position is under attack, research and development expenditure has increased in the past two years, but earnings slowdown. In December 2023, it was selected for the 2023 Fortune Future 50 list.

4.1.3 General Electric (GE)

GE is an American multinational company founded in 1892, headquartered in Boston, Massachusetts. GE's business spans multiple fields, including aerospace, energy, healthcare, transportation, and digital industrial. The company is known for its technological innovation and wide range of product lines. GE's total revenue in 2023 was 68 billion, year-on-year growth of 17%. Adjusted net income was \$5.662 billion, an increase of 79% over the previous year. And free cash flow was GE ranked 167th on the 2023 Fortune Global 500 list.

4.2. Risk and solvency analysis

Risk analysis primarily focuses on the various risks faced by an enterprise, including financial risk, operational risk, and market risk, etc. Additionally, solvency analysis assesses a company's capacity to timely meet its debt obligations upon maturity. This is primarily measured by various financial

ratios, such as current ratio, quick ratio and so on. For this purpose, this paper selects the data of some important metrics of three companies in 2023 for analysis. (Table 1)

Table 1. Risk and solvency metric

Metric	VLO	ENPH	GE
Debt Ratio	0.5476	0.7092	0.8349
Beta	0.66	1.65	1.38
Current Ratio	1.56	4.59	1.33
Quick Ratio	1.11	4.19	1.07

The debt ratio means a ratio of company's total debt to total assets, indicating a company's ability of using external capital or risk. The lower debt ratio suggesting that the less assets obtained by liabilities, the less ability of enterprises to use external funds. But the higher debt ratio suggesting that the debts of the enterprises are larger and the risks are larger. Generally speaking, the debt ratio is between 40% ~ 60%. As you will see in Table 1, only the VLO's debt ratio between 40% and 60%, and ENPH and GE's debt ratio are higher than 60%, indicating that they have a higher risk.

The beta coefficient also a measure of company's system risk. One is a bound in beta analysis, more than one means its risk is higher than the market average and vice versa. In the Table 1, only the VLO's beta smaller than 1, means that its risk blows the market average. However, the ENPH and GE's beta coefficients are greater than 1, indicating that their risks are high than market average. Especially, the ENPH's beta is greater than 1.5, showing that it has superior risk.

The current ratio and the quick ratio are all present a company's solvency. Current ratio's calculation formula is "Current Assets / Current Liabilities*100%", suggesting that the short-term solvency of a company. And quick ratio is "Quick Assets / Current Liabilities*100%" (quick ratio is balance after subtracting less liquid and unstable inventories from current assets.) This ratio reflects the ability to reply current liabilities of a company. From Table 1, all these three companies' current ratios and quick ratios are greater than 1, indicating that none of them have liquidity risk and are fairly solvent.

4.3. Profitability Analysis

Profitability refers to the ability of an enterprise to make. This article Selects the annual data of gross profit margin, net profit margin, return on equity (ROE), and return on total assets (ROA) for three companies in 2023 for comparison. (Table 2)

Table 2. Profitability Metrics

Metric	VLO	ENPH	GE
Gross profit margin	8.93%	46.20%	25.84%
Net profit margin	6.32%	19.16%	13.90%
ROE	35.41%	48.52%	31.03%
ROA	14.25%	13.57%	5.24%

From Table 2, ENPH has higher gross margin on sales and net margin on sales than the other two companies, suggesting that it has greater profitability. For the ROE, these three companies are respectively 35.41%, 48.52% and 31.03%, and the tallest of them is also ENPH, this can be in part to show that its profitability is the strongest. However, if concerning the total assets, VLO's ROA is close to ENPH, and it is even higher than that. Taking these two factors into condition, the profitability of the two companies is about the same.

4.4. Market Analysis

Market analysis is an assessment and analysis of a company's performance in its target market and sector, as well as its competitive landscape with other companies. This article analyzes whether the

stock is undervalued, whether the stock has growth potential and its future trend, etc. And this paper also selects the annual data in 2023 to compare and analyze. (Table 3)

Table 3. Market Metrics

Metric	VLO	ENPH	GE
PE	7.78	42.9	39.02
PEG	0.23	1.39	1.64
Stock Price (\$)	157	117.52	164.63
SMA (50) (\$)	153.75	115.2	161.84
SMA (200) (\$)	144.87	112.43	127.78
Dividend Yield	3.14%	0.49%	0.25%

As we can see in Table 3, the PE ratios (Stock Price / Earnings Per Share) of three companies from left to right are 7.78, 42.9 and 39.02. Only the PE ratio of the VLO (7.78) less than 10, indicating that VLO is be undervalued by the public market, but the other two companies. Then is the analysis of the relationship between stock prices and company profit growth, this article adapts PEG ratio (Price / Earnings to Growth ratio) to account for it. In the meantime, the growth rate factor is added to the formula for the growth ratio, so it can make up for the fact that the PE ratio does not take into account corporate earnings growth. From this Table 3, it is not difficult to observe that only the VLO's PEG ratio less than 1, it just goes to show that only it is undervalued and the other are overvalued. This is consistent with the previous analyses of the PE ratio. SMA (200) means the average daily price of the stock over the past 200 days, SMA (50) in a similar way. This article compares the real time stock price or 50-day average price line with the 200-day average price line to determine whether it is positive or negative, and then infer its future trend. It is called momentum analysis here. In this table, it is very easy to find that all three enterprises' stock price or 50-day average price line are above the 200-day average price line, suggesting that all of them are positive stock. Last but not least, dividend yield also can be used to judge the investment value of a business. The VLO's annual dividend yield in 2023 is 3.14%, far higher than other tow companies, shows that it has more investment value.

4.5. Investment strategies and recommendations

After the above analysis of the three aspects of the three companies, it is not difficult to draw that VLO has advantages over the other two companies in terms of profitability, solvency and competitive position in the market, so it has more investment potential. Different types of investors prefer different types of stocks. As a value investor, they always pay attention on the intrinsic value. They eager to buy stocks when they are trading below intrinsic value, and sell them when stock price higher the intrinsic value in order to make profit, like Warren Buffett, Peter Lynch, they prefer to buying the stock which is undervalued. It is easy to draw a conclusion that the VLO's stock is be undervalued through the above analysis of its PE ratio, so VLO's stock is more attractive to value investors than the other two. Meanwhile, PEG ratio less than 1 also indicates that VLO's stock has growth potential, this is very popular with growth investors. The so-called growth investors buy stocks just believe that the future value of the enterprises can grow rapidly, and then will sell them when the future prices rise sharply to earn profits. Another type of investor is the momentum investor, they pay more attention to the dynamic price trend of stocks over time. Companies expected to have continuously rising stock prices are more attractive in terms of investment value for them. From the above, all three are positive stocks, they usually get the attention of momentum investors. Finally, the dividend yield also confirms VLO as a better investment target.

5. Conclusion

On the basis of reading a large amount of literature, this article studies the macroeconomy of the United States. In the meantime, according to the current investment environment of the US energy industry, analyzes the risk, solvency, profitability and market position of Valero Energy, Enphase

Energy and General Electric respectively through the index analysis. Through comparison, it is concluded that VLO has the most investment value, and also suitable for different types of investors. In terms of the risk and solvency, through the VLO's beta coefficient is 1.22, greater than 1, higher than average market risk, but its debt ratio, current ratio and quick ratio are all within normal limits, it shows that enterprises have a strong ability to use free funds. For the aspect of the profitability, through its profit margin is not outstanding, based on the analysis of ROA and ROE, VLO's profitability is still relatively good. Finally, it is not difficult to conclude that VLO's stock is undervalued and has strong growth potential, meanwhile, the stock prices are expected to rise in the future by comparing the market metrics. To sum up, the VLO's stock is suitable for the value investor, PEG investor or momentum investor, etc.

References

- [1] Zhang Tongle. Research on the Impact of Energy Investment on Carbon Emissions under Carbon Peak Constraints [D]. Qilu University of Technology, 2023. DOI: 10.27278/d.cnki.gsdqc.2023.000790.
- [2] Njindan B I. Climate change, energy security risk, and clean energy investment [J]. *Energy Economics*, 2024, 129107225-.
- [3] Morão H. The impact of carbon policy news on the national energy industry [J]. *Energy Economics*, 2024, 134107596-.
- [4] Liza, F.F., Ahmad, F., Wei, L. et al. Environmental technology development and renewable energy transition role toward carbon-neutrality goals in G20 countries. *Clean Techn Environ Policy* (2024). <https://doi.org/10.1007/s10098-024-02804-3>.
- [5] Umunnawuike C, Mahat A Q S, Nwaichi I P, et al. Biohydrogen production for sustainable energy transition: A bibliometric and systematic review of the reaction mechanisms, challenges, knowledge gaps and emerging trends [J]. *Biomass and Bioenergy*, 2024, 188107345-107345.
- [6] Xiong Weiwei. A Cost-Effective Pathway to Achieve the Temperature Control Goals of the Paris Agreement and Research on China's Energy Transition Response. China University of Geosciences, 2023. DOI: 10.27492/d.cnki.gzdzu.2023.000154.
- [7] Luo H, Sun Y. The impact of energy efficiency on ecological footprint in the presence of EKC: Evidence from G20 countries [J]. *Energy*, 2024, 304132081-132081.
- [8] Mandel T, Pató Z. Towards effective implementation of the energy efficiency first principle: a theory-based classification and analysis of policy instruments [J]. *Energy Research & Social Science*, 2024, 115103613-103613.
- [9] Aifeng Song, Zeeshan Rasool, Raima Nazar, Muhammad Khalid Anser. Towards a greener future: How green technology innovation and energy efficiency are transforming sustainability, *Energy*, Volume 290, 2024, 129891, ISSN 0360-5442, <https://doi.org/10.1016/j.energy.2023.129891>.
- [10] Elkhataat A, Muhtaseb A S. Climate Change and Energy Security: A Comparative Analysis of the Role of Energy Policies in Advancing Environmental Sustainability [J]. *Energies*, 2024, 17(13): 3179-3179.
- [11] Zhu Caiyun. The Impact of Clean Energy Policies in the U.S. Inflation Reduction Act and Corresponding Recommendations [J]. *Energy Conservation and Environmental Protection*, 2024, (07): 28-34.