



Company Valuation of PT Adaro Energy Indonesia Due to the Coal Price Volatility

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ABSTRACT: This study examines the financial performance and valuation of PT Adaro Energy Indonesia, a major coal mining company in Indonesia, considering declining coal prices. The analysis reveals a downward trend in the forecast coal price index from 2023 to 2030, but the company's coal production continues to grow due to global demand. Financial ratios indicate a strong performance compared to industry peers. Discounted cash flow analysis shows positive cash flow, assuming coal price growth ceases by 2030 due to zero carbon emission policies. The study concludes that PT Adaro Energy Indonesia is overvalued and suggests strategic measures such as diversification and exploring new business areas to mitigate risks and enhance long-term sustainability.

KEYWORDS: coal price volatility, discounted cash flow, financial ratios, valuation analysis, weighted average cost of capital (WACC)

INTRODUCTION

Indonesia is a major exporter of mining goods, particularly coal, which contributes significantly to the country's economic growth. The coal sector plays a vital role as the primary energy source for electricity generation and fuel for steel and cement production. Indonesia has emerged as one of the largest global coal producers and exporters, with reserves estimated to last around 80 years. However, in 2023, the coal price has been declining due to various factors such as geopolitics, supply, and demand. The implementation of carbon emissions policies by 2030 will further impact the future coal price. While historical data shows a significant rise in coal prices from 2020 to 2022, the price has started to decline in the first quarter of 2023. This decline in coal prices has affected Indonesian coal companies and their revenue. The coal industry's volatility makes it challenging to forecast, but coal price forecasts can be derived from coal indexes.

Coal is a sedimentary rock that serves as a significant source of energy. Coal companies are involved in various aspects of coal exploration, extraction, processing, and distribution. They supply coal to customers like utilities and industrial manufacturers. However, the demand for coal has been declining due to the availability of cheaper and cleaner energy alternatives and efforts to reduce carbon emissions. This shift in demand has impacted the coal industry and prompted the implementation of policies and regulations to discourage coal usage.

Adaro Energy Indonesia has its origins in the Indonesian government's shift to include coal as a domestic fuel source during the global oil crises in the 1970s. Adaro became involved in the coal industry by acquiring Block 8 in South Kalimantan, despite its perceived lower quality coal. Adaro Energy is a vertically integrated energy producer involved in coal mining, energy, utilities, and supporting infrastructure. They specialize in extracting low-pollutant thermal coal and also possess metallurgical coal resources. Adaro Energy operates through subsidiary companies engaged in mining operations, trading, services, logistics, and power. The company has experienced significant growth since its establishment in 2004, becoming the largest single-mine site in the southern hemisphere. Despite challenges posed by the Covid-19 pandemic, Adaro Indonesia achieved a production of 52.7 million tonnes in 2021.

BUSINESS ISSUE

Coal has traditionally been a major source of energy, but its demand has been declining due to cheaper and cleaner alternatives like natural gas, wind, solar, and other renewable sources. Environmental concerns and efforts to reduce carbon emissions have led to policies discouraging coal use. Coal mining and burning have significant negative environmental impacts, including pollution and deforestation. As a result, coal companies have experienced lower profits and struggled to remain profitable [1].



The government has set a target of achieving net zero emissions by 2060 and plans to accelerate this goal. By 2030, they aim to replace fossil fuels with alternative fuels, leading to a decline in coal demand. The government's plan, known as "Rencana Umum Penyediaan Tenaga Listrik" (RUPTL), focuses on increasing the proportion of alternative energy resources by 2030. In addition, "Peraturan Presiden" Number 112 of 2022 emphasizes the transition from fossil fuels to renewable energy sources, which will have a significant impact on the coal industry and power plants in Indonesia and globally.

Indonesia is the world's third-largest coal producer, and the regulations and plans for net zero carbon emissions will greatly affect the coal industry and the economy. Investor sentiment towards the coal industry has also changed, with declining coal prices leading to decreased interest in coal stocks. Coal price market data is used by investors to analyze the stock prices of coal companies, and the declining sentiment has caused a decrease in coal prices in the first quarter of 2023.

RESEARCH QUESTIONS

Several questions need to be analysed based on the business issues about future PT Adaro Energy valuation The questions are: (1) How to predict the future expected coal market price? (2) How is the future valuation of PT Adaro Energy Indonesia? (3) Will PT Adaro Energy Indonesia still give good investment?

RESEARCH OBJECTIVES

Therefore, the objectives of this research are to identify the connection between the coal market price and the stock market price and to identify the strategy or formula to gain the return needed for the investors. The details objectives are as follows: (1) Identify the coal price in the future (2) Analyze the financial statement and valuation of PT Adaro Energy (3) Analyze the prospect price of PT Adaro Energy

CONCEPTUAL FRAMEWORK

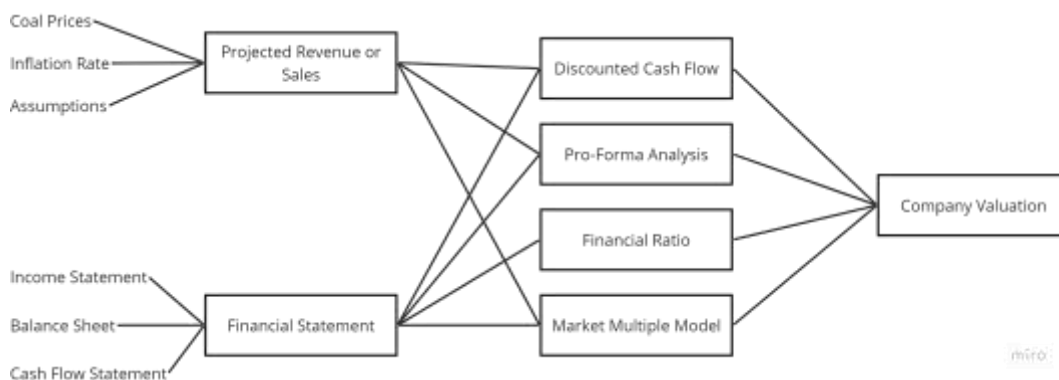


Figure 1. Conceptual Framework by author

The conceptual framework of this research aims to determine the valuation of PT Adaro Energy Indonesia. It involves various dimensions, including coal prices, inflation rate, assumptions, income statement, balance sheet, and cash flow statement. The framework is based on the author's hypothesis.

The framework consists of two main variables, x and y. The x variable includes projected revenue or sales, which is influenced by coal prices, inflation rate, and assumptions. According to Luca (2018), revenues represent the sales of goods or services generated by a company. The y variable comprises four variables: discounted cash flow, pro-forma analysis, financial ratios, and market multiple models [7].

Discounted cash flow analysis, as explained by Massari, Gianfrate, and Zanetti (2016), is a method to assess the value of a company or investment based on its expected future returns. It involves calculating the present value of projected cash flows using a discount rate. [8]



Pro-forma analysis, according to Pearson (Brealey, Myers, & Marcus, 2023), involves the projection and evaluation of financial data using hypothetical scenarios and assumptions. It enables businesses to forecast their financial position and performance under different circumstances, aiding in decision-making processes [2].

Financial ratios, as defined by CFI (2020), are quantitative measures used to evaluate a company's health, performance, and stability. They are derived from data presented in financial statements such as the balance sheet, income statement, and cash flow statement [3].

Market multiple models, as described by Luca (2018), are valuation methods that estimate the value of a company by comparing it to similar players in the industry. The principle is that companies operating in the same industry with comparable characteristics should have similar valuations. By analyzing the multiples of comparable companies, an estimate of the target company's value can be derived [7] [9].

In summary, the conceptual framework combines these variables and methodologies to determine the valuation of PT Adaro Energy Indonesia. It encompasses analyzing projected revenue, financial statements, discounted cash flow, pro-forma analysis, financial ratios, and market multiple models.

METHODOLOGY

Financial ratio analysis is a method used to assess a company's financial performance. It involves analyzing various ratios such as profitability ratios, liquidity ratios, solvency ratios, efficiency ratios, and market ratios [5]. In this research, specific ratios will be focused on, including liquidity ratios to evaluate the company's ability to cover short-term liabilities, profitability ratios to assess the firm's profit performance, and solvency ratios to examine the company's liabilities. Efficiency ratios will also be analyzed to measure the company's operational efficiency [4].

According to Keputusan Menteri Energi dan Sumber Daya Mineral number 41.K/MB.01/MEM.B/2023, the coal industry can use the Harga Batubara Acuan (HBA) as a standard for coal prices. The coal price index used in this research is the global Newcastle index with a calorific value of 6200 kcal/kg. The HBA can be adjusted based on the coal's actual calorific value if it is below 6000 kcal/kg. In the valuation process, two models will be utilized: the discounted cash flow (DCF) method and market multiple models. The Net Present Value (NPV) will be calculated using the DCF method to assess the profitability of an investment by considering the time value of money [2] [3]. The Weighted Average Cost of Capital (WACC) will be used as a discount rate, considering the cost of debt and equity, to evaluate investment opportunities and overall capital expenditure [4].

In the market multiple models, ratios such as P/E ratio, PBV ratio, EPS ratio, EV/EBITDA ratio, EV/EBIT, and EV/Sales will be considered as part of the analysis [7] [8].

These valuation models and financial ratios will provide insights into the company's financial performance and help assess its value.

RESULTS AND ANALYSIS

This journal chapter focuses on the valuation analysis of PT Adaro Energy Indonesia, considering the company's prospects. The analysis relies on various assumptions, with particular emphasis on the coal price. The coal price used for the analysis is obtained from the global Newcastle coal index forecast. The data covers the period from 2023 to 2028, specifically for coal with a calorific value of 6332.

A. Business Analysis

This journal article analyzes PT Adaro Energy Indonesia through external and internal business analyses. The external analysis is conducted using PESTLE analysis, focusing on the political, economic, social, technological, legal, and environmental factors affecting the coal industry.

In the political factor, the regulation of net zero carbon emissions and changes in coal price reference equations impact the power plant and coal company industry. The government also regulates coal production, export, and import, with sanctions for non-compliance.

Under the economic factor, macroeconomics and geopolitics affect the coal price, which has been declining since January 2023. Despite growing demand, the declining coal price negatively impacts the revenue of the coal industry.

On the social front, the coal industry faces negative public perception due to its impact on land, air quality, and the environment. In terms of technology, the coal industry benefits from improved efficiency and productivity through the use of geographic information



systems, automation, robotics, and sensor and monitoring technologies. These technologies can enhance safety, reduce expenses, and optimize environmental mitigation measures.

Legal factors include the potential for mining regulations to change, impacting permit requirements, safety standards, domestic market obligation (DMO), and coal sale prices. Law stability is crucial for operational sustainability and investment.

Environmental considerations revolve around the contribution of mining operations to climate change through coal combustion. As nations strive for zero-carbon emissions, there is a shift towards clean energy. Mining rehabilitation is also important to restore ecosystems affected by mining activities, involving land rehabilitation, ecological restoration, reforestation, and other environmental measures.

Overall, the analysis provides insights into the external and internal factors influencing PT Adaro Energy Indonesia's business in the coal industry.

B. Assumptions

The journal article focuses on the valuation of PT Adaro Energy Indonesia and emphasizes the importance of defining assumptions for the valuation process. The researcher considers various factors, including regulations and the company's current condition, to establish assumptions related to future coal prices, production growth, sales growth, and company growth. These assumptions are informed by historical data, regulatory frameworks, and industry indices.

1) Coal Price

The coal price assumption relies on the global Newcastle index, which serves as a standard for coal prices in the global market. In accordance with Keputusan Menteri ESDM number 41.K/MB.01/MEM.B/2023, the coal price is converted into the "Harga Batubara Acuan" (HBA) to enhance its effectiveness as a standardized price for coal commodities. The future coal price is determined based on these considerations.

Table 1. Global Newcastle Index 2023-2030

gCN index	Coal Price (USD/Ton)
Jun-23	128
Jul-23	141
Aug-23	142
Sep-23	144
Q3 23	142
Q4 23	147
Q1 24	152
Q2 24	148
Cal-24	147,5
Cal-25	142,5
Cal-26	134,7
Cal-27	137,083
Cal-28	138,1
Cal-29	138,1
Cal-30	138,1

Source : Global coal Newcastle index

This coal price standard will be used as an assumption of the future coal price. The coal price will be used to get the revenue in the company. Moreover, due to the calorific value in PT Adaro Energy Indonesia is 5200 kcal/kg, and the coal price in table 4.1. is in 6260 kcal/kg, therefore the coal price needs to be converted into 5200 kcal/kg. The coal price will become:



Table 2. Forecast HPB Coal Price

Year	HPB Coal Price 5.200 kcal/kg, (USD/ton)
2023	146,59
2024	113,09
2025	109,39
2026	103,61
2027	105,38
2028	106,13
2029	106,13
2030	106,13

Source : Author Calculation

Therefore, this is the coal price that will be use for the assumption to get the future revenue of the company.

2) *Production Growth*

PT Adaro Energy Indonesia specializes in open cast mining and focuses primarily on producing coal. Their main business revolves around the extraction and production of coal commodities. Specifically, PT Adaro Energy Indonesia's coal commodities are predominantly of the 5000 kcal/kg calorific value variety. This information regarding the calorific value is obtained from the company's annual report, which provides comprehensive data on their coal reserves and supply. Although the specific figures for the total production of coal commodities in PT Adaro Energy Indonesia are not provided in the given text, the journal likely presents detailed information on their overall coal production. Such data is crucial for understanding the company's mining operations and their contribution to the coal industry. It is particularly relevant for investors, analysts, and stakeholders seeking to assess PT Adaro Energy Indonesia's performance and market position.

Table 3. Historical Production

Total	2018	2019	2020	2021	2022
Production (Mt)	54,05	58,05	54,53	52,7	62,9
Sales (Mt)	54,39	59,18	54,14	51,58	61,35

Source : PT Adaro Energy, Tbk annual report

Based on average CAGR the total production of the coal commodity in PT Adaro Energy Indonesia is 4.33% Therefore, the CAGR will be used for the future grow of the total production in PT Adaro Energy Indonesia.

Table 4. Production Assumption

Year	2023	2024	2025	2026	2027	2028	2029	2030
Production (Mt)	65,63	68,47	71,44	74,53	77,76	81,13	84,65	88,32

Source : Author Calculation

According to the regulations outlined in Keputusan Menteri ESDM No.255.K/30/MEM/2020, coal companies in Indonesia are required to allocate 25% of their total coal production for domestic sales, while the remaining 75% can be sold for export. Consequently, for the purposes of this analysis, it is assumed that PT Adaro Energy Indonesia will follow this distribution pattern, with 25% of their total coal production being sold within Indonesia and the remaining 75% allocated for export. This assumption forms the basis for evaluating PT Adaro Energy Indonesia's sales strategy and market distribution.

3) *COGS and Operating Expenses*

In this section, the author establishes assumptions for the cost of goods sold (COGS) and operating expenses. The assumptions are derived from the inflation rate in Indonesia over the past five years. To determine the growth of expenses, the author calculates the



moving average of the five-year inflation rate, which results in a figure of 2.80%. This inflation rate will be utilized to forecast expense growth.

For the COGS, the author defines it in terms of price per ton. By examining the average COGS margin over the past five years, which amounts to 63%, the author determines the COGS. In the initial period, the COGS is calculated by multiplying the gross margin by the price. From 2023 onwards, the COGS is defined based on the growth rate derived from the inflation rate. Consequently, the COGS and operating expenses can be forecasted.

Table 5. Projected COGS and operating expenses

	2023	2024	2025	2026	2027	2028	2029	2030
COGS/t	\$57	\$59	\$60	\$62	\$64	\$66	\$68	\$69
COGS	\$3.754.897 .270	\$4.027.418 .395	\$4.319.718 .428	\$4.633.232 .872	\$4.969.501 .416	\$5.330.175 .496	\$5.717.026 .406	\$6.131.953 .995
Operating Expenses	\$386.013	\$396.830	\$407.951	\$419.383	\$431.136	\$443.218	\$455.638	\$468.407

Source : Author Calculation

4) *Other Assumptions*

To perform this valuation analysis, various assumptions have been considered. Regarding fixed assets, it is assumed that there will be no additions or sales of fixed assets in the future. The tax rate used in the analysis is based on the corporate tax rate of 22%. Depreciation figures are obtained from PT Adaro Energy Indonesia's 2022 annual report and are calculated using the straight-line method. Other accounts are analyzed using common size ratios. These assumptions provide a foundation for conducting the valuation analysis and assessing the financial position of PT Adaro Energy Indonesia.

C. *Financial Statement*

The financial statement taken from the annual report of PT Adaro Energy Indonesia from 2018 until 2023. The financial statement that taken consists of income statement, balance sheet, and cash flow statement from 2018 until 2023 [10] [11] [12] [13]. To analyze on the internal analysis, it is needed to identify on the financial ratio of the historical data. Through the financial ratio, it will show on the previous performance of the firm. It will show on the condition and the performance of the coal industry company thorough historical data.

Table 6. Historical Financial Ratio of PT Adaro Energy, Tbk

Liquidity ratios	2018	2019	2020	2021	2022	average
Current Ratio	1,96	1,71	1,51	2,09	2,17	1,89
Cash Ratio	1,14	1,28	1,03	1,33	1,66	1,29
Leverage Ratios	2018	2019	2020	2021	2022	average
Debt ratio	0,39	0,45	0,38	0,41	0,39	0,41
Debt to equity ratio	0,64	0,81	0,61	0,70	0,65	0,68
Interest Coverage ratio	13,70	9,31	3,19	18,34	48,24	18,56
Debt service coverage ratio	0,32	0,19	0,12	0,49	1,01	0,43
Efficiency Ratios	2018	2019	2020	2021	2022	average
Asset Turnover ratio	2	2	1	1	2	1,66
Inventory turnover ratio	22	21	19	18	17	19,15
Receivable turnover ratio	10	11	11	9	13	10,71
Days sales in inventory ratio	17	18	20	21	21	19,20
Profitability Ratios	2018	2019	2020	2021	2022	average



Gross margin ratio	33,43%	27,90%	22,75%	44,32%	57,43%	37,17%
Operating margin ratio	24,64%	17,86%	11,24%	38,28%	53,17%	29,04%
Net margin	13,19%	12,58%	6,25%	25,76%	34,94%	18,55%
Return on assets	6,76%	6,03%	2,48%	13,54%	26,26%	11,01%
Return on equity	11,10%	10,92%	4,01%	23,07%	43,37%	18,49%
Market value ratios	2018	2019	2020	2021	2022	average
Book value per share ratios	0,01	0,01	0,01	0,01	0,01	0,01
Earnings per share	0,015	0,014	0,005	0,032	0,089	0,03
price/earnings ratio	0,72	0,79	2,16	0,33	0,12	0,82

Source : Author Calculation

Based on the financial ratios analyzed, PT Adaro Energy's performance can be considered healthy. The liquidity ratio exceeds 1, indicating that the company's cash and current assets are sufficient to cover its current liabilities. In terms of leverage, both the debt ratio and debt equity ratio are below 1, indicating a low risk associated with debt. Additionally, the interest coverage ratio has an average value of 18 times, suggesting a favorable leverage position.

The efficiency ratio shows a decrease, indicating that the company has become more effective in utilizing its resources. In terms of profitability, there are no negative margins, and both the return on assets (ROA) and return on equity (ROE) continue to increase. These findings underscore positive financial performance and highlight the company's ability to generate returns on its assets and equity.

Overall, the financial ratios demonstrate a healthy financial position for PT Adaro Energy. The company exhibits favorable liquidity, low debt risk, improving efficiency, and increasing profitability. These results indicate strong performance and a capacity to generate positive returns for stakeholders.

D. Cross Section Analysis

For the cross-section analysis, PT Adaro Energy Indonesia will be compared to other companies in the same industry. The selected firms for this evaluation are PT Indika Energy, PT Indo Tambangraya, and PT Dian Swastika. These companies have been chosen due to their similar operational and market value characteristics.

In conducting the cross-section analysis, the financial ratios of these four companies will be compared. The chosen financial ratios for the analysis include liquidity ratio, solvency ratio, profitability ratio, efficiency ratio, and market ratio.

The calculation and comparison of these financial ratios among the four companies will provide insights into their relative performance and allow for a comprehensive evaluation of PT Adaro Energy Indonesia within the context of its industry peers.

Table 7. Cross-section Analysis

Liquidity ratios	ADRO	INDY	ITMG	DSSA	Industry
Current Ratio	2,17	1,70	3,26	1,36	2,12
Cash Ratio	1,66	0,98	2,44	0,65	1,43
Leverage Ratios	ADRO	INDY	ITMG	DSSA	Industry
Debt ratio	0,39	0,63	0,26	0,53	0,45
Debt to equity ratio	0,65	1,68	0,35	1,15	0,96
Interest Coverage ratio	13,70	4,22	9,59	10,08	9,40
Debt service coverage ratio	1,01	0,54	2,50	0,52	1,14
Efficiency Ratios	ADRO	INDY	ITMG	DSSA	Industry
Asset Turnover ratio	0,75	1,21	1,38	0,93	1,07
Inventory turnover ratio	17,32	47,60	18,13	11,73	23,69
Receivable turnover ratio	9,80	7,63	12,48	9,98	9,97



Days sales in inventory ratio	21,08	7,67	20,14	31,13	20,00
Profitability Ratios	ADRO	INDY	ITMG	DSSA	Industry
Gross margin ratio	57%	33%	52%	44%	0,47
Operating margin ratio	53%	28%	47%	30%	0,40
Net margin	35%	12%	33%	22%	0,25
Return on assets	26%	14%	45%	20%	0,26
Return on equity	43%	37%	61%	44%	0,46
Market value ratios	ADRO	INDY	ITMG	DSSA	Industry
Book value per share ratios	0,204	0,079	1,726	1,247	0,81
Earning per share	0,089	0,030	1,061	0,543	0,43
price/earning ratio	2,31	2,67	1,63	2,30	2,22

Source : Author Calculation

Based on the analysis, the following conclusions can be drawn for PT Adaro Energy Indonesia. In terms of liquidity ratio, ADRO and ITMG outperform their industry, indicating strong liquidity. ADRO remains above average in the coal industry from a liquidity perspective. ADRO and ITMG demonstrate lower leverage ratios compared to their industry, implying lower risk. This suggests that ADRO has a favorable performance. ADRO shows the highest profitability ratios, including gross profit margin, operating profit margin, and net profit margin, outperforming its industry. However, ITMG has the best return on asset and return on equity values. Nonetheless, ADRO remains above average in the coal industry for profitability ratios. ADRO exhibits a below-average efficiency ratio, indicating higher efficiency. In terms of market value ratios, ADRO surpasses the industry average, indicating favorable market performance.

Overall, the analysis suggests that ADRO performs well across various ratios and indicators, demonstrating good performance and favorable conditions compared to its industry peers.

E. Valuation

To determine the value of the target firm, a valuation analysis using the discounted cash flow (DCF) model is conducted. This research incorporates historical data and the assumptions mentioned earlier to forecast the financial components of the company. The analysis focuses on estimating future revenue, which is derived from factors such as the future coal price index, forecasted total production, and projected sales. The resulting forecasted revenue is presented below.

Table 8. Projected price and sales

	2023	2024	2025	2026	2027	2028	2029	2030
Price/t	146,59	113,09	109,39	103,61	105,38	106,13	106,13	106,13
Swing	147	113	109	104	105	106	106	106
Production (Mt)	65,63	68,47	71,44	74,53	77,76	81,13	84,65	88,32
Sales domestic	\$ 2.405.073.064	\$ 1.935.869.958	\$ 1.953.646.507	\$ 1.930.694.307	\$ 2.048.674.000	\$ 2.152.736.895	\$ 2.246.034.923	\$ 2.343.376.419
Sales Export	\$ 7.215.219.192	\$ 5.807.609.874	\$ 5.860.939.521	\$ 5.792.082.921	\$ 6.146.022.000	\$ 6.458.210.685	\$ 6.738.104.769	\$ 7.030.129.256
Total Sales	\$ 9.620.292.255	\$ 7.743.479.832	\$ 7.814.586.028	\$ 7.722.777.228	\$ 8.194.696.000	\$ 8.610.947.580	\$ 8.984.139.692	\$ 9.373.505.675

Source : Author Calculation



The forecast free cash flow available to equity holder must calculate the growth rate of the sales revenue, COGS, average the revenue and COGS. Moreover, the operating cash flow also needed for the discounted free cash flow. The data will be use from the pro-forma analysis. Based on the pro forma of income statement then the researcher will find the assumption for the COGS and operating cash flow.

1) Pro Forma Analysis

In the pro forma analysis, a common size financial statement is utilized to calculate the various items of the balance sheet and income statement. The common size approach involves expressing each item as a percentage of sales figures. This calculation is performed individually for the balance sheet and income statement using the company's historical data. The historical data is used to determine the average percentage, which is then used to forecast the pro forma balance sheet and income statement. The assumptions used in the pro forma analysis are consistent with those used in the discounted free cash flow analysis. Sales revenue is assumed to be based on the growth of coal sales and the coal price index. Other current accounts align with sales figures, and depreciation remains constant with no additions or reductions in fixed assets. Additionally, the researcher calculates the forecasted financial ratios. The focus is on profitability ratios, liquidity ratios, and solvency ratios. These ratios are compared between the historical data and the pro forma data. The results of the pro forma financial ratios indicate a decrease in profitability ratios due to declining revenue, attributed to the decline in coal prices based on the Newcastle index. However, the liquidity and solvency ratios demonstrate improved performance. Overall, the pro forma analysis provides insights into the future financial position of the company, highlighting changes in profitability, liquidity, and solvency ratios as a result of the forecasted financial statements and the underlying assumptions.

Table 9. Pro-Forma Analysis

Liquidity ratios	2023	2024	2025	2026	2027	2028
Current Ratio	3,93	5,02	5,02	6,04	7,84	8,77
Cash Ratio	3,42	4,51	5,53	6,41	7,33	8,25
Leverage Ratios	2023	2024	2025	2026	2027	2028
Debt ratio	0,29	0,25	0,22	0,20	0,18	0,17
Debt to equity ratio	0,40	0,33	0,28	0,25	0,22	0,20
Interest Coverage ratio	26,07	19,32	17,71	15,34	15,12	14,57
Debt service coverage ratio	1,23	0,73	0,68	0,58	0,61	0,62
Efficiency Ratios	2023	2024	2025	2026	2027	2028
Asset Turnover ratio	1	0	0	0	0	0
Inventory turnover ratio	19	20	22	23	25	27
Receivable turnover ratio	15	12	12	12	13	13
Days sales in inventory ratio	19	18	17	16	15	14
Profitability Ratios	2023	2024	2025	2026	2027	2028
Gross margin ratio	60,97%	47,99%	44,72%	40,01%	39,36%	38,10%
Operating margin ratio	54,40%	54,40%	54,40%	54,40%	54,40%	54,40%
Net margin	42,09%	42,09%	42,09%	42,09%	42,09%	42,09%
Return on assets	27,30%	13,97%	11,43%	8,90%	8,51%	7,93%
Return on equity	38,28%	18,55%	14,63%	11,12%	10,41%	9,53%
Market value ratios	2023	2024	2025	2026	2027	2028
Book value per share ratios (USD/share)	0,33	0,41	0,48	0,53	0,60	0,66
Earning per share (USD/share)	0,127	0,075	0,070	0,059	0,062	0,063
price/earning ratio	2,61	5,39	6,84	9,00	9,61	10,49

Source : Author Calculation



2) Discounted Free Cash Flow

The discounted free cash flow analysis requires consideration of various components, including depreciation. For PT Adaro Energy Indonesia, the researcher obtains the depreciation figures from the company's annual report and assumes that it will remain the same as in the last financial statement. The depreciation calculation follows the straight-line method. This assumption is based on the understanding that the company will not acquire or dispose of assets in the following year. The tax rate applied to PT Adaro Energy Indonesia is 22%, as stated in the company's annual report, aligning with the corporate tax rate. The researcher assumes that there will be no changes to the tax regulations in the future.

The weighted average cost of capital (WACC) encompasses the cost of debt and the cost of equity. To determine the cost of debt, the researcher considers the highest interest rate associated with the bank loan provided to PT Adaro Energy Indonesia. By incorporating these components into the discounted free cash flow analysis, the researcher can better estimate the present value of future cash flows and assess the company's financial prospects. The weigh of debt calculated is 39.06%, and the cost of debt is 5.62%. Therefore, the cost of debt is 2.19%.

Moreover, the cost of equity, the researcher will use capital asset pricing model. The risk-free rate will get from IDX government bond yield and the risk market will be taken from risk equity premium Damodaran. The risk premium is 6.34% and the risk-free rate 9.23%. Based on calculation the beta found is 1.12. Therefore, by use those methods, the cost of equity is 16.71%. Then the weigh of equity is 10.18%. Therefore, the cost of equity is 12.38%. Using the approaches to determine the cost of debt and cost of equity, the researcher is able to calculate the weighted average cost of capital (WACC). The WACC serves as the discounted rate in the discounted free cash flow analysis. To calculate the WACC, the weights assigned to debt and equity are derived from PT Adaro Energy Indonesia's balance sheet in the 2022 financial statement. The weight of debt is determined to be 39.06%, while the weight of equity is 60.94%. With these data, the researcher can proceed to calculate the WACC, which is a crucial parameter in evaluating the company's discounted free cash flow. The WACC that has been calculated is 12.38%.

The discounted free cash flow will be done for forecast of 2023 until 2030. Due to the business issue in chapter 1, which state that in 2030 the coal industry will be do a zero-carbon emission, therefore there an uncertainty in 2030. The researcher assume that the discounted free cash flow could be conduct until 2030.

Table 10. Discounted Cash Flow

In Thousand USD	0	2023	2024	2025	2026	2027	2028	2029	2030
Revenue		\$9.620.2 92	\$7.743.4 80	\$7.814.5 86	\$7.722.7 77	\$8.194.6 96	\$8.610.9 48	\$8.984.1 40	\$9.373.5 06
Cogs		\$3.496.6 49	\$3.769.1 70	\$4.061.4 70	\$4.374.9 85	\$4.711.2 53	\$5.071.9 27	\$5.458.7 78	\$5.873.7 06
Gross Profit		\$6.123.6 43	\$3.974.3 09	\$3.753.1 16	\$3.347.7 92	\$3.483.4 43	\$3.539.0 20	\$3.525.3 61	\$3.499.8 00
Operating Expense		\$674.197	\$628.793	\$642.043	\$650.725	\$676.615	\$701.166	\$724.766	\$749.198
Operating Profit		\$5.449.4 46	\$3.345.5 17	\$3.111.0 72	\$2.697.0 67	\$2.806.8 28	\$2.837.8 54	\$2.800.5 95	\$2.750.6 01
Depreciation		\$258.248	\$258.248	\$258.248	\$258.248	\$258.248	\$258.248	\$258.248	\$258.248
Net operating profit before tax		\$5.191.1 98	\$3.087.2 69	\$2.852.8 24	\$2.438.8 19	\$2.548.5 80	\$2.579.6 06	\$2.542.3 47	\$2.492.3 53
Tax		\$1.142.0 64	\$679.199	\$627.621	\$536.540	\$560.688	\$567.513	\$559.316	\$548.318
NOPAT		\$4.049.1 35	\$2.408.0 70	\$2.225.2 03	\$1.902.2 79	\$1.987.8 92	\$2.012.0 93	\$1.983.0 31	\$1.944.0 36
Depreciation		\$258.248	\$258.248	\$258.248	\$258.248	\$258.248	\$258.248	\$258.248	\$258.248
Free cash flow		\$4.307.3 83	\$2.666.3 18	\$2.483.4 51	\$2.160.5 27	\$2.246.1 40	\$2.270.3 41	\$2.241.2 79	\$2.202.2 84
Discounted Cash Flow		\$3.833.0 26	\$2.666.3 18	\$2.483.4 51	\$2.160.5 27	\$2.246.1 40	\$2.270.3 41	\$2.241.2 79	\$2.202.2 84

Source : Author Calculation



Based on the calculations conducted, the projected free cash flow can be determined. The discounted cash flow analysis employs the previously calculated weighted average cost of capital (WACC) as the discount rate. By utilizing the free cash flow, the analysis can identify both the net present value and the terminal value.

In the terminal value calculation, a growth assumption of 0% is used. This assumption reflects the implementation of the fully executed zero-carbon emission plan by 2030. Consequently, the coal industry is anticipated to be impacted, as there will be no growth in coal demand due to the transition towards cleaner energy sources.

Table 11. Intrinsic Value

NPV	\$	13.286.264
Terminal Value	\$	17.795.479
PV Terminal Value	\$	6.997.387
Total value	\$	20.283.651

Source : Author Calculation

Once the total value has been determined, the valuation analysis enables the identification of the company's overall value. The intrinsic value, which represents the true worth of the company, can be derived from this valuation process. The intrinsic value is obtained by combining the discounted cash flow and the terminal value, providing a comprehensive assessment of the company's underlying worth.

Table 12. Value

NPV	\$	13.286.264
Terminal Value	\$	17.795.479
PV Terminal Value	\$	6.997.387
Total Value	\$	20.283.651
Total Debt	\$	4.254.969
Enterprise Value	\$	16.028.682
Total Shares		31.985.962
Intrinsic Value per share	\$	0,50
Intrinsic Value per share	Rp	7.662
Current Price	Rp	2.380

Source : Author Calculation

3) Market Multiple Model

In order to analyze market behavior within the coal industry sector, a multiple market model is employed. This analysis compares PT Adaro Energy Indonesia with other firms operating in the same industry. The market multiple models are based on prevailing industry conditions. PT Adaro Energy Indonesia is compared with PT Indika Energy, PT Indo Tambangraya, and Dian Swatastika Sentosa, all of which operate within the coal industry.

Various market data points are analyzed, including EV/sale, EV/EBITDA, EV/EBIT, and price-to-earnings ratio (P/E). By examining this market data, industry-wide trends can be identified. These industry market data points are then used to analyze the valuation of PT Adaro Energy Indonesia. By considering ADRO's enterprise value and the price-to-earnings ratio within the industry, the valuation can be determined using the market multiples model.



Table 13. Market Multiple Model

in billion USD at 31 December 2022	Market Data			Financial Data				Valuation			
	Price (IDR)	Market Cap	TEV	Sales	EBIT DA	EBIT	Earni ngs	Ev/Sa les	Ev/E BITD A	Ev/E BIT	P/E
PT Adaro Energy Indonesia	3.850	7,69	4,68	8,10	4,65	4,31	2,83	0,58	1,01	1,09	2,71
PT Indika Energy	2.730	0,92	0,76	4,33	1,45	1,01	0,51	0,17	0,52	0,75	1,79
PT Indo Tambangraya	39.025	2,84	1,66	3,64	1,89	1,54	1,20	0,46	0,88	1,08	2,37
Dian Swatastika Sentosa	39.800	1,98	2,84	5,96	2,64	1,78	1,30	0,48	1,07	1,59	1,52
average								0,42	0,87	1,13	2,10

Source : Author Calculation

From the calculation above, it shows that the price earnings ratio in the coal industry is 2.10. The price earnings ratio could identify the price valuation of the firm. ADRO.

Table 14. EV/EBITDA

EV/EBITDA Multiple	0,87
Projected EBITDA 2023	\$ 5.449.446,32
Enterprise value	\$ 4.738.827,00
Total debt	\$ 4.254.969,00
Cash & Cash Equivalent	\$ 4.067.358,00
Market capital (in billion)	\$ 4.551.216,00
Outstanding Shares	31.985.962.000
Price Relative valuation	\$ 0,14
Price Relative valuation	Rp 2.175,44

Source : Author Calculation

F. Sensitivity Analysis

To assess the risk of the company, the author conducts a sensitivity analysis on the free cash flow. This analysis helps identify which components of the financial accounts require close monitoring, as higher gaps indicate increased risk in those areas. These accounts directly impact the net present value (NPV) of the company. In the sensitivity analysis, swings of +20% and -20% are utilized to evaluate the potential impact on the NPV. By examining the sensitivity of the free cash flow to these changes, the author gains insights into the potential risks associated with various financial components.



Table 15. Sensitivity Analysis

Operating Expenses	\$13.286	\$13.607	\$12.966	\$320	\$320
Coal Price	\$13.286	\$8.330	\$18.282	\$4.957	\$4.996
Total Production	\$13.286	\$8.330	\$18.282	\$4.957	\$4.996
COGS	\$13.286	\$16.697	\$9.852	\$3.411	\$3.434

Source : Author Calculation

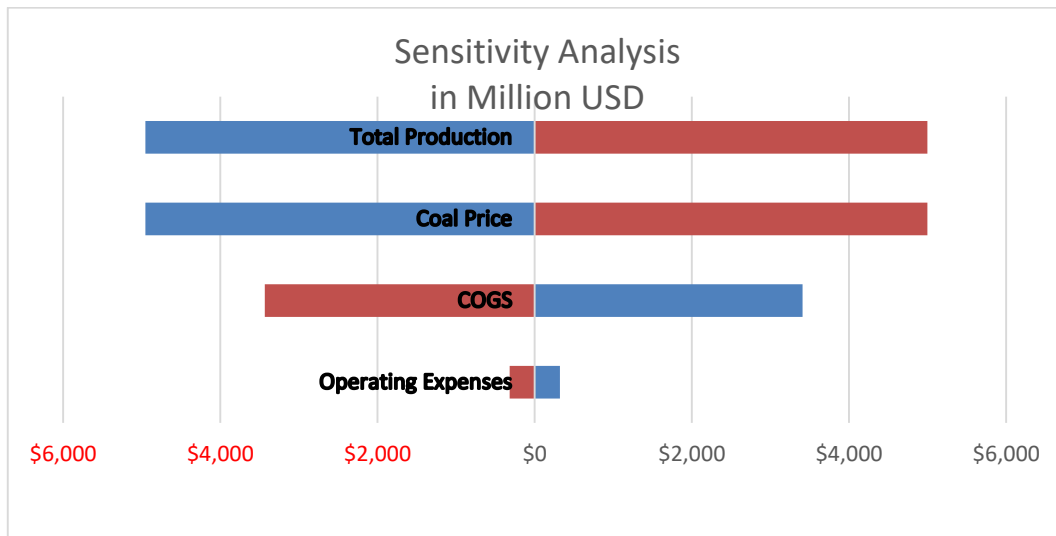


Figure 2. Sensitivity Analysis

Source : Author Calculation

From sensitive analysis, it shows that the coal price and total production has the highest risk rather than the other account. PT Adaro Energy Indonesia need to be aware on those risk due to the highest changes on the NPV.

BUSINESS SOLUTION

According to the regulations outlined in Peraturan Presiden Republik Indonesia number 112 of 2022, the implementation of zero carbon emission in power plants will lead to a decline in forecasted coal prices. Consequently, PT Adaro Energy Indonesia needs to enhance its value and revenue. Several business solutions can be pursued to achieve this.

One solution is for PT Adaro Energy Indonesia to innovate by transitioning from energy coal to metallurgical coal. Metallurgical coal is still in demand for steel production and other metallurgical applications. By adding this revenue stream, the company can mitigate the decrease in demand from the electrical power sector.

Another proposed solution is for PT Adaro Energy Indonesia to diversify its revenue streams beyond coal mining operations. This will contribute to the company's long-term value and prospects.

The main risk faced by PT Adaro Energy Indonesia is associated with coal prices. The decline in coal prices has impacted the company's valuation. To mitigate this risk, the company should develop effective strategies for its coal mining operations.

From an investor's perspective, it is not recommended to buy stocks in PT Adaro Energy Indonesia or invest in the coal industry due to the high risk associated with coal prices. Investors should conduct thorough analysis, including monitoring the coal price market data, as it significantly affects the company's valuation. Therefore, investors interested in the coal industry should exercise caution and closely monitor the coal price trends.



IMPLEMENTATION PLAN

PT Adaro Energy Indonesia should consider implementing a business innovation that focuses on adding a new revenue stream, given the government's intention to shift from fossil fuels to clean energy. A potential solution that could be pursued is the implementation of a gasification plan. As previously mentioned in the business solution, introducing an innovation to diversify revenue streams is crucial.

To effectively implement this solution, the company needs to have a comprehensive understanding of the gasification plan. Conducting an external and internal analysis would be a crucial step in this innovation process. Through external analysis, such as a PESTLE analysis, the company can identify factors that could support its growth. Additionally, leveraging advanced coal mining technologies can improve operational efficiency and effectiveness, as mentioned earlier.

Table 16. Implementation Plan

No.	Plan	Objectives	Indicator	PIC	Long Term Strategy							
					2023	2024	2025	2026	2027	2028	2029	
1	Market Research	To understand the condition of the coal industry and the opportunity to get economic value added	Do a external analysis and internal analysis of the coal industry.	Managerial level								
2	Cost Efficiency	To reduce cost and waste. To increase the profit margin of the firm.	Higher profit margin	Managerial level								
3	Feasibility study on new coal Pit	Create a new revenue stream by new site. Increase productivity and increase sales.	Give a positive NPV, PBP before 2030	Managerial level								
4	Projecting mine plan for new site plan	Create a new revenue stream by new site. Increase productivity and increase sales.	Give a positive NPV, PBP before 2030	Chief and Executive Level								



5	Collaboration from Adaro Green Pillar	Create a new revenue stream, and a new business strategy toward the holding company.	Positive revenue, Positive NPV	Chief and Executive Level							
6	Feasibility study on mineral commodity	Create a new revenue stream. New product in the holding company. Focused on new business level	Give a positive NPV, PBP before 2030	Managerial level							

Source : Author Calculation

Conduct market research for external analysis of the coal industry and internal analysis of PT Adaro Energy Indonesia. This initiative will be carried out by the managerial level within the company to gain insights into the current state of the coal industry and identify opportunities for economic value added.

Develop an innovation plan to establish a new revenue stream. This involves conducting a feasibility study specifically focused on identifying and evaluating potential avenues for generating additional revenue for PT Adaro Energy Indonesia.

Implement cost-efficiency measures in mining operations. The goal is to reduce costs while maintaining coal quality. The managerial level will be responsible for implementing strategies that effectively minimize waste and optimize operational efficiency.

These implementation plans are aligned with the annual report of PT Adaro Energy Indonesia. The company has already taken steps to prepare feasibility studies and explore new revenue streams as part of its innovation efforts. Consequently, the implementation plans are synergistic and consistent with PT Adaro Energy Indonesia's overall strategy, as indicated in the company's annual report and news releases.

CONCLUSION AND RECOMMENDATION

The volatility in coal prices has significantly impacted PT Adaro Energy Indonesia's financial performance. To predict the future value of the company, a valuation analysis is necessary. Despite the declining coal prices in early 2023, there is still demand for the coal commodity globally, resulting in continued growth in total production. However, the analysis also indicates an increasing inflation rate, leading to higher costs of goods sold (COGS) and operating expenses. Therefore, it is crucial to consider these assumptions in projecting discounted cash flows for valuation.

In terms of financial ratios, PT Adaro Energy Indonesia demonstrates a healthy and favorable performance. This is further supported by a pro-forma analysis, indicating sustained positive results. In a cross-section analysis, comparing the company to PT Indika Energy, PT Indo Tambangraya, and PT Dian Swatistika Sentosa, PT Adaro Energy Indonesia outperforms the industry average in various ratios.

In the discounted projected cash flow analysis, the author employs the weighted average cost of capital (WACC) as the cost of capital, considering both the cost of debt derived from interest rates and the cost of equity determined using the capital asset pricing model. The cash flow projections still yield positive values. However, the author assumes that the growth in coal prices will only occur until 2030, as the implementation of zero carbon emission policies will restrict further growth. As a result, the value of PT Adaro Energy Indonesia may be considered overvalued. Additionally, market multiple models indicate lower prices compared to the current price as of December 31, 2023. Consequently, PT Adaro Energy Indonesia's value is projected to decline, necessitating the development



of innovative solutions and the addition of new revenue streams to increase company value and mitigate the risk of declining coal prices.

The implementation of net-zero carbon emissions in Indonesia will have significant impacts on the energy supply and the coal industry. To enhance their value and economic prospects, coal companies must embrace innovation. There are several potential innovations for the coal industry, such as utilizing coal for metallurgical purposes to support steel production and exploring gasification plans that can generate additional revenue streams.

For investors, it is not advisable to invest in the coal industry due to the declining coal prices. The valuation indicates that PT Adaro Energy Indonesia is overvalued, suggesting that its current value is too high. If investors still wish to invest in the coal industry, it is essential to closely monitor and analyze the coal price market data.

The volatility of coal prices makes it challenging to accurately calculate and predict valuations. Furthermore, coal price fluctuations are often influenced by geopolitical factors. Therefore, conducting external analysis and examining the potential factors that could impact the coal industry is crucial.

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