Financial Analysis of the SAUDI ARABIAN MINING Co. (MAADEN)

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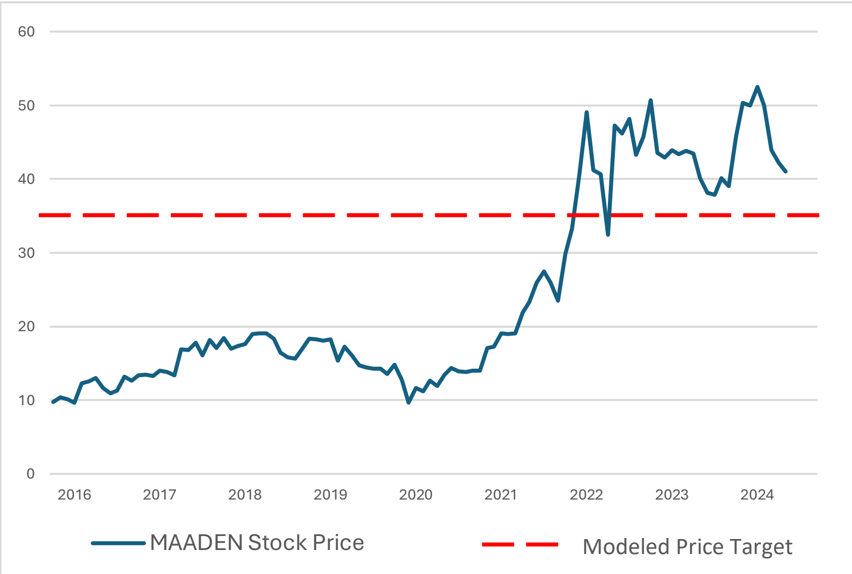
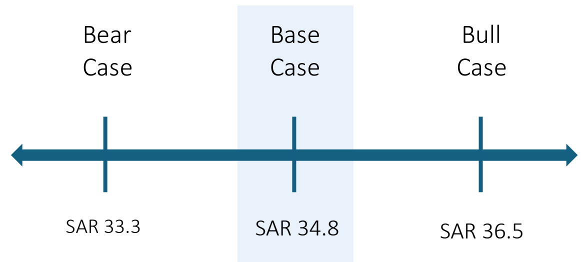


MAADEN (TASI: 1211)

Current Price: SAR 40.90
Modeled Price Target: SAR 34.8
Market Cap: SAR 151 billion
Credit Rating: Baa1 (Moody's)



1. Executive Summary

Introduction
Maaden engages in the exploration and development of mineral and metal resources. It operates through three main Business Units (BUs); the Phosphate BU, the Aluminium BU, and the Base metals and New Minerals BU. The Phosphate BU generates revenue through the sale of fertilizers and ammonia. The Aluminium BU produces alumina, aluminium, and flat-rolled aluminium products. The Base Metals and New Minerals BU primarily sells gold in the spot market.

Performance
In 2023, Maaden reported total revenue of SAR 29.27 billion, a decline from SAR 40.27 billion in the previous year, primarily due to unfavorable price movements in phosphate products.

Profitability
A mining company is a price taker; meaning its margins are largely dependent on market prices. Cost is where management can make a difference, especially in times of unfavorable prices. In 2023, the Phosphate BU achieved an average net margin of 12%, exceeding its long-term average of 10%. The Base Metals and New Minerals BU maintained strong net margins above 30%, consistent with its long-term performance. However, the Aluminium BU recorded net losses, below its already low long-term average net margin of 1%.

Growth
The company has a robust growth strategy focusing on incrementally expanding phosphate and gold output. Phosphate production is expected to rise from 6 million tons to 9 million tons by 2029 through the Phosphate 3 Project. Gold production is projected to increase approximately 70% by 2028 via further Mansourah-Massarah mine production ramp-up, the Mahd Expansion project, and Ar-Rjum Project

Concerns

- The Aluminium BU faces significant challenges with profitability. What measures is management taking to address this issue?
- The volatile prices of phosphate products present a considerable source of earnings variability.

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2. Company overview

The Saudi Arabian Mining Co., Maaden (TASI:1211) is the national mining company of Saudi Arabia with a market cap of SAR 151 billion, as of Aug 14, 2024. It is active in the field of exploration and development of mineral and metal resources. Maaden was founded in 1997 and went public in 2008. Now, there is a total of 3.69 billion shares outstanding; the Public Investment Fund holds 2.48 billion shares (67.18%) while the rest 1.21 billion shares (32.82%) are free floating. The company's main activities are phosphate, aluminium, and gold mining.

Revenue-Generating Business Units (BUs)

- Phosphate BU: Maaden mines phosphate deposits in northern Saudi Arabia, producing fertilizers and ammonia as main end products.
- Aluminium BU: Maaden mines Bauxite deposits from the Al Ba'itha (North of Qassim) then process/refine the output into Alumina, Aluminium, and Flat Rolled Aluminium products (FRP) as end products in the industrial complex of Ras Al Khair.
- Base metals and New Minerals BU: Maaden mines gold from 8 different mines in central Saudi Arabia. The company is focused on expanding this BU via increased production capacity and an intensive exploration program.

Year 2023	***Sales and Profitability per Business Unit (BU)***				
SAR billion	**Total**	Phosphate	Aluminium	Base metals and new minerals	Others
Revenue	**29.27**	58%	30%	10%	1.6%
EBIT	**4.09**	117%	(14%)[*2]	28%	(19%)
EBIT Margin		28%	(6%)[*3]	38%	

Table.1 Sales, EBIT, and EBIT margin figures for Maaden and its different business units during 2023. BUs figures are represented as a percentage of total company figures.

*[*1]Percentage is of the total figure*

*[*2] The number before adjusting for one-off charge is (26%)*

*[*3] The number before adjusting for one-off charge is (12%)*

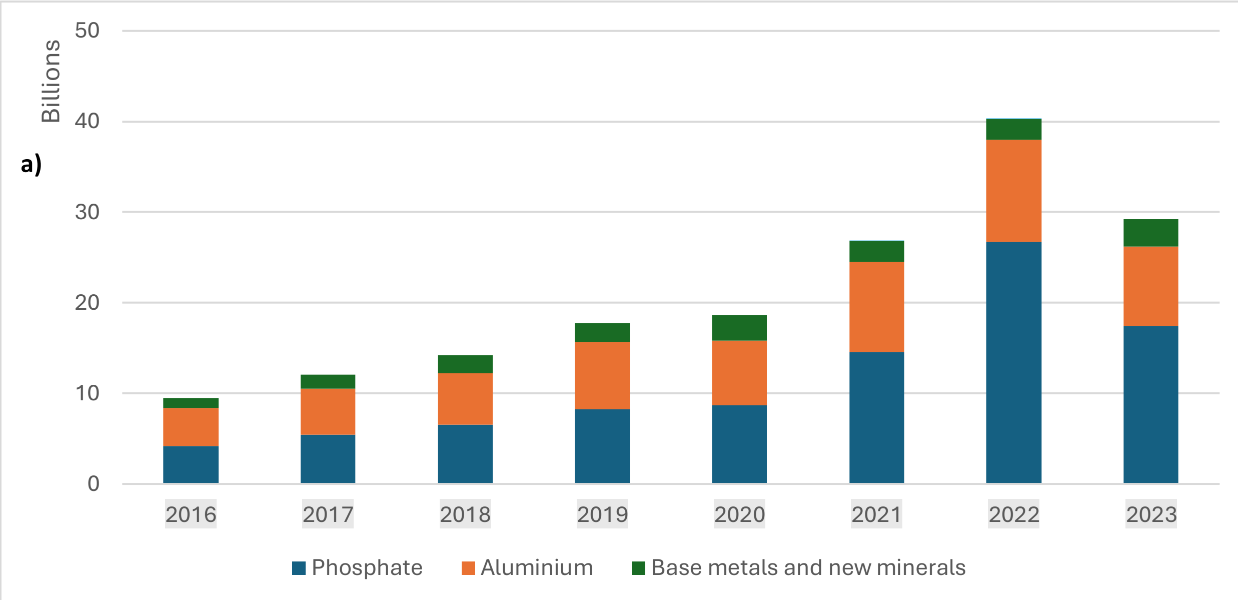
Year 2023	***Assets and Liabilities per Business Unit (BU)***				
SAR billion	**Total**	Phosphate	Aluminium	Base metals and new minerals	Others
Assets	**111.87**	44%	34%	8%	14%
Liabilities	**55.06**	50%	41%	5%	4%
EBIT/ asset		9.6%	(1.5%)[*1]	13.0%	(5.1%)

Table.2 Assets, labilities, and EBIT/asset figures for Maaden and its different business units during 2023. BUs figures are represented as a percentage of total company figures.

*[*1]The number before adjusting for one-off charge is (2.8%)*

During 2023, Maaden achieved total sales of SAR 29.27 billion, 58% of which was generated by the Phosphate BU, 30% from the Aluminium BU, and 10% from the Base metals and new minerals BU. The phosphate BU, and Base metals and new minerals BU positively contributed to Maaden's total EBIT by 117% and 28%, respectively. However, the Aluminim BU recorded large operating losses (Table.1). In term of Business Unit profitability, the Base Metals and New Minerals BU has the highest margins, based on the EBIT margin and EBIT/asset (Table 1, Table 2). The "Others" BU hardly generates any sales compared to the amount of cost it incurs, evident by the large negative impact it has on total EBIT (19%) (Table.1).

Furthermore, looking at Maaden sale across time (Fig.1a), it seems that the main driver for sales variability is the phosphate BU. In addition, it is clear from (Fig.1b) that the majority of the recent growth in operating profits is due to the phosphate BU. The Aluminim BU has been also volatile with years having significant contribution to profitability and other years recording large losses. In contrast, the Base Metals and New Minerals BU has been delivering more consistent base line profits with limited growth.



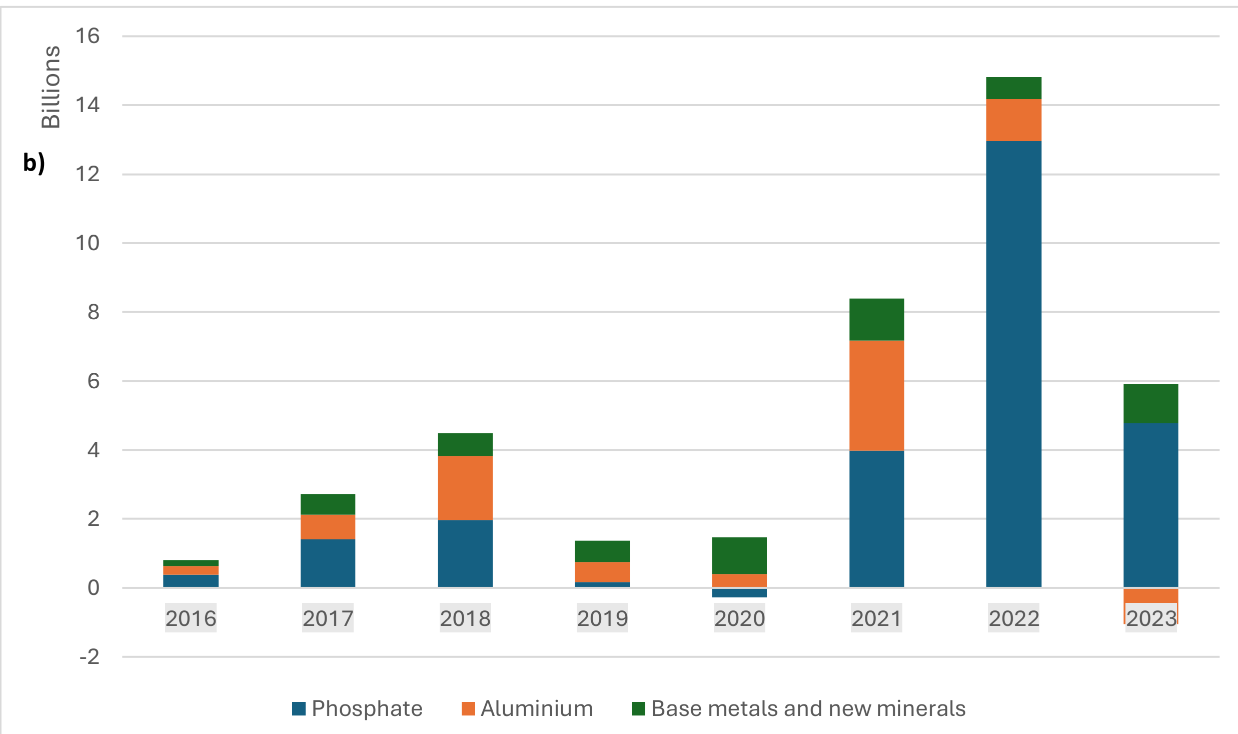


Fig.1a) Maaden's sales by Business Unit through time, 1b) Maaden's EBIT by Business Unit through time

In term of geography, the revenue distribution looks well diversified (Fig.2a). However, when looking at the individual business units, there may be question marks on the concentration of phosphate BU sales in the Indian and the African markets (Fig.2b). More particularly concerning is the concentration of Aluminim BU sales in the domestic market (Fig.2c). Geographical concentration of gold sales is of little concern (Fig.2d) as gold has a well-established global market and is always in demand, reducing the risks associated with geographical concentration.

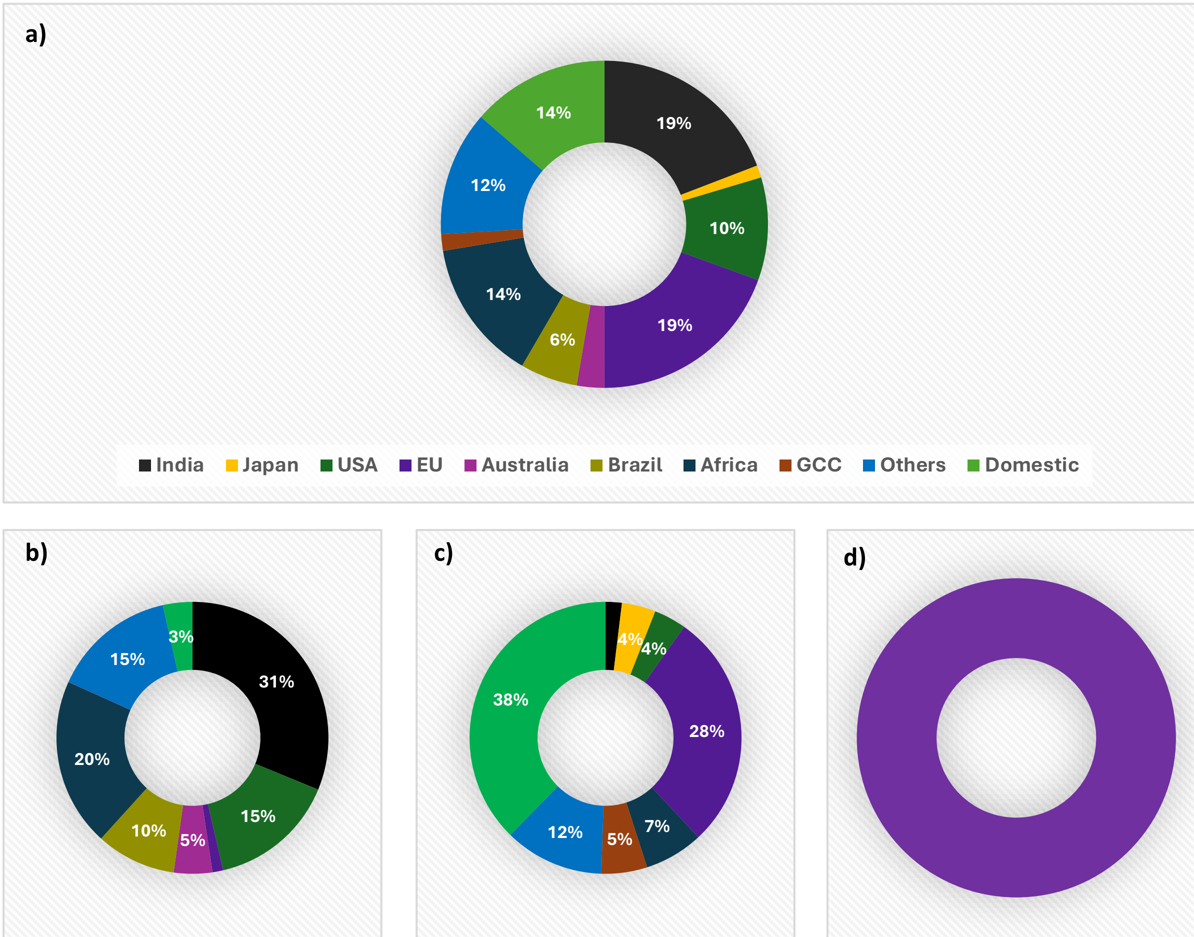


Fig.2a) Maaden's sales by geography, b) Phosphate BU sales by geography, c) Aluminim BU sales by geography, d) Base metals and new minerals BU sales by geography.

Cost Treatment and Cost Structure

Mining is a capital-intensive industry where, other than the typical overhead and adminstriative expenses, capital is needed for explortion and evaluation, delevoment, prdoction, logistics and transportation, and envionmental rehabilitation. Exploration cost is expensed through the income statement as incurred as there is uncertainty whether capital would lead to future benefits. As for development expense, which includes mine construction, overburden removal, equipment and machinery purchases, it is typically capitalized as there is a probable future economic benefit. For production cost, which typically covers mining, processing, labor, maintenance, and consumables, it is expensed. Continuous monitoring, regulatory compliance, and closure fall under environmental rehabilitation activities that are capitalized.

The unit cost of each business unit is shown in Table.3. The lowest COGS as a percentage of business unit sales is the Base Metal and New Mineral BU with 50.4%. The phosphate BU's COGS constitute 64.7% of the BU total sales. Cost of goods sold for the Aluminium BU exceeds the business unit's sales. This cost analysis along with market consideration should guide future CAPEX allocation.

Year 2023	*Sales, COGS, operating expenses, and EBIT of the different BUs*		
	Phosphate	Aluminium	Base Metal and New Minerals
Sales in billion	16.9	8.8	2.9
COGS as a % of BU sales	64.7%	106.9%	50.4%
Operating expenses as a % of BU sales	7.2%	5.1%	11.2%
EBIT in billion	4.77	(1.05)[*1]	1.15

Table.3 Sales, COGS, operating expenses, and EBIT of the different BUs during 2023

*[*1] (inclusive of one-off charge of 0.49 billion assigned to COGS)*

3. Phosphate

Operation

The phosphate segment generates revenue via the sale of fertilizers and ammonia. First, phosphate deposits are minned in northen Saudi Arabia in Al Jalamid and Al Khabra mines. Minned phosphate is then transported to the industrial cities of Ras Al Khair and Wa'ad Al Shamal for conversion into final products, mianly fertilizers and ammonia.
The sales of phosphate products is based on **provisional pricing**, a common pricing approuch in the mining industry. It refers to the practice of setting an initial price for mineral commodities at the time of sale, with the final price being determined later based on market prices at a specified future date. This pricing method is used as prices can fluctuate significantly between the time of shipment and final settlement. For example, during 2023, Maaden's phopshate BU expienced a hit in sales worth more than half a billion SAR due to downward price movment between the time of shipment and setlement (Table.4).

Phosphate Business Unit Sales	*Year ended in 2023*
Sales of goods	16,648,099,083
Movement in provisional price during the year	(512,388,208)
Net sales of goods	16,135,710,875

Table.4 shows the impact of provisional pricing on phosphate business unit net sales.

Performance

This Business Unit drove the record profits for the company in 2022 due to favorable price movement caused by the Russia-Ukraine war. The contraction in the company's top and bottom line during 2023 (Fig.1) has been due to the normalization of phosphate product prices. Even with that, the BU still contributes the most to the company's profit (Table.1).

Areas of Growth

The company emphasizes expansion in this BU via the Phosphate 3 Project, which aims to effectively increase production capacity by 50% from the current 6 the million tons level to 9 million tons by 2029.

million tons	***Guidance for phosphate production***						
	2023	2024	2025	**2026**	2027	2028	**2029**
Phosphate	**6**	6.5	7	**7.5**	8	8.5	**9**

Table.5 Guidance for phosphate production, based on disclosures in the 2023 board report. Incremental production capacity increase is assumed between 2023- 2026, and between 2026-2029.

Exploration

Exploration for phosphates in Maaden does not seem to be a priority, evident from the low exploration expenditure on phosphate.

4. Aluminium

Operation

The company mines bauxite ore in Al Ba'itha mine which is refined to produce alumina that is sold or transported to Ras Al-Khair industrial complex to be smelted into aluminium or more sophisticated products such as Flat Rolled Aluminium products (FRP).

Performance

The Aluminium BU contributes roughly 30% to total sales. However, it is losing money (Table.1, Table.3). Maaden management tries to convey that pressure on prices is driving down the Aluminium BU's earnings. To dissect this, figure.3 shows operating profit/loss along with prices of Aluminum Futures. The 2023 prices appear relatively average and do not seem to justify the significant SAR 562 million operating loss, even after accounting for the SAR 493 million one-off charge (unadjusted EBIT for Aluminium BU SAR -1.05 billion, Table.3). To elaborate, during 2020, prices were approximately 20% lower than 2023, yet the Aluminium BU managed at the time to achieve operating profit (positive EBIT). By looking at the disproportionally high COGS for the Aluminium BU during 2023 (Fig.4), one can deduce that the 2023 Aluminium BU weak performance is due to poor cost management, not pressure on Aluminium prices. is this Inflation in input prices? Additionally, this cost anomaly coincides with the one-off charge of almost half a billion, which warrants further investigation.

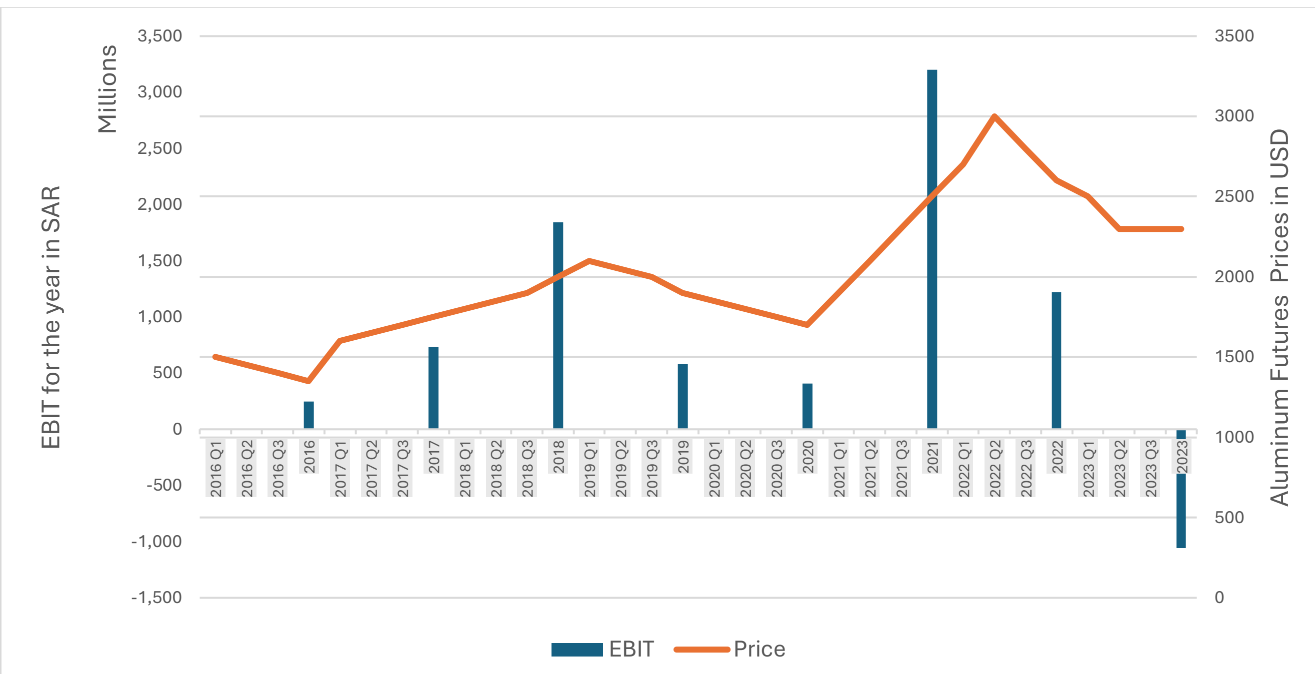


Fig.3 Maaden EBIT for the last 8 years plotted with Aluminum Futures Prices (LMAHDS03:COM). It is meant to show Aluminium BU profitability with various price levels.

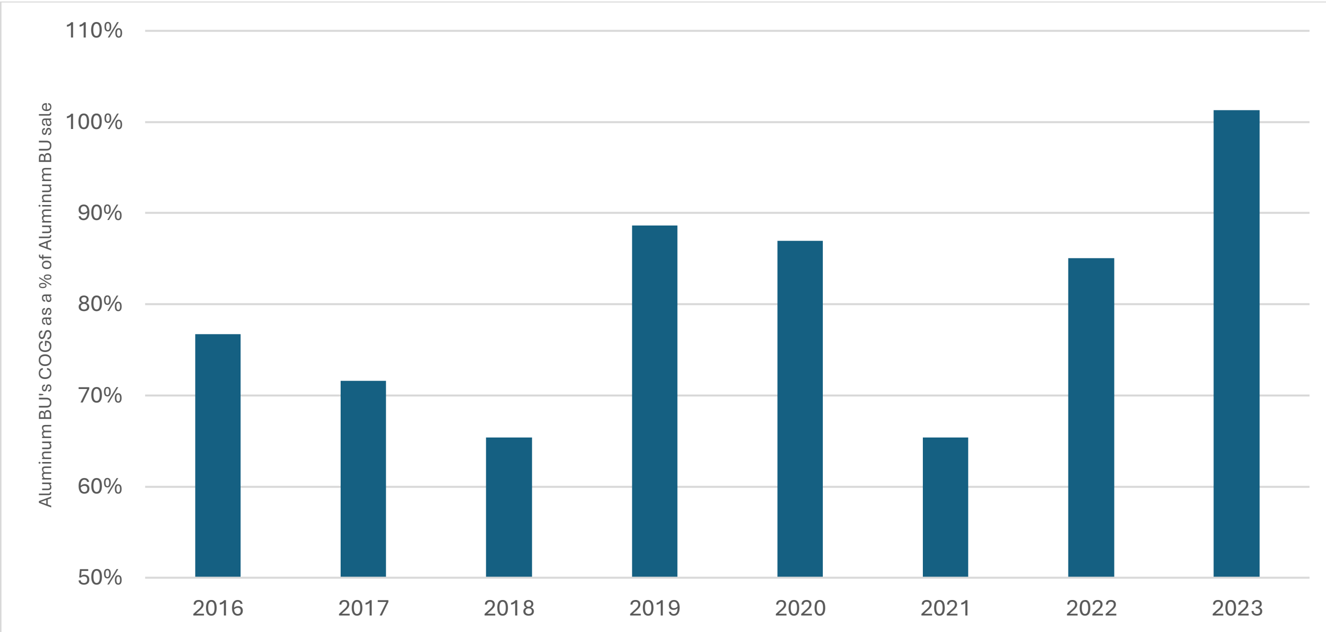


Fig.4 Aluminum BU's COGS as a percentage of the Aluminum BU sales

Furthermore, it is clear that market dynamics are forcing the company to sell more of the basic products (Alumina sales increased 154%), and less of the sophisticated products (FRP sales dropped 20%) (Table.6). What is the reason for this? is there lower demand for Maaden FRP, and why?

Commodity	***Comparison of Aluminium product sold between 2022 and 2023***		
Volumes in metric tonnes	FY22 Sales Volume	FY23 Sales Volume	Change
Alumina	214,000	544,000	154%
Aluminium	587,000	544,000	(7%)
FRP	309,000	248,000	(20%)

Table.6 Comparison of Aluminium product sold between 2022 and 2023 highlighting the change in market dynamics to lower sales volume of FRP and higher sales volume of Alumina.

Remarks

- Since commodities prices are quite volitile, and it is clear that such volatility is impacting Maaden performance, Why is Maaden not employing a hedging strategy?.
- The poor Aluminium BU performance is not limited to 2023. Looking at Table.7, it can be seen that the Aluminium BU is barely profitable with an average net margin of 1% through the 2016-2023 period. It would seem appriopràte to inquire on what kind of action the company is intending to take to address such performance.

Year	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*	*2022*	*2023*
Net Margin	-2%	-4%	11%	-7%	-5%	20%	4%	-14%

Table.7 Average Aluminium BU net margin between 2016-2023.

5. Base Metals and New Minerals

Operation

The Base Metals and New Minerals Business Unit focuses its operations on gold and copper mining. There are 8 gold mines and a single copper mine. Maaden is committed to adding gold and copper reserves from its large exploration expenditure.

Performance

This BU is very profitable with only 8% of assets making up 28% of EBIT (Table.1, Table.2, Table.3).

To dig deeper on the profitability of this BU, I was hoping for a disclosure called the All-In Sustaining Cost (AISC) that is a widely adopted performance metric by gold mining companies. The All-In Sustaining Cost (AISC) is the full cost of producing and selling an ounce of gold. Importantly, it is concerned with the current operation and does not include the cost for mine expansion. This number helps to understand the position on the global cost curve for a mining company and each of its mines. Looking at Fig.5, the cyan blue curve represents the industry AISC curve that is based on all gold mines in operation. A mine with AISC that plots below the current price of gold (orange line) is profitable. To relate this to a real-life example, the All-In Sustaining Cost of Newmont Corporation NYSE: NEM, a major American gold mining company, is represented by the green line in Figure.5. Newmont's AISC sets around $1440/oz, considerably lower than the industry AISC represented by the brown line, setting around $1900/oz. The best mines are tier 1 mines, which plot in the lower half of the industry AISC curve. Newmont's AISC is close to the tier 1 AISC that sets around $1400/oz; meaning the mines Newmont operates are low-cost gold mines.

To assess the cost of producing the gold reserves Maaden has, it is important to know its All-In Sustaining Cost, where does it set on the industry AISC curve, and where each of its mines set. The AISC number allows the analyst to determine the quality of reserves; not all gold reserves are created equal, some are more expensive to exploit.

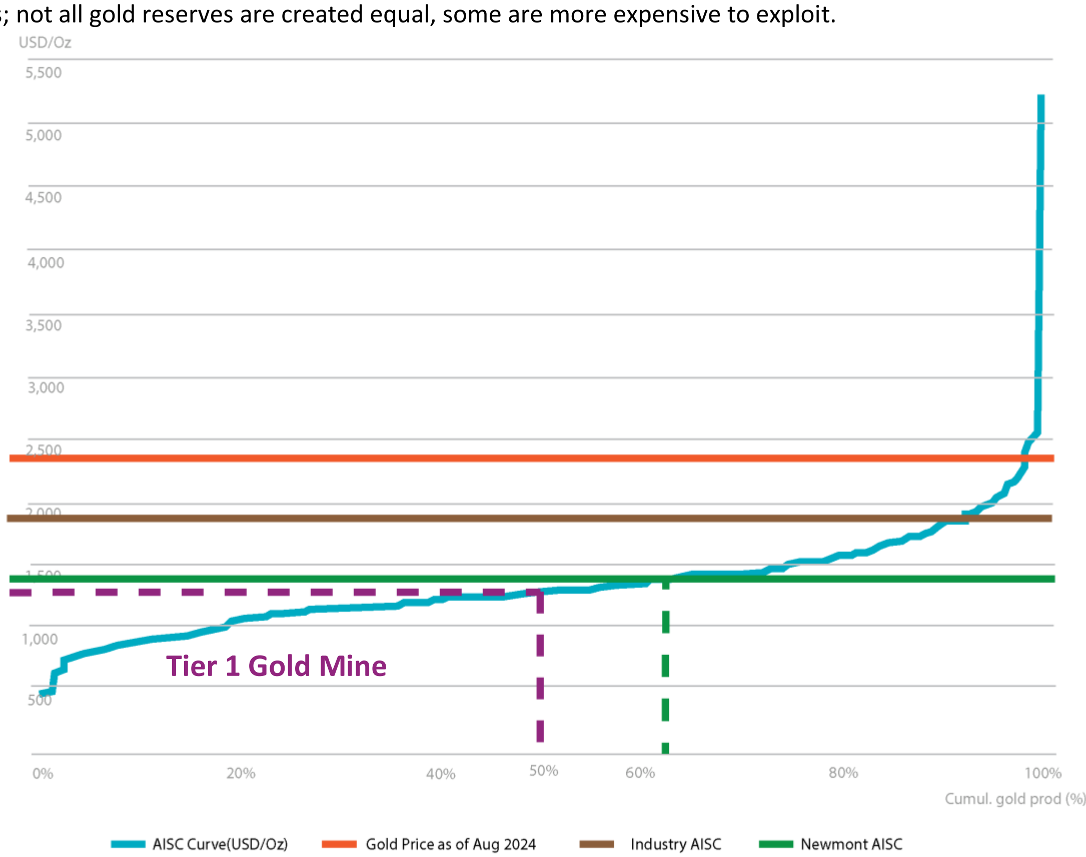


Fig.5 All-In Sustaining Cost Curve is the full cost of producing and selling an ounce of gold. Through the AISC metric, the cost position of the different gold mines can be compared. Data taken from https://www.gold.org/

Areas of Growth

2023 gold output reached 407,000 ounces of gold, 36% of that from the new Mansourah-Massarah mine (Fig.6). Also, the company provides guidance that production from this mine will double in 2024, compared to 2023 production. Moreover, the company expects total production to reach 500,000, 700,000 ounces by 2025 and 2028, respectively (Table.8). Other the Mansourah-Massarah, there is mention of two additional projects in the pipelines that may contribute to this production capacity increase, the Mahd Expansion project and Ar-Rjum Project.

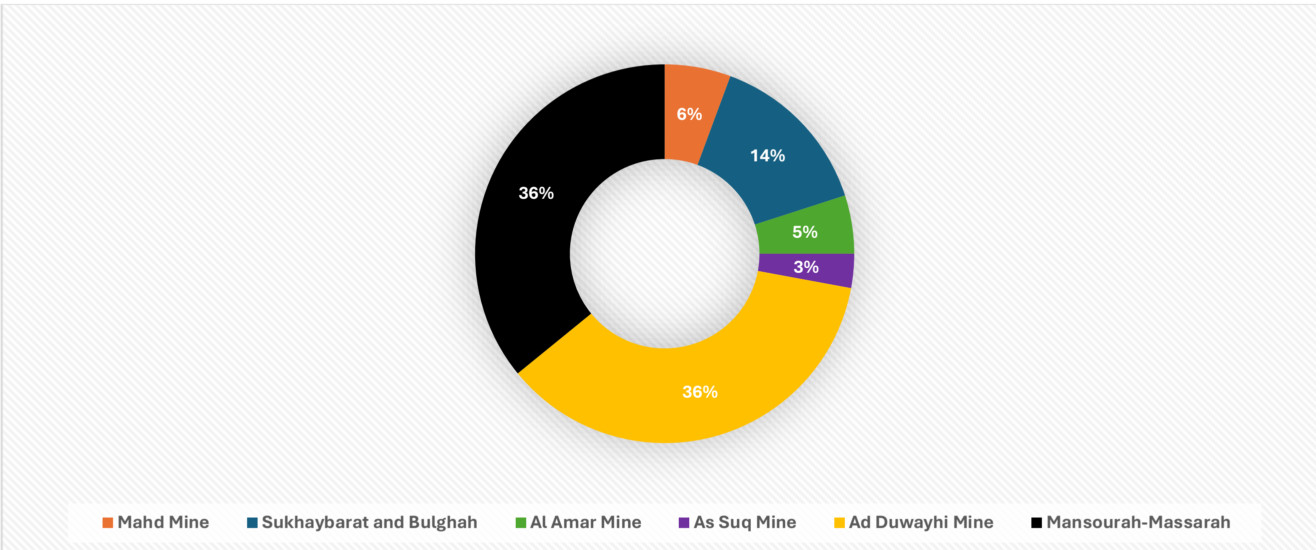


Fig.6 Gold production per mine for 2023

Thousand oz	*Guidance for Maaden's gold production*						
	2023	2024	2025	2026	2027	2028	2029
Gold	407	453.5	500	600	650	700	700

Table.8 Guidance for Maaden's gold production, based on disclosures in the 2023 board report

Exploration

A company that aims to stay relevant needs to maintain a strong reserve portfolio via adding reserves to compensate for the produced ones. Maaden has been ramping up exploration effort with focus on gold and base metals. Exploration spending totaled SAR 500 million during 2023, out of that around 60% was on gold exploration. As a result of that it was announced at 2023 year-end that the company moved 1.5 million oz of inferred gold resources into indicated and measured resources (more on what this means in section 6)

Associated minerals – Copper and Zinc

The company has produced (0.059 Mt) 130 million pounds of copper from its Jabal Sayed mine during 2023
In term of exploration, the other main focus of Maaden's exploration campaign is base metals, namely copper and zinc. Exploration expenditure on such metals was just above 100 million, 20% of the total exploration expenditure for 2023.

6. Reserves

Reserve Vs Resource

Reserves, the most valuable assets for a mining company, are not listed on its balance sheet. "In this section of the report, I will try to explain some key jargon related to reserves, as understanding reserves is crucial for assessing future profit-generating potential. Mineral Resources and Mineral Reserves are fundamental concepts in mining that represent different levels of geological knowledge and economic viability. **Mineral Resources** are naturally occurring concentrations of minerals in the Earth's crust that can potentially be exploited, they are classified based on the level of geological confidence; where measured is the highest confidence. **Mineral reserves** are the economically mineable part of the measured or indicated resources. They incorporate the modifying factors that impact the feasibility of extraction (Fig.7).

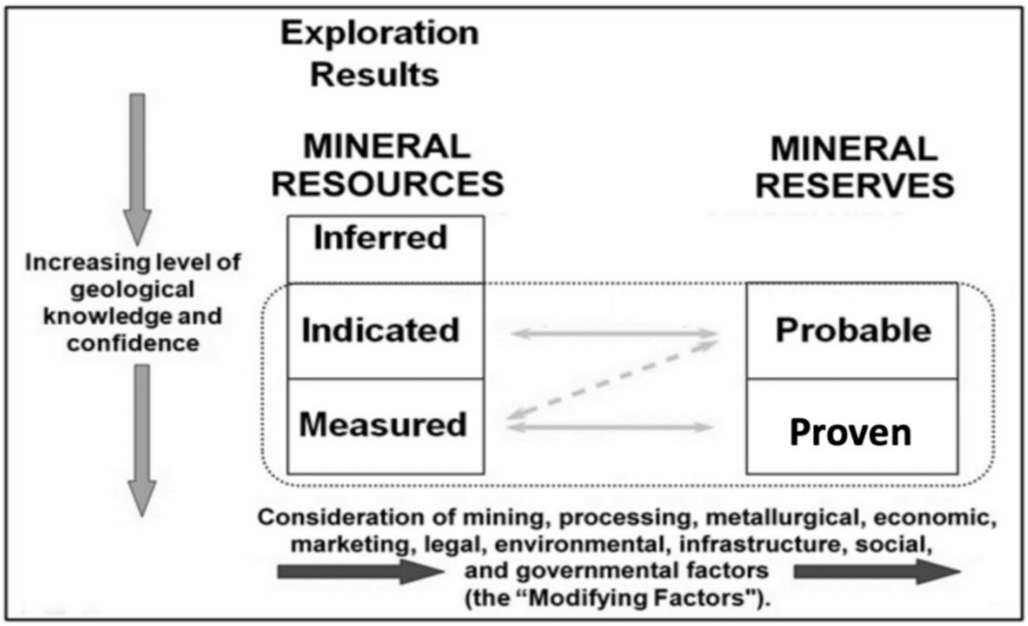


Fig.7 relationship between Mineral Reserves and Mineral Resources (CIM, 2014)

Reserve pricing is a crucial concept in understanding the reserve number. It refers to the minimum price per ounce at which it is economically viable to extract a mineral from the ground, taking into account all associated costs, including mining, processing, transportation, and environmental compliance. The reason this number is key is that by only changing the reserve price, a company can add or reduce reserves. The reserve price is typically compared to the spot price of the commodity to determine the extent of aggressive/conservative accounting that the company is employing.

In the case of Maaden for example, the company sat the reserve price for gold at $1300/oz, which is conservative as it is more than 55% lower than the spot price. Meaning even if gold prices drop to $1300, the quoted gold reserves Maaden have will still be economically viable to exploit. Gold currently sets at around $2300/oz; Given this, and the already conservative gold reserve price, I expect Maaden to increase its reserve price for gold. The implication of increasing the reserve price is that reserves will increase since some of the resources will be reclassified into reserves. This potential adjustment is warranted because the higher gold price now makes previously uneconomical gold deposits viable for extraction. The increase in the reserve figure could positively influence market's perception of Maaden, potentially leading to a price reaction.

Maaden resources and reserves

Commodity	Reserves[*1]	Depletion rate[*2]	Reserve Life	Measured+ indicated	Measured + indicated + inferred	Reserve Price
Phosphate *(million ton)*	219.2	9	24	348.5	1207.3	N/A
Alumina *classified as metallugrgical Bauxite (million ton)*	108.4	1.8	60	178	189.7	N/A
Gold *(million oz)*	11.4	0.4-0.7	16-24	19.15	23	$1300/oz
Copper *(tons)*	0.67	0.059	11	0.89	0.96	$7535/t
Zinc *(tons)*	0.29	No production yet		0.54	0.68	$2103/t

Table.9 Maaden resources and reserves, based on disclosure found in 2022 board report.

*[*1] Proven +probable*

*[*2] range of depletion rate based on current levels – projected levels*

*[*3] range of reseve lives based on current levels – projected levels*

Reserves represent a mining company's ability to generate sustainable sales over the long term; a company that is not able to replace its produced reserves over time may have its going concern assumption brought to question. This highlights the importance of reserves analysis for mining companies.

- **Phosphate:** Looking at disclosed reserves (Table.9), phosphate reserves would last for around 24 years at the projected 9 million tons annual production. Of note, there is significant amount of potential reserve growth from the inferred resources category, more than 800 million tons. Reserve price for phosphate is not disclosed.
- **Alumina:** For alumina reserves, Maaden has 108 million tons of alumina that would sustain the current production levels for 60 years. Reserve price for alumina is not disclosed.
- **Gold**: Maaden is very focused on increasing its gold reserves, evident from the extensive exploration program. The current reserve figure is 11.4 million ounces. The company can produce the quoted reserve at the projected production level of 700,000 oz for 16 years. Looking at the measured+ indicated resources (Table.9), there is considerable upside in terms of reserve addition; the same can be said for inferred resources too. This means that the company can increase its reserves through conducting more technical geological studies and the more practical "modifying factors" (Fig.7). In addition, the company can increase gold reserves by only changing the gold reserve pricing, as discussed.
- **Copper**: Total copper reserves equal to 0.67 million tons, which is around 1,340 in million pounds. Current production is 130 million pounds. Meaning that with the current level of reserves, production can be sustained for 10 years. Copper currently sets around $8,800/t. This 15% diffrence between spot and reserve price is more or less the industry average, so I would not expect a change in reserve price for copper.

7. Mega Projects

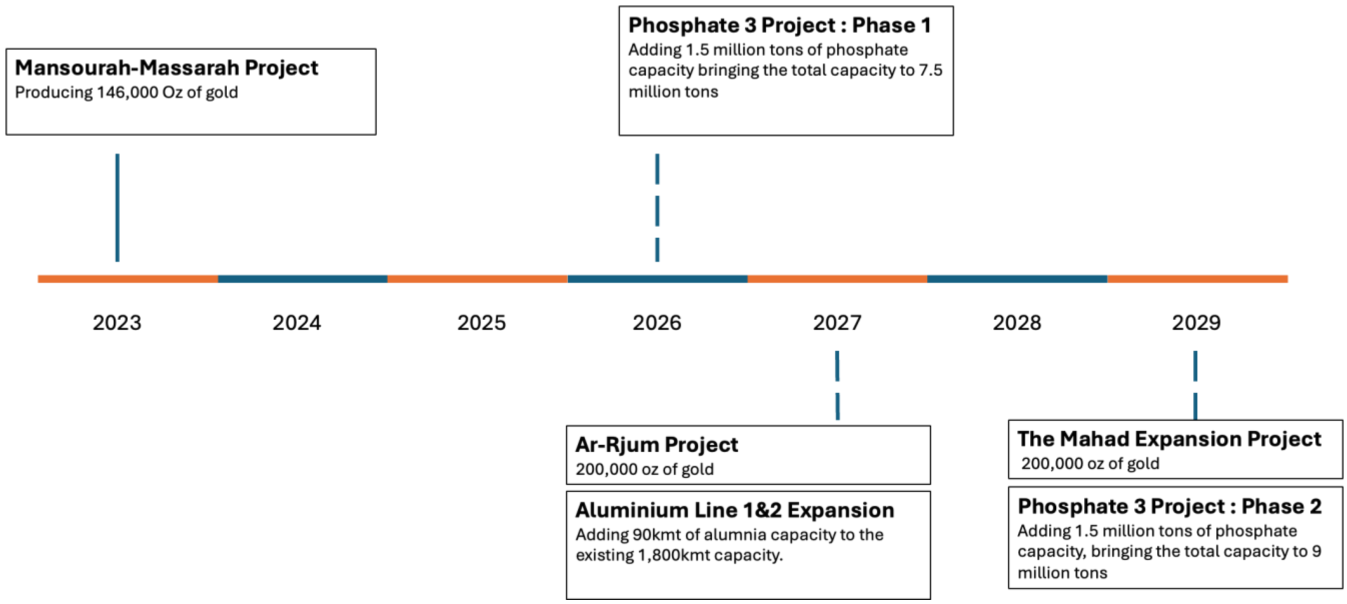


Fig.8 Maaden announced mega projects.

- **Mansourah-Massarah Project** is a major project for the Base Metals and New Minerals unit. It has been in production since end of 2022 and contributing a large chunk to the total 2023 gold production. Incremental capacity will be added to reach an average annual production of 250,000 ounces of gold per year.

- **Ar-Rjum and the Mahad Expansion Projects** each is disclosed to add an annual production of 200,000 oz of gold.

- **The phosphate 3 project** aims to add incremental capacity of 1.5 million tons by 2026, and another 1.5 million tons by 2029 brining the phosphate production capacity from 6 to 9 million tons.

- **Aluminium Line 1 & 2 expansion** the Aluminium BU intends to rise alumina production capacity by 90,000 tons, a 5% increase in production capacity.

8. Forecasting and Valuation

Sales Volume Forecasts	*2024*	*2025*	*2026*	*2027*	*2028*	*2029*
Gold (oz)	453,500	500,000	600,000	650,000	700,000	700,000
Fertilizer (mt)	6,438,435	6,972,825	7,431,250	7,951,438	8,508,038	8,991,813
Ammonia (mt)	2,161,668	2,341,086	2,495,000	2,669,650	2,856,526	3,018,950
Alumina (mt)	544,000	544,000	544,000	571,200	571,200	571,200
Aluminium (mt)	544,000	544,000	544,000	571,200	571,200	571,200
FRP (mt)	248,000	248,000	248,000	260,400	260,400	260,400

Table.10 shows forecasted sales volume for each of the major revenue-generating products. The Forecast is based on announced production capacity increase, with the assumption that all additional capacity will translate into sales. The modeled sale volumes are based on sale volumes in 2023, with growth in each commodity's sales projected based on plans provided by the company. This is discussed in detail under "Reasoning Behind Forecast assumptions"

Sales in SAR	*2024*	*2025*	*2026*	*2027*	*2028*	*2029*
Gold	3,940,348,125	4,344,375,000	4,996,031,250	5,647,687,500	6,082,125,000	6,082,125,000
Fertilizer	3,386,616,810	3,667,706,005	3,908,837,500	4,182,456,125	4,475,228,054	4,729,693,375
Ammonia	730,643,784	791,287,218	843,310,000	902,341,700	965,505,619	1,020,405,100
Alumina	854,760,000	854,760,000	854,760,000	897,498,000	897,498,000	897,498,000
Aluminium	5,250,960,000	5,250,960,000	5,250,960,000	5,513,508,000	5,513,508,000	5,513,508,000
FRP	3,231,750,000	3,231,750,000	3,231,750,000	3,393,337,500	3,393,337,500	3,393,337,500
Transportation services *Phosphate*	766,395,811	830,006,664	884,575,036	946,495,289	1,012,749,959	1,070,335,794
Transportation services *Aluminium*	93,267,015	93,267,015	93,267,015	97,930,366	97,930,366	97,930,366
Total Revenue	29,577,208,179	31,326,343,266	33,131,896,426	35,564,448,498	37,399,900,098	38,617,603,941
Growth in revenue	6%	6%	6%	7%	5%	3%

Table.11 shows sales in SAR for each of the main revenue generating stream, based on Maaden average realized prices that were announced in their earnings release for Q2, 2024. Sales from transportation services are assumed to grow proportionally to BU sales growth. More details on assumptions can be found under "Reasoning Behind Forecast assumptions"

Net margins	
Gold	32%
Phosphate	10%
Aluminium	1%

Table.12 Net margins based on average margin from 2023-2016

	2024	2025	2026	2027	2028	2029
NI	3,004,123,285	3,267,922,706	3,591,842,397	3,937,438,274	4,216,559,683	4,338,330,068
NCC*1	5,680,224,021	6,016,140,754	6,362,892,428	6,830,057,571	7,182,551,160	7,416,407,939
Wc*1	2,054,726,219	2,176,238,490	2,301,670,120	2,470,659,312	2,598,167,984	2,682,761,769
Fc	6,000,000,000	6,000,000,000	6,000,000,000	6,000,000,000	6,000,000,000	4,500,000,000
NB*2	3,624,626,799	3,679,307,321	3,735,751,554	3,811,796,690	3,869,175,593	3,232,242,796
FCFE	4,254,247,886	4,787,132,291	5,388,816,259	6,108,633,223	6,670,118,453	7,804,219,034

Table.13 forecasted free cash flow to equity with relevant variables.

**1 non-cash charges (NCC), and working capital (Wc) are based on 2023 numbers, and are projected to grow by the same percentage as revenue growth.*

**2 Net borrowing (NB): The year 2023 has seen significant debt reduction. However, future capital need (fixed and working) will have to be financed, at least in part, by borrowings. The following formula has been applied, NB= (Fc+ Wc) * 0.45; 45% of capital is funded by debt, based on the current capital structure.*

Valuation Senarios	***Bear***	***Base***	***Bull***
Beta assumption	1.3	1.2	1.1
Required return on equity	12	11.5	11
Value of Equity	112,386,123,727	118,006,425,557	124,292,366,530
Cash and Cash Equivalents	10,536,860,355	10,536,860,355	10,536,860,355
Total Value of Equity	122,922,984,082	128,543,285,912	134,829,226,885
Number of shares	3,691,773,438	3,691,773,438	3,691,773,438
Forecasted Price per share	**33.3**	**34.8**	**36.5**

Table.14 valuation per share based on the three different beta assumptions. The assumption for the terminal value is a long-term growth of 3%. More details on required rate on equity can be found under "Reasoning Behind Forecast assumptions"

Reasoning Behind Forecast assumptions:

- **Net Income**
  - Sales volume**:** The sales volume is based on the figures achieved in 2023. It is assumed that any incremental increase in production capacity will result in all additional output being sold.
    - *Base Metals and New Minerals BU:* Maaden sets its production target more than 500,000 ounces by 2025 and 700,000 by 2028. Incremental sales volume is assumed between those key years.
    - *Phosphate BU (fertilizers and ammonia):* Based on guidance, production will increase from the current 6 to 7.5 and 9 million tons by 2026 and 2029, respectively. Incremental increase is assumed between those fixed years. The same percentage change is assumed for fertilizers and ammonia sales volume
    - *Aluminium BU:* "adapted to market shifts by rather increasing production of primary aluminium and alumina products" (Maaden 2023 annual report). This indicates that the aluminium market is dynamic, and product mix can evolve in either direction. I don't have superior knowledge in the aluminium market to predict this evolution. Thus, I will stick with the 2023 product mix. Sales volume is forecasted to be constant until 2027. A 5% increase in sales volume is projected for each of the products, based on the capacity added from the Aluminium Line 1 & 2 expansion.

  - Commodity prices are a key assumption. To avoid providing baseless projections, average Maaden realized prices from the Q2 2024 earnings call are used.
  - Net margins for each BU are based on 8 years average.

- **Non-Cash Charges (NCC)**

Table.15 shows the relevant items considered in the non-cash charges computation. For the forecasted period, growth of non-cash charges is assumed to be proportionate to revenue growth.

2023 Non-Cash Charges

Depreciation of mine properties	708,657,383
Depreciation of property, plant and equipment	4,021,821,781
Depreciation of right-of-use assets	385,182,758
Amortization of deferred income	(10,599,836)
Amortization of intangible assets	49,148,355
Property, plant and equipment written-off	7,777,037
Loss on derecognition of property, plant and equipment	3,796,019
Obsolete spare parts written-off	10,959,068
(Reversal of) / allowance for inventory obsolescence, net	(18,905,633)
Expected credit loss allowance / (reversal)	16,175,246
Loss / (gain) on adjustment to provision for decommissioning, site rehabilitation and	23,164,582
Current and past service cost of employees' termination benefits	103,621,355
Provision for severance fees	63,306,892
Total non-cash charges	**5,364,105,007**

Table.15 non-cash charges summary for 2023

- **Working Capital Investment**

Table.16 shows the calculations behind the working capital investment for 2023. For the forecasted period, growth of working capital investment is assumed to be proportionate to revenue growth.

2023 Working Capital	***2023***	***2022***	***Change***
Advances and prepayments (Asset)	341,423,806	484,041,350	142,617,544
Inventories (Asset)	7,200,233,920	6,874,231,243	(326,002,677)
Trade and other receivables (Asset)	6,045,678,972	7,368,933,495	1,323,254,523
Projects and other payables – Trade (Liability)	4,549,783,714	4,267,822,976	281,960,738
Accrued expenses – Trade (Liability)	5,070,199,674	4,551,654,359	518,545,315
Total change in working capital			**1,940,375,443**

Table.16 change in working capital between 2022 and 2023 to compute working capital investment.

- **Fixed capital investment**

Fixed capital investment is based on guidance provided by the company for 2024, 2025, and 2026 being between SAR 5.6 – 6.6 billion per year. For the year 2029, which terminal value is based upon, more average levels of capital investment are projected. The rationale behind this is that beyond 2029 there is no announcement of mega projects, meaning reduced capital need.

- **Net Borrowings**

Year 2023 has seen significant debt reduction. However, future capital need (fixed and working) will have to be financed, at least in part, by borrowings. The following formula has been applied,

- At any given year, annual net borrowing is assumed to equal to capital needs, fixed and working, multiplied by the weight of debt in the capital structure. NB= (Fc+ Wc) * weight of debt in the capital structure. Based on the current capital structure, 45% of capital is funded by debt (Table.17). For net borrowing calculations, the 45% weight of debt is assumed to be the consistent for the forecasted period.

Maaden Captial Structure as of end of 2023	*Amount in SAR*	*As a Percentage of total capital*
Equity attributable to owners of parent	46,423,296,016	55%
Total debt	37,307,890,683	45%
Total captial	83,731,186,699	

Table.17 Maaden Capital Structure

- **Required return on equity (Discount rate)**

The discount rate for FCFE is reached via the CAPM model. As of the time of writing this report the risk-free rate is around 5%. The Saudi market risk premium is assumed to be 5%. Beta is a key assumption. Due to the clear volatility of earnings, above market beta is appropriate. Given Maaden's unique position as a diversified mining company involved in multiple activities, finding a comparable peer for accurate beta estimation is challenging. Therefore, a range of beta scenarios has been considered in this analysis (Table.18)

Cost of equity	*Bear*	*Base*	*Bull*
Beta	1.4	1.3	1.2
Risk free rate	0.05	0.05	0.05
Equity risk premuim	0.05	0.05	0.05
Required rate of return	12.0%	11.5%	11.0%

Table.18 CAPM- based cost of equity with 3 different scenarios.

- **Growth rate**

Long term growth rate of equities should be similar to long term GDP growth. 3% long-term growth rate is assumed for Maaden. This is higher than Saudi long term GDP growth; I think this justified due to the preferential focus on mining development as a piler of Saudi economy.

- **Forecast horizon**

The period of forecast is decided based on mega projects that the company has in its pipelines. No mega projects are announced beyond the year 2029.

9. Where I might have gone wrong

- The forecast is based on consolidated financial statements. For greater accuracy, it would be preferable to base the forecast on attributable figures.
- The forecast assumes that any added production capacity from mega projects will lead to proportional increases in sales. This is a significant assumption, as it implies that demand will remain consistently high throughout the forecast period. This assumption might be considered aggressive. I made this assumption because I do not have access to inventory data by product to make specific adjustments. Additionally, I am uncertain about the exact amount of alumina required to produce aluminium. It’s unclear whether the difference between alumina production and sales is due to a large unsold inventory of alumina or if the difference is because alumina is being used as an input for aluminium production.
- The forecast recognizes the incremental addition of sales, as explained in the pervious point. However, it does not assume shifts within the product mix of a specific BU, such as selling more aluminum versus alumina within the Aluminium BU or any similar shifts within the Phosphate BU. This is because I don’t have superior understanding of how these markets will evolve in the long term.
- The forecast is based on 2023 sales volumes, which may not be representative of the forecasted period.
- The forecast assumes 1% net margins for the aluminium BU, which is based on actual 8 years average. A very different valuation can be reached if even slightly higher net margin is used.
- While the current assumption is that 45% of future capital needs will be met by debt, it is important to recognize that equity earnings or net earnings may not fully cover the remaining 55% of capital requirements. My assumption is somewhat aggressive, as it relies on the company consistently generating sufficient equity to meet its capital needs. If these earnings fall short, the company may need to increase its reliance on debt financing, which could alter the intended capital structure and increase financial risk, reducing value of equity.

10. Disclaimer

The information contained in this report is for informational purposes only and does not constitute investment advice. The analysis and opinions expressed herein are my own and are based on my independent research as a CFA Level 2 candidate. While I strive to ensure the accuracy and reliability of the information provided, I make no representations or warranties as to its completeness or accuracy. Investors should consider their financial situation and consult with their own financial advisors before making any investment decisions. I do not accept any liability for any loss or damage resulting from the use of this report. This report may contain forward-looking statements that are based on current expectations and projections about future events. Such statements are subject to risks and uncertainties that could cause actual results to differ materially. I am under no obligation to update or amend any information contained in this report following the publication date. I currently hold 285 shares in Maaden. This may be considered a conflict of interest, and readers should take this into account when considering the information and opinions presented in this report.