



# **HINDALCO INDUSTRIES**

**UNFOLDING OF THE  
NON-FERROUS STORY**



March 11, 2024

**INITIATING COVERAGE** | Sector: Metals & Mining (Non-ferrous)

# Hindalco Industries Ltd

## Expansion plans to strengthen company's foothold in the industry

We initiate coverage on Hindalco Industries Ltd ("HIL" or "the company") with a bullish BUY rating based on its: (1) steadfast focus on downstream businesses for Aluminium and Copper, (2) emphasis on cost optimization projects to ensure global competitiveness, (3) sustainably strong earnings outlook in the light of upcoming capex, and (4) a discernible bottoming out of global Aluminium prices.

### Steadfast focus on Aluminium and Copper downstream businesses

Novelis is a key contributor to Hindalco's earnings. Commanding more than 50% of EBITDA earnings share, Novelis profitability is largely insulated from the LME Aluminium pricing risk. HIL is focused on expanding its downstream businesses, which are high margin markets in India as well as for Novelis. HIL is determined to improve its VAP product mix to gain higher margins, especially in its Indian Aluminium business. Going forward, HIL intends to add ~200 ktpa downstream capacity in India, a likely gamechanger for its Aluminium business.

### Emphasis on cost optimization projects to ensure global competitiveness

In addition to having a strong growth plan on the downstream side, HIL continues to focus on cost optimization projects in order to keep itself as one of the pioneers in the non-ferrous segment globally. Majority of the Aluminium Chinese smelters operate in the third and fourth quartile of the cost curve, whereas HIL continues to remain in the first quartile thereby, generating margins on both its upstream and downstream assets. Additionally, power costs account for ~40% of the Aluminium cost sheet. The company's annual coal requirement is ~16.0 mtpa, out of which ~12 mtpa is sourced through Coal India Ltd through contracts and e-auctions. With the captive coal mines now coming up in the next couple of years, we see that the company's reliance on sourcing the raw material from external sources would completely go away thereby creating more trigger points for margin expansions.

### Sustainably strong earnings outlook in the light of upcoming capex

The company's growth plans showcase HIL's focus on shifting to being one of the low-cost producers for the non-ferrous metals going down the line. We expect the EBITDA/tonne for the Aluminium business to grow steadily with the introduction of new downstream capacities as well as the new cost-saving initiatives both on the upstream and the downstream side. For copper, the company operates on the TC/RC's as well as cathode and CCR production. We expect the copper business to sustain ~INR 2,000 crores of EBITDA on an annual basis. The incremental EBITDA we project, should come from the rise in the copper prices, an industry that has continuously been in a supply side deficit which is expected to enhance in the upcoming years. On the Novelis front, post the company's acquisition of Aleris, it has given a boost on the sustainable EBITDA performance front. We expect the company to maintain the \$500/tonne levels for the upcoming quarters as the demand outlook for the Aluminium FRP products remains strong. Historically, the beverage can demand has remained strong even during periods of recessions and the company's focus remains on maintaining the higher share for the cans in its product mix.

### A discernible bottoming out of global Aluminium prices

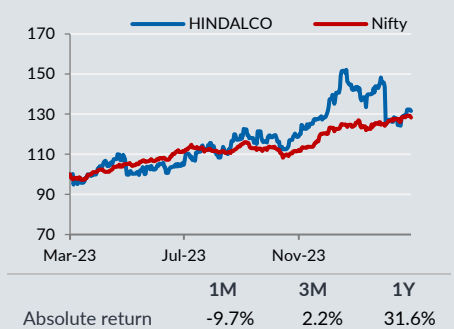
Aluminium prices went through a slump during most part of CY 2023, largely an outcome of global economic slowdown especially in US and Europe coupled with a poorly performing Chinese economy as per street estimates. We reckon the global transition towards green energy sources and EV makers will provide enough momentum for aluminium demand, thereby helping prices firm up from the current levels.

Recommendation	: BUY
CMP	: Rs. 534
Target Price	: Rs. 663
Potential Return	: +24.3%

#### Stock data (as on March 11, 2024)

Nifty	22,333
52 Week h/l (Rs)	621 / 381
Market cap (Rs/USD mn)	1200406 / 14516
Outstanding Shares (mn)	2,237
6m Avg t/o (Rs mn):	3,053
Div yield (%)	0.6
Bloomberg code:	HNDL IN
NSE code:	HINDALCO

#### Stock performance



#### Shareholding pattern (As of Dec'23 end)

Promoter	34.6%
FII+DII	57.5%
Others	7.9%

#### Financial Summary

(Rs bn)	FY23	FY24E	FY25E
Revenue	2,232.0	2,143.0	2,250.6
YoY Growth	14.4%	-4.0%	5.0%
EBIDTA	239.2	252.3	276.2
EBITDA (%)	10.7%	11.8%	12.3%
PAT	101.0	99.8	121.0
EPS	45.48	44.96	54.49
ROE	10.6%	9.5%	10.3%
ROCE	10.2%	10.4%	10.9%

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## COMPANY OVERVIEW

### Introduction

Hindalco Industries Limited (“Hindalco” or “the company”) is the metals flagship company of the Aditya Birla Group, headquartered in India. The company is primarily involved in the business of Aluminium and Copper and operates across ten countries globally. Hindalco is one of Asia’s largest producers of primary Aluminium (excl. China) as also the world’s largest Aluminium rolling and recycling company. Formed in 1958, Hindalco was India’s first integrated Aluminium facility set up in Renukoot, Uttar Pradesh. In 2007, the company acquired Novelis – the world’s largest Aluminium rolling company, marking Hindalco’s global footprint, and ranking it among the top 5 global Aluminium majors.

### Key Management Personnel

#### Exhibit 1: Management Team

Management Personnel	Position	Experience
<b>Mr. Kumar Mangalam Birla</b>	<i>Non-Executive Chairman</i>	Mr. Birla is the Chairman of the Board of Directors of the Company and the Chairman of Aditya Birla Group, which operates in 36 countries across six continents. He is a Chartered Accountant and holds an MBA degree from the London Business School
<b>Mrs. Rajashree Birla</b>	<i>Non-Executive Director</i>	Mrs. Birla is an exemplar in community initiatives and rural development. Mrs. Birla spearheads the Aditya Birla Centre for Community Initiatives and Rural Development, the Aditya Birla Group apex body responsible for development projects.
<b>Mr. Satish Pai</b>	<i>Managing Director</i>	Mr. Pai joined the Company in August 2013 as CEO Aluminium Business. He is a Mechanical Engineer from IIT Madras. He began his career in 1985 with Schlumberger Ltd. and held variety of senior global roles in Operations, Technology Services, IT Services, Human Resources, and large manufacturing units
<b>Mr. Praveen Kumar Maheshwari</b>	<i>CFO and Whole time Director</i>	Mr. Maheshwari, a Chartered Accountant with an MBA from IIM - Ahmedabad, has over 40 years of work experience in areas of General Management and Finance, including mergers & acquisitions, fundraising, investor relations in India and global financial markets. Prior to joining the Company, he was a Group CFO & Executive Director – Finance of Bharat Forge Limited.
<b>Mr. Steve Fisher</b>	<i>CEO, Novelis</i>	Steve Fisher is President and Chief Executive Officer of Novelis Inc. Fisher has served in several executive positions, most recently as Chief Financial Officer. Prior to that, Fisher served as Vice President of Strategic Planning and Corporate Development, where he spearheaded major strategic, corporate, and financial transactions across the company, most notably the discussions that led to the 2007 acquisition of Novelis by Hindalco.
<b>Mr. Devinder Ahuja</b>	<i>CFO, Novelis</i>	Dev Ahuja is Executive Vice President and Chief Financial Officer of Novelis Inc. In this role, Dev oversees all aspects of the company’s financial functions and activities including accounting, treasury, global financial planning and analysis, global tax compliance, investor relations and finance transformation.

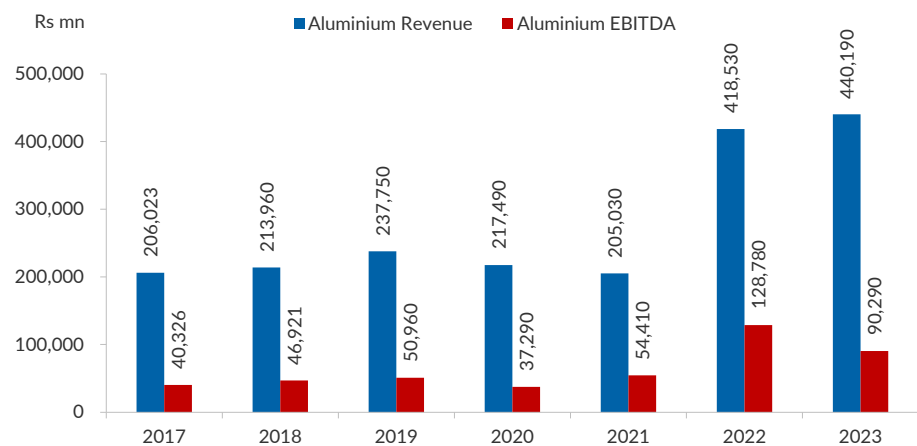
Source: Company, YES Sec

### Breaking down the business segments

One among the world’s top five Aluminium companies, Hindalco is a vertically integrated Aluminium producer with operations across the value chain from bauxite mining, alumina refining, aluminium smelting to downstream rolling, extrusions, and recycling. Further, the company also produces copper products and chemicals.

**Aluminium Business** – Hindalco’s product offerings include high quality Aluminium products. Hindalco’s Aluminium metal is accepted under the high-grade Aluminium contract on the London Metal Exchange (LME) as a registered brand. The company’s product offerings include alumina, primary aluminium products in the form of ingots, billets and wire rods and value-added products (VAPs) such as rolled products, extrusions, and foils. Hindalco’s Aluminium smelting operations are located at Uttar Pradesh, Odisha, and Madhya Pradesh with a combined capacity to produce 1.30mtpa of primary Aluminium in a year. In addition to meet the needs of the industry, Hindalco also has captive sources for its raw material requirement which includes both coal and bauxite mines.

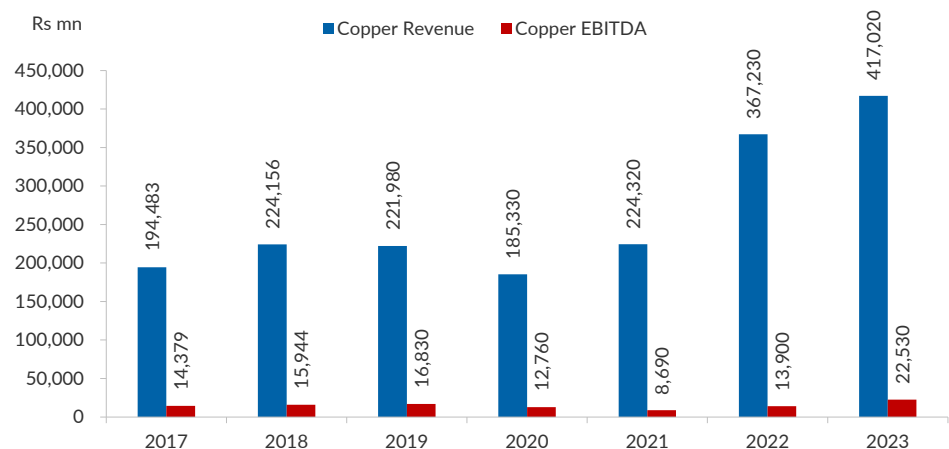
## Exhibit 2: Aluminium Business



Source: Company, YES Sec

**Copper Business** – Hindalco’s copper division, Birla copper is one of the largest custom copper smelters in the world, located in Gujarat. The Birla copper unit comprises of 3 copper smelters, 3 refineries, 2 rod plants along with a captive power plant for manufacturing needs. Hindalco produces LME grade copper cathodes, continuous cast copper rods in various sizes, and precious metals like gold and silver. Hindalco is one of the major manufacturers of 19.6mm diameter copper rods, which is used for railway electrification.

## Exhibit 3: Copper Business



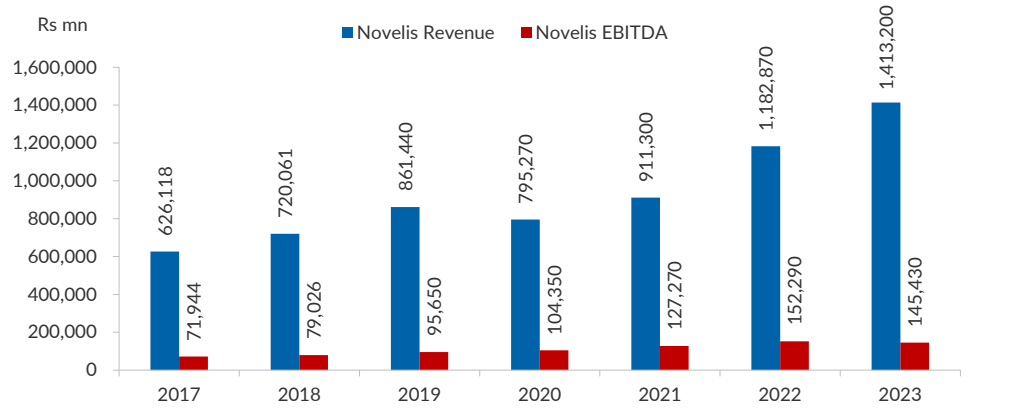
Source: Company, YES Sec

**Novelis** – Hindalco’s acquisition of Novelis in 2007, made it the world’s largest Aluminium rolling company. With this acquisition, Hindalco made itself a pioneer across the full upstream and downstream value chain of Aluminium. Novelis is Hindalco’s main source of providing VAPs in the global market including - flat rolled products (FRPs), extrusions and foils and packaging

solutions etc. Novelis operates globally having recycling facilities in South Korea, USA, Brazil, Germany, UK, and Italy. Novelis product mix mainly includes –

- Beverage can sheet
- Automotive body sheets
- Specialties
- Aerospace products

#### Exhibit 4: Novelis Business



Source: Company, YES Sec

Novelis primarily operates in the Aluminium FRP industry with operations across North America, Europe, Asia, and South America. The company's business is based on producing downstream Aluminium products through recycled Aluminium.

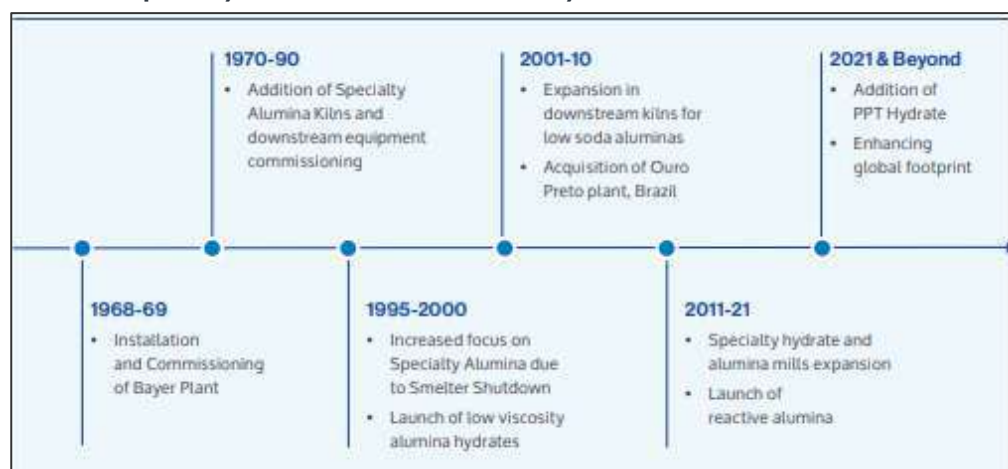
Disruptions in demand for aluminium rolled products caused by the pandemic and semiconductor shortages in the automotive industry have moderated. Increasing customer preference for sustainable packaging options and package mix shift towards recyclable aluminium are driving higher demand for aluminium beverage packaging worldwide. The beverage can industry is expected to grow at a rate of 4% CAGR (CY22-31). Beverage cans make up for ~60% of Novelis' product mix.

On the automotive front, the company is witnessing swift growth due to the rising market share of EVs which encourage Aluminium use. The industry is expected to grow at a rate of 11% CAGR (FY23-28), thereby opening a new foray for Novelis to have a stronghold position in.

Shipments of aerospace aluminium plate and sheets have improved in FY2023, as demand for air travel has recovered. Looking ahead, the company believes significant order backlogs for key OEMs including Airbus and Boeing will translate into future growth. The company has multi-year supply agreements which make it well positioned to benefit from the future expected demand.

**Specialty Chemicals** – Hindalco also operates in the space of producing and selling specialty chemicals. The two manufacturing plants in Belagavi and Muri have been on the forefront for the manufacturing in the chemicals business for the last 4 decades. Alumina's remarkable mechanical properties, thermal stability, strength, and chemical inertness make it a material of choice primarily in three major applications: refractory, ceramics, and polishing. The key market segments for the company's operations in this space are – water treatment chemicals, ceramics, refractories, glass, and abrasives.

## Exhibit 5: Specialty Chemicals Business Journey



Source: Company, YES Sec

## Manufacturing Capabilities and Production Scenario

Hindalco operates across the Aluminium value chain as well as produces copper cathodes and value-added copper products including copper cast rods (CCR). At the heart of the operations of the company, lies its manufacturing capabilities and how the company backward integrates its operations to reduce costs and improve margins for the businesses it operates in.

**Aluminium Business** - The Indian Aluminium business are integrated and consist of bauxite mining, alumina refining, smelting, and converting primary metal into value-added products. The manufacturing facilities are in regions close to raw material sources, low cost and available labour and demand markets. This helps in reducing costs and improving profit margins. Hindalco has several coal mining blocks in Jharkhand and Chhattisgarh which caters to its power needs as well as for manufacturing Aluminium. In addition to the coal blocks, the company also has bauxite mines across the 4 states of Jharkhand, Orissa, Chhattisgarh, and Maharashtra. Bauxite is the main raw material for producing Aluminium and India has one of the highest quality bauxites available in the world. Hindalco has a total of 27 leases of bauxite mines with a total capacity of approximately 15 million metric tonnes.

## Exhibit 6: Indian Aluminium Capacities

Alumina Plant	Capacity (ktpa)	Aluminium Plant	Capacity (ktpa)
Renukoot	700.0	Renukoot	410.0
Utkal	2,200.0	Aditya	360.0
Muri	450.0	Mahan	359.0
Belagavi	350.0	Hirakud	216.0
<b>Total</b>	<b>3,700.0</b>	<b>Total</b>	<b>1,345.0</b>

Source: Company, YES Sec

**Copper Business** - The copper unit at Dahej comprises copper smelters, backed by a captive power plant, oxygen plants, by-products plants, utilities, and a captive jetty. There is also a precious metals recovery plant at Dahej, which produces gold, silver, and selenium. The company has a copper rod capacity of 540 ktpa and a copper cathode capacity of 420 ktpa. In 2021, the company acquired a 100% stake in Ryker Base Pvt Ltd. In a bid to strengthen its portfolio of copper downstream value-added products (VAP).



**Novelis** – Novelis is the world's largest Aluminium FRP producer and Aluminium recycler. It recycles over 80 billion cans annually and uses around 57% of the recycled content across its portfolio. Novelis has a 4.10 mtpa rolling capacity along with a 2.50 mtpa capacity for recycling. In addition to that, the company also announced a \$4.1 bn greenfield project including a rolling and a recycling facility.

## Capex Plans in Pipeline

Hindalco's capex plans in the pipeline are majorly focused on the downstream Aluminium expansions with a great emphasis on its subsidiary – Novelis.

**Novelis** – Approximately \$4.5bn worth of project expansions across different categories are already underway. These expansions include an integrated rolling and casting facility of 600 KT capacity in Bay Minette, Alabama, expected to be commissioned in FY2026. The facility is expected to be the world's most sophisticated, automated, safest, and greenest aluminium rolling mill. Hindalco is looking to bet big with its new rolling and recycling facility in Bay Minette. This facility will cater to the growing demand for can sheets and an undersupplied market, especially in North America.

In addition to this, the company is also focused on the Automotive sheet ingot recycling facility of 240 ktpa capacity in Guthrie, Kentucky. This facility is expected to be commissioned in FY2025.

## Exhibit 7: Novelis Upcoming Projects

Project Name	Location	Amount (Approx)
Greenfield Rolling & Recycling Facility	Bay Minette, USA	\$ 4.1 billion
Automotive Recycling Center	Guthrie, USA	\$ 365.0 million
Recycling Expansion	Ulsan, South Korea	\$ 50.0 million
Debottlenecking & Rolling Capacity Release	Oswego, Logan, Yeongju and Brazil	\$ 350.0 million

Source: Company, YES Sec

**India Aluminium** – Hindalco is the only large and organized player in the Indian downstream sector. The company is adding 170 ktpa FRP project with casting and cold rolling at its Aditya and Hirakud facilities which will contribute to enhancing the company's downstream capacity. The following projects are in pipeline for the company's aluminium business in the next 5 years -

- High-End Extrusions facility at Silvassa
- New Flat-Rolled Products (FRP) casting at Aditya
- Cold Rolling facility at Hirakud
- Coated Air Conditioning Fins facility (under the PLI scheme of Govt of India) at Taloja
- New Battery Foil Mill at Aditya
- New Battery Enclosures facility at Pune

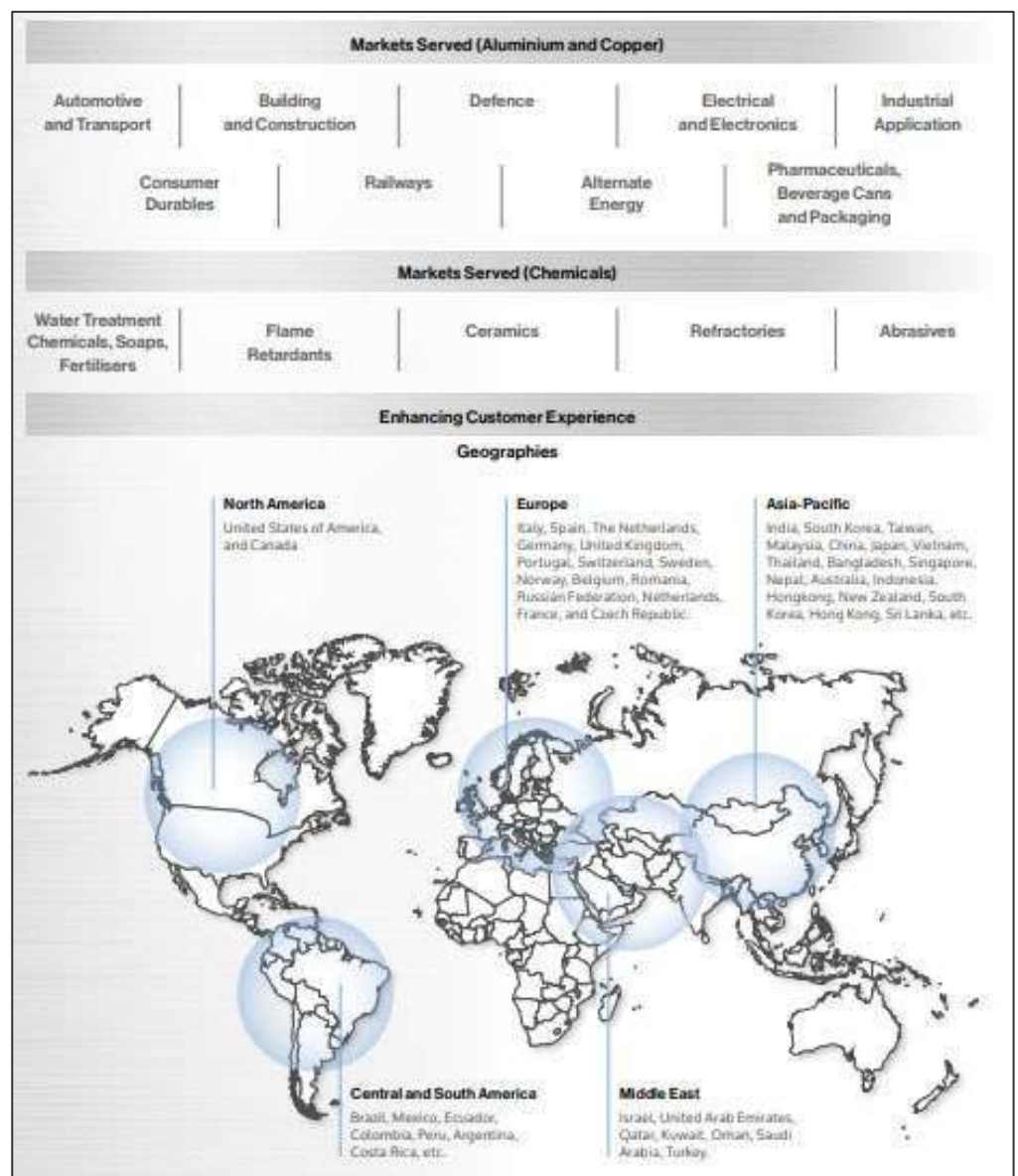
With the following additions, the company's downstream capacities will move on from the current ~400 ktpa to ~600 ktpa by FY2026.



**Cost Optimization Projects** – With the new projects, the company’s top line growth is expected to come from the volume additions that would take place in the upcoming years. In addition to these, the company is also working on its cost optimization projects. Several initiatives such as strengthening of backward integration, investments in renewables, and bolstering the supply chain for sources of raw materials are in various stages of implementation. The company is also investing in procuring captive coal mines to become self-reliant and protect itself from the volatility of energy prices. Currently, the company is reliant on Coal India Ltd to meet its thermal coal needs. Around 70% of the required quantities of coal is sourced through contracts in place, whereas the remaining is purchased through e-auctions. Chakla coal mine with a capacity of 4.50 mtpa is expected to be operational by FY2026. Meenakshi coal mine with a capacity of ~10.0-12.0 mtpa is currently awaiting regulatory approvals. The current requirements are of roughly 16.0 mtpa for the company’s energy needs.

## Customer Base and Offerings

**Exhibit 8: Hindalco’s market presence in a nutshell**



Source: Company, YES Sec

**Aluminium Business** - On the aluminium front, HIL is involved in producing aluminium products for various industrial applications ranging from primary applications to flat-rolled products, foils, and extrusions. The markets it serves are majorly – automotive and transport, building and construction, defense, electricals and electronics, packaging etc.

**Copper Business** – The copper side of the business generally focuses on production of copper rods and the copper wires which are useful for the power industry, automotive industry, construction, and electronic segments.

**Novelis** - Novelis operates integrated, technologically advanced rolling and recycling facilities in North America, South America, Europe, and Asia. The Company offers sustainable and innovative manufacturing solutions to various sectors mainly comprising manufacturing and construction, healthcare, consumer staples, real estate, materials, and utilities. The major offerings at Novelis includes – Aluminium sheets and plates, foil products, tubes, beverage can sheet etc.

## Environmental, Social and Governance Aspects

Hindalco is making great strides towards its ESG initiatives. Right from biodiversity to renewable energy to waste and water management, the company has achieved high ratings and maintained its position by achieving the highest score for 3 straight years out of 29 companies assessed in the Aluminium industry in the S&P Global Corporate Sustainability Assessment (2022 ESG Score 83/100).

At Hindalco operations, Scope 1 and 2 accounted for 27.56 million tCO<sub>2</sub>e for FY23. The increase in emissions is due to the expansion of operations and an increase in production. At Novelis, however the Scope 1 and 2 were lower for FY23 as compared to FY22.

### Exhibit 9: Emissions Summary

Y/e Mar (mn tCo <sub>2</sub> e)	Aluminium			Copper			Novelis			
	Scope 1	Scope 2	Total	Scope 1	Scope 2	Total	Scope 1	Scope 2	Scope 3	Total
2020	25.94	0.58	26.52	1.00	0.11	1.11	1.32	1.11	15.48	17.91
2021	24.33	0.39	24.72	0.83	0.04	0.87	1.45	1.10	13.34	15.89
2022	25.76	0.45	26.21	0.79	0.14	0.93	1.42	0.91	17.80	20.13
2023	26.07	0.52	26.59	0.79	0.18	0.97	1.38	0.86	15.01	17.25

Source: Company, YES Sec

Hindalco is working on its targets to achieve Net Carbon Neutrality by 2050. The aluminium production process is a high energy intensity business and power costs account for roughly 42% of the total cost sheet. For Hindalco, especially for its upstream aluminium business, use of renewable sources of energy would become a must down the line to meet its sustainability targets. HIL currently has about 100 MW of renewable energy capacity which it plans to scale up to 300 MW by 2050.

On the short-term ESG goals, the company aims to reduce its emissions intensity by 25% by FY25. At HIL, the targets on the water consumption and preservation are as follows–

- To achieve 20% reduction in specific freshwater consumption by 2025 against the baseline of FY 2018-19.
- To achieve water positivity across our mining sites by 2025 and across all our operations by 2050.
- To achieve Zero Liquid Discharge (ZLD) status by 2025 across all our plants.
- To reduce water use at Novelis by 10% at all our operations by 2026 from the base year of 2020.

In addition to the above, HIL is also taking initiatives on sustainable mining practices. HIL has 21 operational mines covering about 7,475 hectares across India. The mines are in different geographic locations and have diverse habitats. To reduce the impacts while operating, HIL has taken initiatives like restoring the void mines by backfilling them with bauxite residue.

## Recent Developments surrounding the Company -

- **Bay Minette project costs shoots up 64% than earlier estimations** – The Bay Minette project is something that both Novelis and the industry has been looking forward to since its initial announcement. Earlier the estimated costs for the project had come out to be ~USD 2.5bn, however during the company's Q3FY24 results, the estimated costs were shot up by 64% re-baselining the project costs to ~USD 4.1 bn. This update came as a negative as it damages the company's return profile for the project. Earlier, it was estimated that the project was expected to generate an IRR ranging mid-teens (about 15-16%), which will come down to lower double digit levels (~10-12%) due to the elevation in the project costs. The commissioning of the plant also got delayed to the second half of the calendar year 2026.
- **Novelis seeking IPO listing in the US - On February 20th, 2024, Hindalco announced that its wholly owned subsidiary** – Novelis has confidentially submitted a draft registration statement with the Securities and Exchange Commission (SEC). We see this move to be positive for the company as with this move. In the public offer, the common shares are expected to be offered by Novelis' sole shareholder, i.e., A. V. Minerals (Netherlands) N.V., a wholly owned subsidiary of Hindalco. Novelis will not receive any proceeds from the sale of common shares by its sole shareholder. Novelis expects to complete the public offering after the SEC completes its review process, subject to market and other conditions, according to the company's filing with the exchanges.

## VALUATION AND VIEW

Initiate with a BUY rating and a TP of Rs 663/sh

### Our View

We see Hindalco to be a strong Aluminium player in India in the upcoming years as well as globally. The company has been undertaking projects to expand its presence across the value chain for primary and secondary Aluminium as well as copper products. Just with steel, we see that the Aluminium industry would undergo major shifts in its structure down the line and the countries having easy raw material accessibility will tend to benefit the most. Hindalco is a backward integrated company when it comes to the sourcing of raw materials and with the upcoming coal mines, the company is expected to make themselves completely self-reliant on the primary aluminium manufacturing process. Not to mention that this comes at a time where the company is already in the first quartile of the global cost curve for aluminium production.

Additionally, we see Novelis to play a huge role when it comes to capturing the global aluminium FRP market. The company is investing heavily in its Bay Minette recycling unit targeting the North American and European markets with a major emphasis on the global beverage can market. Additionally, the growth is also focused on sustainable operations with the Bay Minette facility going to be the world's most automated and greenest Aluminium rolling mill. Despite the latest delay which may cause some short-term hiccups on the cost front, we see this facility to bring in incremental volumes that could help the company solidify its position as one of the largest aluminium recycler and producer on a global level.

We value Hindalco using the SOTP model to derive a price target of Rs 663/sh. We value Novelis at 6x FY26E EV/EBITDA, the Indian Aluminium business at 5.5x FY26E EV/EBITDA multiple to incorporate the new value-added facilities and the Indian Copper business at 5.0x FY26E EV/EBITDA multiple.

### Valuation Assumptions and Summary

#### Exhibit 10: Pricing Assumptions

Y/E Mar	FY24E	FY25E	FY26E
LME Aluminium Prices (\$/t)*	2,247.67	2,314.93	2,450.00
LME Premium (\$/t)*	91.04	90.00	90.00
LME Copper Prices (\$/t)*	8,303.25	8,610.00	9,038.94
TC/RC (\$/t)*	86.00	80.00	80.00

Source: YES Sec; \* - Bloomberg Estimations

#### Exhibit 11: Production Assumptions

Y/E Mar	FY24E	FY25E	FY26E
Aluminium Upstream Sales (kt)	1,337.5	1,318.1	1,338.3
Aluminium Downstream Sales (kt)	354.0	377.6	458.3
Copper Cathode Sales (kt)	488.6	441.0	511.1
Copper CCR Sales (kt)	388.2	405.0	432.0
Novelis Shipments (kt)	3,639.4	3,772.0	4,017.2

Source: YES Sec

## Exhibit 12: SOTP Model

Particulars (Rs mn)	FY26E
<b>Novelis</b>	
Shipments (kt)	4,017.2
EBITDA/tonne (\$)	542.1
EBITDA	185,112.8
Multiple (x)	6.0
Target EV	1,110,676.7
<b>Indian Aluminium</b>	
Sales (kt)	1,796.6
EBITDA/tonne	51,325.8
EBITDA	92,209.6
Multiple (x)	5.5
Target EV	507,153.1
<b>Copper</b>	
Sales (kt)	943.1
EBITDA	29,262.3
Multiple (x)	5.0
Target EV	146,311.6

Source: YES Sec

## Exhibit 13: Valuation Summary

Particulars	EBITDA (Rs mn)	Multiple (x)	EV (Rs mn)	Per Share Value
Novelis	185,112.8	6.0	1,110,676.7	500.3
Hindalco Aluminium	92,209.6	5.5	507,153.1	228.4
Hindalco Copper	29,262.3	5.0	146,311.6	65.9
			<b>1,764,141.3</b>	<b>794.7</b>
Less: Net Debt			(423,747.6)	(190.9)
Add: CWIP			73,400.0	33.1
Add: Investments			58,570.0	26.4
Total			<b>1,472,363.7</b>	<b>663.2</b>
CMP				533.7
Upside				24.3%

Source: YES Sec

## Exhibit 14: Du-Pont Analysis

Y/e 31 Mar	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24E	FY25E	FY26E
Net profit margin (%)	1.9%	5.3%	4.2%	3.2%	2.6%	7.0%	4.5%	4.7%	5.4%	5.8%
Asset turnover (x)	0.7	0.8	0.9	0.7	0.7	0.9	1.0	0.9	0.9	1.0
Financial leverage (x)	3.2	2.7	2.7	2.9	2.9	2.9	2.4	2.2	2.1	2.0
RoE (%)	4.1%	11.1%	9.6%	6.5%	5.2%	17.6%	10.6%	9.5%	10.3%	10.9%

Source: YES Sec

**Exhibit 15: Comps Table**

COMPANY	Capacity (ktpa)	CMP	Market Capitalization Current (in INR millions)	Net Debt Current (in INR millions)	EV Current (in INR millions)
Hindalco	1,345	533.7	1,197,991.1	429,670.0	1,627,661.1
National Aluminium	460	158.4	288,902.2	(21,584.7)	267,317.5
Vedanta	2,370*	275.3	1,023,161.0	447,380.0	1,470,541.0

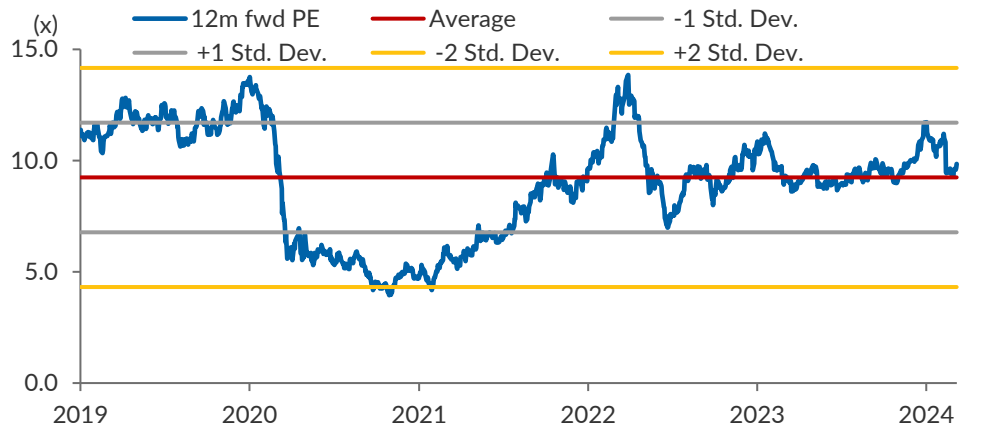
\*- includes 570 ktpa of BALCO capacity

COMPANY	Revenue			EBITDA			EPS (Rs)		
	FY23	FY24E	FY25E	FY23	FY24E	FY25E	FY23	FY24E	FY25E
Hindalco	2,232,020.0	2,143,030.4	2,250,551.3	239,230.0	252,268.3	276,203.7	45.5	45.0	54.5
National Aluminium	141,708.6	128,488.0	142,046.5	24,449.5	24,309.5	32,578.0	7.8	7.3	7.8
Vedanta	1,454,040.0	1,397,834.0	1,460,232.8	342,560.0	333,713.8	372,801.2	28.3	19.9	27.4

COMPANY	P/E (x)			BVPS (Rs)			P/BV (x)			EV/EBITDA (x)		
	FY23	FY24E	FY25E	FY23	FY24E	FY25E	FY23	FY24E	FY25E	FY23	FY24E	FY25E
Hindalco	11.7	11.9	9.8	427.1	472.1	526.6	1.2	1.1	1.0	6.8	6.5	5.9
National Aluminium	20.3	21.7	20.2	1.1	2.1	2.0	144.0	74.0	80.4	10.9	11.0	8.2
Vedanta	9.7	13.8	10.1	2.6	3.2	3.2	106.3	87.4	86.0	4.3	4.4	3.9

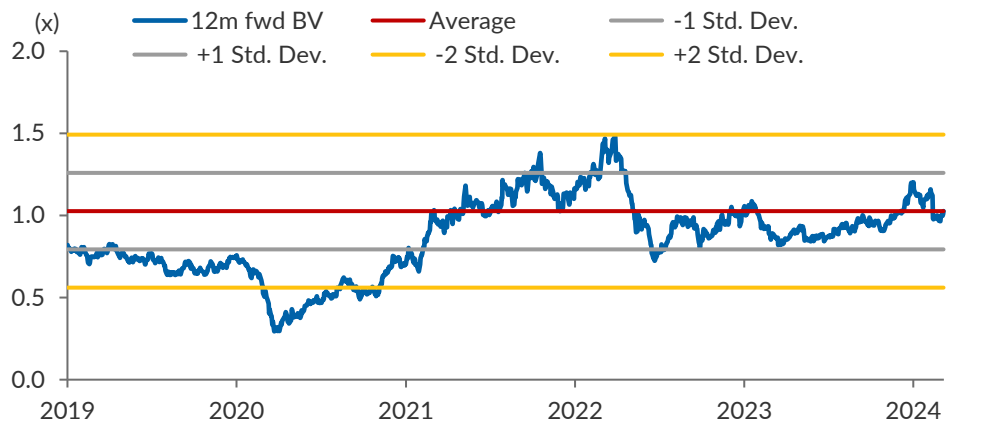
Source: Bloomberg, YES Sec

**Exhibit 16: P/E**



Source: YES Sec

**Exhibit 17: P/BV**



Source: YES Sec

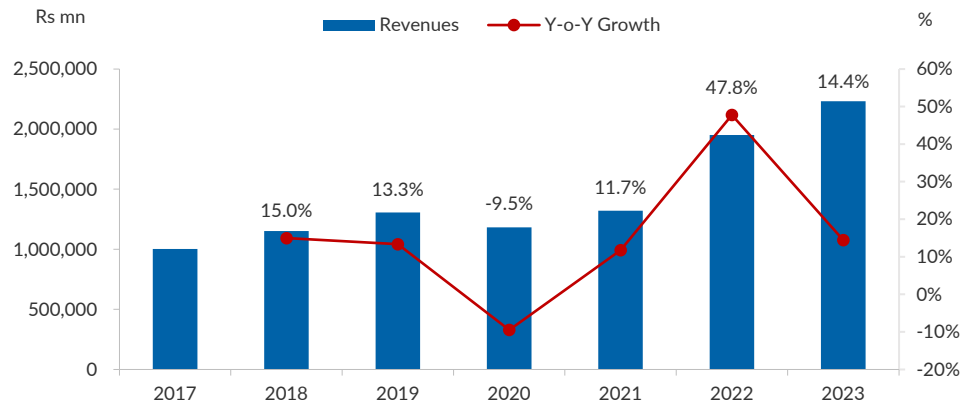
## Key Risks to our Investment Rationale

- **Commodity pricing risk:** Being involved in a business where the commodity prices are heavily linked to the profitability of the business does create a cause of concern. Alumina prices, LME Aluminium prices, LME Copper, Treatment Charges and Refining Charges (TC/RC), freight and prices of by-products especially sulfuric acid, are all linked to global economic factors and are prone to price fluctuation risk. Our thesis sees that prices for LME Aluminium prices and LME Copper prices have mostly bottomed out and we see upside from the current levels. Additionally, we see Hindalco investing heavily in its downstream assets to mitigate the price fluctuation risk.
- **Global demand and cyclical nature of the industry:** The metals industry is a highly cyclical industry dependent on varied factors involving global supply-demand equilibrium, future demand prospects. Amid this, China also plays a major role being a dominant player on both the demand and supply front. Chinese demand plays a vital role in the way the metal prices get affected. We see any economic slowdown on a global scale and especially in China to bring the commodity prices under pressure and thereby hamper our thesis. Additionally, geopolitical events such as wars, trade disruptions, etc. mixed with natural calamities that could hamper the mining side (the feedstock for manufacturing the metal) of the business continue to have a major impact on the price volatility front.
- **Raw material security and input costs:** On a company level, we see that backward integration is key to mitigate the risks involved in procuring raw material and getting impacted by higher costs of the same. The company currently procures thermal coal for its power requirements from Coal India both through linkages and e-auctions. In the upcoming fiscals, this dependency is expected to go away as the company is ramping up its own mines. However, in the near term, the company will continue to rely on third party sourcing for the raw materials which may impact the business operations in cases of supply side disruptions.



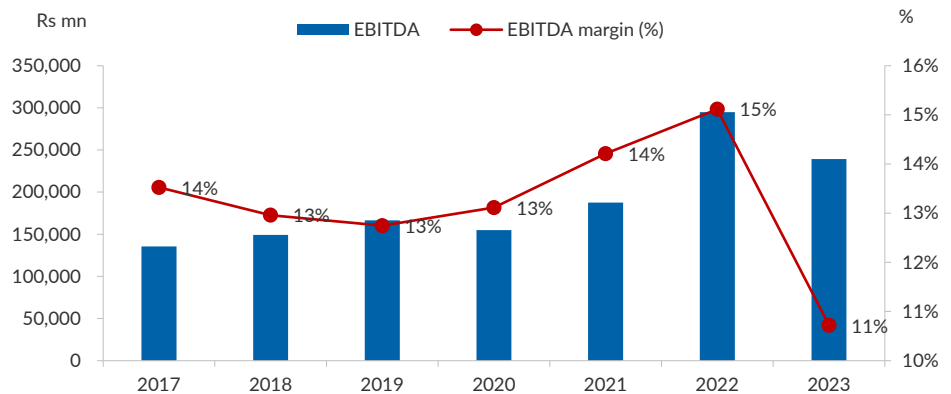
## STORY IN CHARTS

**Exhibit 18: Revenue From Operations**



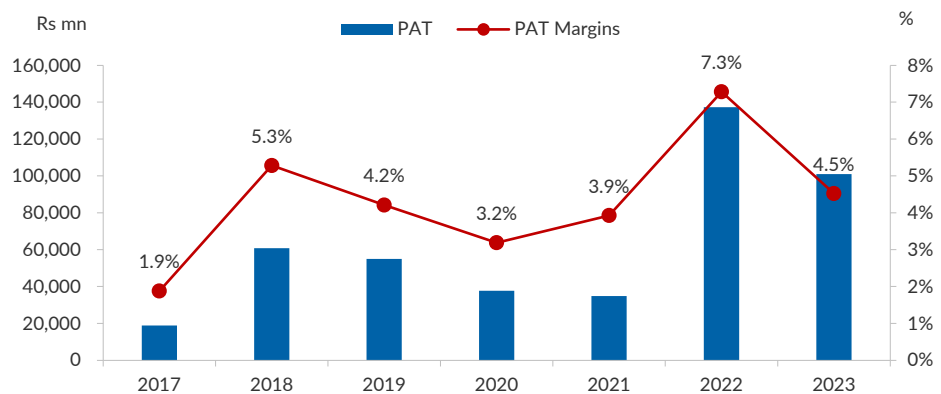
Source: Company, YES Sec

**Exhibit 19: EBITDA Picture**



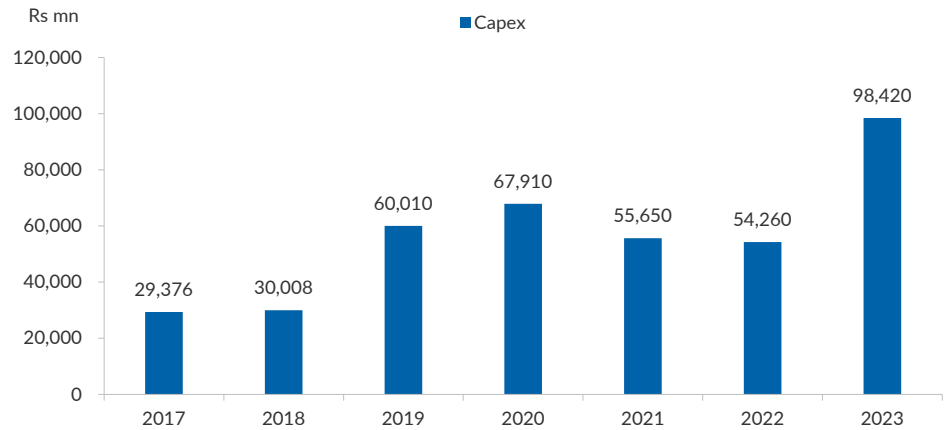
Source: Company, YES Sec

**Exhibit 20: PAT Picture**



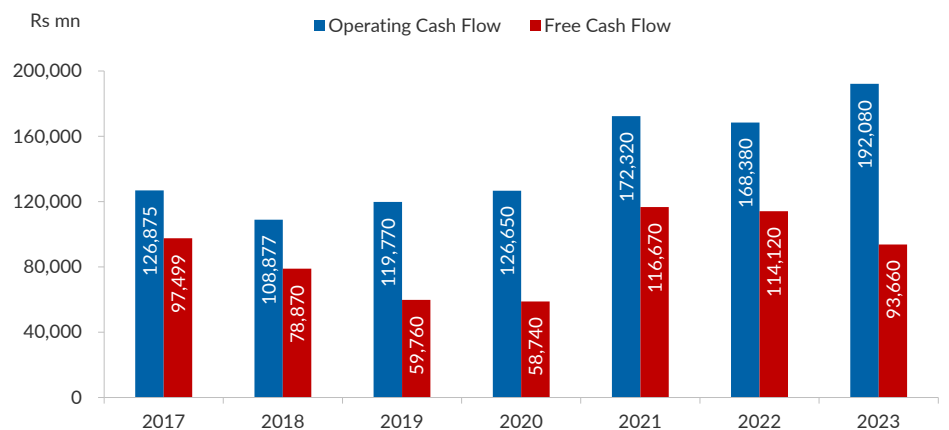
Source: Company, YES Sec

## Exhibit 21: Capex History



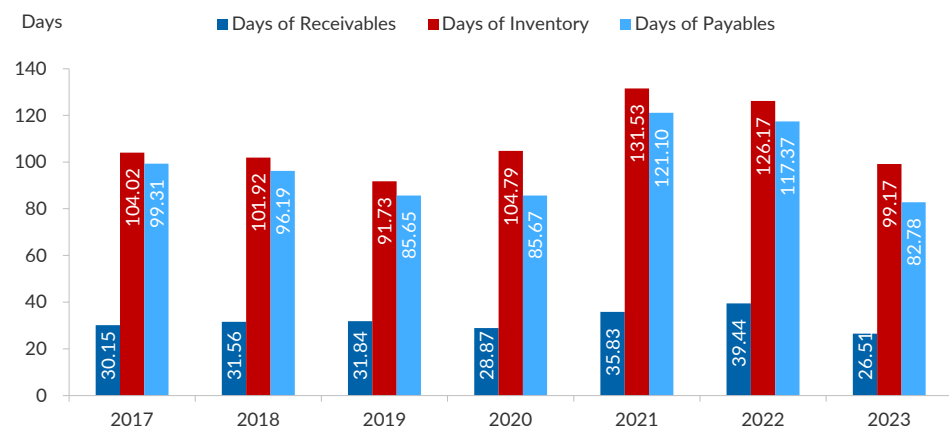
Source: Company, YES Sec

## Exhibit 22: Cash Flow Summary



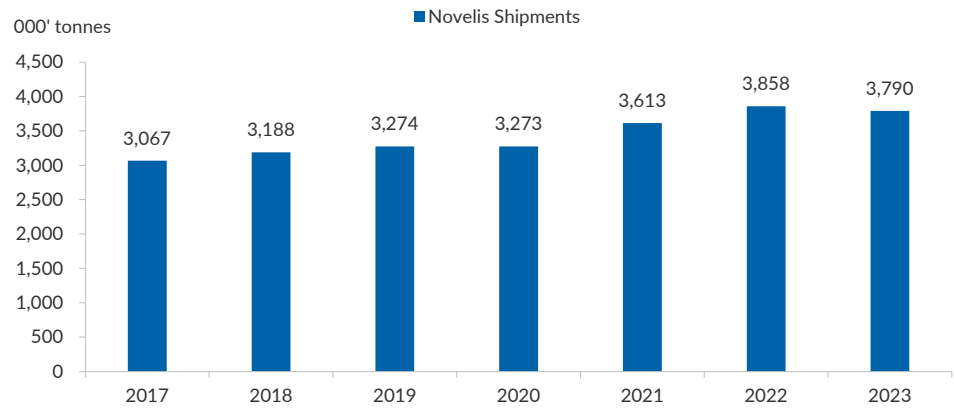
Source: Company, YES Sec

## Exhibit 23: Working Capital Analysis



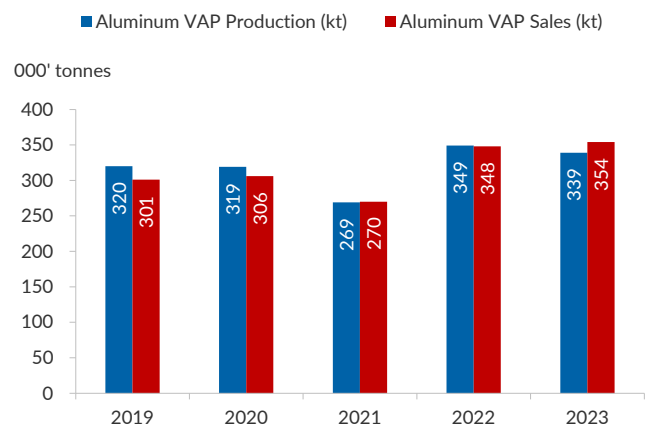
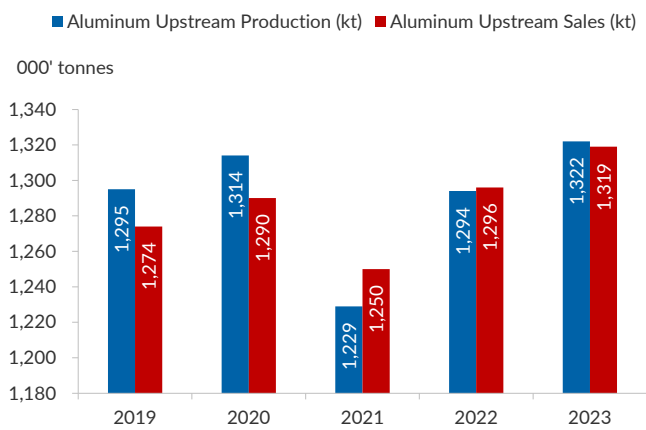
Source: Company, YES Sec

## Exhibit 24: Novelis – Operational Overview



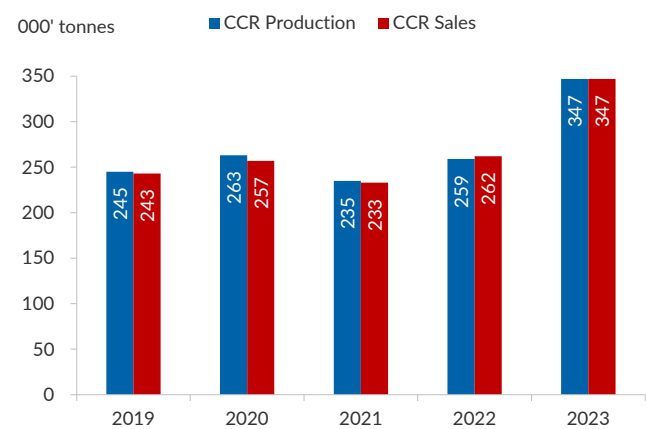
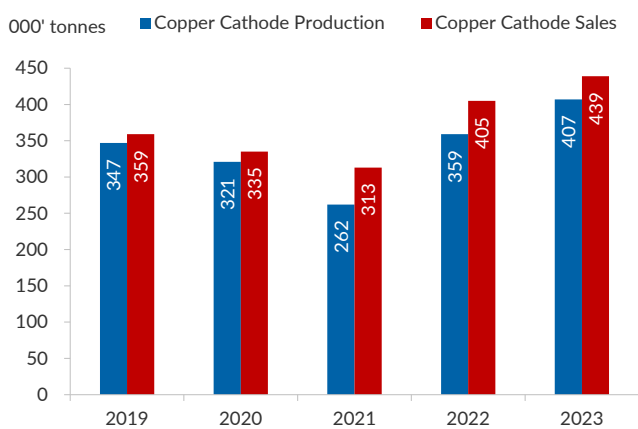
Source: Company, YES Sec

## Exhibit 25: Aluminium Business – Operational Overview



Source: Company, YES Sec

## Exhibit 26: Copper Business – Operational Overview



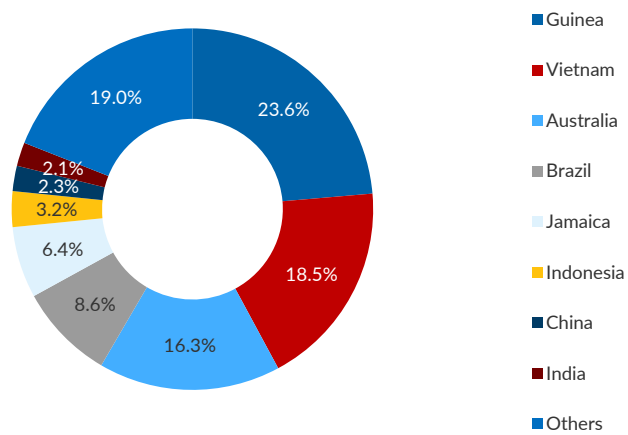
Source: Company, YES Sec

## THE ALUMINIUM INDUSTRY

### An Overview

Aluminium is the most abundant metal available in the Earth's crust and the most widely used non-ferrous metal. Aluminium is found in the ore form of Bauxite. It takes roughly 4 tonnes of bauxite to produce 2 tonnes of alumina which produces 1 tonne of Aluminium. The main raw material for Aluminium production is Bauxite and the availability of bauxite makes the industry highly dependent for the metal production.

### Exhibit 27: Bauxite distribution by Country

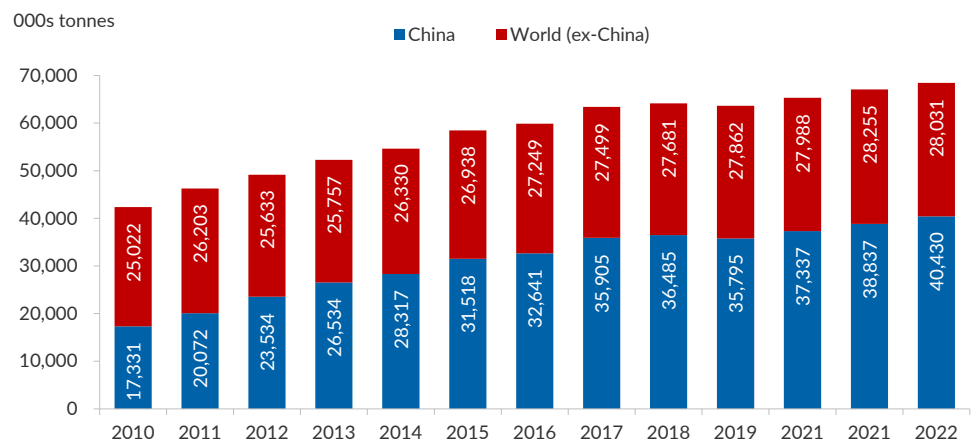


Source: USGS, YES Sec

The Aluminium value chain includes the upstream and downstream operations. The upstream process involves mining, refining, and smelting activities, while downstream process involves casting and fabricating. Aluminium downstream products include rods, sheets, extrusions, and foils.

The global Aluminium metal production grew to 68.46 mt in 2022 registering a growth of 2.04% YoY. China accounts for ~60% of the total global production. The global metal consumption for 2022 is expected to be 65.87 mt with China accounting for more than half of the total.

### Exhibit 28: Global Production over the years

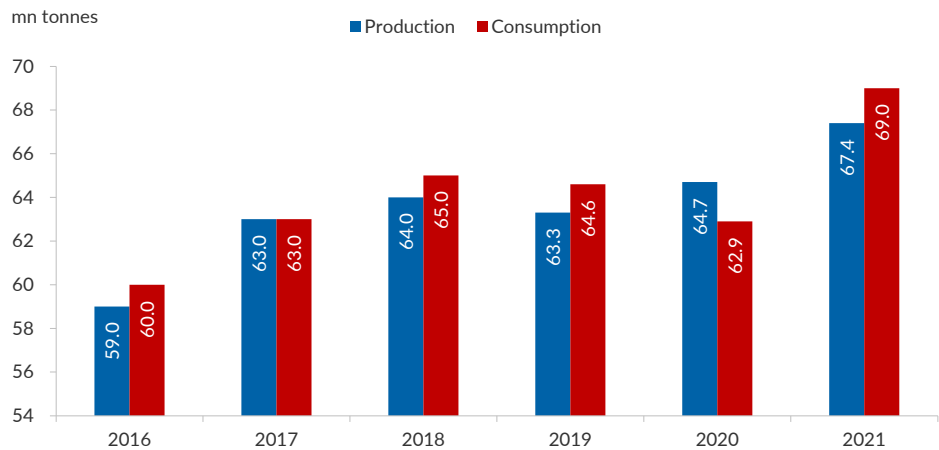


Source: IAI, YES Sec

## A closer look at the demand side

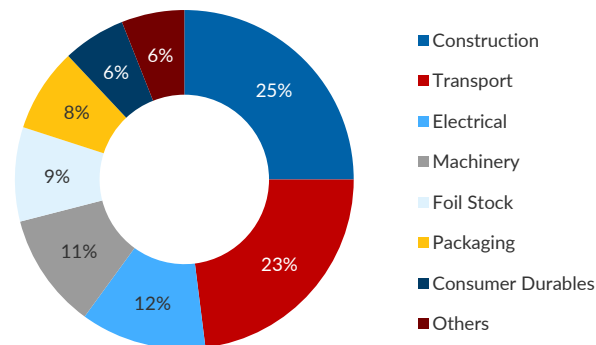
Aluminium is one of the most important metals and has varied industrial applications. Aluminium today, ranks second in the consumption volumes of all metals, overpowered in its ranking only by Steel. Aluminium has a demand in certain industries such as construction, power, transport, electrical applications, consumer goods and packaging.

### Exhibit 29: Production vs Consumption of the non-ferrous metal



Source: IAI, YES Sec

### Exhibit 30: End use of Aluminium by sector



Source: Statista, YES Sec

## Key demand drivers for the metal

As the world shifts to a greener and a net-zero carbon economy along with policy creation towards a sustainable environment is expected to have a substantial effect on the Aluminium demand. The rise of electric vehicles (EVs), as well as the adaption of renewable energies paves way for the metal going forward. As per a report from CRU, the Aluminium consumption is expected to grow by 33.30 mt in the following decade, going from 86.20 mt in 2020 to 119.5 mt in 2030. Around 3/4<sup>th</sup> of the incremental demand is projected to come from Transportation (35%), Electrical (16%), Construction (14%), and Packaging (10%) sectors.

**Transportation Sector** – The sector is at a position where we see it to be likely to experience a generalized shift towards EVs in the upcoming years, which would be one of the biggest drivers for the rise in the Aluminium demand.

**Electrical Sector** - The electrical sector, driven by the rise of renewable energies and the expansion of the power grid, will be one of the main drivers for aluminium demand in the coming decades. both wind and solar power are substantially more aluminium intensive than traditional energy sources, solar power uses, on average, more than four times the amount of aluminium per

megawatt than wind technologies. With the expected growth in the solar powered energy solutions for countries, Aluminium will be one of the biggest beneficiaries of the change going into the future.

## New Bauxite players to steer change in Chinese supply chains

The Aluminium industry faces some challenges on the road ahead, one of them being – the transportation (logistics) costs. With the major chunk of smelting capacities set up in China and bauxite reserves spread around the world, a change in the supply chains is inevitable.

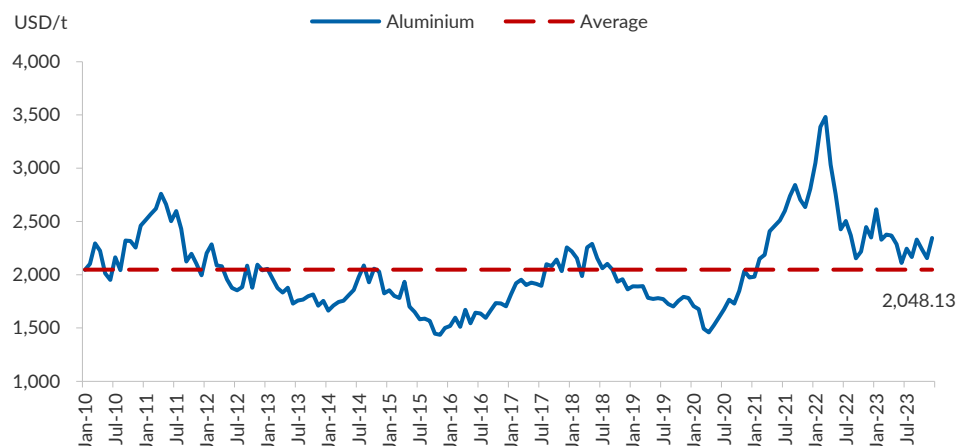
Decarbonizing the sector comes to play a critical role here. Approximately 70% of the emissions arising from aluminium production come from China, despite it only producing around 60% of the global total output. This reflects the dominance of coal in China as a power source for both smelting and refining aluminium, with coal accounting for 85% of the energy used for smelting and 87% of the energy used in refining. With the upcoming efforts to decarbonize the sector, carbon costs and rising mining costs will have to be considered in primary aluminium production. This cost push will eventually force the Chinese capacities to restructure and hence, new capacities with integration will have to come up.

As with iron ore and steel, the capacities will soon see a switch to coming up wherever the reserves are. e.g. - India, Australia, and Indonesia etc. Indian capacities (old and upcoming) with this integration will see an increase in the downstream aluminium production to meet demand. Hence, both the ends of the aluminium value chain (upstream & downstream application development) will do well. Aluminium industry is at a stage where aluminium needs green power and green power needs aluminium. All major aluminium processors are racing to use more secondary aluminium in their products – as is the case for the automotive industry, which needs the metal for its light-weighting programs.

As a result of this shift, the global aluminium industry is slowly moving to an environment where the production of primary aluminium will be a luxury, and something reserved only for countries and regions abundant in reserves and cheap renewable energy.

## Aluminium pricing trajectory

**Exhibit 31: Aluminium pricing**



Source: Bloomberg, YES Sec

Aluminium's subdued price performance this past year was attributable to the supply and demand variables. Supply grew steadily in 2023 despite some midway hiccups. China has been quite persistent on its decarbonization agenda, and we have seen stringent limitations being put on industries that are the biggest polluters. China recovery might take time however as the world prepares for a shift towards EV and other decarbonization mechanisms, the demand is expected to pick up and cause a balance in reducing the demand-supply deficit. Hence, we

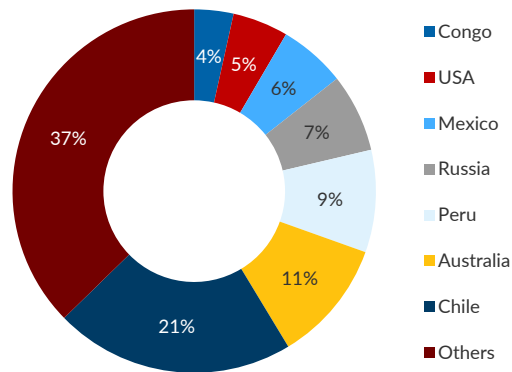
believe that the Aluminium prices are bottoming out and should take an upward movement from here.

## COPPER INDUSTRY

### An Overview

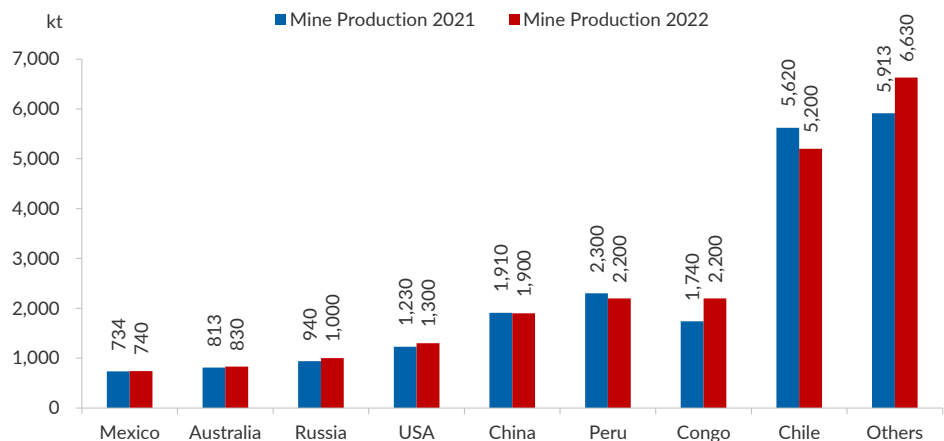
Copper is one of the most sought metals with a very complicated manufacturing process along with a very fragmented industry structure. Famously known as the 'first-ever metal' discovery by humans, copper still stands strong as a metal with varied uses. Some important properties for the metal are its high electrical and heat conductivity, anti-bacterial properties, and recyclability. However, the industry structure makes it a very challenging task for the companies to have high margins. Pure copper metal is generally produced from a multistage process, beginning with the mining, and concentrating of low-grade ores containing copper sulfide minerals, and followed by smelting and electrolytic refining to produce a pure copper cathode.

**Exhibit 32: Global distribution of the Copper Ore Reserves**



Source: USGS, YES Sec

**Exhibit 33: Mine Production Picture**



Source: USGS, ICSG, YES Sec

Starting at the very beginning of the copper manufacturing process is the mining of the ore. The total estimated reserves for copper in the world are 890 million metric tonnes. Chile accounts for roughly 1/5th of the global copper reserves and the similar picture carries on for the mine production as well.



The Latin American nations of Peru and Chile account for roughly 1/3rd of the global mine production. However, these countries are currently facing challenges due to which the growth in the numbers of production has not been seen over the last couple of years. DR Congo – the new player on the copper mining front has emerged and with the growth shown over the last few years, we see it overtaking the second spot from Peru in the upcoming years. The global copper mine production was 22.0 mt in 2022 as per the USGS data, a minor growth of 3.8% YoY due to multiple operational issues in the traditional miners like Chile and Peru.

On the other hand, India doesn't have Copper reserves that are rich in copper content. Majority of the Copper smelters in India, import the copper concentrates (30% copper content) from the mines in Chile and Peru as well as Australia. Hindalco doesn't have any copper mines of its own and relies completely on the copper concentrates to be sourced through imports. Additionally, the company generates revenue through the TC/RC charges for the treatment of the ore concentrates from the miners.

## Exhibit 34: Largest Copper Mines - Globally

Rank	Mine	Country	Owners	Source	Capacity
1	Escondida	Chile	BHP (57.5%), Rio Tinto Corp. (30%), Japan Escondida (12.5%)	Concs & SX-EW	1350
2	Grasberg	Indonesia	PT Freeport Indonesia (PT Inalum and the provincial/regional government 51.2% and Freeport-McMoRan Inc 48.8%)	Concentrates	770
3	Collahuasi	Chile	Anglo American (44%), Glencore plc (44%), Mitsui (8.4%), JX Holdings (3.6%)	Concentrates	640
4	Morenci	United States	Freeport-McMoRan Inc 72%, 28% affiliates of Sumitomo Corporation	Concs & SX-EW	570
5	Buenavista del Cobre (former Cananea)	Mexico	Grupo Mexico	Concs & SX-EW	535
6	Cerro Verde II (Sulphide)	Peru	Freeport-McMoRan Copper & Gold Inc. 53.56%, Compañía de Minas Buenaventura 19.58%, Sumitomo 21%	Concentrates	500
7	Antamina	Peru	BHP (33.75%), Teck (22.5%), Glencore plc (33.75%), Mitsubishi Corp. (10%)	Concentrates	450
7	Polar Division (Norilsk/ Talnakh Mills)	Russia	Norilsk Nickel	Concentrates	450
9	Kamoa-Kakula	Congo	Ivanhoe Mines (39.6%), Zijin Mining Group (39.6%), Crystal River Global Limited (0.8%), Government of the Democratic Republic of Congo (20%)	Concentrates	430
10	El Teniente	Chile	Codelco	Concs & SX-EW	401
11	Chuquibambilla	Chile	Codelco	Concs & SX-EW	400
11	Las Bambas	Peru	MMG (62.5%), Guoxin International Investment Corporation Limited (22.5%), CITIC Metal Co., Ltd. (15%)	Concentrates	400
11	Tenke Fungurume	Congo	China Molybdenum Co., Ltd 56%, affiliate of BHR Partners (Chinese private equity firm) 24%	SX-EW	400
14	Cobre Panama	Panama	First Quantum Minerals Ltd 90%, Korea Panama Mining Corp. (LS-Nikko Copper Inc. and Korean Resources Corporation) 10%	Concentrates	380
15	Los Pelambres	Chile	Antofagasta Plc (60%), Nippon Mining (25%), Mitsubishi Materials (15%)	Concentrates	370
16	Quellaveco	Peru	Anglo American 60%, Mitsubishi Corp. 40%	Concentrates	350
17	Kansanshi	Zambia	First Quantum Minerals Ltd (80%), ZCCM (20%)	Concs & SX-EW	340
18	Los Bronces	Chile	Anglo American 50.1%, Mitsubishi Corp. 20.4%, Codelco 20%, Mitsui 9.5%	Concs & SX-EW	340
19	Toromocho	Peru	Chinalco	Concentrates	320
20	Bingham Canyon	United States	Kennecott (Rio Tinto)	Concentrates	310

Source: ICSG, YES Sec

The global copper mining however has been quite distressed lately and operational and financial issues come into play behind the slump –

- Falling Ore Grades – Traditional miners like Chile, Peru and USA are facing major challenges on the falling ore grades thereby leading to increased mining costs. The largest mines in Chile who account for most of Chile's supply are seeing grades fall from 2.5-3% during early 1990's to a mere 0.6% now.
- Water supply issues – Chile, being a deserted area, faces major water supply issues which eventually impact the miner's productivity and causes potential supply side problems.
- Slower capex growth – The global mine expansions haven't soared even with the copper pricing has seen quite a large increase. The global demand of the metal is expected to rise significantly on the back of a green transition and a change towards renewable energy.

## Exhibit 35: Largest Copper Smelting Capacities - Globally

Rank	Smelter	Country	Operator/Owner(s)	Process	Capacity
1	Guixi (smelter)	China	Jiangxi Copper Group 43.72%, Hong Kong Securities Clearing Company Ltd. 31.03%, Other companies and private 25.25%	Flash Smelter	520
2	Birla Copper (Dahej)	India	Birla Group (Hindalco)	Outokumpu Flash, Ausmelt, Mitsubishi Continuous	500
3	Jinguan (Flash Smelter)	China	Tongling Nonferrous Metals 100%	Flash Smelter	480
4	Saganoseki (smelter)	Japan	JX Nippon Mining & Metals Co., Ltd.	Outokumpu Flash	450
4	Toyo (smelter)	Japan	Sumitomo Metal Mining Co. Ltd.	Outokumpu Flash	450
4	Chuquicamata (smelter)	Chile	Codelco	Outokumpu/ Teniente Converter	450
4	Hamburg	Germany	Aurubis	Outokumpu, Contimelt, Electric	450
8	Chinalco Southeast Copper (smelter)	China	Chinalco (Yunan Copper 60%, Fujian Investment & Development Group Co., Ltd. 40%)	Flash Smelter	400
8	Shandong Fangyuan (smelter)	China	Dongying Development Zone Fangyuan nonferrous metal industry and Trade Co., Ltd 71.39%, Singapore Meijin Jeweler 28.61%	Bottom-Blown	400
8	El Teniente (Caletones)	Chile	Codelco	Reverberatory/ Teniente Conv.	400
8	Hongsheng Copper	China	Yangxin Hongsheng Copper Industry Company Limited (Daye Nonferrous 52%, China NO.15 Metallurgical Construction Group 24%, Huangshi Xingang Development Co., Ltd 16%, Huangshi State Asset Management Co., Ltd 8%)	Flash Smelter	400
8	Sterlite Smelter (Tuticorin)	India	Vedanta	Isasmelt Process	400
8	Chifeng Yunnan (smelter)	China	Chifeng Yunnan Copper (Yunnan Copper 45%, Chifeng state-owned capital operation Co., Shandong Xiangguang Group Co., Ltd(57.14% shares) ;Shandong Fengxiang (GROUP) Co., Ltd.(29.09% shares) ; China Merchants Securities Asset Management Co., Ltd(10.78% shares); BRIGHT VISION TRADING INVESTMENTS PTE. LTD.(3.06 shares)	Side-Blown	400
8	Xiangguang Copper (smelter)	China	Shandong Xiangguang Group Co., Ltd(57.14% shares) ;Shandong Fengxiang (GROUP) Co., Ltd.(29.09% shares) ; China Merchants Securities Asset Management Co., Ltd(10.78% shares); BRIGHT VISION TRADING INVESTMENTS PTE. LTD.(3.06 shares)	Outokumpu Flash	400
8	Norilsk (Nikelevy, Medny)	Russia	Norilsk Nickel	Reverb, Electric, Vanyukov	400
8	Jinchuan (Fangchenggang smelter)	China	Jinchuan Group 70%, Trafigura Pte Ltd. 20%, Trafigura Investment (China) Co., Ltd.10%	Flash smelter	400
17	Pirdop (smelter)	Bulgaria	Aurubis (99.77%)	Outokumpu Flash	360
17	Ilo Smelter	Peru	Southern Copper Corp (Grupo Mexico 88.9%, international investment community 11.1%)	Isasmelt Process	360
19	Onahama (smelter)	Japan	Mitsubishi Materials Corp. (55.714%), Dowa Metals & Mining Co. Ltd.(31.621%), Furukawa Mitsubishi/ Reverb.		354
20	Sarchesme Copper Complex (smelter)	Iran	National Iranian Copper Industry Co.	Flash Smelter	350
20	Heding Copper	China	Jiangxi Copper 40%, Fuchunjiang Smelting 40%, Xuancheng Quanxin Mining Co., Ltd.15%, Side-Blown		350

Source: ICSG, YES Sec

On the smelting side, we see that most of the smelters are in countries like China and India. China dominates in terms of global copper production. In 2022, China accounted for roughly 50% of the global smelter production, followed by Japan (7.4%), Chile (5.2%) and Russia (4.6%).

Hindalco has the world's second largest smelter with a cathode production capacity of 420 ktpa and 540 ktpa capacity to produce continuous casting rods. The excess quantity of cathodes required for CCR Rods production is usually imported from China and other countries.

## Exhibit 36: Largest Copper Refineries - Globally

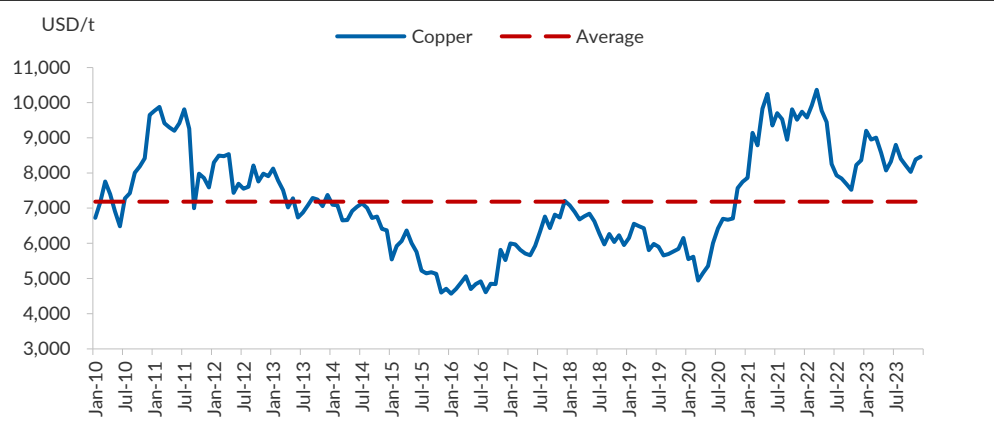
Rank	Refinery	Country	Owner(s)	Process	Capacity
1	Guixi	China	Jiangxi Copper Corporation	Electrolytic	1100
2	Shandong Fangyuan (refinery)	China	Dongying Development Zone Fangyuan nonferrous metal industry and Trade Co., Ltd 71.39%, Singapore Meijin Jeweler 28.61%	Electrolytic	700
3	Daye/ Hubei (refinery)	China	China Non-ferrous Metals Mining Group Company Ltd (CNMC) 57.99%, Hubei Hongtai State-owned Capital Investment Operation Group 38.56%, Daye City Construction 2.32%, Huangshi State Asset Management Co., Ltd and Yangxin County State Asset management Co., Ltd 1.13%	Electrolytic	600
3	Jinchuan Gansu (refinery)	China	Gansu state-owned Assets Investment Group 47.97%, Gansu Government State-owned Assets Supervision and Administration Commission 12.89%, The China Development Bank 13.53%, Other investors 25.61%	Electrolytic	600
3	Xiangguang Copper (refinery)	China	Shandong Xiangguang Group Co., Ltd(57.14% shares) ;Shandong Fengxiang (GROUP) Co., Ltd.(29.09% shares) ; China Merchants Securities Asset Management Co., Ltd(10.78% shares); BRIGHT VISION TRADING INVESTMENTS PTE. LTD.(3.06 shares)	Electrolytic	600
6	Birla	India	Birla Group (Hindalco)	Electrolytic	500
7	Jinchuan (Fangchenggang refinery)	China	Jinchuan Group 70%, Trafigura Pte Ltd. 20%, Trafigura Investment (China) Co., Ltd.10%	Electrolytic	495
8	Heding Copper (refinery)	China	Jiangxi Copper 40%, Fuchunjiang Smelting 40%, Xuancheng Quanxin Mining Co., Ltd.15%, One of Fuchunjiang's branches 5%	Electrolytic	470
9	Jinlong (Tongdu) (refinery)	China	Tongling Nonferrous Metals 61.41%, Sumitomo Metal & Mining Co. Ltd. 27.07%, Sumitomo Corporation 7.86%, Pingguo Aluminium Company 3.67%	Electrolytic	460
9	Pyshma Refinery	Russia	UMMC (Urals Mining & Metallurgical Co.)	Electrolytic	460
11	Amarillo	United States	ASARCO (Grupo Mexico)	Electrolytic	450
11	Chuquicamata Refinery	Chile	Codelco	Electrolytic	450
11	Toyo (refinery)	Japan	Sumitomo Metal Mining Co. Ltd.	Electrolytic	450
14	Las Ventanas	Chile	Codelco	Electrolytic	440
14	Onsan Refinery I	Korean Republic	LS-Nikko Co. (LS, Nippon Mining)	Electrolytic	440
16	Hamburg (refinery)	Germany	Aurubis	Electrolytic	416
17	El Paso (refinery)	United States	Freeport-McMoRan Copper & Gold Inc.	Electrolytic	415
18	Chifeng Yunnan (refinery)	China	Yunnan Copper 45%, Chifeng state-owned capital operation Co., Ltd. 45%, Jinfeng Copper 10%	Electrolytic	400
18	Chinalco Southeast Copper (refinery)	China	Yunan Copper 60%, Fujian Investment & Development Group Co., Ltd. 40%	Electrolytic	400
18	Hongsheng Copper (refinery)	China	Yangxin Hongsheng Copper Industry Company Limited (Daye Nonferrous 52%, China NO.15 Metallurgical Construction Group 24%, Huangshi Xingang Development Co., Ltd 16%, Huangshi State Asset Management Co., Ltd 8%)	Electrolytic	400
18	Jinguan (refinery)	China	Tongling Nonferrous Metals 100%	Electrolytic	400
18	Morenci (SX-EW)	United States	Freeport-McMoRan Inc 72%, 28% affiliates of Sumitomo Corporation	Electrowinning	400
18	Tenke Fungurume (SX-EW)	Congo	China Molybdenum Co., Ltd 56%, affiliate of BHR Partners (Chinese private equity firm) 24%, Gecamines 20%	Electrowinning	400
18	Zijin	China	Zijin Mining Group Co., Ltd. 100%	Electrolytic	400

Source: ICSG, YES Sec

## Copper pricing trajectory

Since the start of 2020, the copper prices have been on an upswing and majorly been above the last 10 years average. Several factors have contributed to this increase – supply chain disruptions during the pandemic impacting the mining operations contributed a lot for the pricing changes. Additionally, the fall of ore grades, rising mining costs and stagnant production at the traditional miners like Chile and Peru forced the industry to remain stuck with the supply side deficit. The world’s attempt to shift to a greener economy will be on the back of copper and Aluminium. However, the expected rise in the demand of copper suffers from the supply side constraints thereby causing the prices to hover over the \$8000/t. We expect these prices to keep a similar momentum.

### Exhibit 37: Copper pricing over the years



Source: Bloomberg, YES Sec

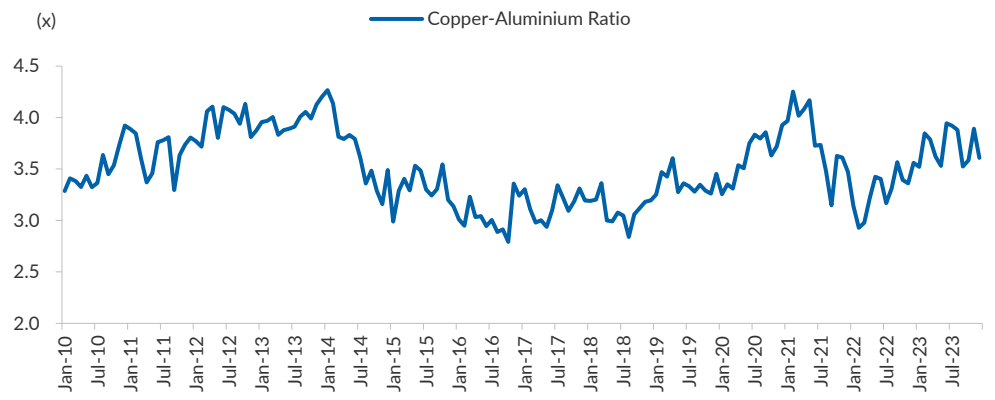
## Copper-Aluminium substitution effect

Copper prices have been on an upswing, driven by a shift to EV, higher extraction costs (lower yields in existing mines) & the general pullback in the global economy. This steady rise in demand is so fierce, that the supply is in deficit. If there is one metal where the super-cycle characteristics can be seen, it is Copper.

With a 300% increase in copper content per vehicle in EVs (from 19 kgs/vehicle to 83 kgs/vehicle), and higher electrification of the world, Copper supply needs to more than double from the existing 23 mn tons to ~50 mn tons, in a “business-as-usual” scenario by 2035. This, even as copper yields are dropping from 1.6% to 0.6% (copper-in-ore content). New mines suffer from tighter Carbon standards and Water usage guidelines, especially in the traditional miners like Chile, Peru, Canada, etc. That has pushed up baseline costs above \$4500-5500/ton. It takes roughly 2-3 years to extend an existing mine and over 8 years for a new mine to come up. No major greenfield project approvals have come (at least from the traditional production centers; although the DRC-Congo has a huge greenfield project in the pipeline), despite a doubling of prices. The most probable path for copper prices that avoids both the inventory depletion risk and the one that encourages new greenfield project is only to go up from the current prices. Consumers will start to look elsewhere – Aluminium.



## Exhibit 38: Copper – Aluminium Pricing Ratio Trend



Source: Bloomberg, YES Sec

During the last commodity super-cycle led by China in 2011, copper prices crossed \$ 6,000 per tonne (~2.5 times Aluminium prices). This converted 500,000 tonnes or ~3% of the then copper demand to Aluminium, primarily in electrical conductivity. To double the copper market by 2040 from today, the market prices will most likely be in the \$13,000 - \$15,000 per tonne (given the higher post-carbon mining cost). This will accelerate substitution to Aluminium, which is priced at ~\$2,500 per tonne. Already Aluminium-Graphene composites have been accepted by Rolls Royce for substitution of the Copper in their cars. (Just one of the examples)

Whenever, the copper-aluminium price ratio has risen to more than 3:1, there has been a migration of applications to aluminium at roughly 2% of global demand per one time increase in the copper-aluminium ratio. If the copper-aluminium ratio goes up from 3:1 to 4:1, the conversion rates should go up from 2% to 4%. There will be a “lock effect”, a sudden cataclysmic shift (particularly in Construction, another big but low-end application of copper).

## COMPANY FINANCIALS

### Exhibit 39: Income Statement

Y/e 31 Mar (Rs bn)	FY18	FY19	FY20	FY21	FY22	FY23	FY24E	FY25E	FY26E
Revenue	1,152	1,305	1,181	1,320	1,951	2,232	2,143	2,251	2,469
COGS	775	883	780	851	1,287	1,581	1,471	1,544	1,689
Employee Cost	86	90	88	108	120	131	146	135	151
Other Expenses	1	0	1	1	3	2	2	2	2
Other Income	11	11	11	12	12	11	13	11	-
EBITDA	149	166	155	188	295	239	252	276	307
EBITDA (%)	13.0%	12.7%	13.1%	14.2%	15.1%	10.7%	11.8%	12.3%	12.4%
Depreciation	45	48	51	66	67	71	74	79	85
EBIT	104	119	104	121	228	168	178	197	221
EBIT (%)	9.0%	9.1%	8.8%	9.2%	11.7%	7.5%	8.3%	8.7%	9.0%
Finance Costs	39	38	42	37	38	36	40	36	31
Exceptional Items	18	-	(3)	(5)	6	0	0	0	0
PBT	82	81	59	79	196	132	139	161	190
Tax	21	26	22	27	54	31	39	40	48
PAT	61	55	38	35	137	101	100	121	143
EPS	27.29	24.76	16.97	15.69	61.85	45.48	44.96	54.49	64.24

Source: Company, YES Sec

### Exhibit 40: Balance Sheet

Y/e 31 Mar (Rs bn)	FY18	FY19	FY20	FY21	FY22	FY23	FY24E	FY25E	FY26E
Net Block	639	642	661	708	765	758	856	889	927
CWIP	20	40	76	100	47	73	77	81	85
Non-current Assets	977	988	1,032	1,221	1,245	1,355	1,456	1,493	1,535
Inventory	216	222	224	307	445	430	437	459	502
Receivables	100	114	93	130	211	162	188	197	216
Cash & Bank	81	98	216	88	174	154	120	137	153
Current Assets	500	540	663	676	985	893	897	948	1,032
<b>Total Assets</b>	<b>1,477</b>	<b>1,528</b>	<b>1,695</b>	<b>1,897</b>	<b>2,231</b>	<b>2,248</b>	<b>2,353</b>	<b>2,441</b>	<b>2,567</b>
Share Capital	2	2	2	2	2	2	2	2	2
Reserves	546	573	581	663	780	946	1,046	1,167	1,309
Non-current Liabilities	605	613	740	747	676	695	665	635	605
Current Liabilities	323	340	372	485	773	605	639	636	650
<b>Total Equity and Liabilities</b>	<b>1,477</b>	<b>1,528</b>	<b>1,695</b>	<b>1,897</b>	<b>2,231</b>	<b>2,248</b>	<b>2,353</b>	<b>2,441</b>	<b>2,567</b>

Source: Company, YES Sec

## Exhibit 41: Cash Flow Statement

Y/e 31 Mar (Rs bn)	FY18	FY19	FY20	FY21	FY22	FY23	FY24E	FY25E	FY26E
Profit before Tax	33	82	81	59	79	196	132	139	161
Profit before Working Capital changes	131	141	155	139	176	297	224	253	276
Working capital changes	4	(18)	(17)	(12)	15	(91)	(5)	7	(12)
Cash flow from Operations	135	123	139	128	192	206	220	260	264
Taxes Paid	(8)	(14)	(19)	(1)	(19)	(38)	(28)	(39)	(40)
<b>Net Cash flow from Operating Activities</b>	<b>127</b>	<b>109</b>	<b>120</b>	<b>127</b>	<b>172</b>	<b>168</b>	<b>192</b>	<b>221</b>	<b>224</b>
Capex	(29)	(30)	(60)	(68)	(56)	(54)	(98)	(171)	(113)
Other Investments	1	80	4	(15)	(201)	(16)	17	(4)	(4)
<b>Net Cash flow from Investing Activities</b>	<b>(28)</b>	<b>50</b>	<b>(56)</b>	<b>(83)</b>	<b>(256)</b>	<b>(71)</b>	<b>(81)</b>	<b>(175)</b>	<b>(116)</b>
Proceeds/(Repayment) from borrowings	(10)	(111)	(14)	113	(9)	(46)	(82)	(40)	(55)
Other financial activities	(45)	(53)	(41)	(47)	(40)	(22)	(22)	(40)	(36)
<b>Net Cash flow from Financing Activities</b>	<b>(56)</b>	<b>(164)</b>	<b>(55)</b>	<b>66</b>	<b>(49)</b>	<b>(68)</b>	<b>(103)</b>	<b>(80)</b>	<b>(91)</b>
Opening Cash Balance	43	82	80	91	213	83	116	128	94
Net Change in Cash	43	(5)	9	110	(133)	30	7	(34)	17
FX Changes	(4)	3	2	12	4	3	5	-	-
<b>Ending Cash Balance</b>	<b>82</b>	<b>80</b>	<b>91</b>	<b>213</b>	<b>83</b>	<b>116</b>	<b>128</b>	<b>94</b>	<b>111</b>

Source: Company, YES Sec

## Exhibit 42: Key Ratios

Y/e 31 Mar	FY18	FY19	FY20	FY21	FY22	FY23	FY24E	FY25E	FY26E
<b>Growth (%)</b>									
Total Sales	15.0%	13.3%	-9.5%	11.7%	47.8%	14.4%	-4.0%	5.0%	9.7%
EBITDA	10.2%	11.5%	-6.9%	21.1%	57.2%	-18.9%	5.5%	9.5%	11.0%
EBIT	14.6%	13.8%	-12.3%	16.6%	87.6%	-26.0%	5.8%	10.4%	12.4%
PAT	223.2%	-9.7%	-31.4%	37.6%	174.0%	-28.9%	-1.2%	21.2%	17.9%
<b>Profitability (%)</b>									
GP Margins	32.7%	32.4%	34.0%	35.5%	34.0%	29.2%	31.4%	31.4%	31.6%
EBIDTA Margins	13.0%	12.7%	13.1%	14.2%	15.1%	10.7%	11.8%	12.3%	12.4%
EBIT Margins	9.0%	9.1%	8.8%	9.2%	11.7%	7.5%	8.3%	8.7%	9.0%
PAT Margins	5.3%	4.2%	3.2%	3.9%	7.3%	4.5%	4.7%	5.4%	5.8%
ROCE	9.0%	10.0%	7.9%	8.6%	15.6%	10.2%	10.4%	10.9%	11.5%
ROE	11.1%	9.6%	6.5%	5.2%	17.6%	10.6%	9.5%	10.3%	10.9%
<b>Per Share Data (Rs)</b>									
EPS	27.3	24.8	17.0	15.7	61.8	45.5	45.0	54.5	64.2
BVPS	246.1	259.1	262.7	299.7	352.3	427.1	472.1	526.6	590.8
<b>Valuations (x)</b>									
P/E	7.9	8.3	5.4	23.0	9.2	9.2	11.9	9.8	8.3
P/BV	0.9	0.8	0.3	1.2	1.6	1.0	1.1	1.0	0.9
EV/EBIDTA	6.1	5.3	4.3	7.3	6.0	5.8	6.5	5.7	4.9
Market cap/Sales	0.4	0.3	0.2	0.6	0.6	0.4	0.6	0.5	0.5

Source: Company, YES Sec

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**ADD:** Upside between 10% to 20% over 12 months

**NEUTRAL:** Upside between 0% to 10% over 12 months

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