



## OPERATIONAL REVIEW

## ZINC INDIA

**The year in brief**

Mine production progressively improved during the year with ore production for the full-year up 2% YoY to deliver a record 16.74 million tonnes, supported by strong production growth at Rajpura Dariba Mine, SK Mines and Rampura Agucha mine, which were up 11%, 7% and 6% respectively. Mined metal production was up 4% YoY to 1,062 kt primarily on account of higher ore production improved mined metal grades and operational efficiencies.

**1,032 kt**Highest ever refined  
Zinc-Lead production**714 tonnes**Ever-highest silver production  
10% YoY ↑**16.74 million tonnes**

Record ore production

**Occupational health & safety**

In line with our commitment to ensure zero harm to employees, the leadership has undertaken the prime responsibility of providing a safe workplace for all employees entering our premises. While committed to operate a business with 'Zero Harm', it is with deep sadness that we report the loss of six business partners colleagues and one HZL employees in work-related incidents at our managed operations. These incidents happened despite our constant efforts to eliminate fatalities and attain a Zero Harm work environment. A thorough investigation was conducted to identify the causes of these incidents and to share the lessons learned across Hindustan Zinc, to prevent similar incidents in the future.

During the year, to avoid fatalities and catastrophic incidents in HZL, Vihan: A Critical Risk Management (CRM) initiative was launched to improve managerial control over rare but potentially catastrophic events by focussing on the critical controls. We have launched four critical risks i.e., Fall of Ground (FOG), Fall of person/object from height (WAH), Vehicle Pedestrian Interaction (VPI) and Entanglement. Through this initiative, we want to ensure that all identified critical controls are being monitored and systems are in place.

Safety Pause was also conducted across all our operational units under the theme 'Stop Work if it's not Safe'. During this connect, all recent safety incidents happened across group companies were discussed and key learnings were shared.

Community of Practice - Structure Stability established during the year to establish a review mechanism of all prevailing civil and mechanical structures; further a specific categorisation was founded to mark the structures based on which their repair/replacement is planned.

Second half of the year has been an era of innovation for mining operations to avoid manual intervention and related risk with inclusion of: Single point remote blasting over wi-fi at pilot level, digitalised drilling of production stops during blasting operations in which no manpower is present and machine drills in auto mode with interlock features of approaching man, Digital RFID based cap lamps along with proximity sensors to ensure real-time tracking and monitoring of personnel working in underground and Digital interlockings have been developed to stop over winding operation during excess of mud/water at shaft bottom.

Training and capability building was also core theme during the year, few key programmes are first underground practical cum digitised training gallery developed at RAM to provide all facility of surface training to underground operations team, Wi-Fi Network available at training place so that underground manpower can connect from underground to any kind of seminars/trainings, safety leadership development program initiated for mines frontline supervisor through ex-DGMS officials and Dupont, RAM has also launched a unique virtual reality-based simulator training for jumbo operator.

Response during any emergency is a paramount parameter to ensure safety of the people. As a proactive measure, we have conducted ERCP (Emergency Response and Crisis plan) Gap Assessment study across all the sites. 51<sup>st</sup> All India Mines Rescue Competition was hosted under the aegis of DGMS at Rajpura Dariba Complex, 10 days Capacity Building Training Programme on Disaster Management was conducted at ZM, the training included medical first responder, collapsed structure search & rescue, fire management, chemical emergencies, etc. RAM has reaffirmed safety & rescue by establishing Underground Fire Tender with remote operated foam unit and thermal imaging camera for blind zones.





Demonstrating the highest standards of health and safety management during the year, Dariba Smelting Complex received the prestigious 'Sword of Honour' from British Safety Council for showing excellence in the management of health and safety risks at work. Kayad Mines received 5 Star Rating Award in Safety and Welfare by Rajasthan Government and Jaswant Singh Gill Memorial Industrial Safety Excellence Award 2022 in underground Metal mine in India.

## Environment

Hindustan Zinc commits to 'Long-term target to reach net-zero emissions by 2050' in line with Science Based Targets initiative (SBTi) aiming to have a clear and defined path to reduce emissions in line with the Paris Agreement goals. To achieve the target, we are working towards improving our energy efficiency, switching to low carbon energy sourcing, introducing battery operated electrical vehicles and increasing the role of renewables in our energy mixes.

We have entered into a power delivery agreement for supplying 450 megawatts of renewable power by 2025 which will not only strengthen our commitment towards a clean future but also help reduce emissions to the tune of 2.7 million tCO<sub>2</sub>e. Also, Pantnagar metal plant is sourcing 100% green power for its operations thus making it a one-of-a-kind initiative, leading towards reducing emissions by 30,000 tCO<sub>2</sub>e.

Technology and digitalisation are key to strengthening our ESG footprint and creating a net-zero future. It is our ambition to convert all our mining equipment to battery-operated Electric Vehicles (EVs). To make our

mining operations environment-friendly, we plan to invest US\$1 billion over the next five years towards combating climate change impacts.

Electric Vehicles (EVs) are a globally recognised means to alleviate dependence on petroleum products and reduce CO<sub>2</sub> emissions. Therefore, Hindustan Zinc signed a Memorandum of Understanding (MoU) with Epiroc Rock Drills AB, Normet Group Oy and Sandvik AB to introduce battery electric vehicles (BEV) in its underground mining operations making Hindustan Zinc the first company in India to introduce battery-operated vehicles in underground mines.

HZL has led by example by inducting LNG-powered truck for transportation which shall contribute 30% lesser towards GHG emission. We are also using 5% biomass for power generation and reducing carbon footprint through our captive thermal power plants.

In-line with HZL's policy of a green value chain, our business partners have also started operating Electric vehicles, several electric forklifts have been introduced in our multiple business units.

At HZL, we recognise the reality of climate change. Therefore, our risk management processes embed climate change in the understanding, identification, and mitigation of risk. We have published our second TCFD (Task Force on Climate-related Financial Disclosure) report during the year which sets the adoption of the TCFD framework for climate change risk and opportunity disclosure.

Endeavouring towards sustainable organisation, we have relooked our materiality matrix and established the ESG governance at tier 3 level as well as at SBU level to implement ESG projects on ground.

Hindustan Zinc joins the Taskforce on Nature-Related Financial Disclosures (TNFD) piloting with ICMM to access the challenges in implementing LEAP process of TNFD.

Miyawaki afforestation was completed at DSC and CLZS. 12,000 Indigenous Plants and 6,500 native seeds planted in the area of 1 hectare at each of the location to create a self-sustaining forest in the span of 3 years. 3 years Engagement with IUCN has initiated, under this Prepared IBAT (Integrated Biodiversity Assessment Tool) Report for all Rajasthan-based locations identifying species present in the core area, Reframed Biodiversity Policy of HZL, Ecosystem Service review conducted across the Rajasthan based locations and Biodiversity risk assessment and site visit by IUCN team members for one season completed. These studies will help HZL to prepare a strategy to achieve 'No Net Loss' towards biodiversity. Green cover study done by SRSAC (State Remote Sensing Application Centre, Jodhpur) for all Rajasthan-based locations of HZL.

One of the most notable achievements has been the successful commissioning of a 3,200 KLD Zero Liquid discharge (RO-ZLD) plant at the Dariba Smelter. Apart from that, Zawar (ZM) and Rampura Agucha Mine ZLD projects of 4,000 KLD capacity each have been initiated to improve recycling and strengthen the zero discharge. Like ZM, dry tailing plant at Rajpura Dariba Mine is also under final stage of commissioning and will result in significant amount of water recovery from the tailings.

Site Inspection and updated GISTM (Global Industry Standard on Tailing Management) Conformance Assessment completed by ATC Williams for all TSF (Tailing Storage Facility). Environment Product Declaration (a Type 3 Ecolabel) for zinc product published.

Public hearing was conducted successfully at CLZS for proposed enhancement of zinc production capacity from 504 to 630 kt and installation of Induction Furnace, Slab Casting Line, RZO Unit, change in product mix in Pyro unit on total metal basis & installation of lead refinery & minor metal complex etc.

## Production performance

Production (kt)	FY 2023	FY 2022	% Change
Total mined metal	1,062	1,017	4%
Refinery metal production	1,032	967	7%
Refined zinc – integrated	821	776	6%
Refined lead – integrated <sup>1</sup>	211	191	10%
Production – silver (in tonnes) <sup>2</sup>	714	647	10%

1. Excluding captive consumption of 7,912 tonnes in FY 2023 vs. 6,951 tonnes in FY 2022.
2. Excluding captive consumption of 41.4 tonnes in FY 2023 vs. 37.4 tonnes in FY 2022.

## Operations

For the full-year, ore production was up 2% YoY to 16.74 million tonnes on account of strong production growth at Rajpura Dariba Mine, SK Mines and Rampura Agucha Mine, which were up 11%, 7% and 6% respectively. FY 2023 saw the best-ever Mined metal production of 10,62,089 tonnes compared to 10,17,058 tonnes in the prior year in line with higher ore production across Mines supported by better metal grades and operational efficiencies.

For the full year, we saw our ever-highest metal production, up 7% to 1,032 kt in line with better plant and MIC availability, while silver production was 10% higher at 714 million tonnes in line with higher lead metal production.

Particulars	FY 2023	FY 2022	% Change
Average zinc LME cash settlement prices US\$ per tonne	3,319	3,257	2%
Average lead LME cash settlement prices US\$ per tonne	2,101	2,285	(8%)
Average silver prices US\$/ounce	21.4	24.6	(13%)

FY 2023 started well with the prices around ~US\$4,000/t. With the impact of the Russia-Ukraine War, lockdown announced in China and US GDP contraction, zinc prices hovered around US\$4,400/t for most of April 2022 and ended at US\$4,100/t. In the month of May, prices went down to US\$3,499/t over concerns of economic slowdown in the US and China. Prices again rebounded above US\$4,000/t driven by increased expectation of a stimulus from the Chinese government to support growth in order to offset the impact of the coronavirus. However, in Q3 FY 2023, negative sentiment of the market pushed down the LME prices in October 2022 and reached to US\$2,682/t on 3 November 2022, lowest since February 2021. With the sudden end to China's zero-Covid policy at the end of CY 2022 and the prospect of Chinese demand rebound, the faith in base metals has been restored in investors. This gave the much-needed boost and prices rose above US\$3,400/t in January 2023, with monthly average of US\$3,289/t. However, the trend has not lasted for long and prices have corrected to US\$2,956/t in March 2023.

In long term, the prices will be pressured by growing surpluses. The higher zinc prices in recent years have encouraged the development of a significant amount of new mine projects. However, the smelter capacity suggests not all of this new mined output will be processed, leading to concentrate surpluses. At the same time, smelter output growth is forecast to outpace demand growth. This, in turn, will lead to a significant refined stock build. As the cumulative surplus becomes unsustainably large, prices will fall lower to rebalance the market.







## Zinc Demand-Supply

Zinc Global Balance In kt	CY 2021	CY 2022	CY 2023 E
Mine Production	13,094	12,862	13,080
Smelter Production	13,867	13,489	13,855
Consumption	14,147	13,587	13,794

Source: Wood Mackenzie, March STO

Global demand witnessed contraction in CY 2022, decreasing by 3.0% to 13.6 million tonnes, largely due to the fall in Chinese demand. At supply level, the refined zinc metal production fell by 2.6%, as several smelters closed for care and maintenance across the world owing to the increase in energy prices. The global mined zinc production is expected to grow stronger during 2023 to 2026 period as there will be new mine projects ramping-up. And it is expected that the production will grow by 1.8% to 13.8 million tonnes in 2023.

The global zinc warehouse stocks also fell during this period due to supply constraints. The total tonnage of zinc in the Shanghai Futures Exchange (SHFE) warehouses fell to 20 kt at the end of December 2022 and settled at 97 kt at the end of March 2023, from 176 kt in April 2022. And the London Metal Exchange (LME) stocks stood at 45 kt at the end of the March 2023, down from 140 kt in April 2022.

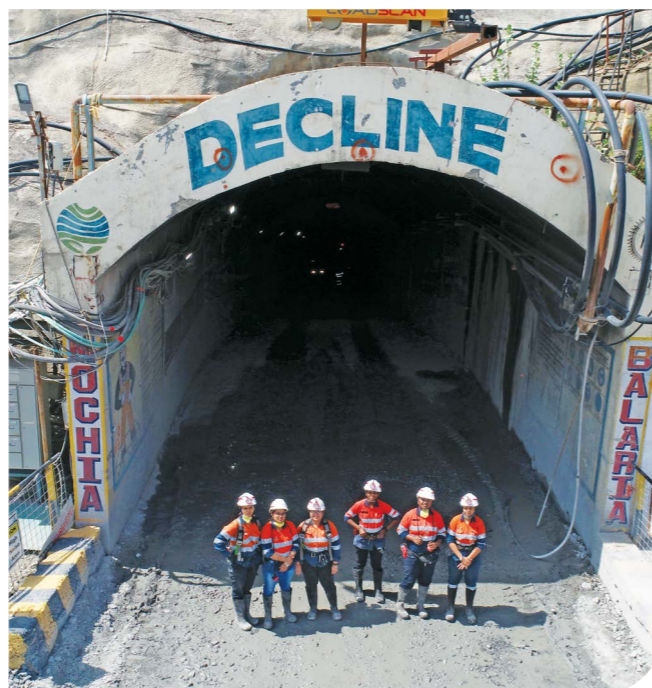
The Indian economic environment has remained optimistic. The same was reflected by the S&P Global Manufacturing PMI which stood at 56.4 in March 2023 as compared to 54.7 in April 2022 and 55.3 in February 2023, reflecting expansion in manufacturing sector. The Indian automobile industry is on a growth trajectory, with 13.5% increase in production to reach 227 lakh units till February 2023 from April 2022, compared to the same period in the previous fiscal. The passenger vehicle sales stood at 29 lakh units, marking a growth of 30% over the same period in the previous year.

(Source: SIAM & SP Global Index)

The finished steel domestic production was at 110.44 million tonnes during April 2022 to February 2023, up by 7.2% over the same period in the previous year. Consumption in domestic market during the same period stood at 108.15 million tonnes, up by 12.6%. The total net finished steel exports till February 2023 stood at 5.90 million tonnes, down by 52% over same period in the previous financial year on account of export duty levy.

(Source: MIS Report on Iron & Steel by JPC)

The overall domestic demand for primary zinc in this financial year has seen growth rate of 3.8% compared to last year, reaching pre COVID levels, and it is expected to grow further by 4% in FY 2024.



## Unit costs

Particulars	FY 2023	FY 2022	% Change
Unit costs (US\$ per tonne)			
Zinc (including royalty)	1,707	1,567	9%
Zinc (excluding royalty)	1,257	1,122	12%

For the full year, zinc COP excluding royalty was US\$1,257/t, higher by 12% YoY (21% higher in ₹ terms). The COP has been affected by higher coal & commodity price increase partially offset by benefits from better volumes, operational efficiencies & recoveries.

## Financial performance

Particulars	FY 2023	FY 2022	% Change
Revenue	33,120	28,624	16%
EBITDA	17,474	16,161	8%
EBITDA margin (%)	53%	56%	-

Revenue from operations for the year was ₹33,120 crore, up 16% YoY, primarily on account of higher metal & silver production, higher Zinc LME prices, gains from strategic hedging and favourable exchange rates partially offset by lower lead and silver prices.

EBITDA in FY 2023 increased to ₹17,474 crore, up 8% YoY. The increase was primarily driven by improved metal and silver volumes, higher Zinc LME prices, gains from strategic hedging and favourable exchange rates partly offset by higher costs and lower lead & silver prices.

## Projects

In HZL journey of 1.25 MTPA MIC expansion, only left-out project of RD Beneficiation plant revamping is under execution at RD Mines which is scheduled to be commissioned in Q1 FY 2024. Fumer plant final commissioning delayed due to VISA issues of OEM from China. The plan is to complete commissioning of plant through OEM support in Q1 FY 2024. For further phase of expansion of Mines and Smelters, studies are under progress and results are expected in FY 2024.

The capacity of smelters is being enhanced by putting up a new Roaster in Debari with latest technologies. The order placement is targeted by Q1 FY 2024.

A new project of Hindustan Zinc Alloys ordered in Q1 FY 2023 is under execution and scheduled for completion in Q1 FY 2024. HZL is also setting up new Fertiliser Plant in Chanderiya for which partner has been locked in. Formal order placement is scheduled to be completed in Q1 FY 2024. Project is scheduled for completion in 24 months.

## Exploration

Zinc India's exploration objective is to upgrade the resources to reserves and replenish every tonne of mined metal to sustain more than 25 years of metal production by fostering innovation and using new technologies. The Company has an aggressive exploration program focussing on delineating and upgrading Reserves and Resources (R&R) within its licence areas. Technology adoption and innovations play key role in enhancing exploration success.

The deposits are 'open' in depth, and exploration has identified number of new targets on mining leases having potential to increase R&R over the next 12 months. Across all the sites, the Company increased its surface drilling to assist in Resource addition and upgrading Resources to Reserves.

In line with previous years, the Mineral Resource is reported on an exclusive basis to the Ore Reserve and all statements have been independently audited by SRK (UK).

On an exclusive basis, total ore reserves at the end of FY 2023 totalled 173.49 million tonnes and exclusive mineral resources totalled 286.56 million tonnes. Total contained metal in Ore Reserves is 9.64 million tonnes of zinc, 2.7 million tonnes of lead and 310.2 million ounces of silver and the Mineral Resource contains 12.8 million tonnes of zinc, 5.66 million tonnes of lead and 545.7 million ounces of silver. At current mining rates, the R&R underpins metal production for more than 25 years.

## Strategic Priorities & Outlook

Our primary focus remains on enhancing overall output, cost efficiency of our operations, disciplined capital expenditure and sustainable operations. Whilst the current economic environment remains uncertain, our goals over the medium term are unchanged.

### Our key strategic priorities include:

- Further ramp-up of underground mines towards their design capacity, deliver increased silver output in line with communicated strategy
- Sustain cost of production to be in the range of US\$1,125-US\$1,175 per tonne through efficient ore hauling, higher volume & grades and higher productivity through ongoing efforts in automation and digitisation
- Disciplined capital investments in minor metal recovery to enhance profitability
- Increase R&R through higher exploration activity and new mining tenements, as well as upgrade resource to reserve
- Progressing towards sustainable future with continued efforts towards reduction in GHG emissions, water stewardship, circular economy, biodiversity conservation and waste management

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