



Vedanta - Zinc Day

Hindustan Zinc Limited

30 August, 2017





The views expressed here may contain information derived from publicly available sources that have not been independently verified.

No representation or warranty is made as to the accuracy, completeness, reasonableness or reliability of this information. Any forward looking information in this presentation including, without limitation, any tables, charts and/or graphs, has been prepared on the basis of a number of assumptions which may prove to be incorrect. This presentation should not be relied upon as a recommendation or forecast by Vedanta Resources plc and Vedanta Limited and any of their subsidiaries. Past performance of Vedanta Resources plc and Vedanta Limited and any of their subsidiaries cannot be relied upon as a guide to future performance.

This presentation contains 'forward-looking statements' – that is, statements related to future, not past, events. In this context, forward-looking statements often address our expected future business and financial performance, and often contain words such as 'expects,' 'anticipates,' 'intends,' 'plans,' 'believes,' 'seeks,' or 'will.' Forward-looking statements by their nature address matters that are, to different degrees, uncertain. For us, uncertainties arise from the behaviour of financial and metals markets including the London Metal Exchange, fluctuations in interest and or exchange rates and metal prices; from future integration of acquired businesses; and from numerous other matters of national, regional and global scale, including those of an environmental, climatic, natural, political, economic, business, competitive or regulatory nature. These uncertainties may cause our actual future results to be materially different than those expressed in our forward-looking statements. We do not undertake to update our forward-looking statements. We caution you that reliance on any forward-looking statement involves risk and uncertainties, and that, although we believe that the assumption on which our forward-looking statements are based are reasonable, any of those assumptions could prove to be inaccurate and, as a result, the forward-looking statement based on those assumptions could be materially incorrect.

This presentation is not intended, and does not, constitute or form part of any offer, invitation or the solicitation of an offer to purchase, otherwise acquire, subscribe for, sell or otherwise dispose of, any securities in Vedanta Resources plc and Vedanta Limited and any of their subsidiaries or undertakings or any other invitation or inducement to engage in investment activities, nor shall this presentation (or any part of it) nor the fact of its distribution form the basis of, or be relied on in connection with, any contract or investment decision.



01

Corporate Overview

Amitabh Gupta, CFO

02

Social Responsibility – Giving Back

Neelima Khetan, Head CSR

03

Delivering 1.2 mtpa

Naveen Singhal, Director Projects

04

Resource- Driven Growth

Scott Caithness, Head Exploration

05

Silver – Fastest Growing Portfolio

Sunil Duggal, CEO

06

Way Forward

Sunil Duggal, CEO

Q&A



01

Corporate Overview

Amitabh Gupta, CFO



2nd largest zinc-lead miner globally with **12 million+ MT** of ore production capacity

Rampura Agucha: **2nd** largest zinc mine globally

4th largest zinc-lead smelter globally: **1 million+ MT** of production capacity

18th largest silver producer of the world*

One of the lowest cost zinc producers in the world

3 mines with **five-star** ratings by Indian Bureau of Mines

Vision: To be the world's largest and most admired zinc-lead & silver company

Rankings source: (1) Wood Mackenzie, Long-Term Outlook Q2 2017
(2) For HZL related data, actuals for FY 16-17
* Source : Thomson Reuters



Core Strengths

- 1

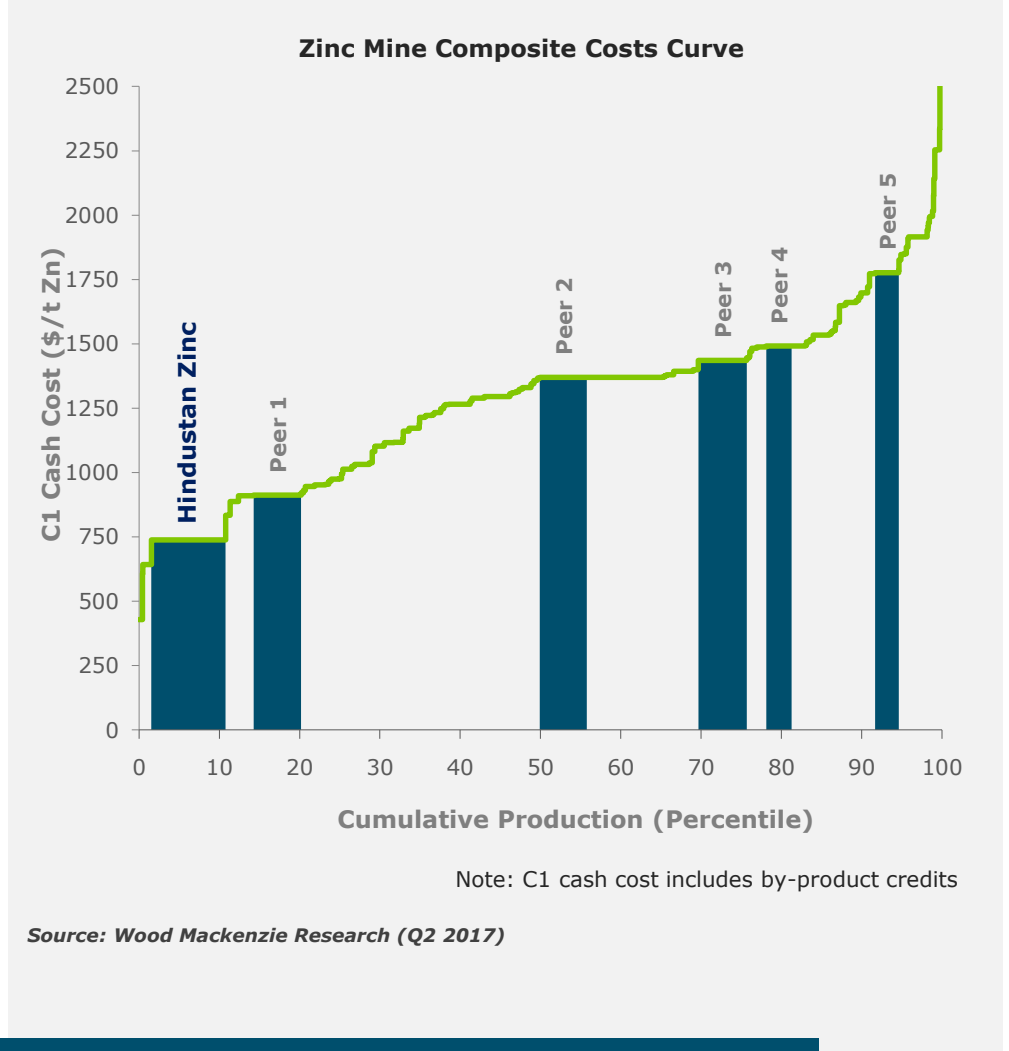
Captive mines with R&R base of 404.4 million MT ensuring mine life of 25+ years
- 2

Integrated metal production supported by captive power plants
- 3

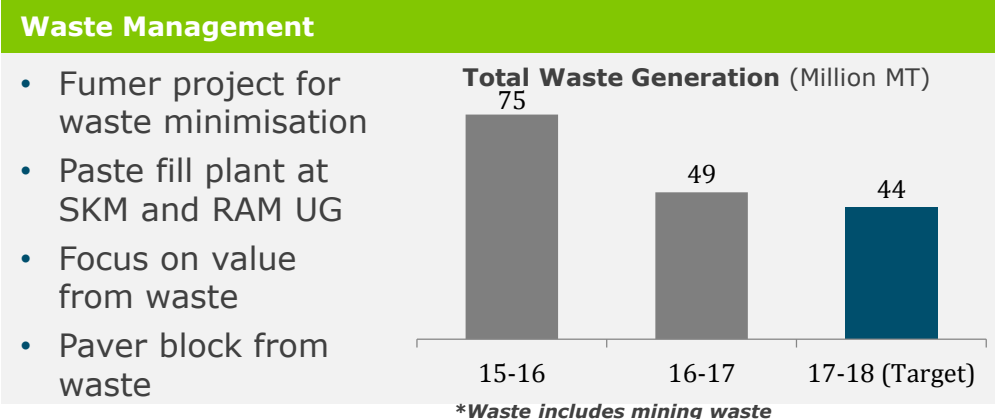
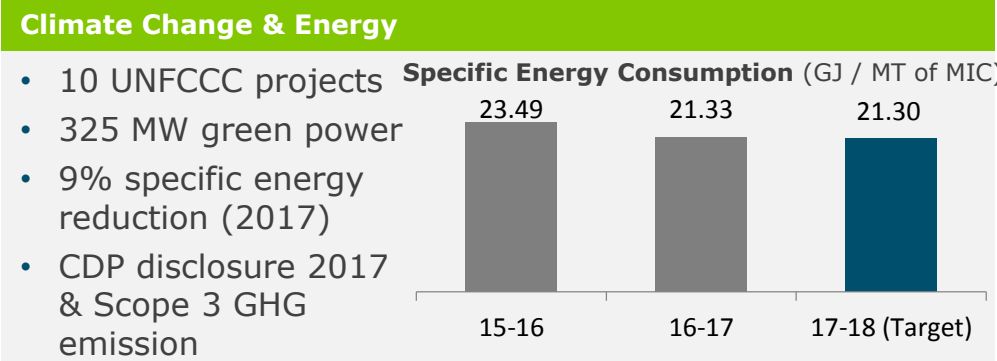
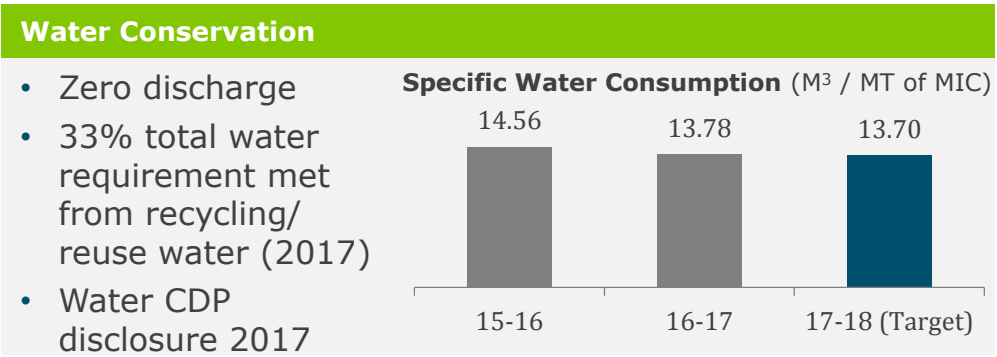
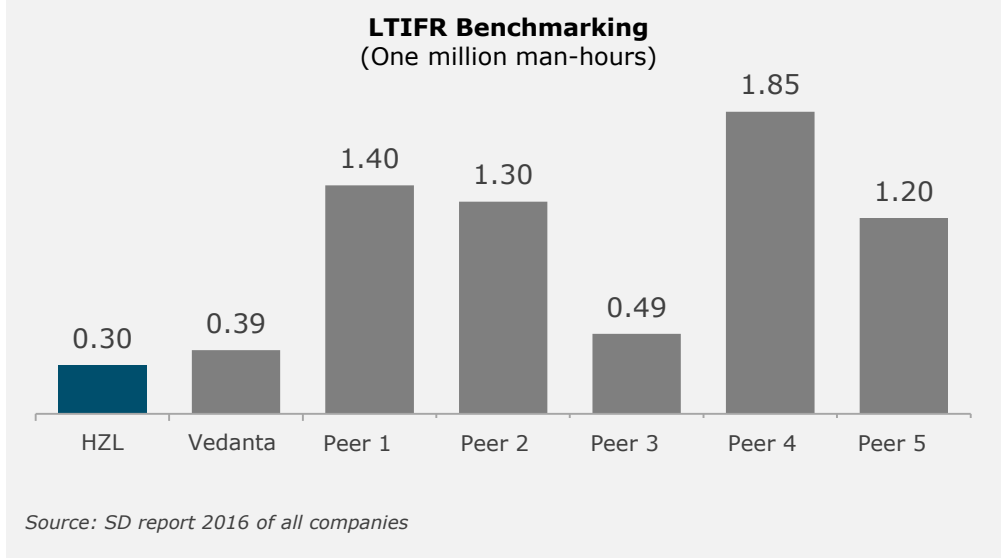
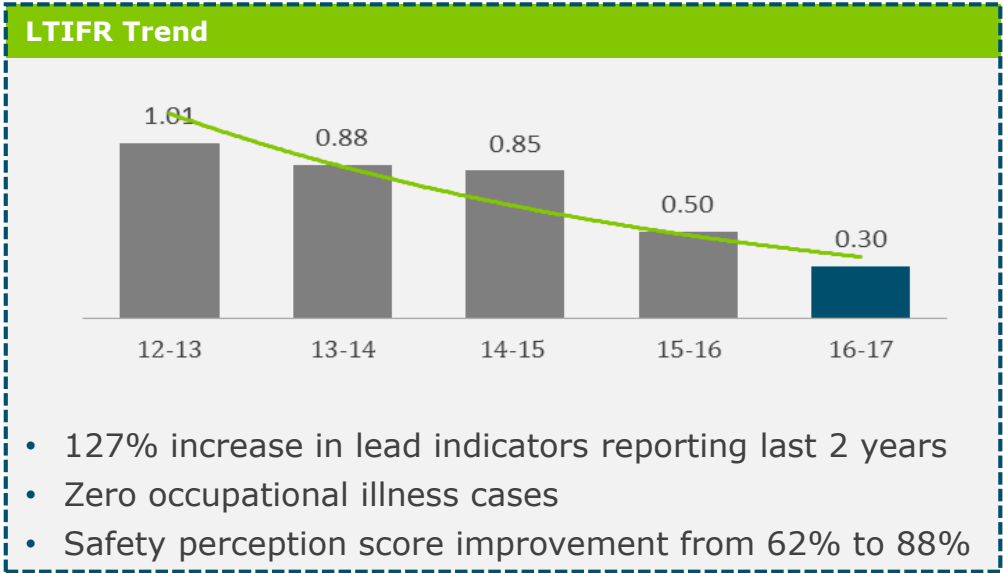
Low cost of operations driven by quality assets and recovery from waste
- 4

Market leadership in India with strong presence in emerging economies of Asia

Among the Lowest Cost Producers of Zinc



Leading the Way with Fully Integrated Operations





Portfolio of Tier - 1 Assets

Rampura Agucha Mine

Reserves : 49.7 mn MT
Resources : 50.3 mn MT
Reserve Grade : Zn 13.9%, Pb 1.9%
Current Ore Capacity : 6.15 mtpa

Kayad Mine

Reserves : 5.4 mn MT
Resources : 1.7 mn MT
Reserve Grade : Zn 7.8%, Pb 1.1%
Current Ore Capacity : 1.00 mtpa

Sindesar Khurd Mine

Reserves : 35.6 mn MT
Resources : 87.2 mn MT
Reserve Grade : Zn 4.2%, Pb 2.9%
Current Ore Capacity : 4.50 mtpa

Rajpura Dariba Mine

Reserves : 9.0 mn MT
Resources : 50.3 mn MT
Reserve Grade : Zn 6.3%, Pb 1.5%
Current Ore Capacity : 0.90 mtpa

Zawar Mining Complex

Reserves : 9.5 mn MT
Resources : 85.7 mn MT
Reserve Grade : Zn 3.3%, Pb 1.8%
Current Ore Capacity : 4.00 mtpa
CPP : 80 MW

Chanderiya Smelting Complex

Pyrometallurgical Lead Zinc Smelter:
1,05,000 MTpa zinc and 35,000 MTpa lead

Hydrometallurgical Zinc Smelter:
4,20,000 MTpa zinc

Ausmelt™ Lead Smelter: 50,000 MTpa lead

Captive Power Plant: 234 MW

Dariba Smelting Complex

Hydrometallurgical Zinc Smelter:
2,10,000 MTpa zinc

Lead Smelter: 1,00,000 MTpa lead

Captive Power Plant: 160 MW

Zinc Smelter Debari

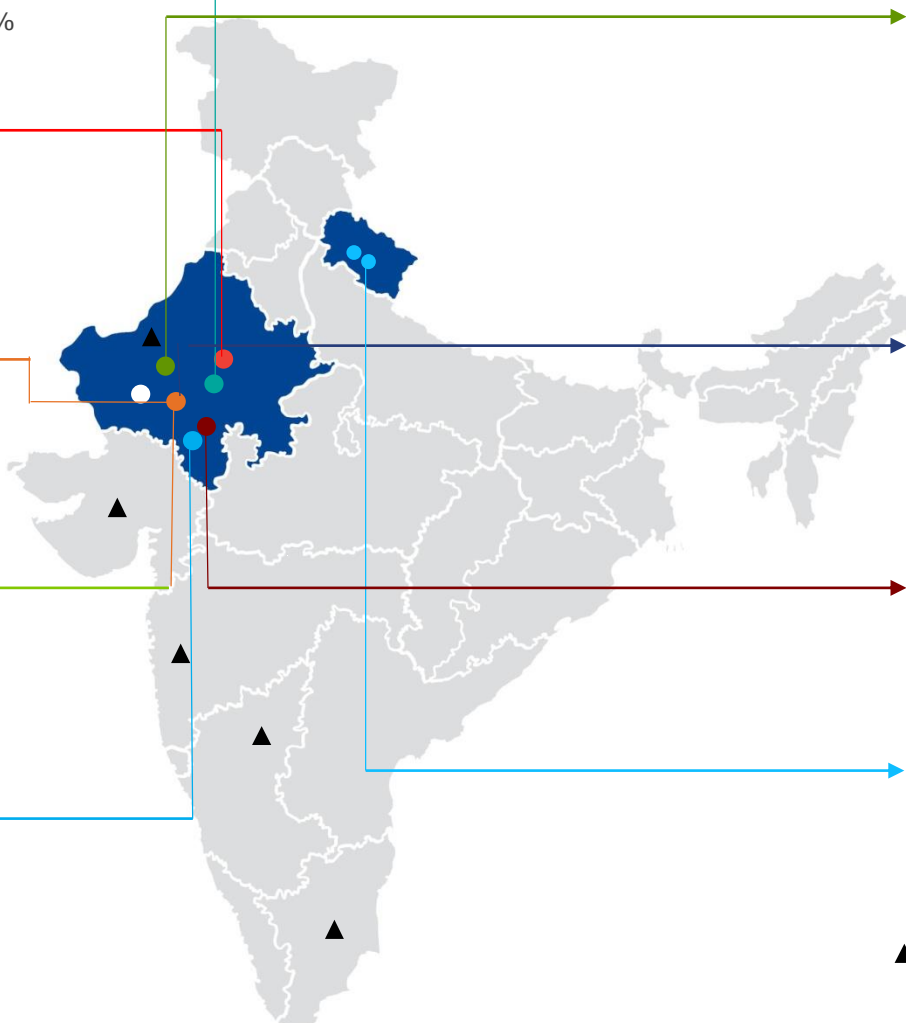
Hydrometallurgical Zinc Smelter:
88,000 MTpa zinc

Pantnagar & Haridwar

Processing and refining of zinc, lead and silver

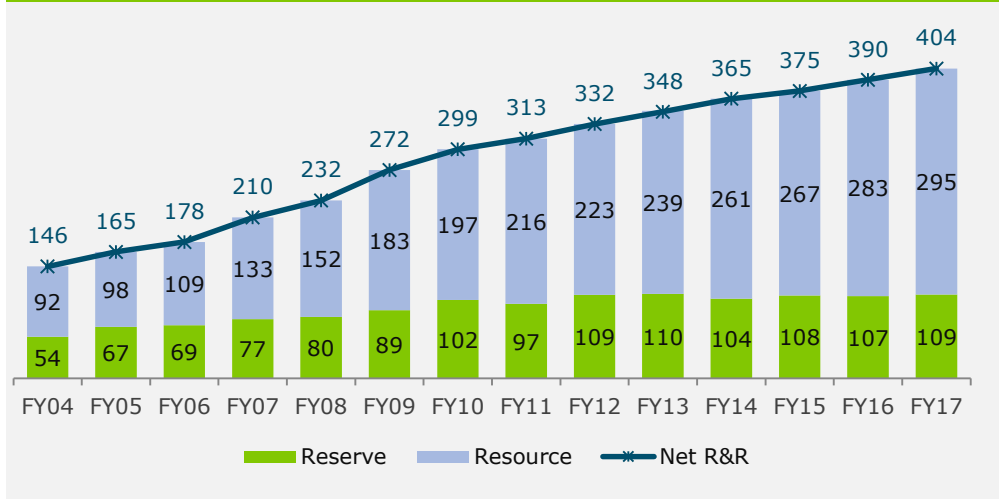
Renewable Power

▲ **Wind:** 274 MW
Solar: 16 MW
Waste heat recovery: 35 MW

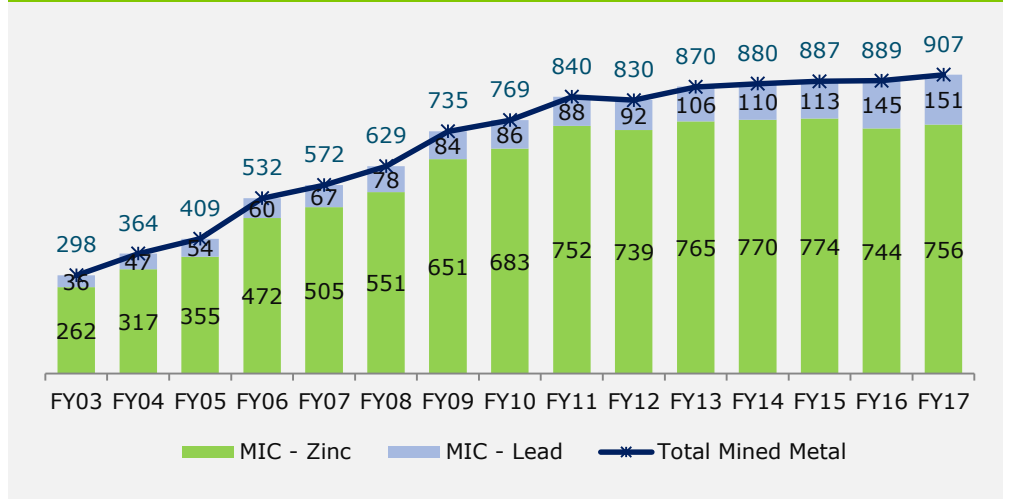


Strong Track Record of Growth

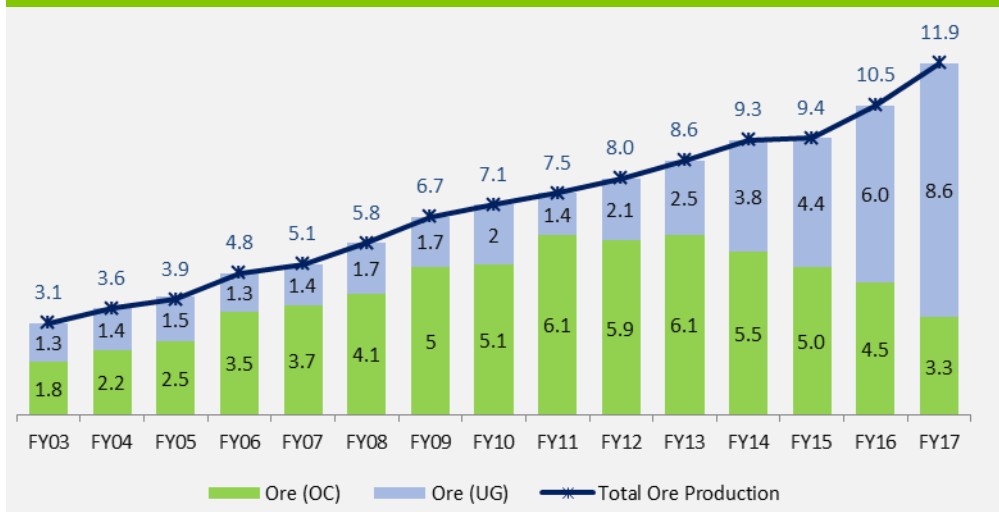
Reserves & Resources (mn MT) – 2.5X Growth



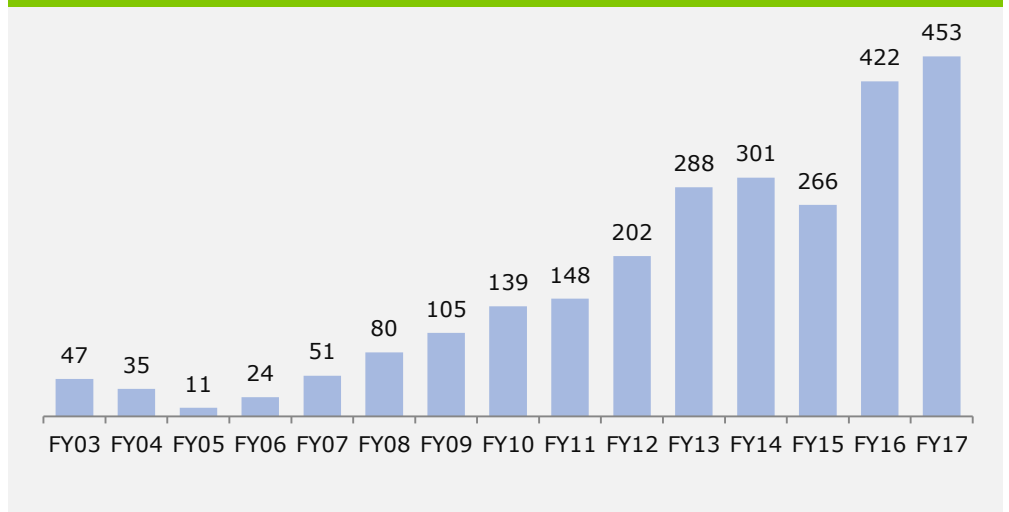
Mined Metal (kt) – 3X Growth



Ore Production (mn MT) – 3.5X Growth

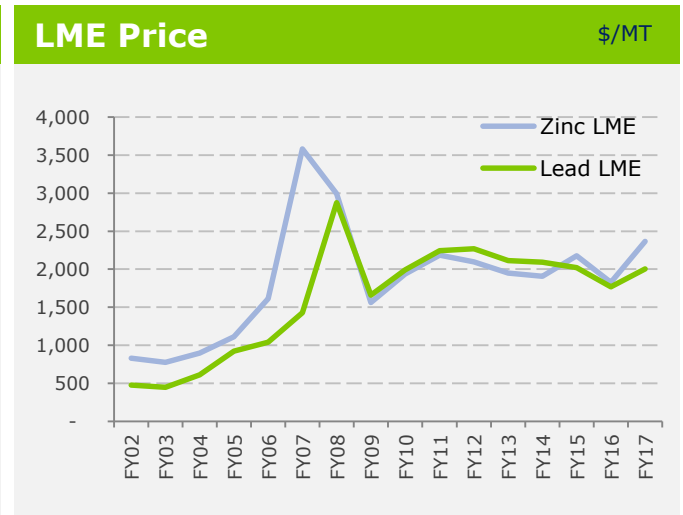
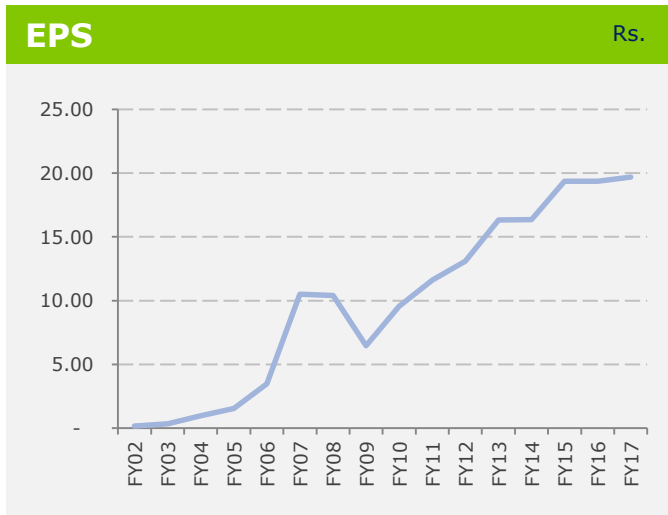
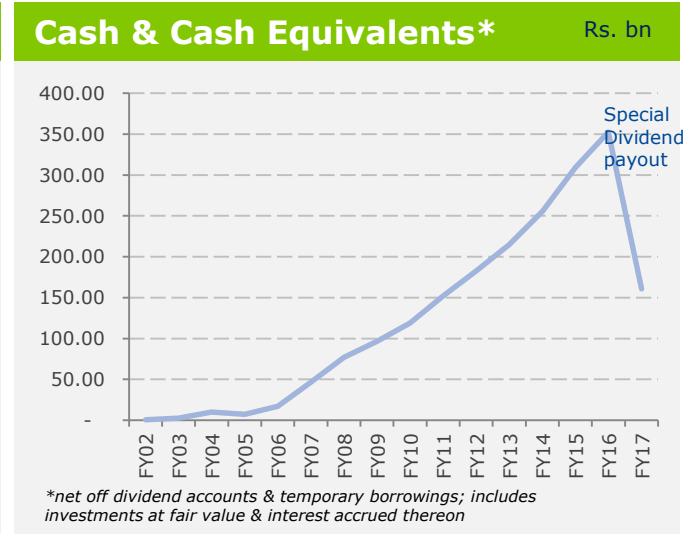
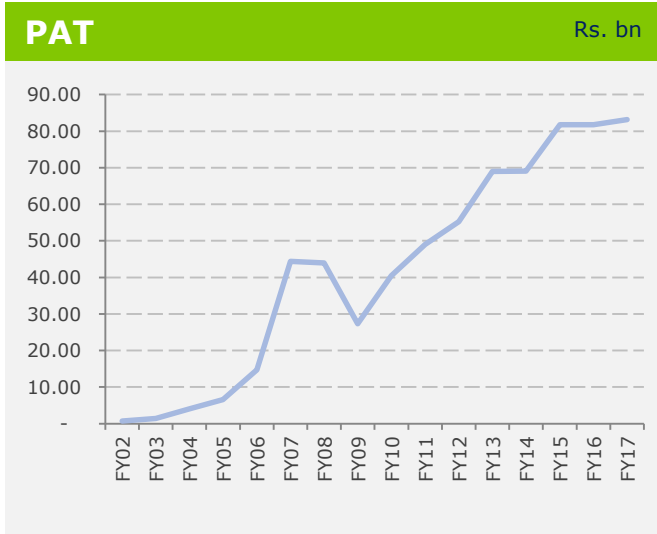
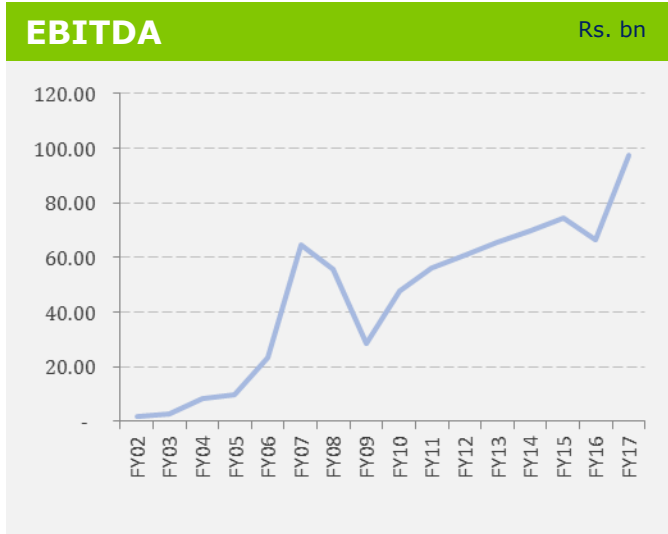


Silver Metal – Integrated Saleable (MT) – 9X Growth

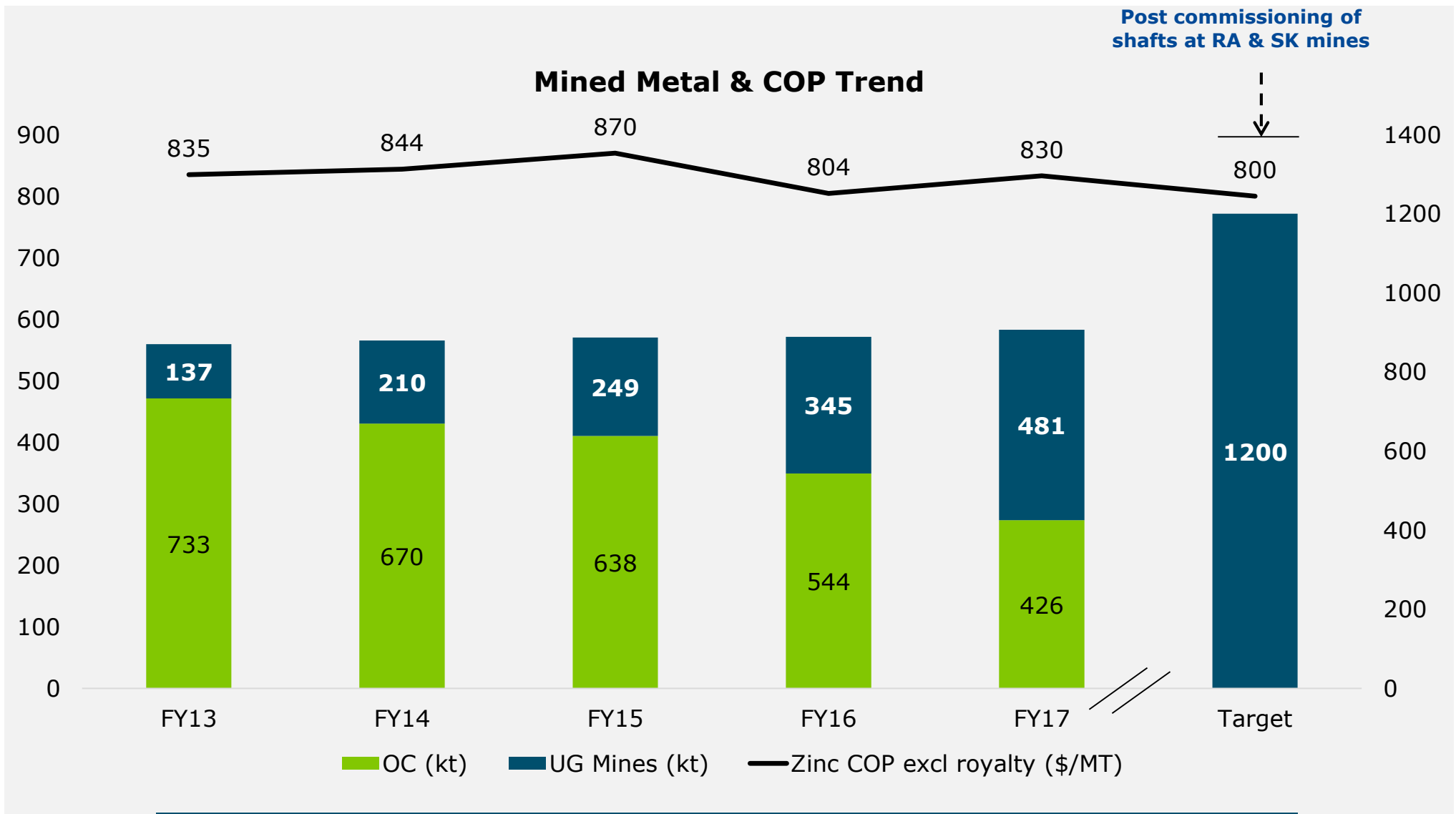


Multi-fold growth since disinvestment

Robust Financial Performance



EBITDA CAGR 28% despite Zinc LME growth of only 7%



COP held firm despite transition to underground mining



02

Corporate Social Responsibility

Neelima Khetan
Head CSR



Vision

To enhance the quality of life and economic well being of communities around our operations.

Goals

- To positively & holistically impact the quality of life of the communities living around our areas of operation.
- To work in partnership through a multi-stakeholder approach for innovatively, effectively and efficiently addressing development challenges.
- To emerge as a thought leader, creating benchmarks of good practices in CSR across Rajasthan & country.

Reach

Over half a million people in Rajasthan; positively impacting lives of more than 100,000 households

HZL is proud to have had an unbroken social license to operate for the last 5 decades

Core Principles

Neighbourhood Communities

Our first and foremost commitment

The Partnership Multiplier

Work, as much as possible, through strong and credible local partners

Impact Centric

In almost everything we do, we focus on impact rather than on spends

Strong Governance

Multi-tiered and objective governance structures and routines

Thematic Areas



Education



Sustainable Livelihoods



Women's Empowerment



Health, Water & Sanitation



Sports & Culture



Environment



Community Assets Creation

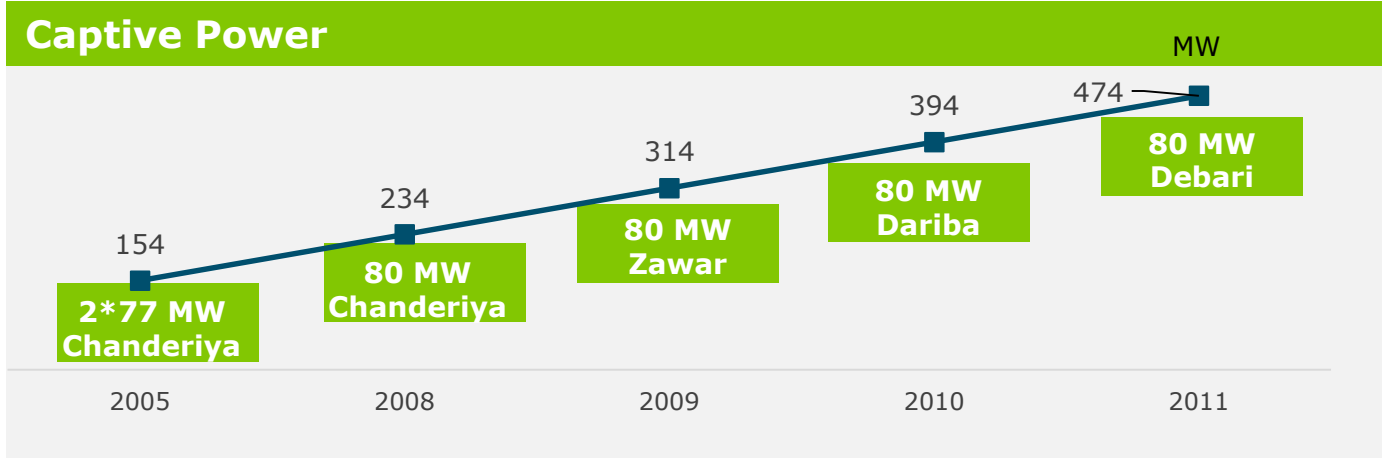




03

Delivering 1.2 mtpa

Naveen Singhal
Director Projects



Smelters

2005
Zn Hydro-1 at Chanderiya (170 kt)

2006
Ausmelt at Chanderiya (50 kt)

2008
Zn Hydro-2 at Chanderiya (170 kt)

2010
Zn Hydro-3 at Dariba (210 kt)

2012
Pb Smelter Dariba (100 kt)
Silver refinery Pantnagar (500 MT)

Mines

2005
RA OC 2.3 to 3.75 mtpa

2007
SKM 0.3 mtpa

2009
RA OC 3.75 to 5 mtpa

2010
RA OC 5 to 6 mtpa

2012
SKM 0.3 to 2 mtpa

2013
Production commenced at Kayad Mine

2016
SKM 2 to 3 mtpa

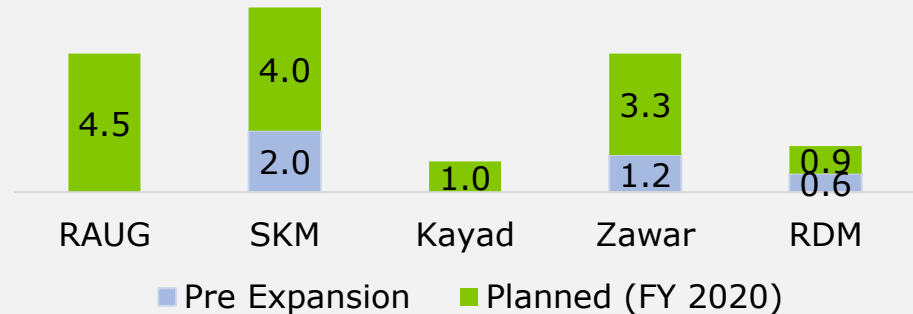
2017
SKM 3 to 3.7 mtpa
RAUG 1.4 mtpa
SK Mill commissioned



- Mine expansions in sync with increasing R&R
- Five major projects to increase MIC capacity to 1.2 mtpa, including RAM OC replacement
- Transition from Open Cast to UG mining
- Smelters' debottlenecking to remain integrated
- Six year capex of \$1.6 bn; ~\$1 bn spent

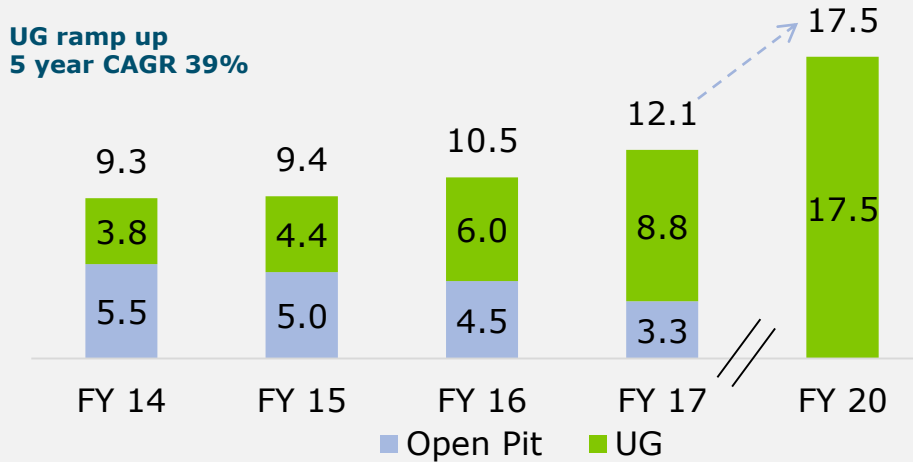
Underground Mines Capacity Expansion

3.8 mtpa → 17.5 mtpa



OC to UG Transition

UG ramp up
5 year CAGR 39%

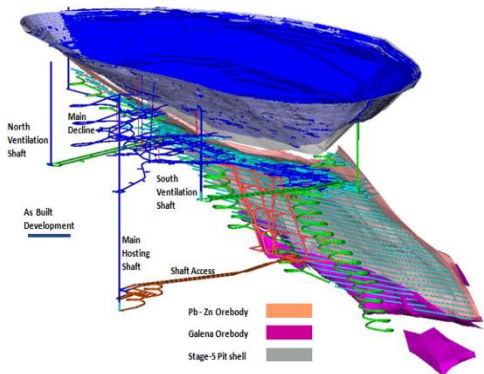


Underground Mines – concurrent expansion



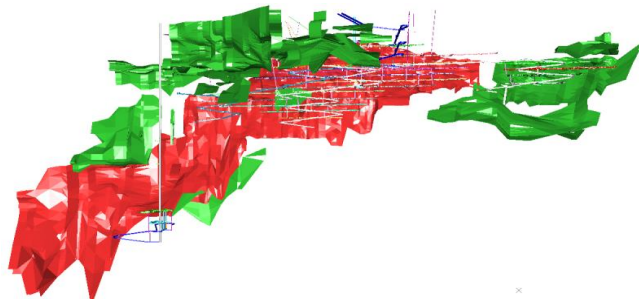
Rampura Agucha – a mine in transition

Reserve & Resource : 100.0 mn MT



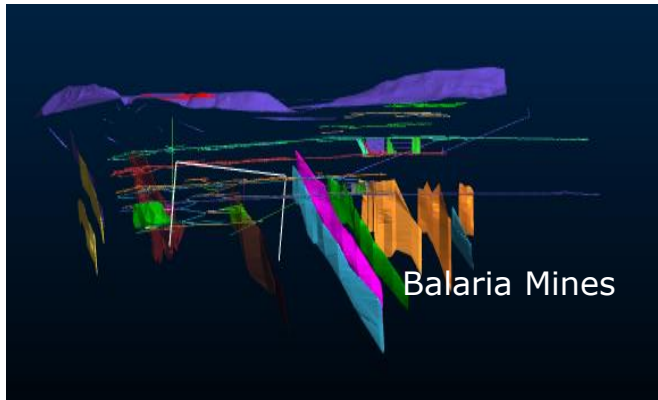
Sindesar Khurd Mine – satellite lenses

Reserve & Resource : 122.8 mn MT



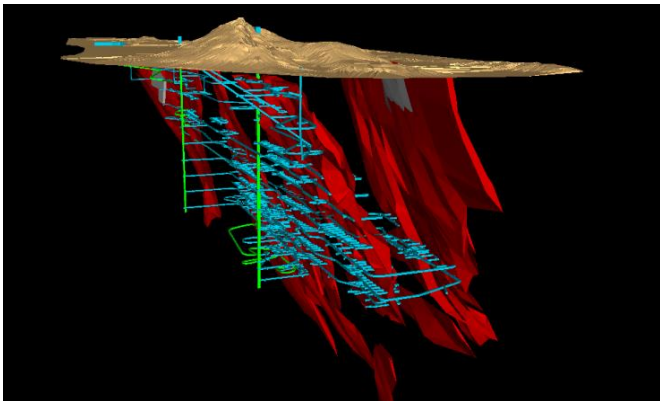
Zawar – integrating multiple mines

Reserve & Resource : 95.2 mn MT



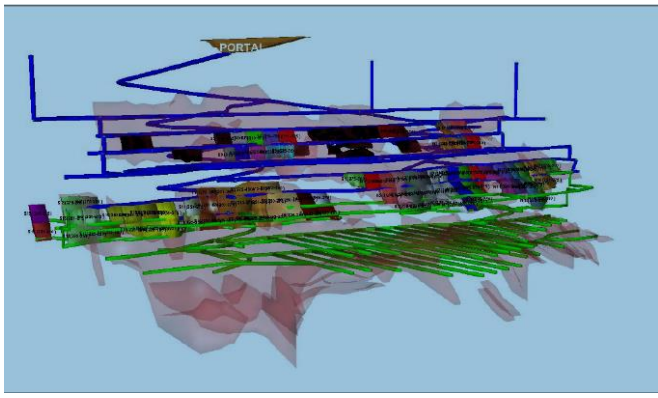
Rajpura Dariba Mine – upgrading a legacy

Reserve & Resource : 59.3 mn MT



Kayad Mine – near mine exploration

Reserve & Resource : 7.1 mn MT



Diverse ore bodies require different mining solutions



Robust Mine Plan

- LOMP, Mining schemes by AMC, Australia and reviewed by Golder, Canada
- Rock Mechanics & Stability Study by AMC - Beck, Australia
- **Central Design Center** - act as a think tank for adapting best mining design / practices



World-Class Infrastructure

- **Safety** - Rescue chambers, Gas Leak Detectors, Emergency escape systems
- **Communication** - Leaky feeder systems, Pitram mine Monitoring
- **Ventilation** - Development of Independent ventilation circuit by using Raise bore
- **Shafts** - 7.5 mtrs dia , 1 km deep shaft for man, material & ore hoisting
- **Workshop** - Fully equipped at surface & Underground for equipment maintenance by OEM
- **Pastefill** - Most Modern and efficient back filling



Best-in-Class Execution Partners

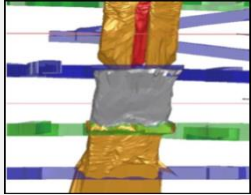
- **Shaft Sinking** - METS - Shaft Sinkers, South Africa; NFC- ENFI - CC5, China
- **Mine Development** - Barmenco, Australia; AAC - Reliant, Peru; Indian contractors, Expats
- **Mining Fleet** - Atlas Copco - Sandvik - Normet, Sweden; Catter Pillar, USA
- **Raise Boring** - Bergteamet, Sweden; Atlantis, South Africa
- **Paste Fill Plant** - Golder Associates, Canada



Talent Pool

- **Experienced expats** on board for handholding, mentoring & training HZL team
- **Mining academy** - Skill development and enhancement of local youth in UG operation
- **Skill development** and competency building of existing manpower pool

Technology Initiatives



Cavity Monitoring System: Stope scanning identifies and minimises deviation



Refuge Chamber: First of its kind in the country, provides a safe refuge during UG emergency

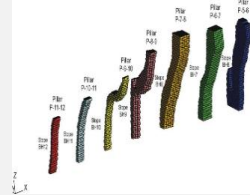


Mobile Carrier Rig: Eases mobility of exploration drills



1500 KW Ventilation Fan: First of its kind in the country, provides best UG working environment.

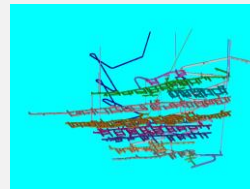
Mine Planning



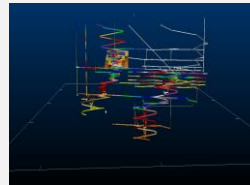
Measurement 3D numerical modelling for stope and pillar design



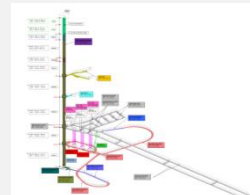
In-situ stress measurement



3D design using datamine



Schedule simulation using 5D planner



Shaft sinking modelling

Mine Operation



Best-in-class mining equipment



Virtual reality and simulation-based training



Mine digitisation and tele remote



3D scanning with laser scanner



Electronic shot firing



Process & Technology

Metal	Process	Technology
Zinc	Hydro Metallurgy	Outokumpu roast-leach-electro winning technology
	Pyro Metallurgy	Imperial smelting technology
Lead	Pyro Metallurgy	Imperial smelting technology
		Ausmelt Top Submerged Lance technology
		SKS, bottom blowing technology

Smelter Debottlenecking

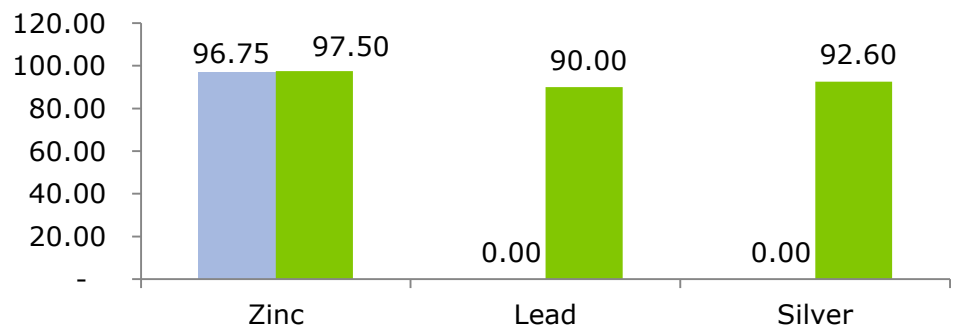
Phase 1 : December 2017

- Cell house operation @ 200 KA from 180 KA
- Upgradation of Roaster leaching circuits
- Mechanisation of cell house at Debari zinc plant

Phase 2 : December 2018

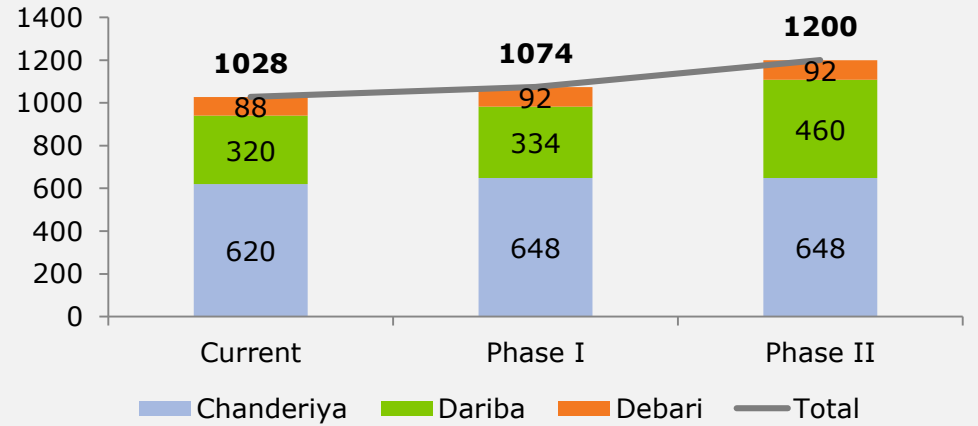
- Expansion of Dariba zinc cell house
- Leaching & purification circuit debottlenecking @ Dariba
- Oxygen enrichment in roasters to increase throughput

Metal Recovery in Hydro Metal recovery %



■ Existing Metal Recovery
 ■ Enhanced metal recovery with fumer (pilot project commissioning in mid FY 2019)

Smelter Capacities After Debottlenecking kt



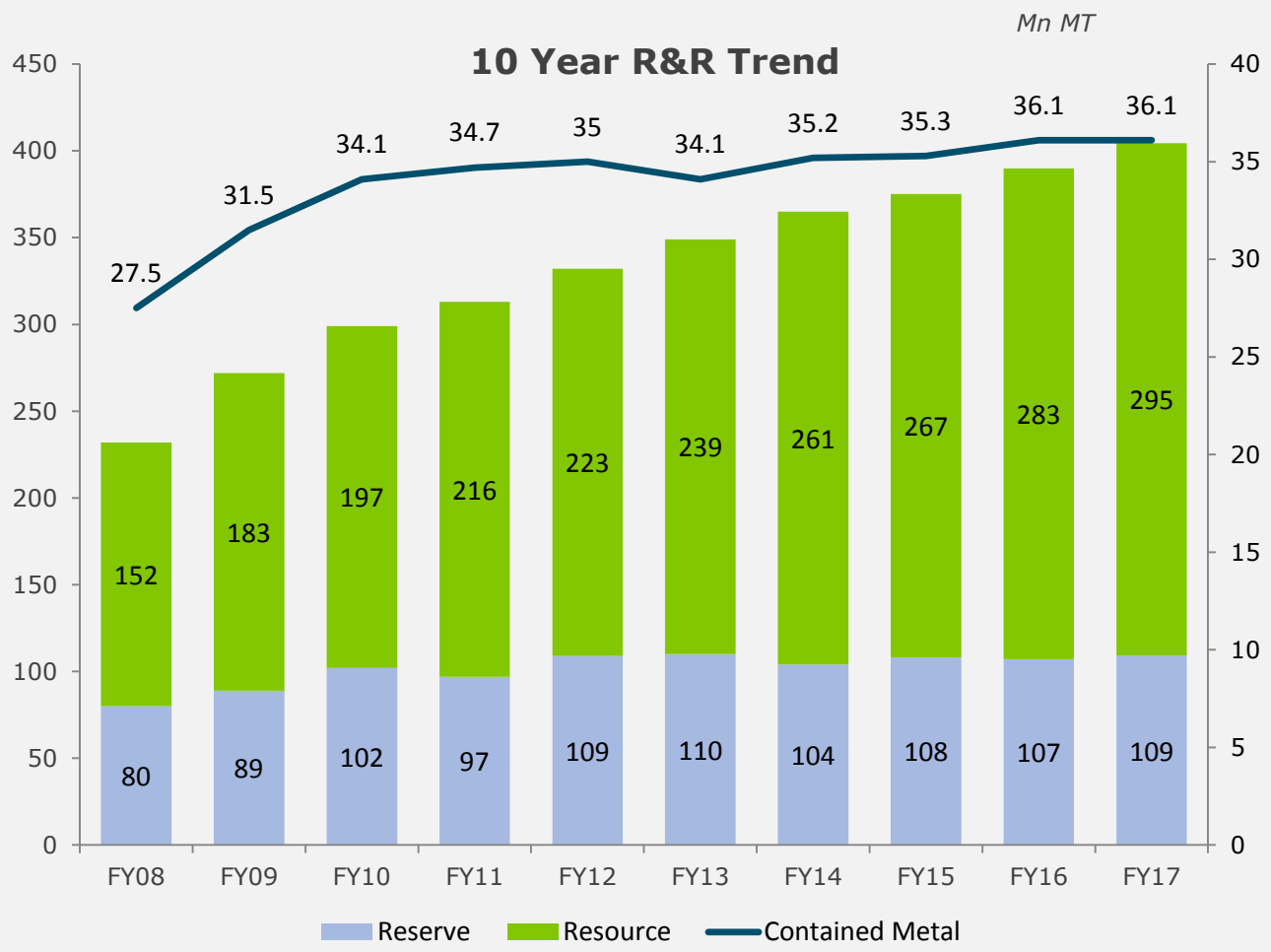


04

Exploration

Scott Caithness
Head Exploration

Sustained Commitment to Exploration → Strong Track Record of R&R Addition



- R&R 404 MT in 2017 - underpins 25+ years of production at current rate
- R&R estimation to the JORC standard and audited by international consultants
- Drill 80,000+ metres pa to add new resource tonnage
- Clear exploration strategy to grow R&R
- Use of latest global technologies

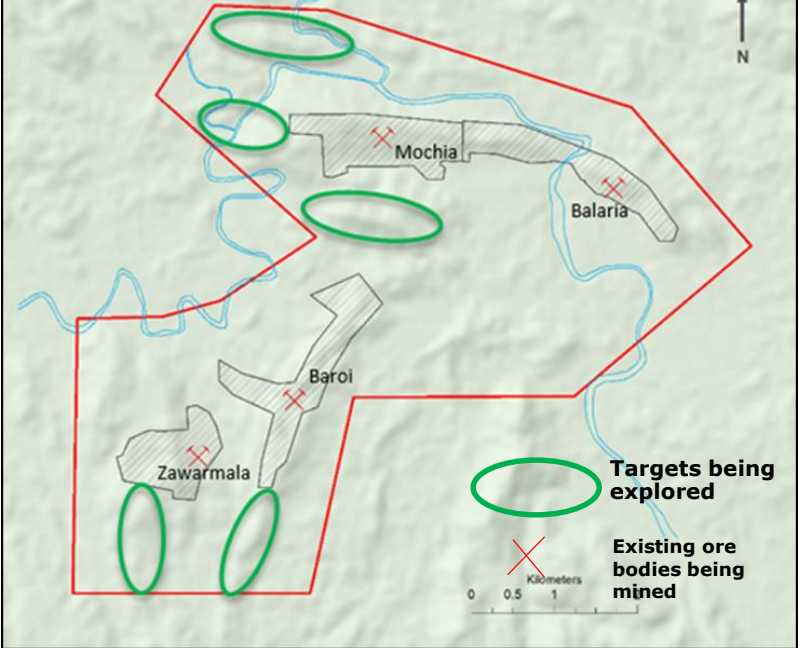
Every year since disinvestment, we have added more than depleted

- All deposits remain 'open' either at depth or along strike
- New exploration targets could exist within held MLs
 - Zawar in-mine bonanza silver – 2-8 metres zones grading +5oz/t Ag
 - New prospects in all MLs
- Zawar has 5 new prospects
 - Exploration potential for 50-80 mn MT of 4-6% Zn+Pb
 - +5km of prospective geology, strong Zn+Pb in soils and ancient mine workings
 - Next steps - Surface geophysics, forest clearance and drilling
- More than 20 valid ML, PL and RP applications provide potential for greenfield discoveries

Zawar Bonanza Silver

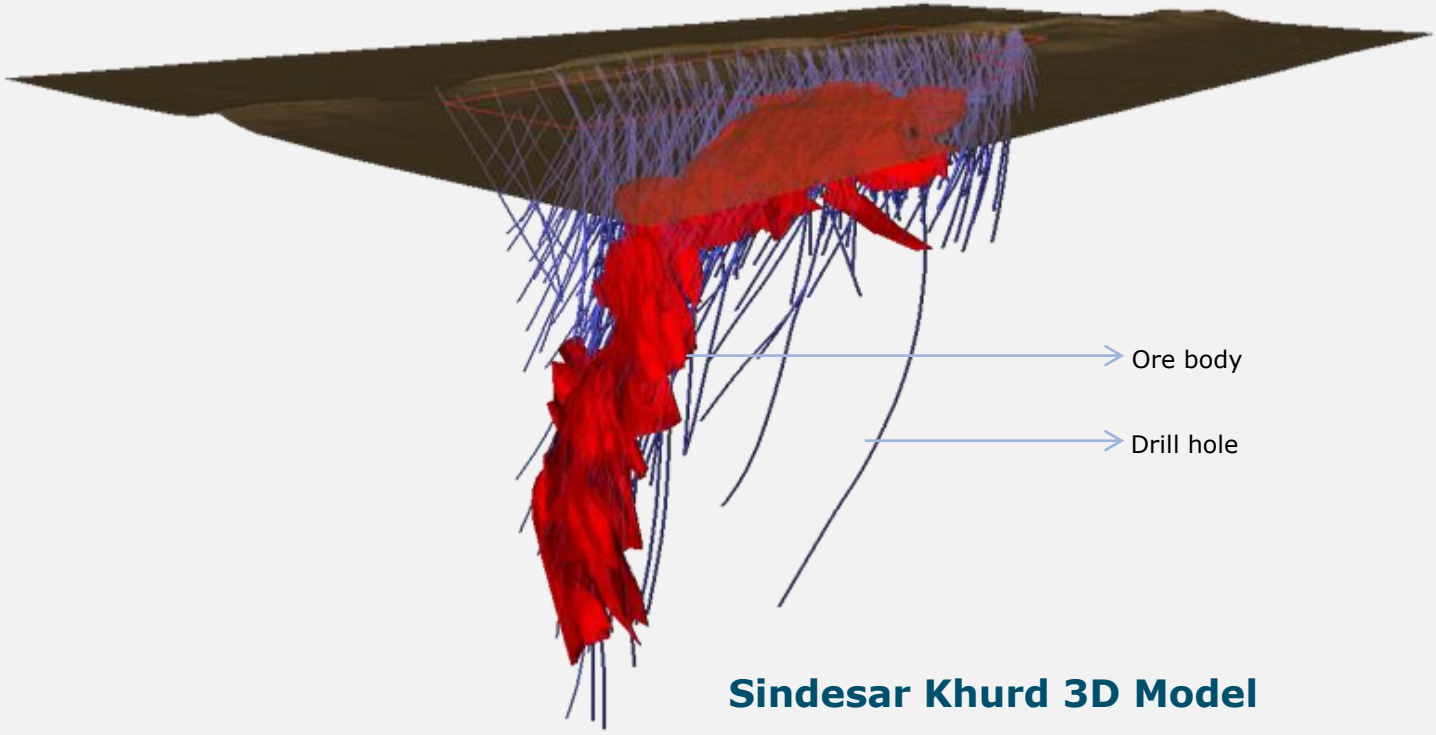


Zawar Targets



Using Global Leading Exploration Technologies

- Modern drill rigs and motorised directional drilling
- Drilling and geochemical data management software
- 3D visualisation software packages
- Geophysical techniques



Sindesar Khurd 3D Model



High speed drill rig at Kayad Mine



05

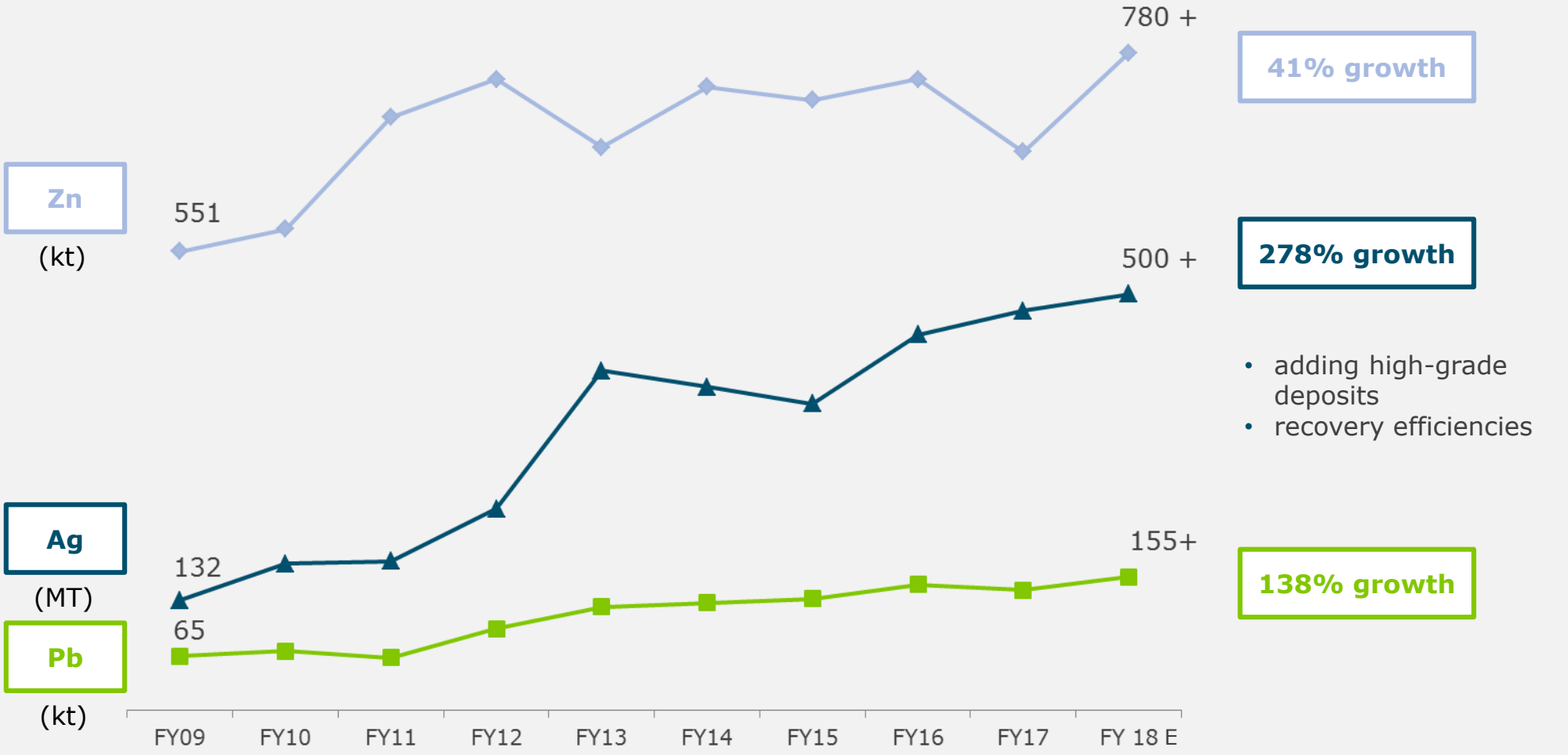
Silver

Sunil Duggal
CEO

Silver – Fastest Growing Portfolio of Hindustan Zinc



Strong Management Focus to Drive Silver Portfolio

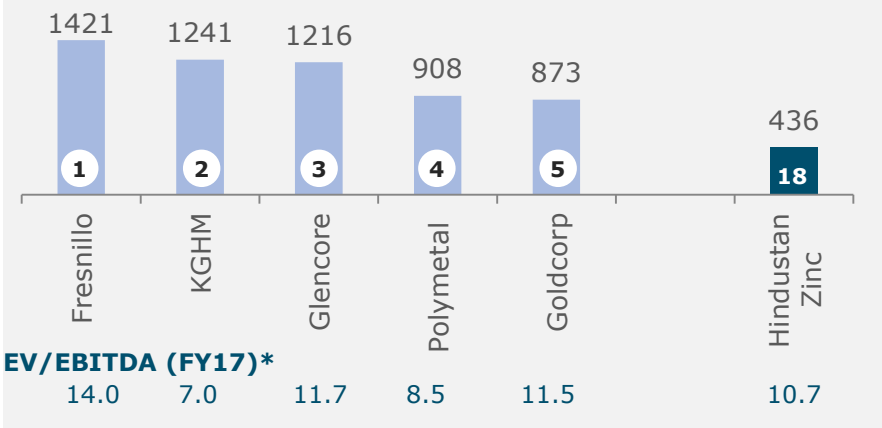


- adding high-grade deposits
- recovery efficiencies

Refined metal includes captive consumption

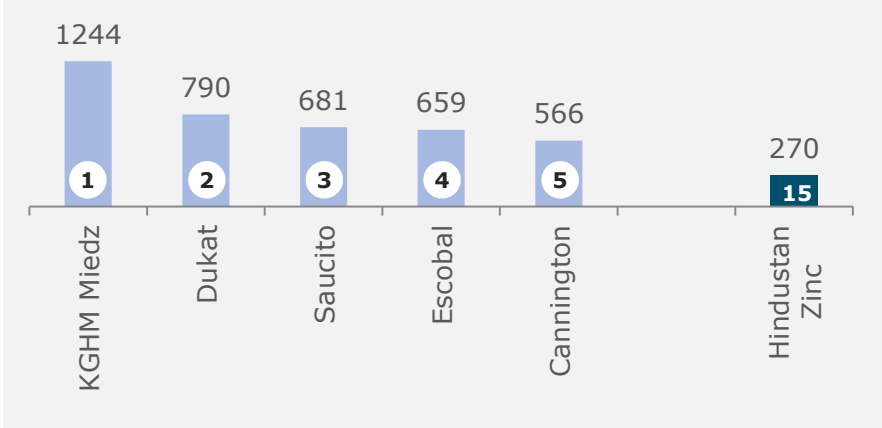


Global Production (MT) Ranking 2016



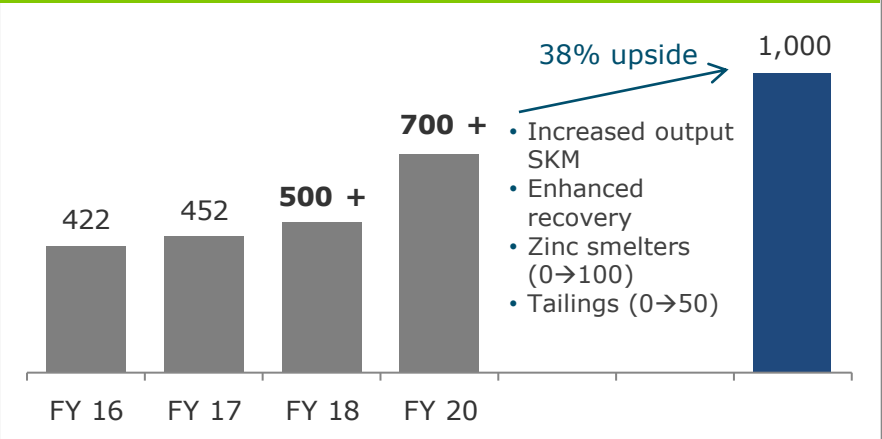
Source : Metals Focus and *Reuters

Global Production (MT) Ranking 2016 - Mines

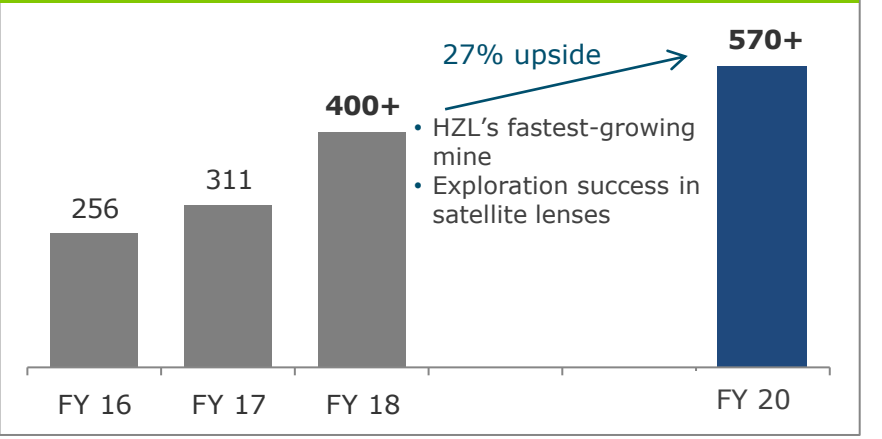


Source : Metals Focus

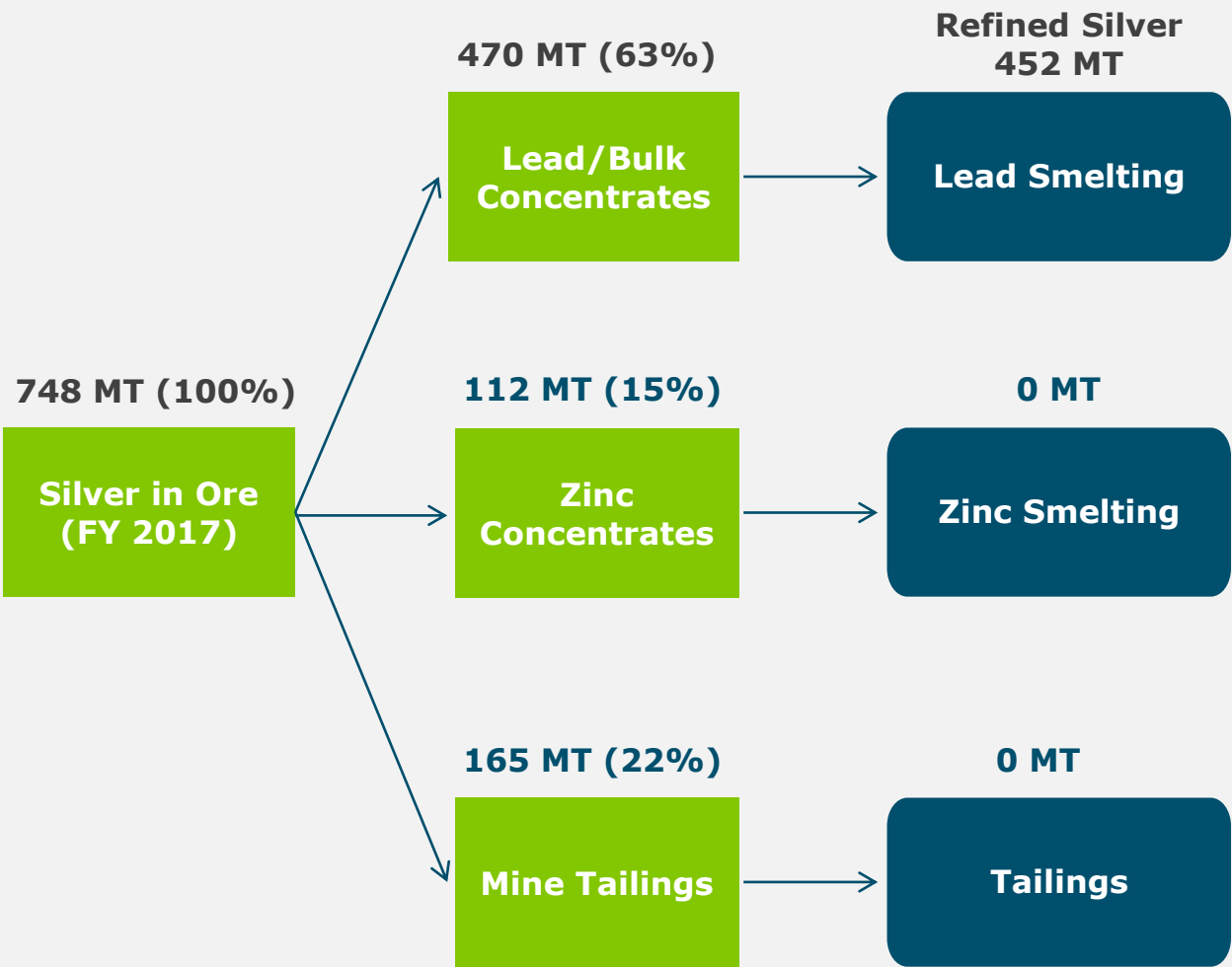
Growth in Integrated Production (MT) – HZL



Growth in Production (MT) - SKM



Hindustan Zinc Poised to be Among 'Top 5 Silver Companies'



Key Focus Areas

Mining
(452 → 850)

- Focus on silver-rich deposits → ongoing
- Achieving benchmarked recoveries in mines;
 - Prefloat, flash float → May 18

Zinc Smelters
(0 → 100)

- Fuming technology → June 18 (first fumer)
- Second/third fumer → April 20 (plan)

Recovery from Tailings
(0 → 50)

- Reflux classification → June 18 (pilot)

452 MT FY 2017 → **1,000 MT**



06

Way Forward

Sunil Duggal,
CEO



1.5 mtpa capacity under planning



- Shaft and decline integration
- Multi-level mining
- Digital transformation
- New prospects & tenements
- R&R addition

1.2 mtpa capacity by FY 2020

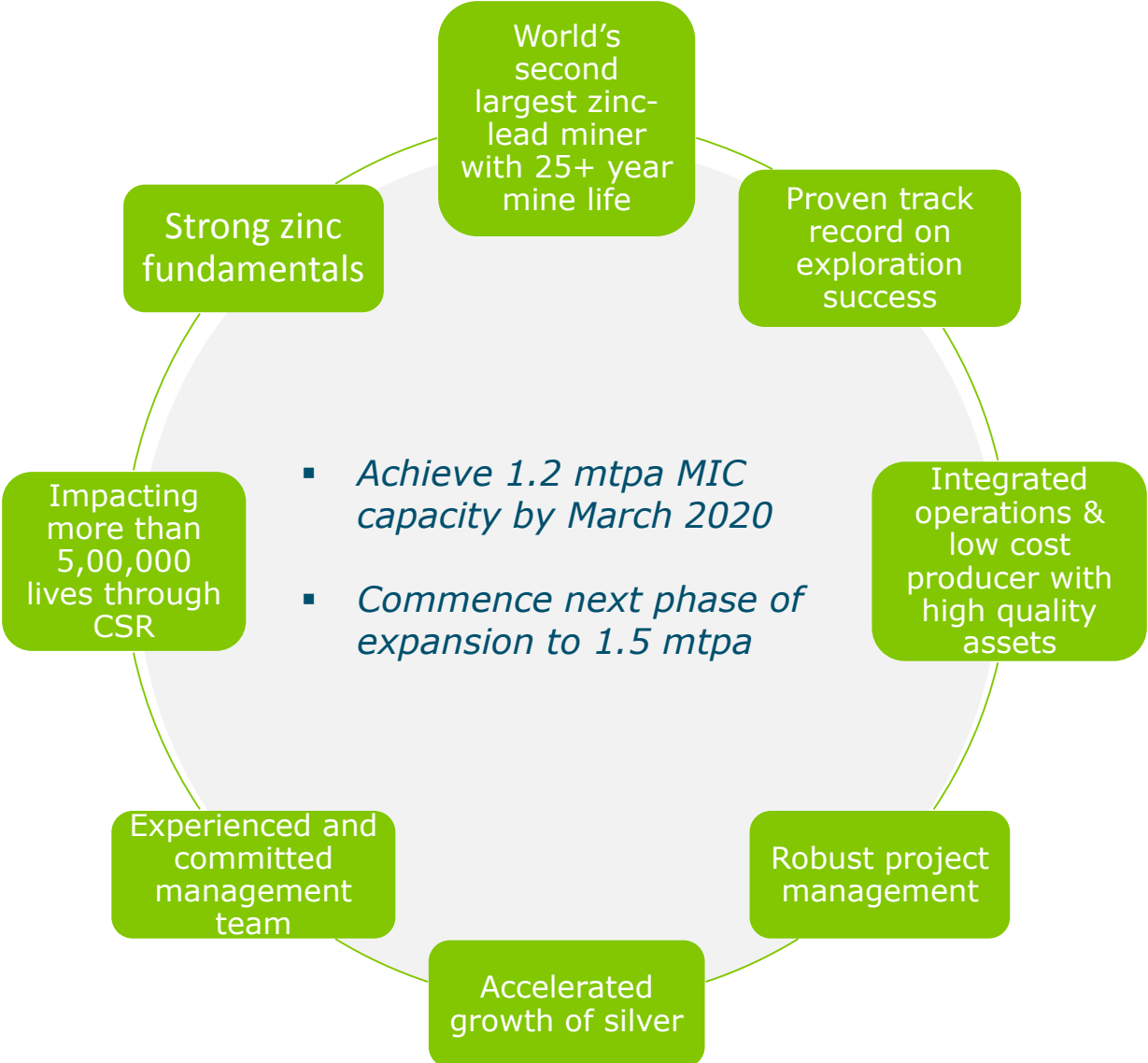


- 25+ years of mining R&R with potential of 1.2 mtpa
- Transition to underground mining progressing smoothly
- Shaft commissioning on track for Q3 FY 2019
- Mill & smelter capacity to keep pace
- Reduction in COP on shaft commissioning

Outlook FY 2018



Mined metal: Higher than 907 kt of FY 2017
Refined zinc-lead: 950 kt; silver: 500 +MT
Marginally higher dollar COP (excluding royalty)
Project Capex of \$350-360 million (including ongoing mine expansions, fumer and smelter debottlenecking)





Thank You

Sample Financial Working & Sensitivity



	INPUTS			
	S. No.	Particulars	UOM	Value
	1	Mined metal production	kt	1,200
	2	Metal production - Zinc	kt	979
	3	- Lead	kt	173
	4	Silver production	kt	750
	5	Realisation* - Zinc	\$/MT	2,950
	6	- Lead	\$/MT	2,350
	7	-Silver	\$/Trozt	17.00
	8	Cost Of Production(COP) - Zinc	\$/MT	800
	9	- Lead	\$/MT	700
	10	- Silver	\$/Kg	20
	11	Royalty - Zinc		13.20
	12	- Lead	%	19.14
	13	- Silver		9.24
	14	Exploration and others		30
	15	Sustaining capex	\$ mn	80
	16	Project capex		320
	17	Revenue - Zinc		2,889
	18	- Lead		406
	19	-Silver		410
	20	Total Revenue		3,705
	21	COP - Zinc		783
	22	- Lead		121
	23	-Silver		15
	24	Total COP		919
	25	Royalty - Zinc	\$ mn	381
	26	- Lead		78
	27	-Silver		38
	28	Total Royalty		497
	29	EBITDA Metal		2,258
	30	EBITDA Wind Power		25
	31	EBITDA Total		2,283
	30	Operational Free Cash**		1,916

SAMPLE FINANCIAL WORKING			
	17	Revenue - Zinc	2,889
	18	- Lead	406
	19	-Silver	410
	20	Total Revenue	3,705
	21	COP - Zinc	783
	22	- Lead	121
	23	-Silver	15
	24	Total COP	919
	25	Royalty - Zinc	381
	26	- Lead	78
	27	-Silver	38
	28	Total Royalty	497
	29	EBITDA Metal	2,258
	30	EBITDA Wind Power	25
	31	EBITDA Total	2,283
	30	Operational Free Cash**	1,916

*Includes conservative LME & Premium

**Excludes treasury income and working capital movement

Cost Sensitivity

	EBITDA (\$ mn)	
Increase in LME		
Zinc (\$100/MT)	82	↑
Lead (\$100/MT)	17	↑
Silver (\$1/Toz)	20	↑
Every \$10/MT increase in COP		
Zinc	9	↓
Lead	2	↓
Every 10kt increase in volume		
Zinc	19	↑
Lead	13	↑

All the above are individual Sensitivities and assume that the other parameters in the sample calculations stay constant

Open Pit

Ultimate Pit Depth : 400 metres from surface

UG Mine

- **Planned Production Capacity** : 4.5 mtpa
- Fully mechanised trackless mining operation
- **Mining Method** : LHS with paste fill

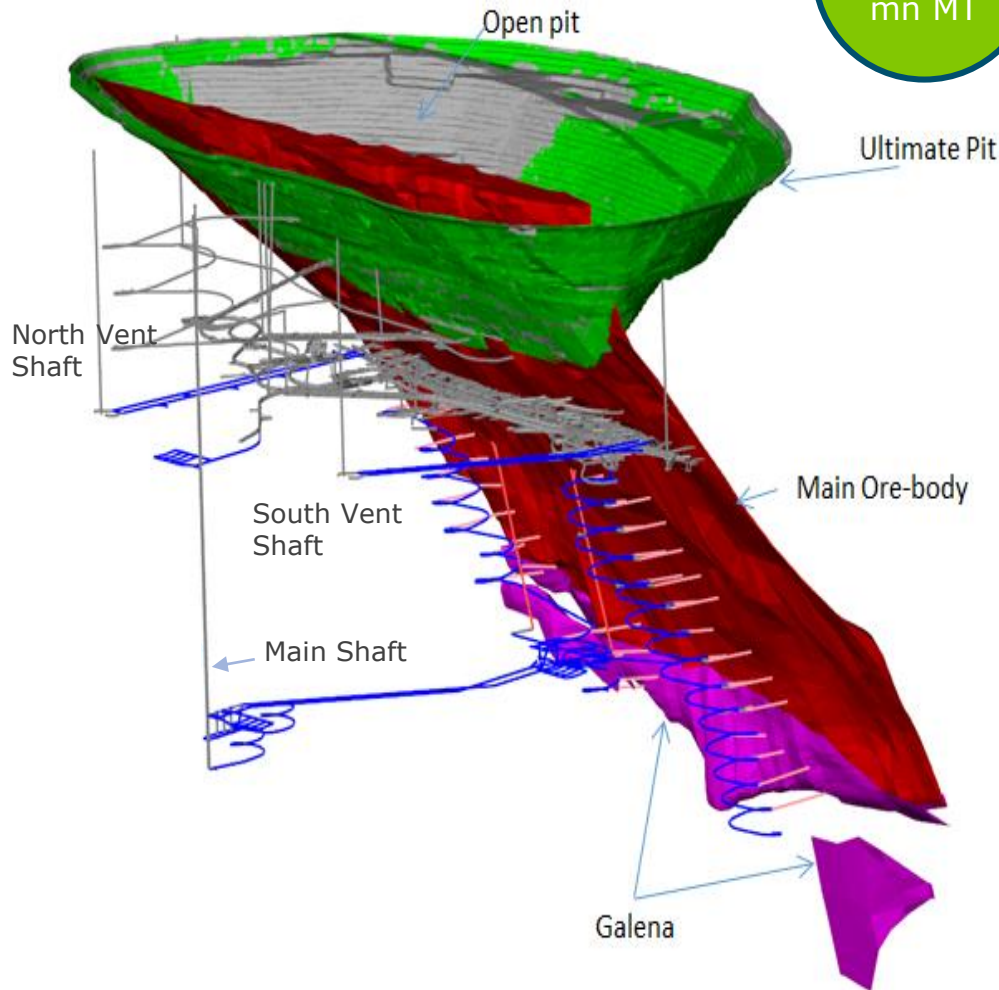
Major Activities

- Decline and ancillary development
- Production shaft and crusher system
- Raise boring
- Paste fill plant
- Surface & underground infrastructures

Shaft

- Main shaft 7.5 metres dia, capacity 3.75 mtpa, 955 metres deep
- 2 nos. ventilation shafts of 7.5 metres dia

R&R
100.0
mn MT



Year	Milestone
2013	<ul style="list-style-type: none"> • North and South ramp started • Main shaft sinking started
2015	<ul style="list-style-type: none"> • Paste fill plant installed • North vent. shaft completed
2016	<ul style="list-style-type: none"> • Production from main block • Main shaft sinking completed • South vent. shaft completed
2017	<ul style="list-style-type: none"> • Shaft winder commissioning
2018	<ul style="list-style-type: none"> • Main shaft commissioning

R&R
122.8
mn MT

UG Mine

- **Planned Production Capacity** : 6.0 mtpa
- **Mining Method** : Long hole stoping with paste filling
- Fully mechanised trackless mining operation

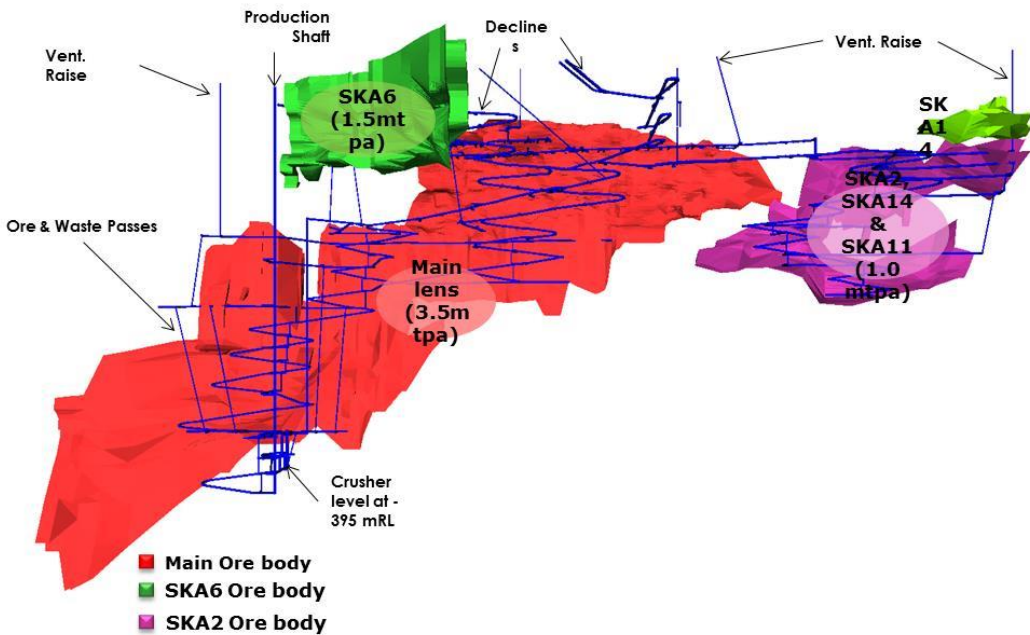
Major Activities

- Decline and ancillary development
- Production shaft and crusher system
- Raise boring
- Paste fill plant
- Beneficiation plant
- Surface and underground infrastructures

Shaft

- Main shaft 7.5 metres dia, capacity 3.75 mtpa, 1,050 metres deep

Year	Milestone
2013	• Main shaft sinking started
2014	• South ramp commenced • Paste fill plant started
2015	• Paste fill plant commissioned • Mill DBN (2 to 2.8 mtpa) completed
2016	• Production from SKA6 • Main shaft sinking completed
2017	• Production from SKA14 • Mill plant (1.5 mtpa) commissioned
2018	• Shaft and winder commissioning • Mill (1.5 mtpa) commissioning

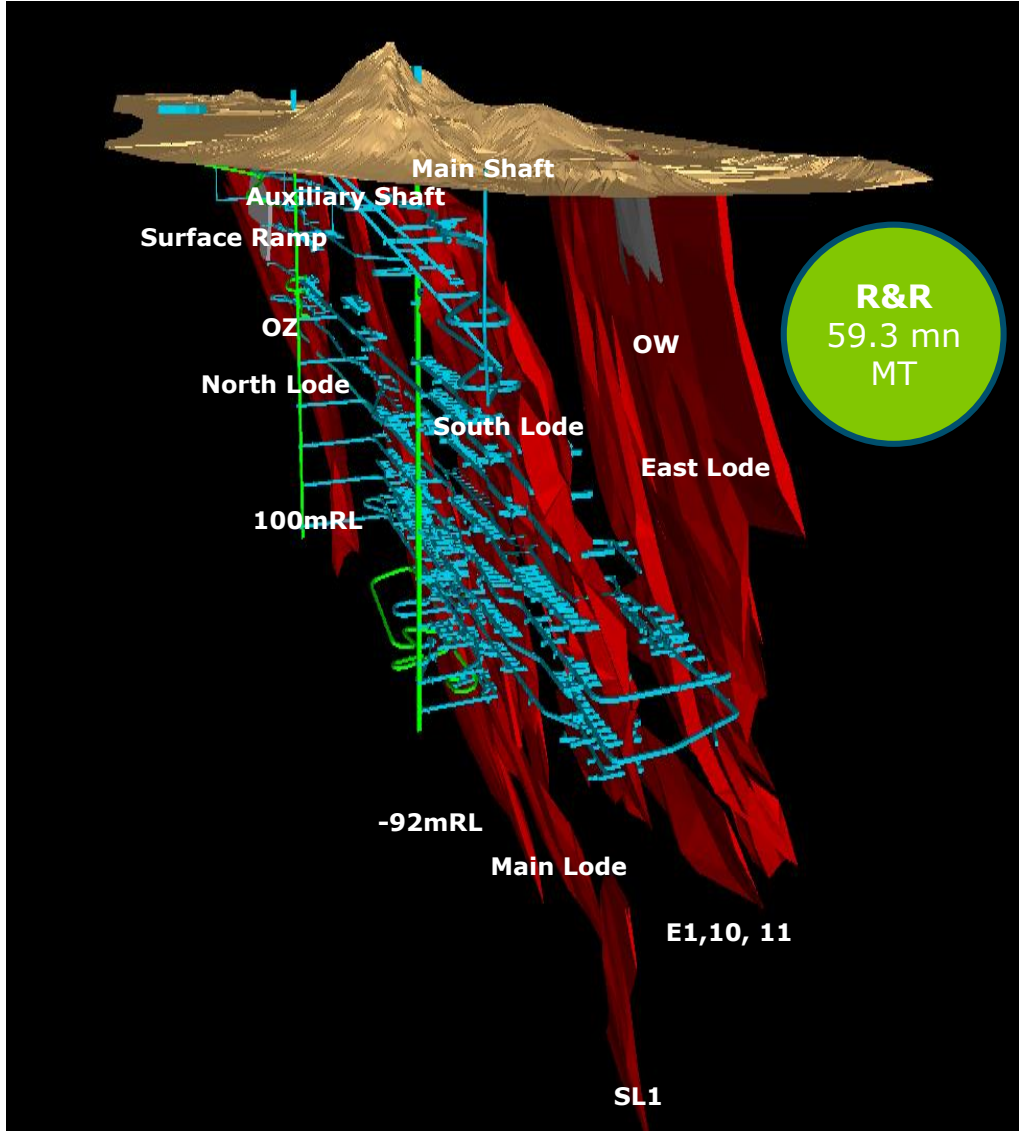


UG Mine

- **Access to Mine** : Through ramp and shaft
- **Method of Working** : Blast hole stoping with hydraulic filling
- **Ore Hauling** : Through ramp and shaft

Major Activities

- Ramp up to 1.5 mtpa ore production capacity
- Decline and ancillary development
- Raise boring
- Hydro fill plant
- Debottlenecking of beneficiation capacity
- Surface and underground infrastructures – new and upgradation



UG Mine

- Cluster of 4 mines having independent infrastructure
- **Access to Mine** : Through ramp and shaft
- **Access to Mine** : Through ramp and shaft
- **Method of Working** : Blast hole open stoping
- **Ore hauling** : Through ramp and shaft

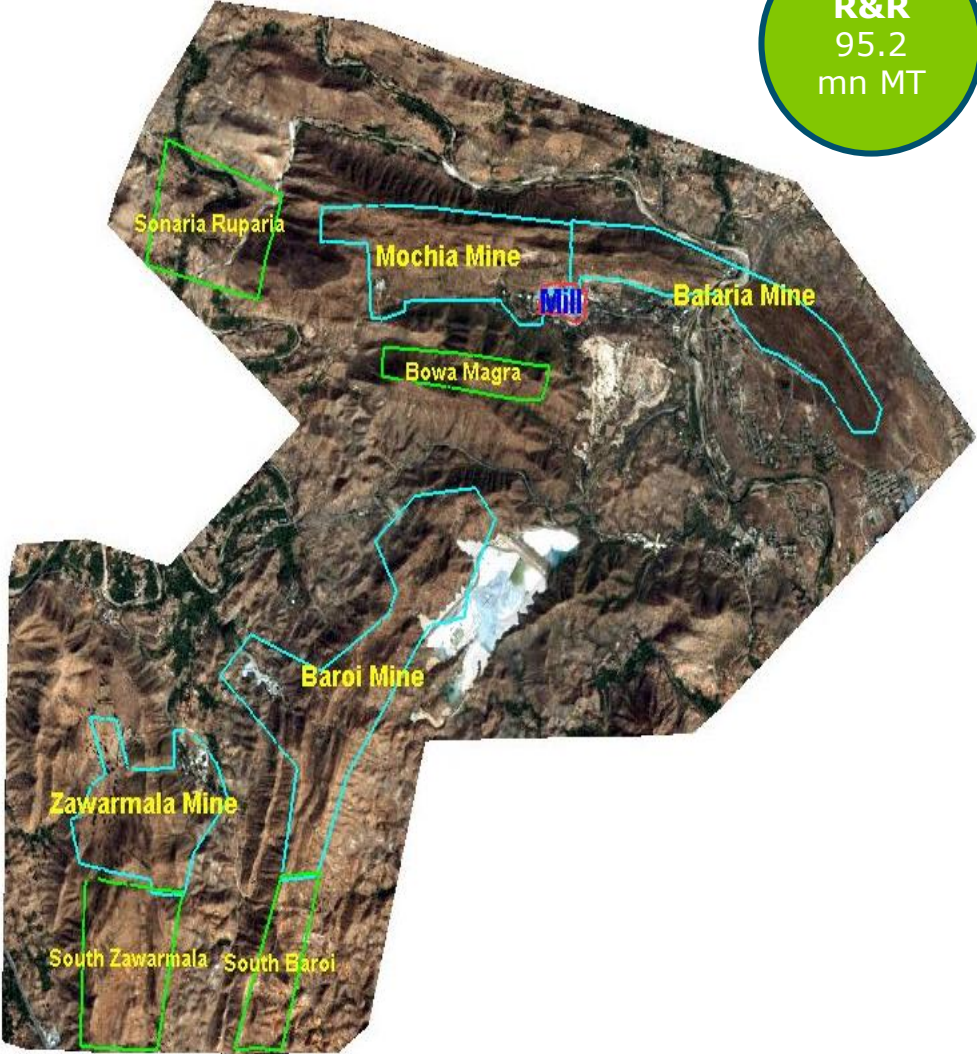
Major Activities

Ramp up to 4.5 mtpa ore production capacity

- Declines and ancillary development
- Crusher system
- Raise boring
- Beneficiation plant
- Surface and underground infrastructures
- Introduction of mechanised mining
- New declines under development for trackless mining

Year	Milestone
2015	• Mochia, Balaria and North Baroi mine dev commenced
2016	• Surface infrastructure at North Baroi
2017	• North Baroi decline completion • Mill DBN (1.2 to 2.7 mtpa) commissioning
2018	• Mochia decline completion • Mill (2 mtpa) commissioning
2019	• Balaria decline completion • Back fill plant commissioning

R&R
95.2
mn MT



UG Mine

- Shallow Ore Body
- **Access to Mine** : Through ramp
- **Mining Method** : Long hole open stoping with filling
- **Ore Hauling** : By 50 T LPDT through ramp
- **Ore Treatment** : By 50 T LPDT through ramp

Major Activities

- Decline and ancillary development
- Raise boring
- Cement Rock fill plant
- Surface and underground infrastructures

