

Vedanta Resources Plc FY2018 Interim Results and Capital Markets Day Delivering Growth and Shareholder Returns



10 November 2017

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Time	Section	Presenter	Page
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1120hrs	Zinc International	Deshnee Naidoo, CEO – Zinc International	16
1135hrs	Zinc India	Sunil Duggal, CEO - Zinc India	25
1150hrs	Zinc Q&A		34
1230hrs	Lunch		

Oil & Gas

Sudhir Mathur – CEO, Oil & Gas



10 November 2017



- Contribute to 50% of India's domestic crude oil production with volumes of 500kboepd and reserves of over 3bn barrels of oil equivalent
- Operate diversified and sustainable portfolio
- Deliver long-term value to Shareholders, Governments and Local Communities

Key Levers to deliver the vision

✓ **Exploration Portfolio**

Rejuvenate exploration portfolio to add contingent resources of over 700mmboe (Rajasthan Basin, Offshore blocks and participation in OALP)

✓ **Development Projects**

Rich set of opportunities in project portfolio ranging from enhanced oil recoveries, Tight Oil and Tight Gas to add ~100kboepd to production

✓ **Operations**

Maintain opex at the lower end among global peers even as we ramp-up production amidst increased field complexity and liquid handling



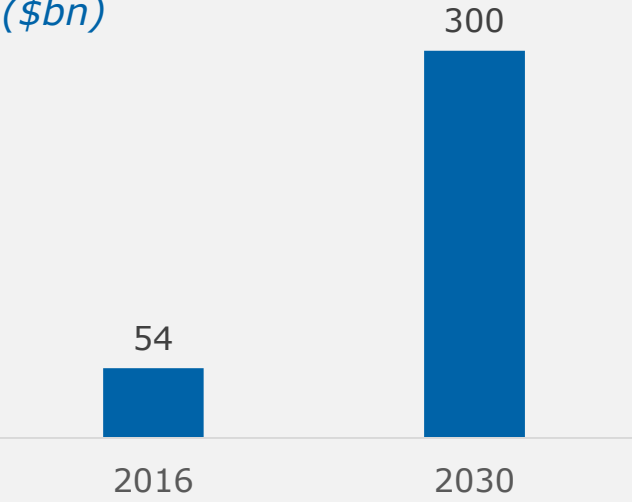
Untapped opportunity

- Over 80bn boe of 'in place resources'
- ~50% of the sedimentary basins to be appraised
- Only 7 of 26 basins in production
- \$9bn annual Oil & Gas sector investments required through 2030

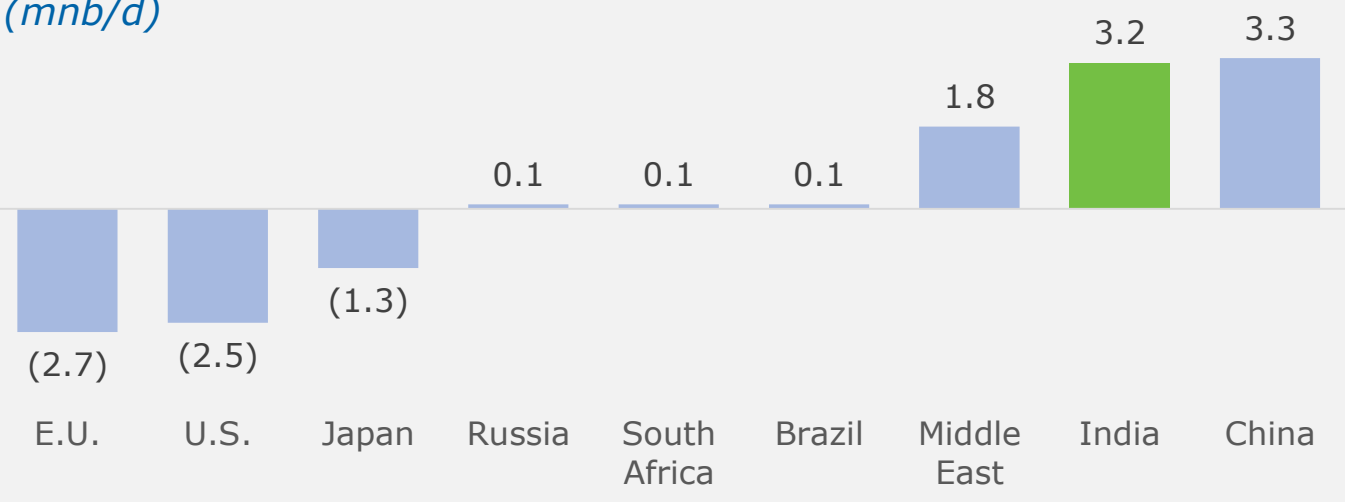
Positive policy measures

- Hydrocarbon Exploration and Licensing Policy (HELP)
- Open Acreage Licensing Policy (OALP)
- National Data Repository
- Discovered Small Field Policy
- PSC Extension

India Net Oil & Gas Imports (\$bn)

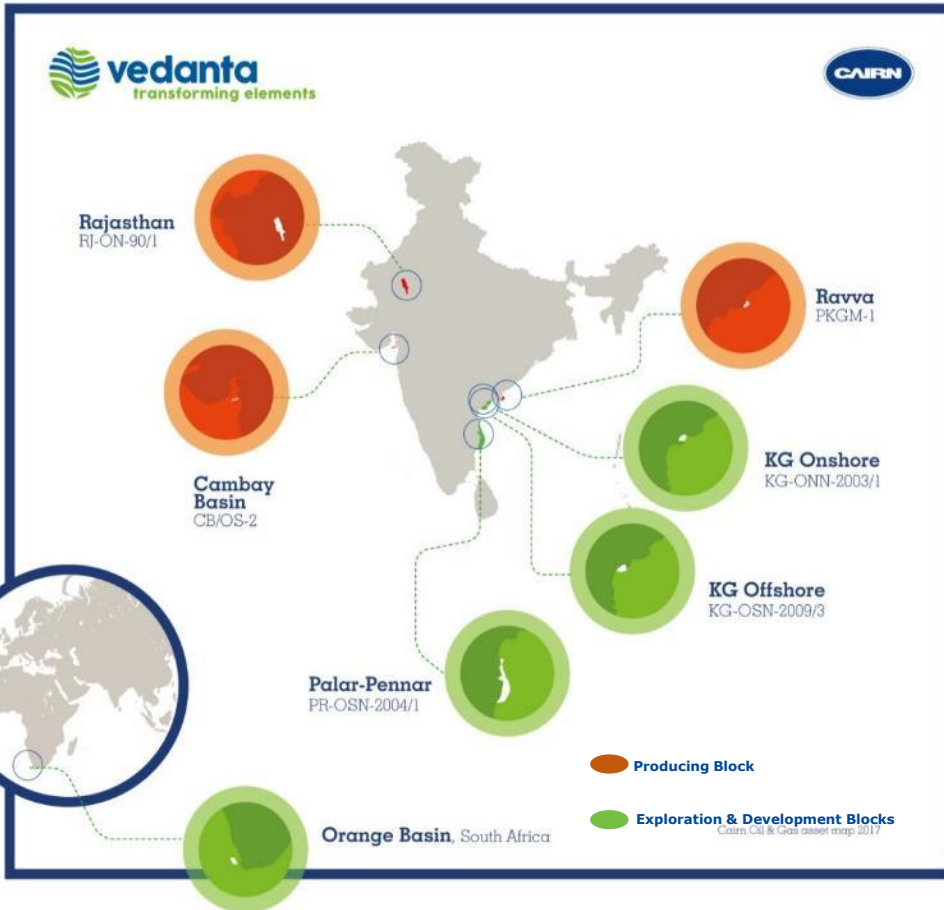


Change in global oil demand 2015-2030 (mnb/d)



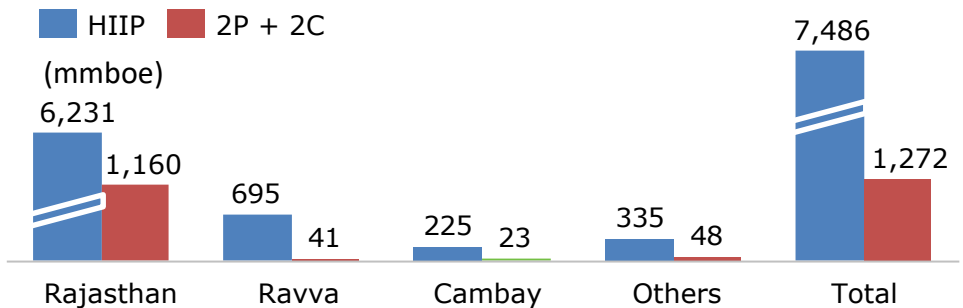
Assets: Diverse and Prolific geological basins

- 7 blocks with net acreage of ~35,000km²
- 3 core producing blocks - 1 onshore, 2 offshore
- 51 discoveries till date (38 in Rajasthan)



World Class Resource Base (as on Mar 17)

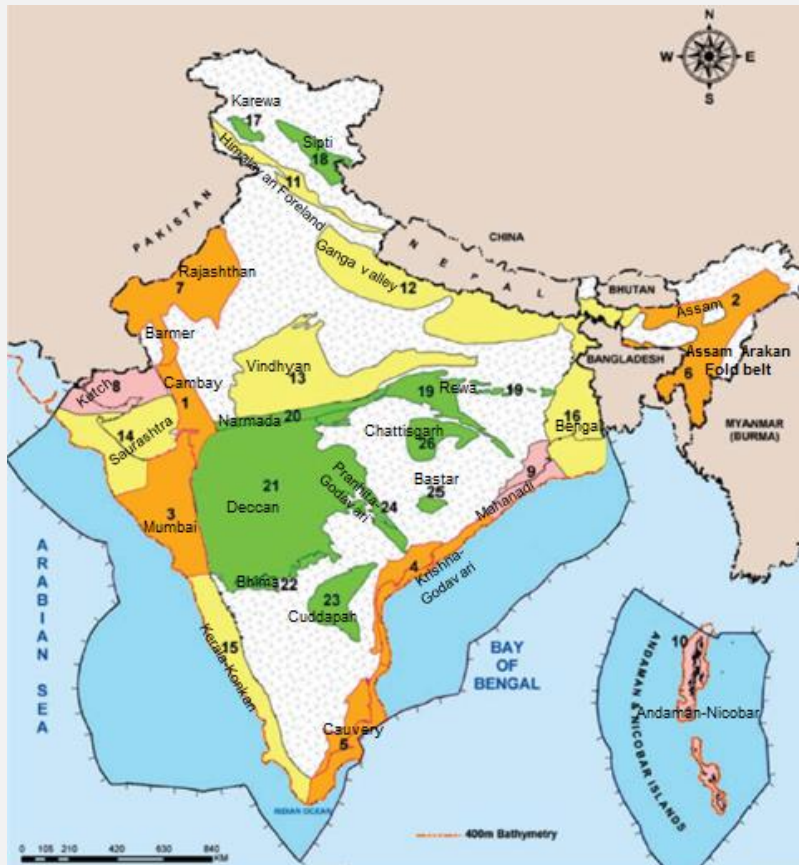
- Hydrocarbon Initially in Place of 7.5bn boe
- 2P¹ Reserves and 2C Resources of 1.3bn boe



Pioneering Cutting Edge Technology in India

- World's longest continuously heated pipeline from Barmer in Rajasthan to Bhogat in Gujarat (~700kms)
- World's largest Enhance Oil Recovery (EOR) project in Mangala Field
- Successfully tested Alkaline-Surfactant-Polymer (ASP) flood process in the Mangala field
- 4D Seismic Technology for identification of Bypassed / Un-drained Oil
- Drag Reducing Agents to enhance pipeline throughput to 240kbpd
- High end hydraulic fracking technology for monetizing tight oil and tight gas formations

1. Gross Reserve and Resource estimates based on SPE guidelines as at 31st March, 2017



India: Geology and Potential

- Only 7 of 26 basins under commercial production
 - Discovered Reserves: 28 billion boe of Ultimate Reserves
- Over 80 billion boe of 'in place resources'
- Potential in remaining 19 basins yet to be established: Recent data acquisition by DGH to fast track potential realization

Policy Changes: Open Acreage Licensing Policy (OALP)

- Provides opportunity for acreage acquisition after a gap of 8 years
- Open areas can be accessed without waiting for a bid round: 2.7mn sq. km.
- Acreage award based on transparent competitive bidding process

Cairn Oil & Gas: First to submit EOI's under OALP

- Dedicated team in place for evaluation of blocks under OALP with defined mandate:
 - Discover large fields in high permeability oil reservoir or tight gas reservoir
 - Develop exploration strategy with a mix of medium to low risk new plays and low risk established plays
 - Focus on quick monetization in areas closer to infrastructure
 - Prioritize areas around the prolific Barmer and KG basins
- Bids for EOI's will be submitted by 15th March, 2018 as per policy guidelines

Barmer Basin: Singular access to the prolific Basin spread over 3,000 sq. km. with established discoveries

Rajasthan (Barmer Basin)

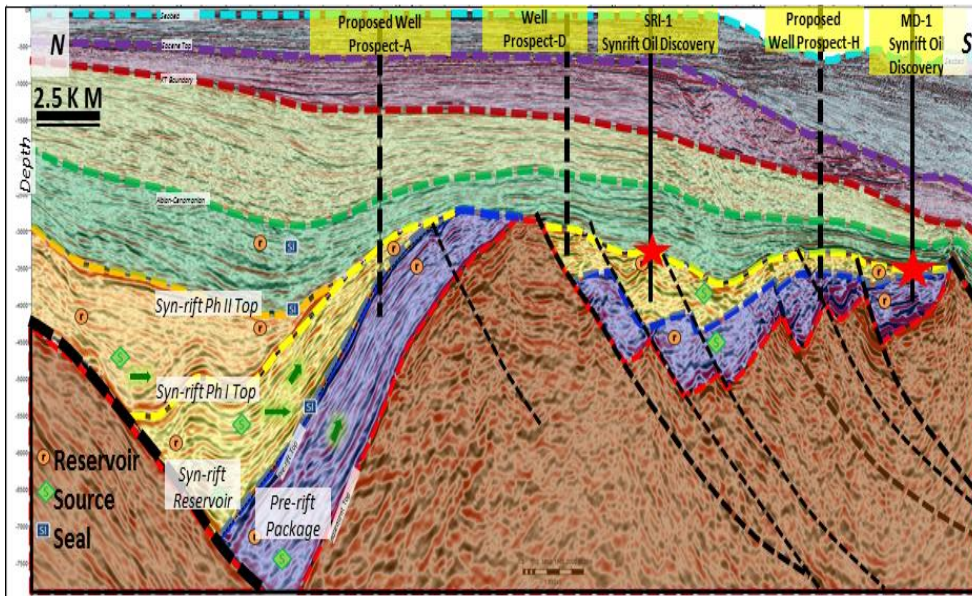
- Basin provides access to multiple play types with
 - Oil in high permeability reservoir
 - Tight Oil
 - Tight Gas
- 38 discoveries till date in 6 of the 7 plays
- G&G data including recently acquired 3D seismic and drilled wells being analysed to firm up new plays and prospects
- Global partners engaged to unravel the full potential of the block and establish 1.5bn boe of Prospective Resources
- Exploration and appraisal drilling campaign to commence from H1 CY 2018 to add 300-600mmboe of Contingent Resources



Offshore Basin: Our efforts are centred around the prolific Krishna Godavari basin

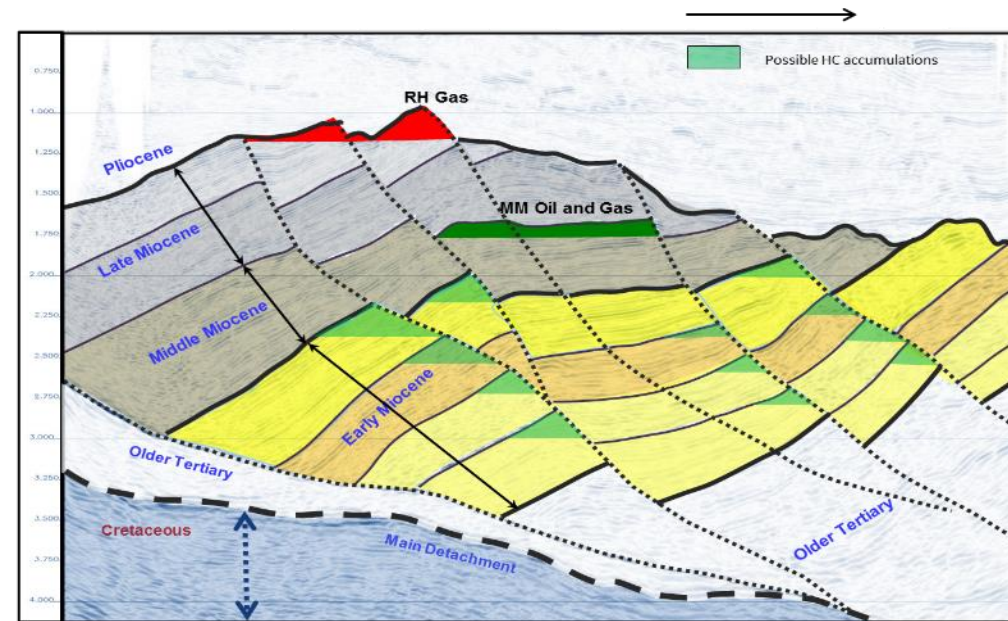
KG-OSN-2009/3 (KG Offshore)

- Aim to establish 300mmboe of Contingent Resources
- Seismic interpretation resulted in identification of prospects and leads over different play types
- 2 well exploration drilling campaign commencing in Q4 FY18
- Exploration success to trigger appraisal drilling from Q3 FYF19



Ravva

- Aim to establish 100 mmboe of Contingent Resources
- Prospect inventory identified in deeper prospects
- Exploratory and Appraisal drilling expected to commence in FY19



\$1bn Capex Initiated to Deliver 300 kboepd at \$5 per boe

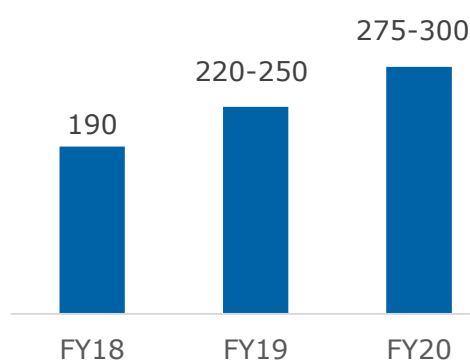
Enhanced Execution Strategy

- Fundamental shift to 'Integrated Project Development' with in-built risk and reward mechanism to drive incremental value from project schedule and recoveries
- Engaging global partners to access cutting edge technologies to deliver economic value

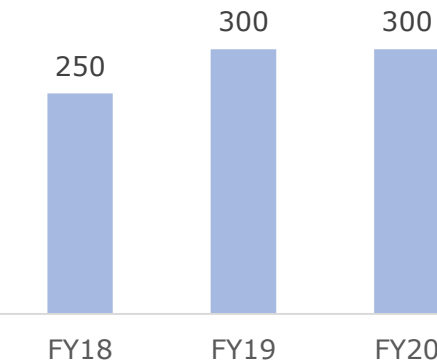
Project Portfolio

- **Enhanced Oil Recovery:** Replicating the success of Mangala Polymer EOR in Bhagyam and Aishwariya. ASP in Mangala to further add over 100 mmbbls at \$5/bbl in due course
- **Tight Oil & Gas:** Deploying latest fracking technologies to recover Oil & Gas from tighter reservoir formations through execution of Raageshwari Deep Gas (RDG) and Aishwariya Barmer Hill (ABH)
- **Other Projects:** Infill wells around existing producers in Mangala and Cambay to accelerate near term production;
Increasing liquid handling capacity at Mangala Processing Terminal by over 30% to handle incremental volumes

Gross production (kboepd)



Net capex (\$mn)



Project	Gross EUR (mmboe)	Gross Capex (\$m)	Peak Production (kboepd)
Enhanced Oil Recovery	40	155	19
Tight Oil & Gas Projects	137	640	45
Other Projects:	41	290	53
- Mangala Infill (60 wells)	22	140	32
- Liquid Handling Upgrade	12	120	15
- CB/OS-2 Infill (3 wells)	7	30	6
Total	218	1,085	117

Project IRR of over 20% even at \$40/bbl per barrel Brent → Positive Free Cash Flow post capex every year

✓ **Consistent reduction in waterflood operating cost since FY15 driven by scope optimization, process efficiencies and contract optimization**

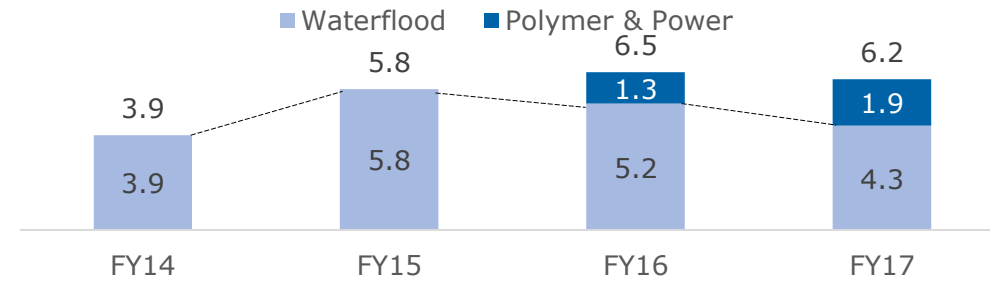
- RJ waterflood operating cost lower despite increased liquid handling (~ 1bn barrels of fluid), increased complexity and higher well count
- Savings on power costs through captive power and open access
- Reservoir optimization and production technology
- Wells and facilities management optimization

✓ **Optimizing Polymer cost and consumption**

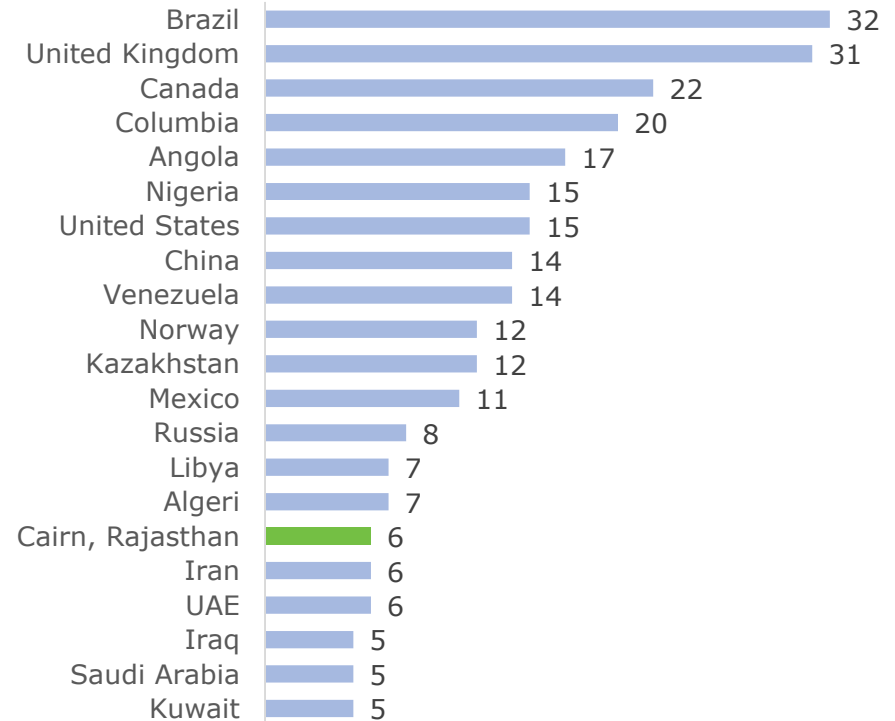
- Reduced polymer cost to \$8-9/bbl compared to initial estimates of over \$12/bbl



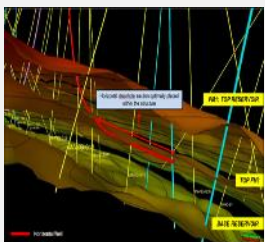
Rajasthan costs (\$/boe)



Global Cost Profile (\$/boe)

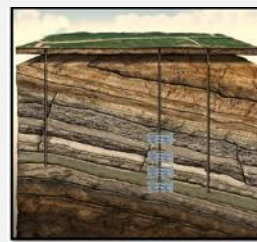


Source: For peer company Opex - Rystad Energy, Nov 2015



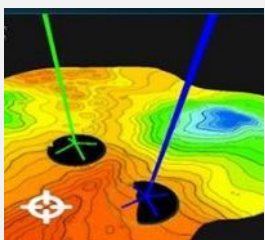
SUB SURFACE

- Implementation of EOR techniques
 - World's largest polymer flood in Mangala
 - Successfully tested ASP flood process in the Mangala field
- 4D Time Lapse Technology in Ravva
- Turnaround of Ravva and Cambay fields



DRILLING OPERATIONS

- Multi stage fracking to improve well productivity and improve EUR
- Enhanced well productivity through frac design
- Limited entry frac - multiple perforation in single stage



DIGITAL OIL FIELD

- Digital Oil Field – 24 hour real time monitoring



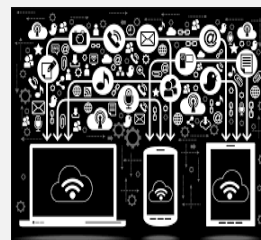
PIPELINE

- World's largest continuously heated pipeline (700+ Km)
- Pipeline intrusion detection system
- Using drag reducing agents to augment capacity by 30% with no additional Capex



BIG DATA & ANALYTICS

- Real time data analytics
- Process automation
- Collaborative ecosystem and overall integrated enterprise



DIGITILIZATION

- Partnerships with leading firms
- Predictive maintenance
- Sensors, wearables
- Enterprise dashboards

- **Exploration** program recommenced to add to the prospective and contingent resources with a focus on Onshore Barmer Basin, Offshore Basins and OALP rounds
- **Development Projects** execution in progress with a gross investment of \$1bn for incremental volumes of ~ 100 kboepd in the next 2-3 years
- **Operating cost** optimization to keep cost at the lower end amongst global peers amidst increased field complexity and liquid handling
- Oil & Gas business to continue generating **positive free cash flow** post capex every year



Q & A
Oil & Gas



10 November 2017



Zinc International

Deshnee Naidoo – CEO, Zinc International



10 November 2017

<https://www.youtube.com/watch?v=-tcsgJpTIHk&feature=youtu.be>

Established track record...

- Improved safety performance
- Fundamental changes to operating philosophies
- Delivered LoM extensions of all assets
- Counter cyclical project investment

.....Enabling key focus areas for growth

- 1 Drive 'best in class' HSE
- 2 Develop quality project pipeline
- 3 Achieve 1st quartile costs through innovation and technology
- 4 Create an enabling environment for communities to live & thrive

Vision is to be the safest, socially responsible 1mtpa integrated Zn producer; in the Q1 median of the global cost curve

Skorpion Zinc (100% VEDL)

- Open pit zinc mine and refinery
- Largest integrated zinc operation in Africa
- LoM of 4 years
- Refinery capacity of 150ktpa



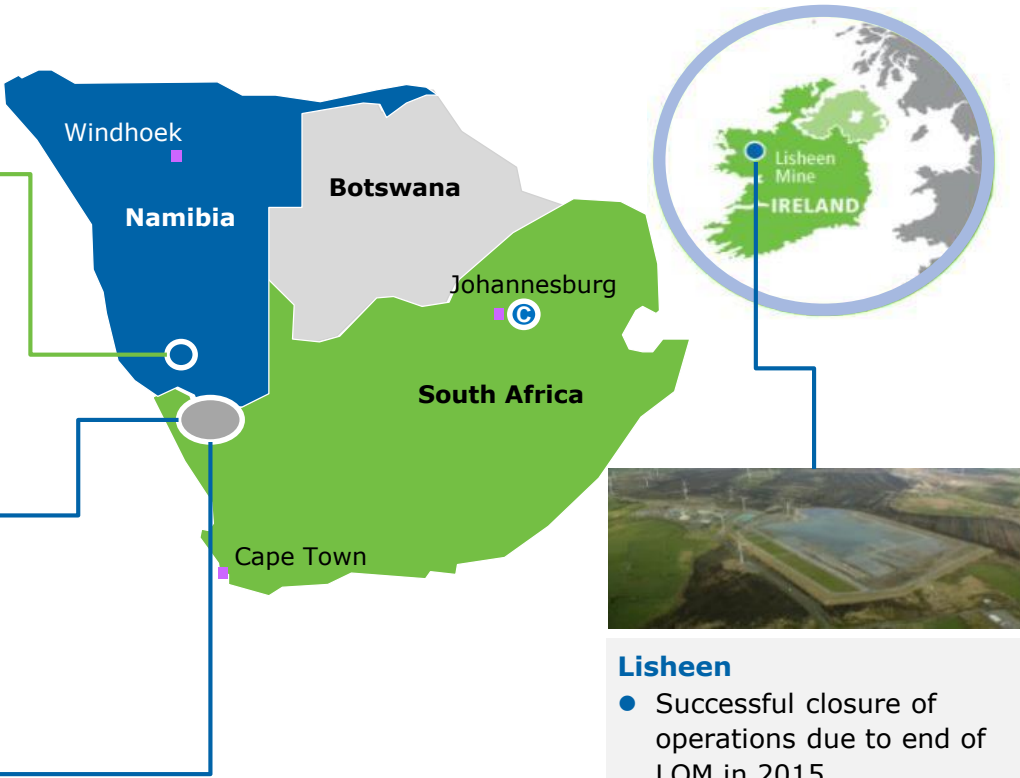
Black Mountain Mine (74% VEDL)

- Underground operation, mining zinc, lead, silver and copper deposit
- LoM of 4-5 years
- Plant capacity of ~100ktpa Zn eq. metal in concentrate



Gamsberg Project

- One of the world's largest known Zn deposits
- Phase 1 of project in execution, \$400mn capex investment¹, 250ktpa metal in concentrate
- First production by mid CY 2018



- HSE progress to ZERO
- R&R 306 Mt (22 Mt Zn eq.)
- >4,000 employees
- ~160,000 tons of Zn eq. in FY2018



- Lisheen**
- Successful closure of operations due to end of LOM in 2015
 - World-class closure process underway

1. Excluding Investment During Construction

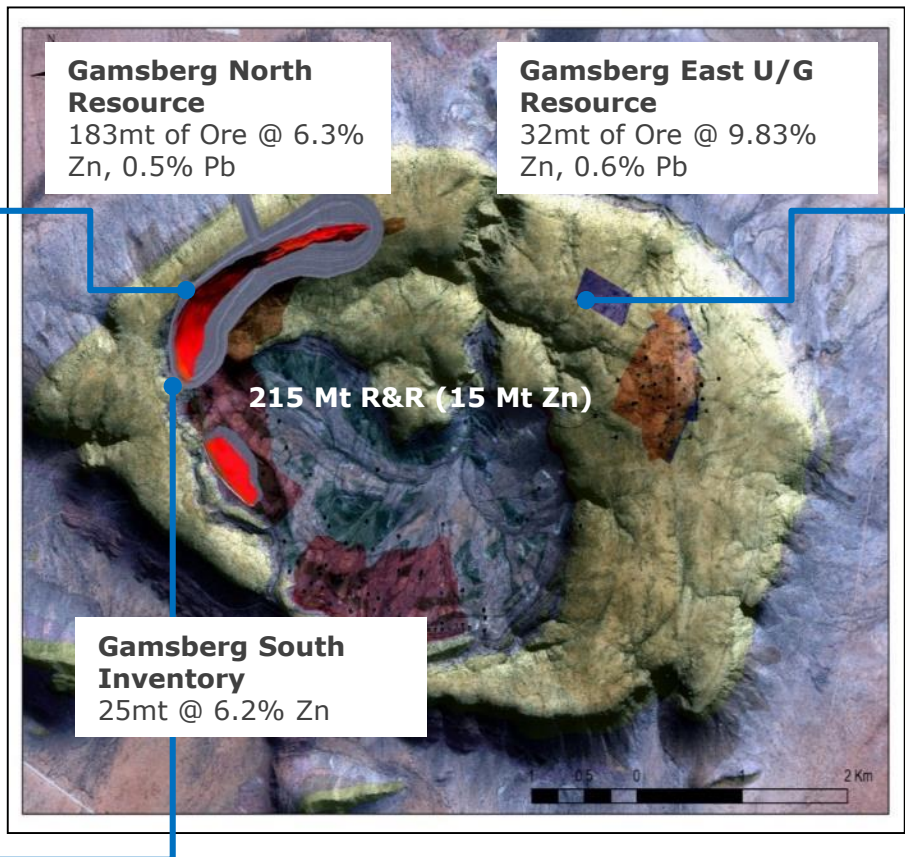


Gamsberg Project (Phase 1)

- Current project (open-pit mine, concentrator and related infrastructure) 4mtpa ROM: **250ktpa MIC**
- **\$400mn** investment
- **First production by Mid CY 2018**, 9-12 months of ramp up to full capacity.
- COP at 1,000-1,150 \$/ton, First quartile of cost curve.
- ~2,000 jobs during peak construction, 850-900 jobs once operational
- **Phase 1 enables accelerated Phase 2 implementation**

Gamsberg Mega Pit (Phase 2)

- Expanded open pit by 4mtpa ROM (c.\$200 mn)
- 2nd concentrator stream of 4mtpa (c. \$150 mn)
- Additional metal production - **200ktpa MIC**



Gamsberg U/G (Phase 3)

- New underground option for Gamsberg East 2.5mtpa
- Potential Expansion of Gamsberg North open pit to U/G
- +150ktpa MIC

Gamsberg Extension areas (Beyond Phase 3)

- Good Potential
- Extensive drilling required to firm up potential



North pit



Thickener pre-assembly test



Transformer installed on site



Tailings dam



Plant civil footprint



Mill shell on site



Jaw Crusher Delivered to Site

Mining (>50% Pre-strip work complete)

- Pre-stripping volume ramped up to > 4mtpm
- Pre-stripping >35mt completed of 65mt
- First ore production – early 2018

Plant and Infra (~55% complete)

- All long lead equipment ordered and >75% will be on site by end of 2017
- First ore feed to Plant – Mid CY 2018

Tailings Facility & Bulk Water

- Tailing facility: 45ha of 110ha liner installed
- Water pipeline installation: 25 of 38 km installed

Digitalisation

- Partnership model for end-to-end digitalization has been adopted

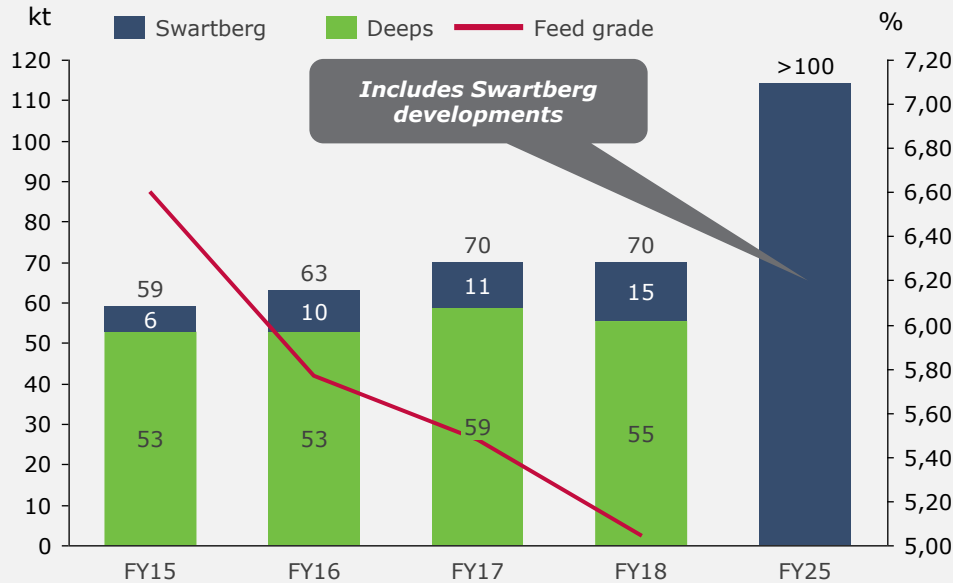
Others

- Biodiversity - ~85,000 plants relocated (2015)
- Housing being constructed in anticipation of operational requirements
- >100 houses being constructed

All major ordering with major commitments completed - Bulk mining, Plant & Infra and Tailings Dam
More than 80% of the capex committed. All contractors mobilised at site. More than 1,900 employees at construction site

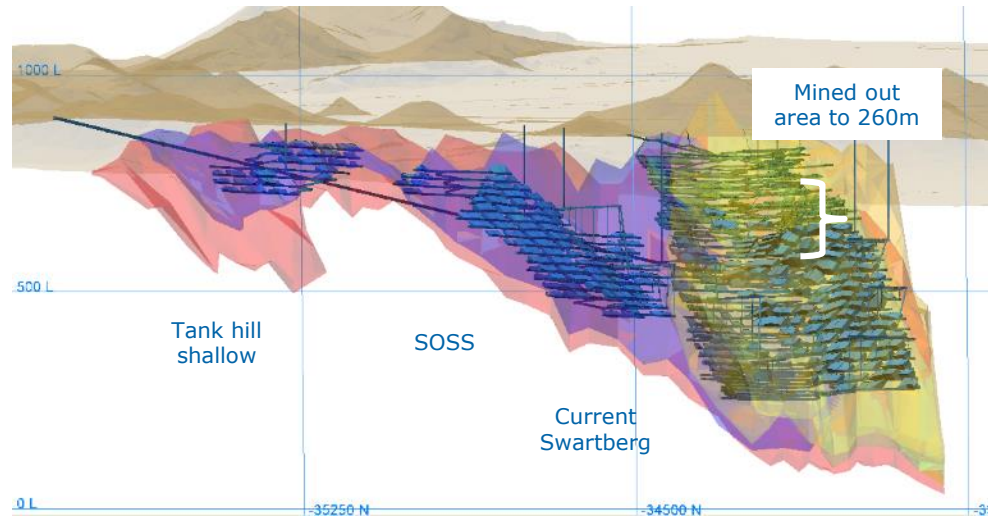
BMM Operational Performance is Trending Positively...

Production per year, Metal (Zn & Pb) in concentrate



- BMM continues to perform well, despite:
 - Decreasing working areas (from 10 to 5)
 - Backfill placement up by >80%
- Specific initiatives over last 2 years include:
 - Long hole mining up by >190% to 40kt
 - Milling throughput up by 11% to 1.7mtpa

..and can be Further Enhanced with Swartberg Phase 2



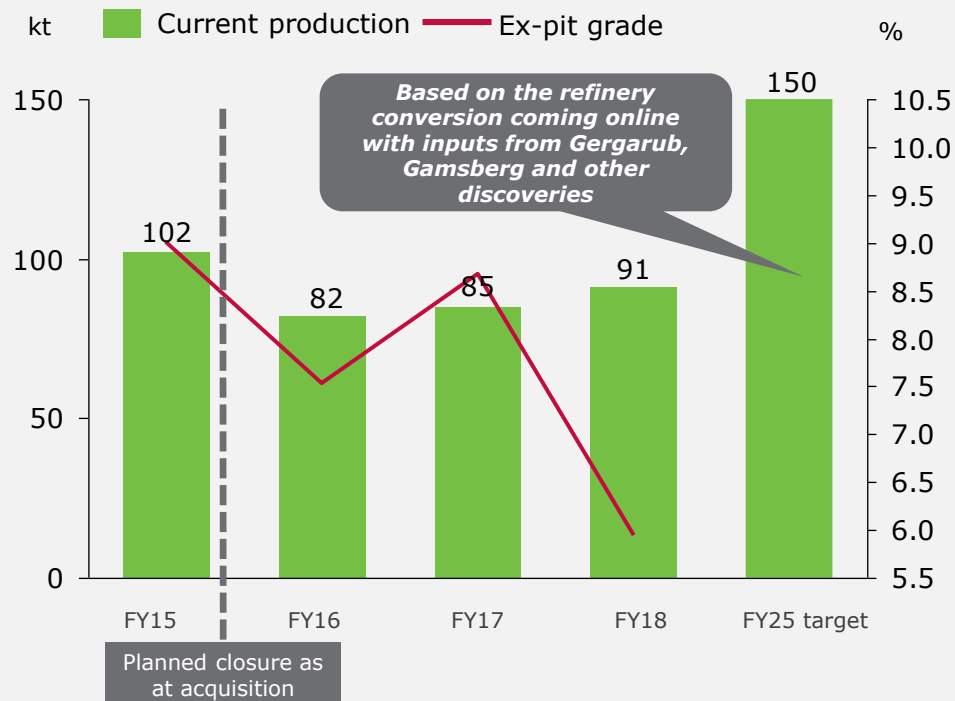
Mining method - Longhole open stoping with backfill
Mineable resource - 26.3mt
Total contained metal - 1,096kt
Ramp up to steady state - 4 years
Steady state production - 1.7mtpa for 13 years
Metal production (MIC) - 4.3kt Cu, 47.5kt Pb, 8.3kt Zn

Black Mountain Complex – Operational readiness

- Strong Future complex moving toward 500kt Zn eq - Gamsberg 450kt, Swartberg 75kt (primarily Pb)
- Synergy benefit on combined Black Mountain Complex (BMC) - Shared overhead structure, Commercial and Shared Infrastructure
- Combined operating model - outsourcing of Gamsberg vs owner operation on current operation. Opportunity to ensure optimal operation

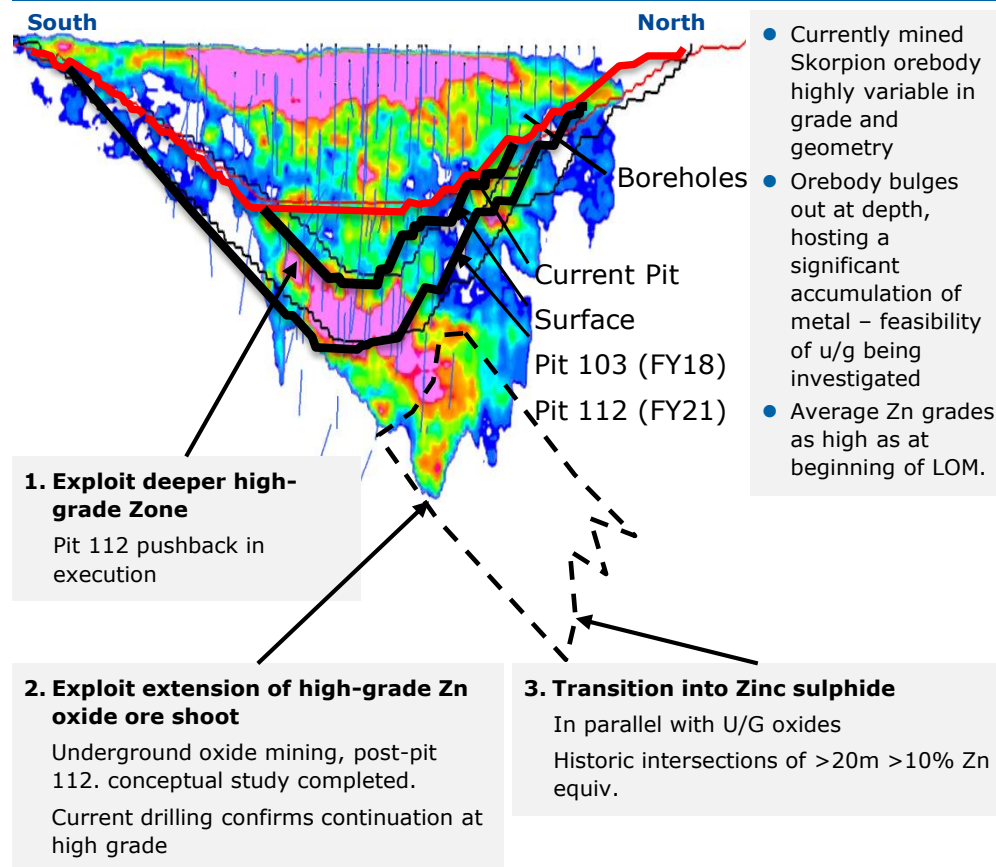
The delivery of Pit 112 has created more certainty around SZ...

Production per year, Zn metal



- Skorpion has continued to deliver despite decreasing grades and ex-pit ore due to:
 - Extension of life from 0.5 to 4 years via the Pit 112 pushback
 - Successfully outsourced mining to Basil Read Namibia and tripled total excavation
 - Targeted plant improvement projects to increase Zn into leach

...With further potential at Pit 112 and the planned refinery conversion



Refinery conversion

- Current refinery needs to be converted to process sulphide concentrates
- Techno commercial feasibility/Basic Engineering completed
- Estimated ~\$160mn Capex

**Indicative
Consolidated Outlook**

	FY18	FY19	FY20
Prod (kt)	150-160	240-260	410-430
COP (\$/t)	<1,500	<1,200	<1,100

Gamsberg

**250kt Production@
~\$1000/t**

Project on track and progressing as per plan

- First production by mid CY2018 and on budget for capex target of \$400mn
- FY19 production expected to be 100kt+, with ramp-up to 250kt by FY2020
- Targeted COP of \$1,000-1,150/t, placing ZI in 1st quartile of global cost curve

**Skorpion &
Black Mountain**

>200kt Production

FY2018: Production of c.160kt @ < CoP of \$1,500/t

- Skorpion c.90kt & Black Mountain c.70kt
- Focus on further reducing COP through operational and cost initiatives

FY2019 & FY2020: Plan to increase production to c.200ktpa by ramping up Pit 112

- Skorpion c.130kt & Black Mountain c.70kt

Next phase of projects

Currently progressing next phase of projects within pipeline

- Gamsberg Phase 2: 4 mtpa RoM (200 kt)
- Swartberg Phase 2: 1.7 mtpa RoM (65-70 kt)

Zinc India

Sunil Duggal – CEO, Zinc India



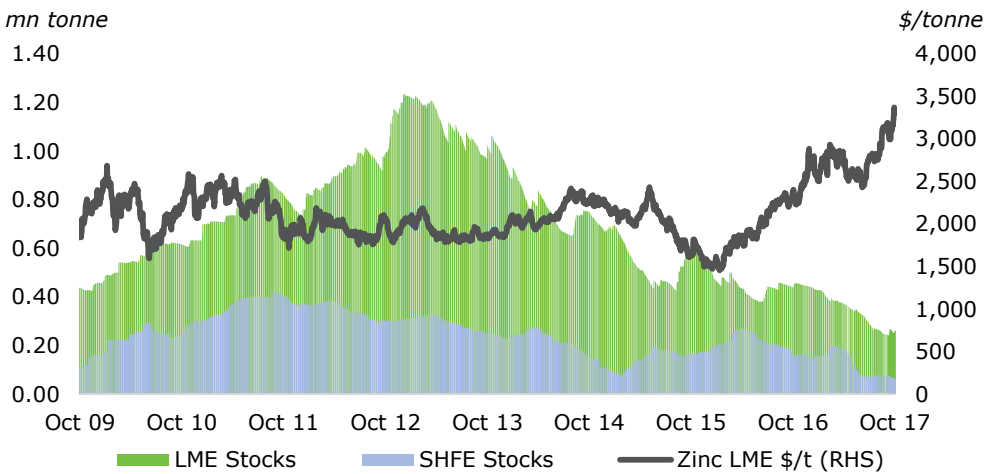
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Supply Shortage Leading to Multi-year low spot TCs

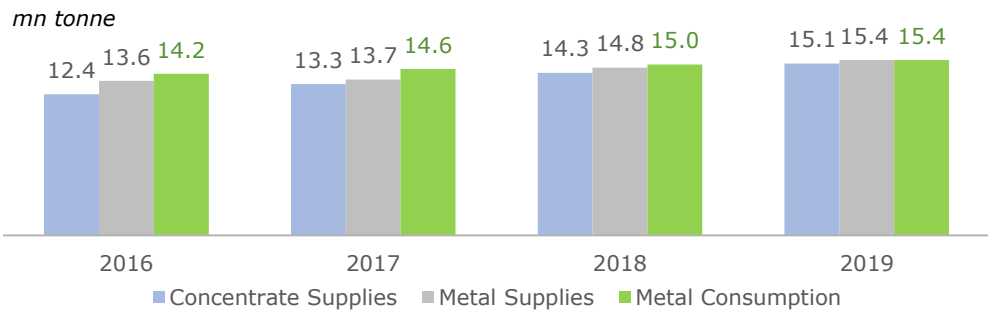


Source: Wood Mackenzie

Declining stocks at LME & SHFE warehouses



Source: Fast markets



Metal Inventory (mn tonne)

Year	Inventory (mn tonne)
2016	2.2
2017	1.3
2018	1.1
2019	1.1 (< 1 month)

Source: Wood Mackenzie

- **Mine to End Use:** Mine supply to metal consumption ratio continues to be under pressure
- **Market balance:** Imbalanced market; Inventories at risk, with levels at below one month
- **Demand:** Steady global demand growth of 2-3%
- **Mine Production:** Market sensitive to timing of new supplies, stable operations & reversal of production cuts
- **Smelter Production:** Falling TCs not incentivising early smelter start ups and halting new projects

Significant increase in mine & smelter supplies required in next 5 years for stable inventory levels

2nd largest zinc-lead miner globally;
4th largest zinc-lead smelter globally

On track for **1.2 million tonnes** of MIC capacity by 2020;
UG mines ramping up at 5 year CAGR of 39%

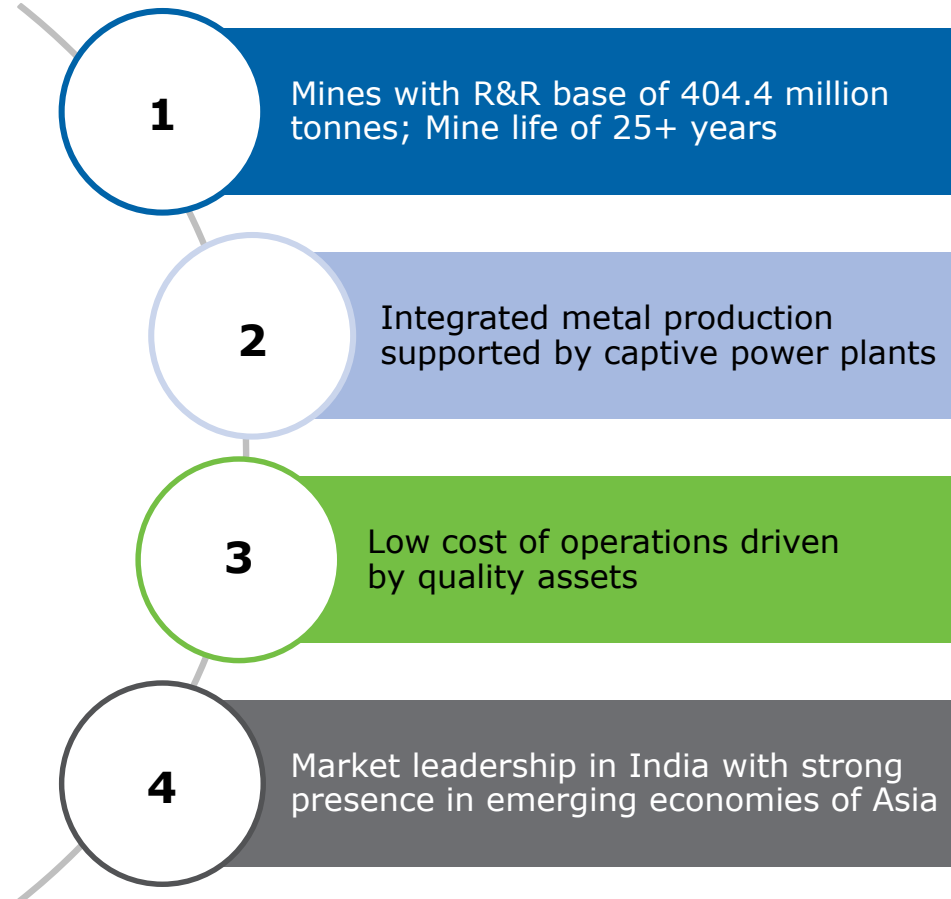
1000 tonnes silver production by 2021;
Poised to be in top 5 global silver producers

One of the lowest cost zinc producers in the world

3rd rank globally in the Environment category and 11th
Overall in **Dow Jones Sustainability Index**

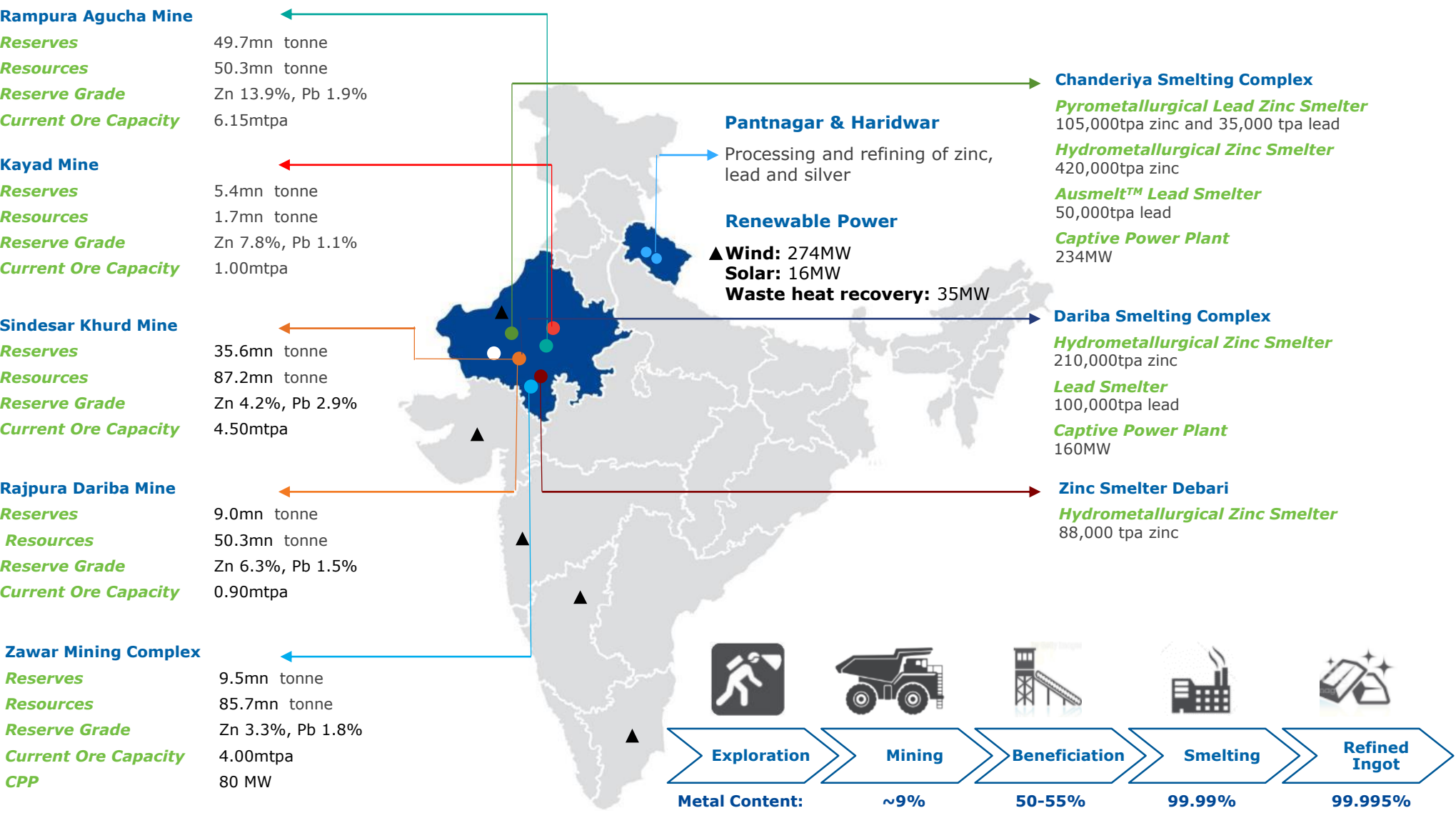
3 mines with **five-star** ratings by Indian Bureau of Mines

Core Strengths



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

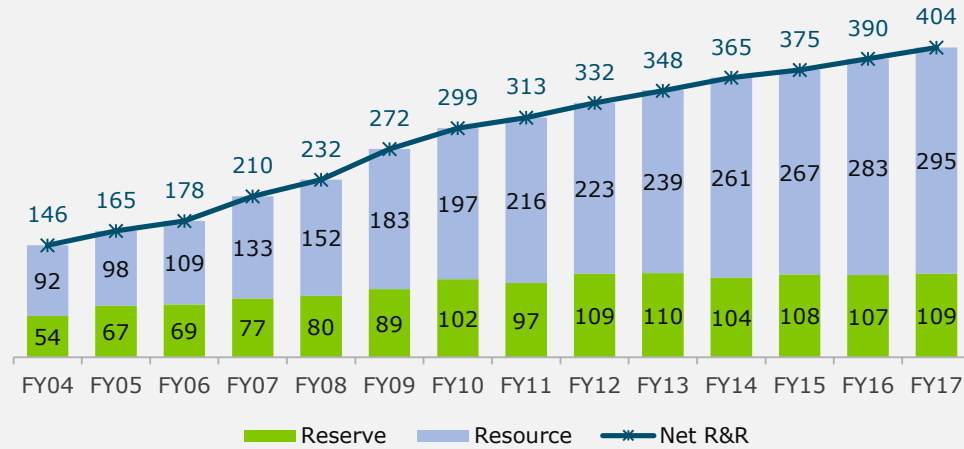
Portfolio of Tier-1 Assets



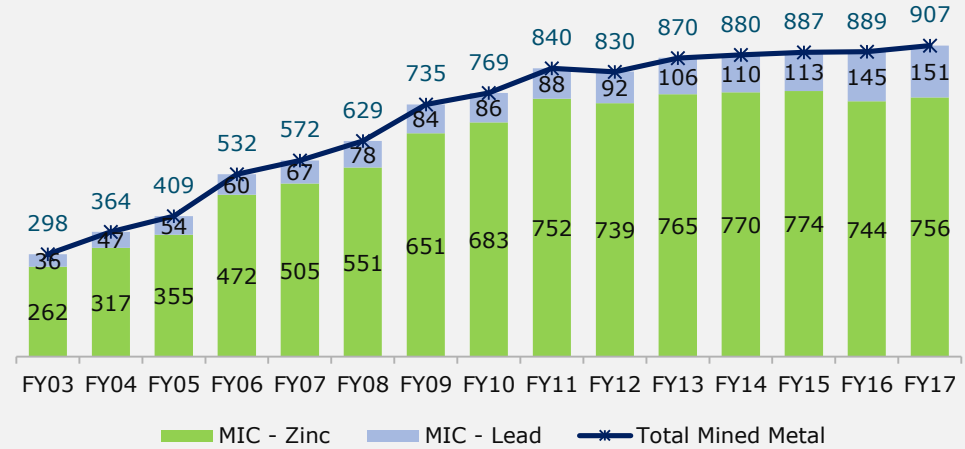
Note: Resources do not include Reserves



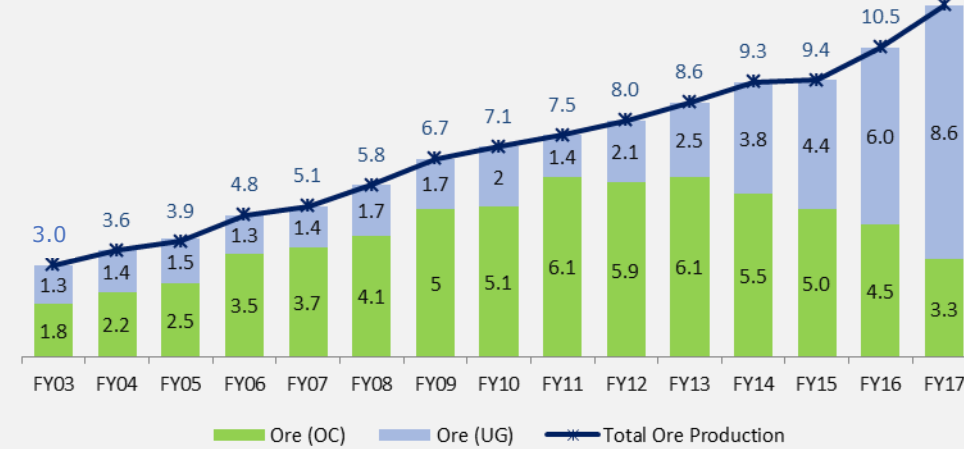
Reserves & Resources (mn tonne) – 2.5X Growth



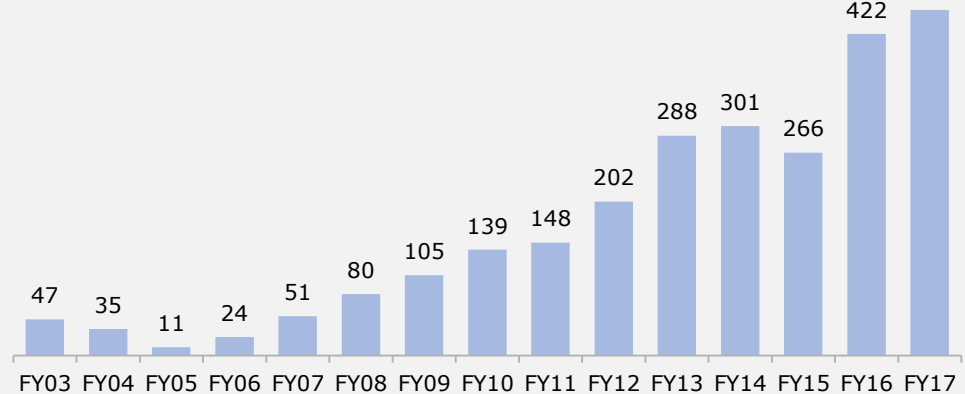
Mined Metal ('000 tonne) – 3X Growth



Ore Production (mn tonne) – 3.5X Growth



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



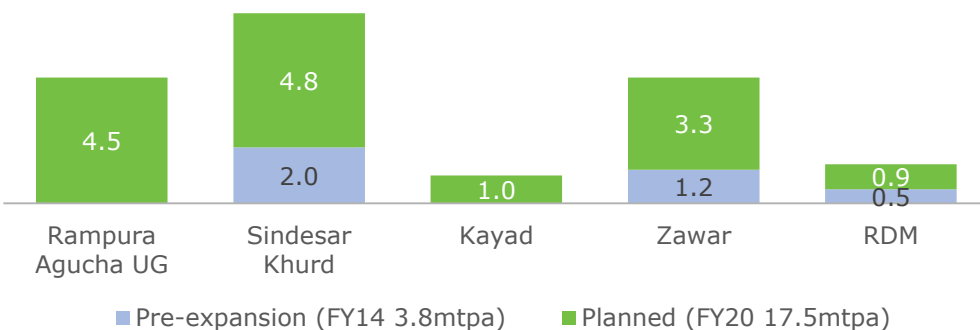
Multi-fold growth since disinvestment by Government of India in 2002

Mine expansions in sync with increasing R&R

- Five major projects to increase MIC capacity to 1.2mtpa (17.5mtpa ore capacity), including RAM OC replacement
- Transition from Open Cast to UG mining
- Smelters' debottlenecking to remain fully integrated
- Six year capex of \$1.6bn ; ~\$1bn spent

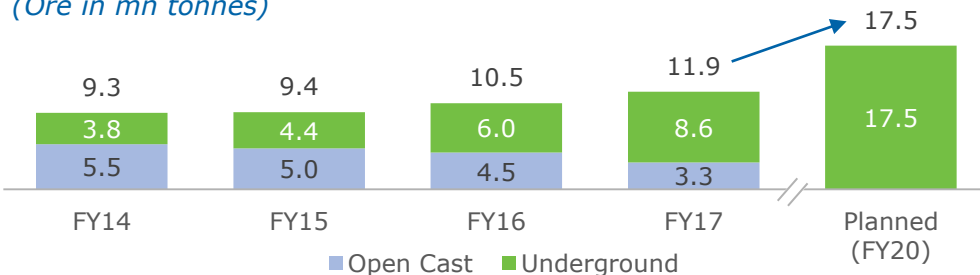
UG Capacity Expansion – Journey to 1.2mtpa MIC

(Ore production capacity in mn tonnes)



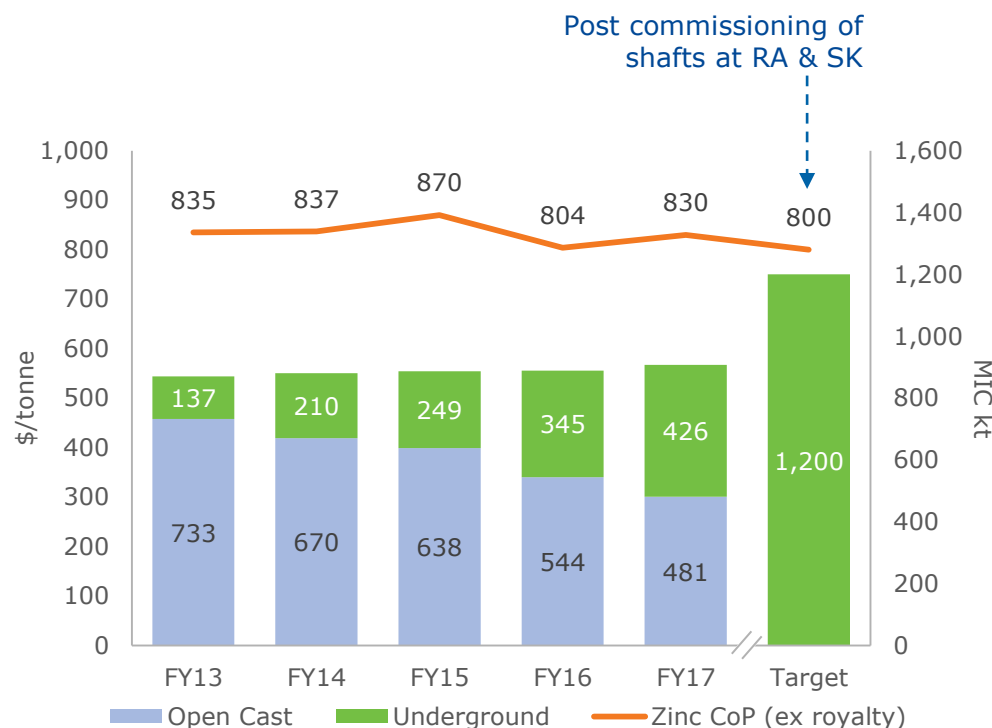
Transition from OC to UG

(Ore in mn tonnes)

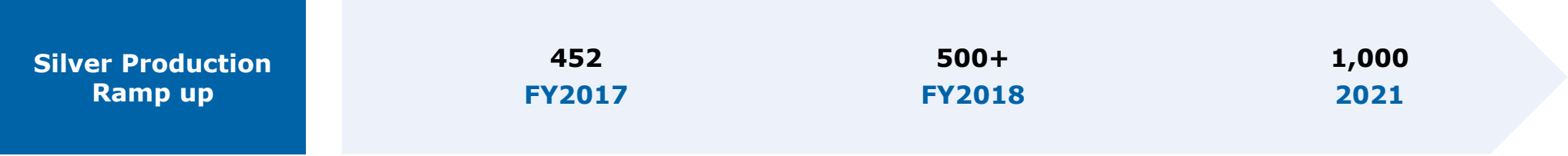


Maintaining First Quartile of Global Cost Curve

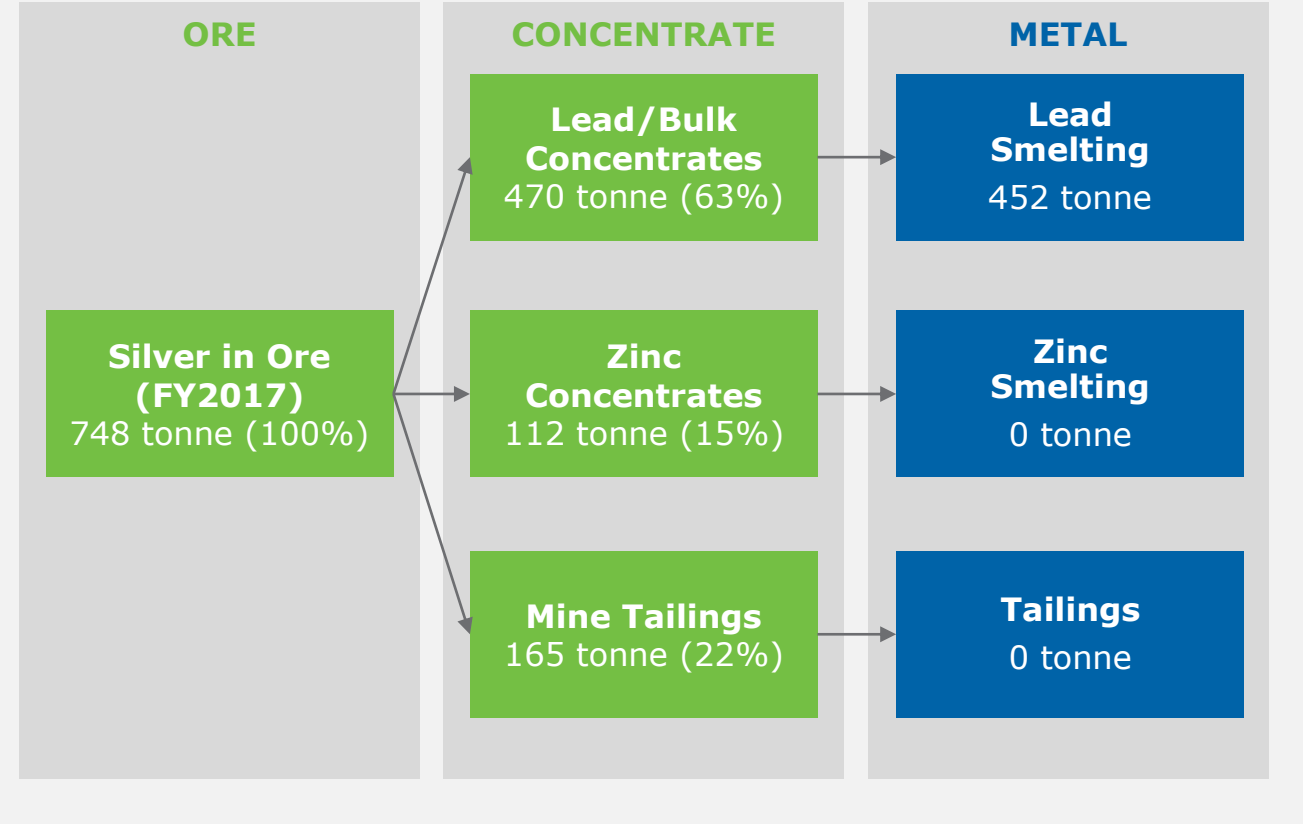
- Continue to be in first quartile of global cost curve
- CoP held firm last few years despite transitioning to UG
- Temporary spurt in FY2018 expected due to substantial increase in input commodity prices
- CoP to reduce post commissioning of shafts at RA & SK



UG ramp up at 5 year CAGR of 39% while holding COP steady



Ore to Metal Recovery (FY2017)

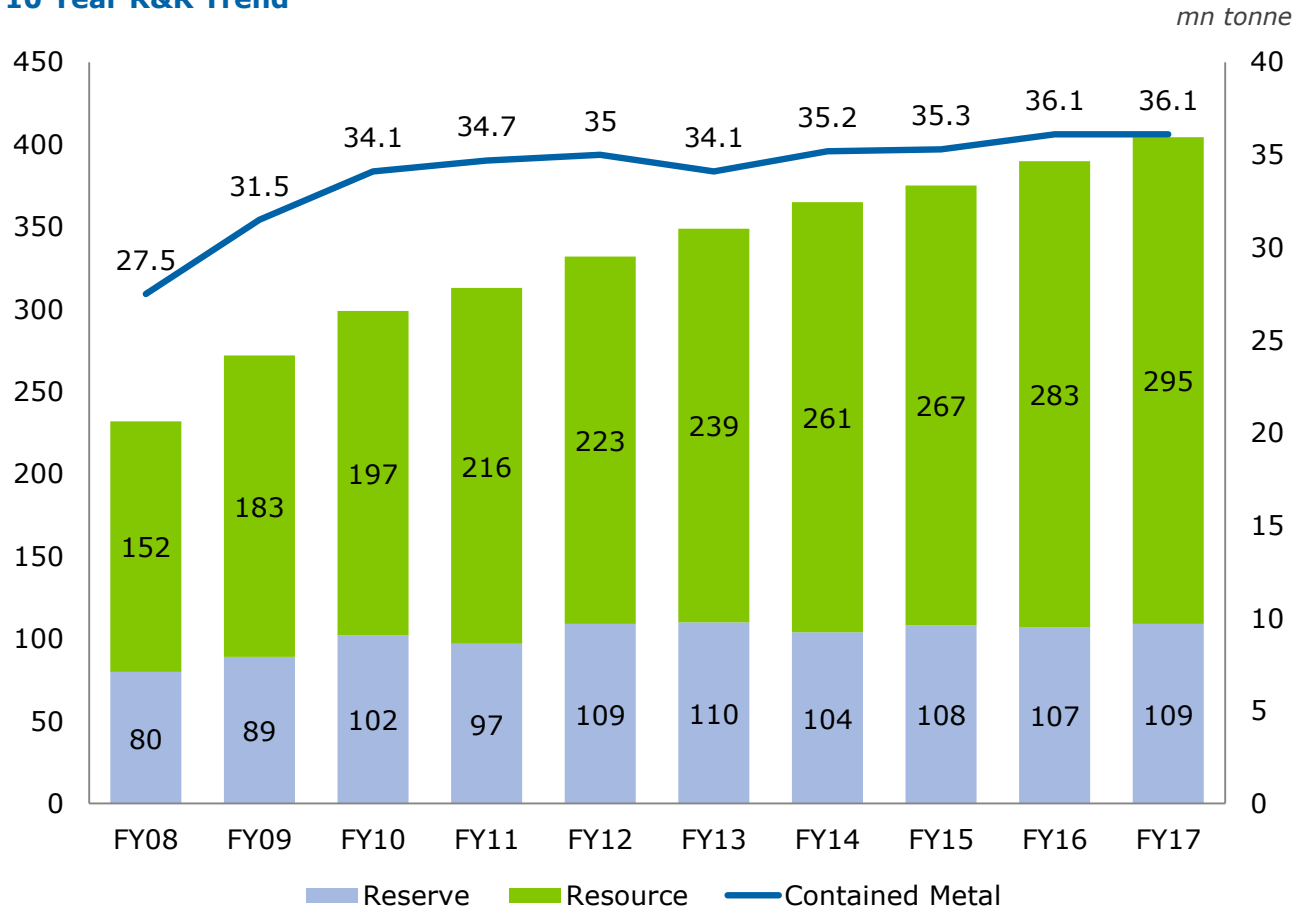


Achieving 1,000 tonnes

- ### Key Focus Areas
- Mining**
(452 → 850)
 - Focus on silver-rich deposits → ongoing
 - Achieving benchmarked recoveries
 - Zinc Smelters**
(0 → 100)
 - Fuming technology → June 18 (first fumer)
 - Second/third fumer → April 20 (plan)
 - Recovery from Tailings**
(0 → 50)
 - Tailings retreatment → June 18 (pilot)

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

10 Year R&R Trend



- R&R 404mn tonne in FY2017
- R&R estimation to the JORC standard and audited by international consultants
- Drilling 80,000+ metres pa to add new resource tonnage
- Clear exploration strategy to grow R&R
- Use of latest global technologies

**Added more than depleted every year since Vedanta's takeover;
25+ years of mine life**

**1.5mtpa
capacity
under
planning**



Shaft and decline integration
Multi-level mining
Digital transformation to boost productivity
New prospects & tenements

**1.2mtpa
capacity
by FY2020**



25+ years of mining R&R with potential of 1.2mtpa
Transition to underground mining progressing smoothly
Shaft commissioning in Q3 FY2019 to give step jump
Mill & smelter capacity to keep pace

**Outlook
FY2018**



Mined metal: Higher than 907kt of FY2017
Refined zinc-lead: 950kt; silver: 500+ tonne
Project Capex of \$300-325mn
Dollar COP (excluding royalty) likely to be \$900-\$950/t

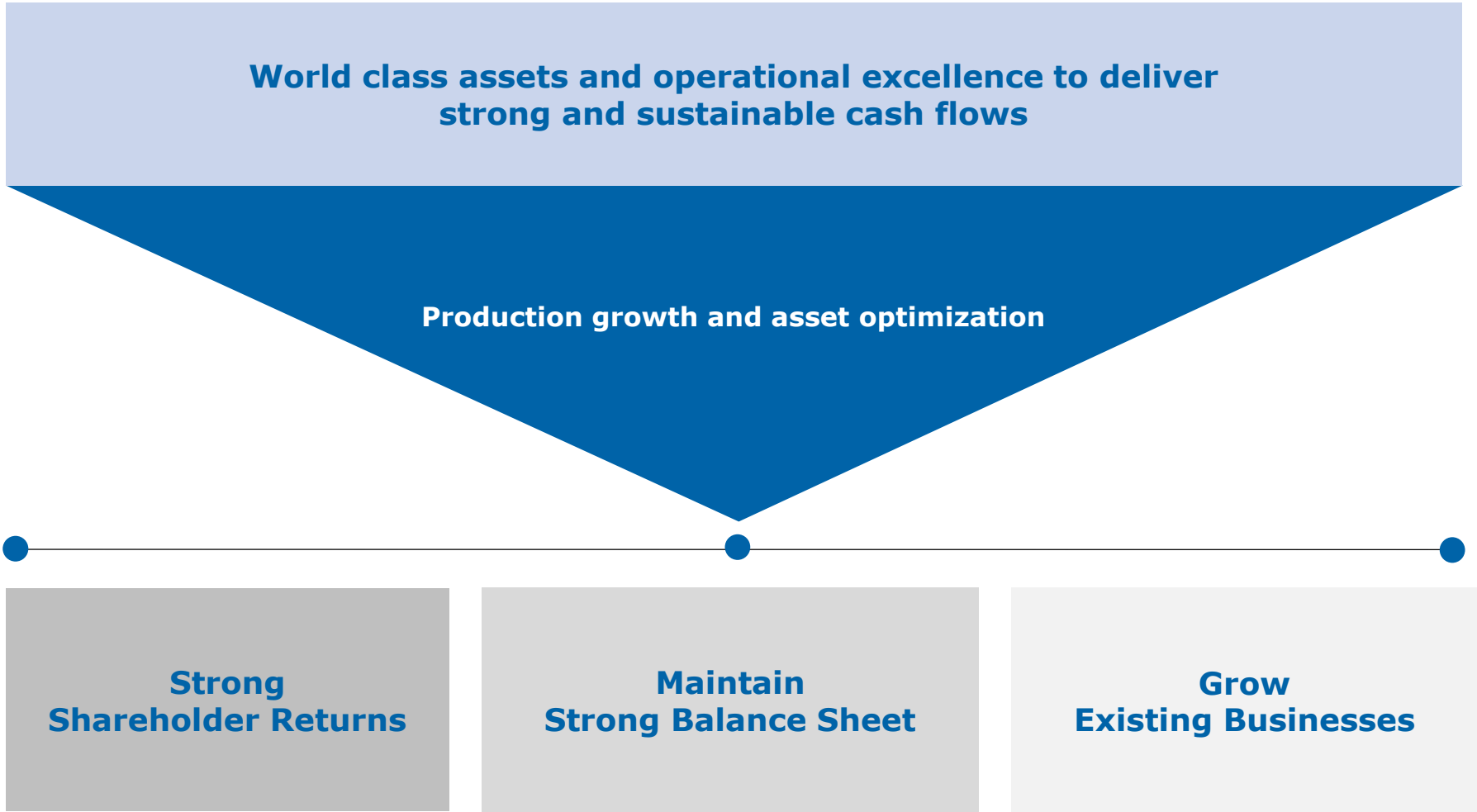
Q & A

Zinc



10 November 2017

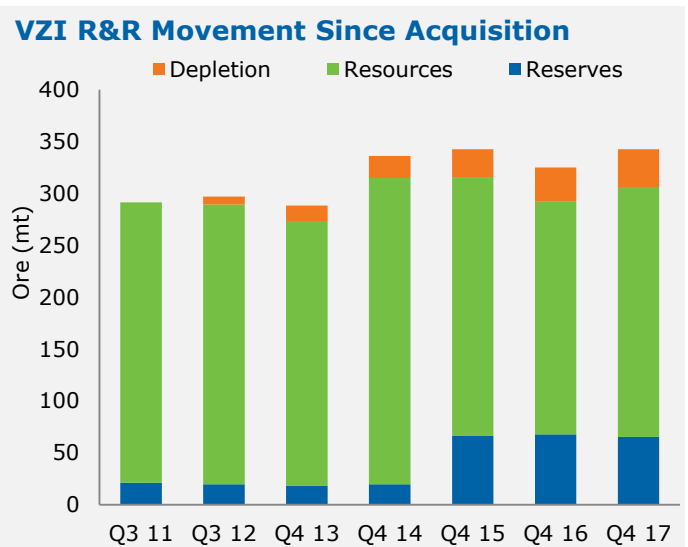
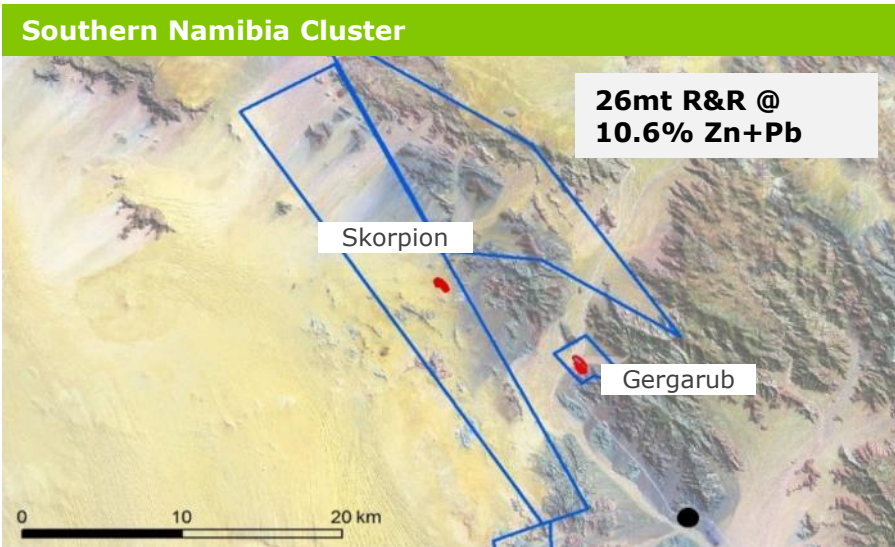




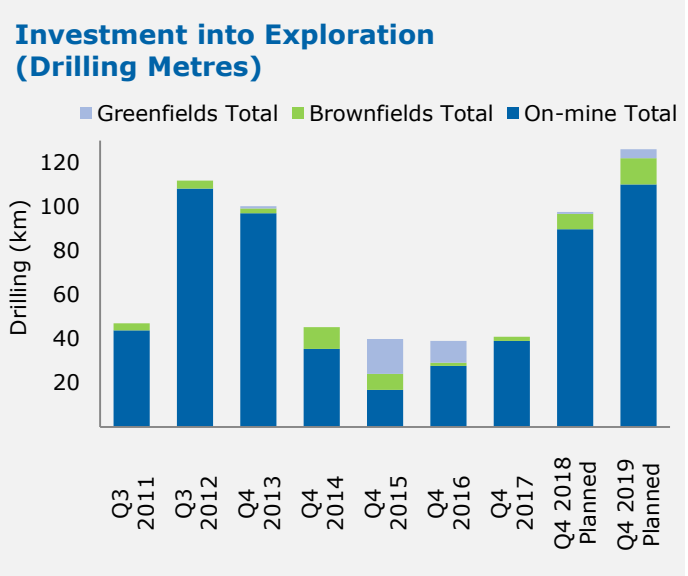
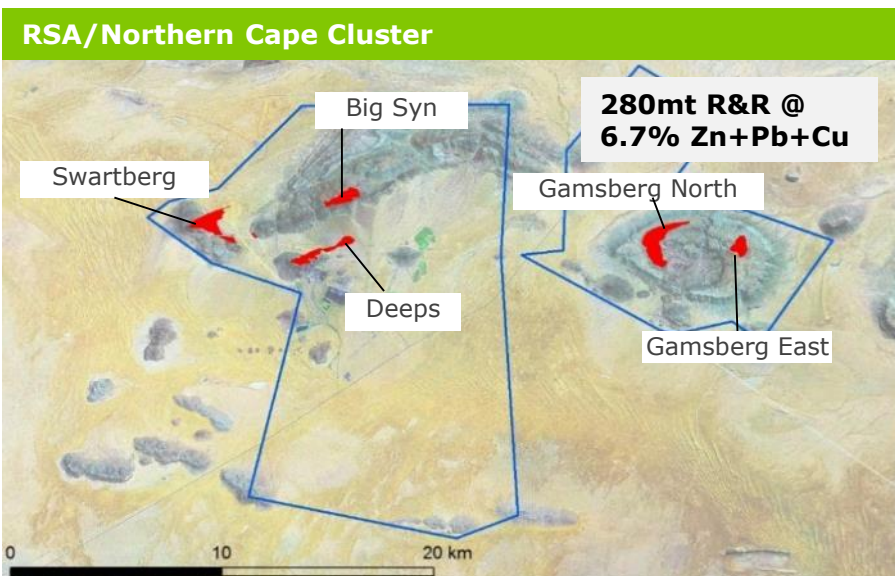
Appendix



Southern African Zinc Cluster: Unrivalled Opportunity for Long-Term LOM & Organic Growth



- ### High value Resource Base to enable long LOM and expansions
- Total of 21.5mt of Metal in R&R
- ### Best Zn Address in Africa
- Extensive tenement portfolio (>5,000km²)
 - Opportunity to double R&R
- ### Aggressive Exploration Programme



- R&R including depletion has increased by >15 % since acquisition to 23mt metal
- Exploration throughout downturn. Significant step-up in 2017
- Use of state of the art technology (geophysics) – high discovery rate