

Kumba Iron Ore Limited



SISHEN SITE VISIT 23 NOVEMBER 2017



AGENDA

- **Welcome** **Bothwell Mazarura**
- **Safety induction** **Mapi Mobwano**
- **Introduction** **Themba Mkhwanazi**
- **Marketing** **Timo Smit**
- **Kolomela** **Masala Mutangwa**
- **Sishen** **Mapi Mobwano**
- **Technology** **Glen McGavigan**
- **Conclusion** **Themba Mkhwanazi**
- **Details of Site Tour** **Mapi Mobwano**



INTRODUCTION THEMBA MKHWANAZI

WHAT YOU WILL HEAR ON THE VISIT



Marketing

- Producing **niche high quality products** that command premia
- Marketing excellence to achieve **industry leading realised prices**



Operating Model

- **Operating Model** implementation update
- Progress on delivery of **productivity improvements**



Sishen transformation

- **Technical excellence** delivering a step change in performance
- Mine planning focused on **value over volume**

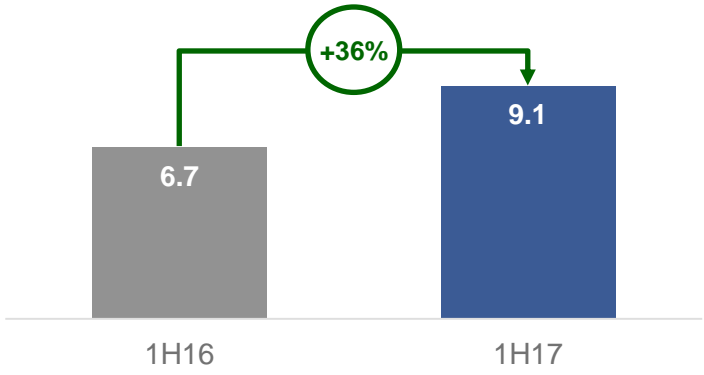


Technology and future potential

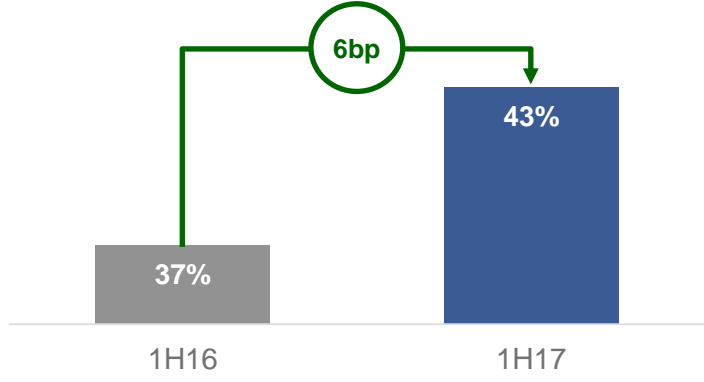
- **Ultra-high density medium separation (UHDMS) plant** overview
- **Maximising our endowment value** through innovation

FOCUSING ON CASH FLOW AND RETURNS

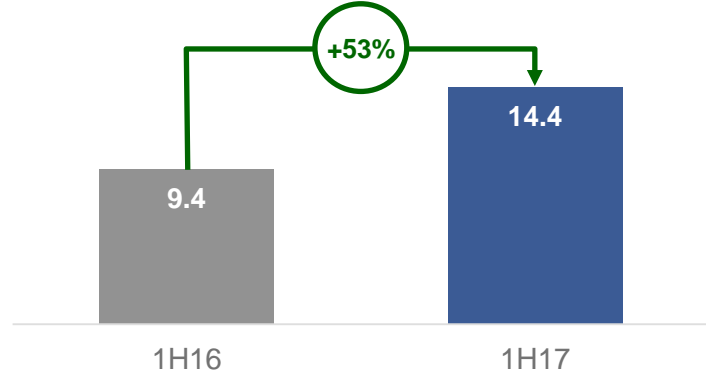
EBITDA (Rbn)



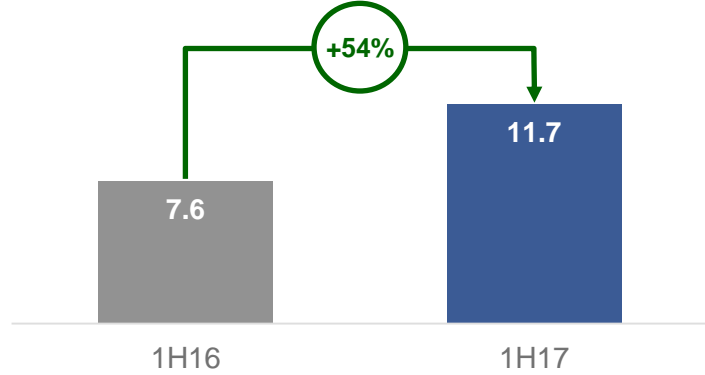
EBITDA margin (%)



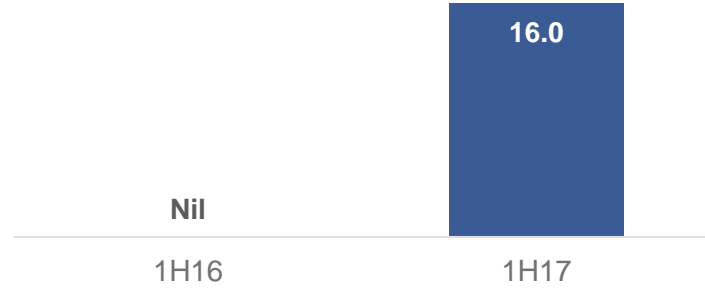
HEPS (R/share)



Operating cash flow (Rbn)

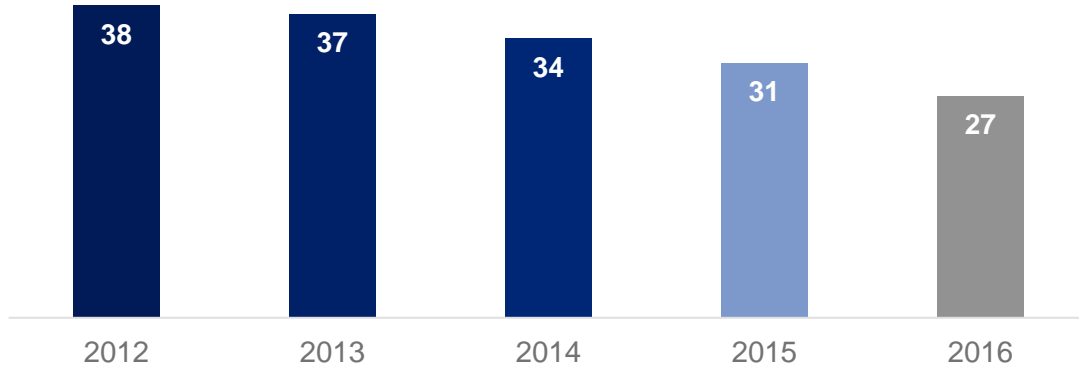


Dividend (R/share)

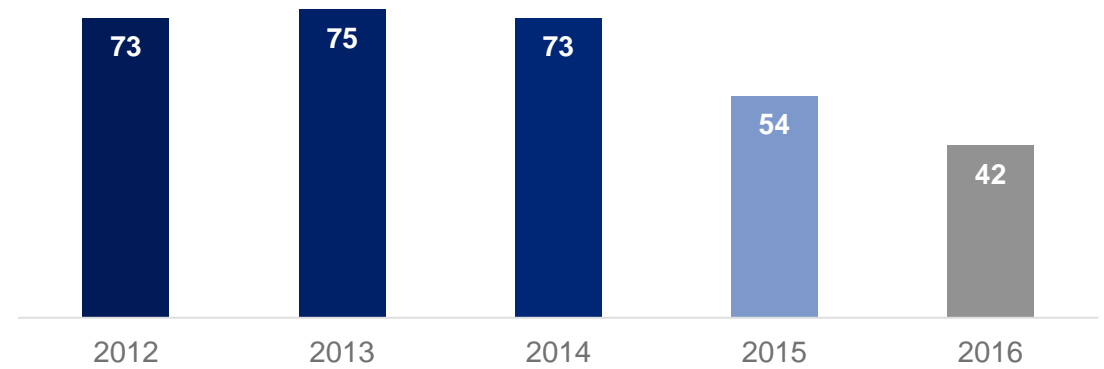


KEY COST METRICS ARE IMPROVING...

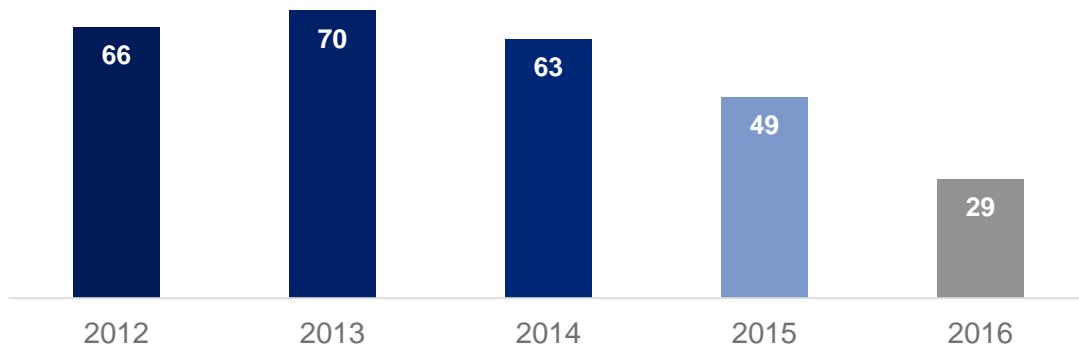
C1 – Cost (\$/dmt)



CFR China Cash Cost (US\$)



Breakeven Price (US\$)



- Breakeven price driven by controllables (C1-cost) and uncontrollables (freight rates, R:\$ exchange rate, lump premium)

... AS IS PRODUCTIVITY

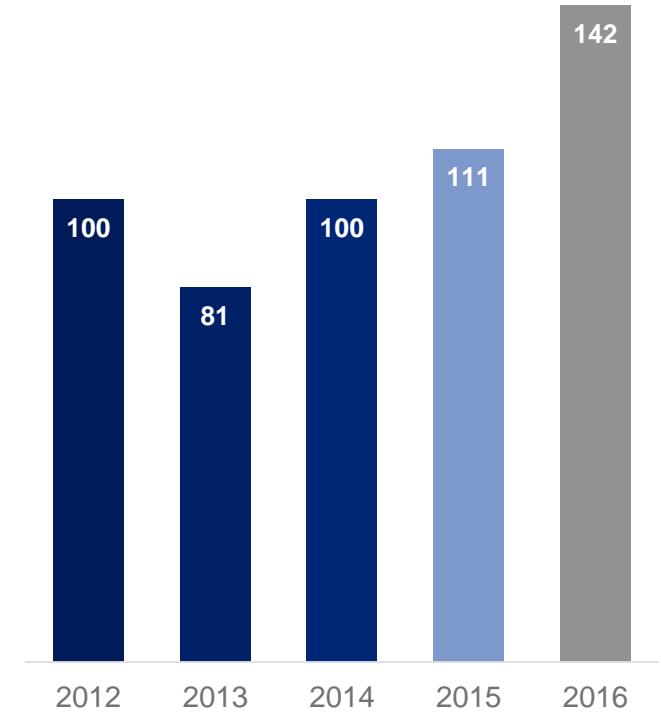
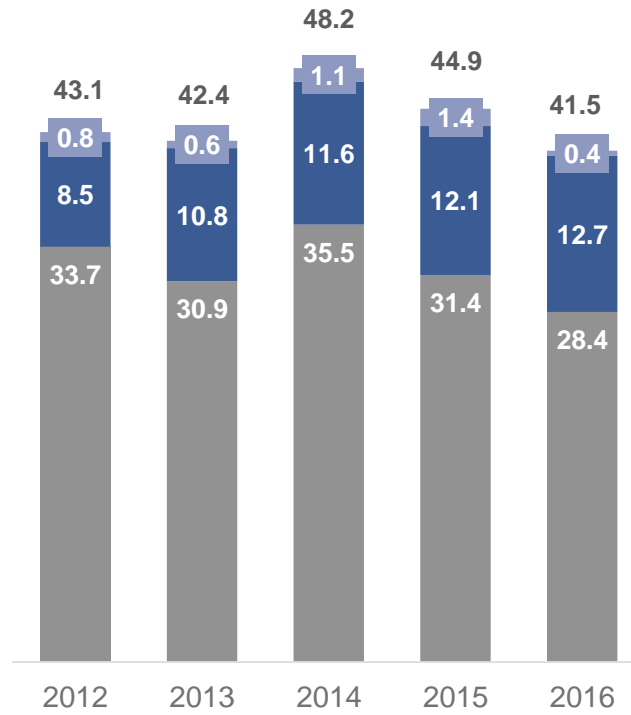
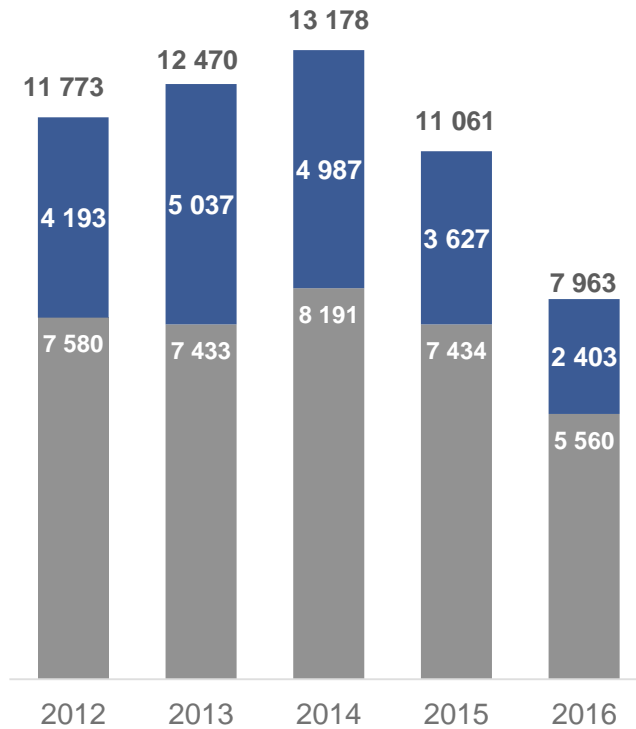
Number of Employees & Contractors



Total Production Mt (dry)



Productivity t/employee, indexed



MAXIMISING THE RETURN POTENTIAL OF OUR CURRENT ASSETS

Integrate technology through value chain
Optimise resource utilisation

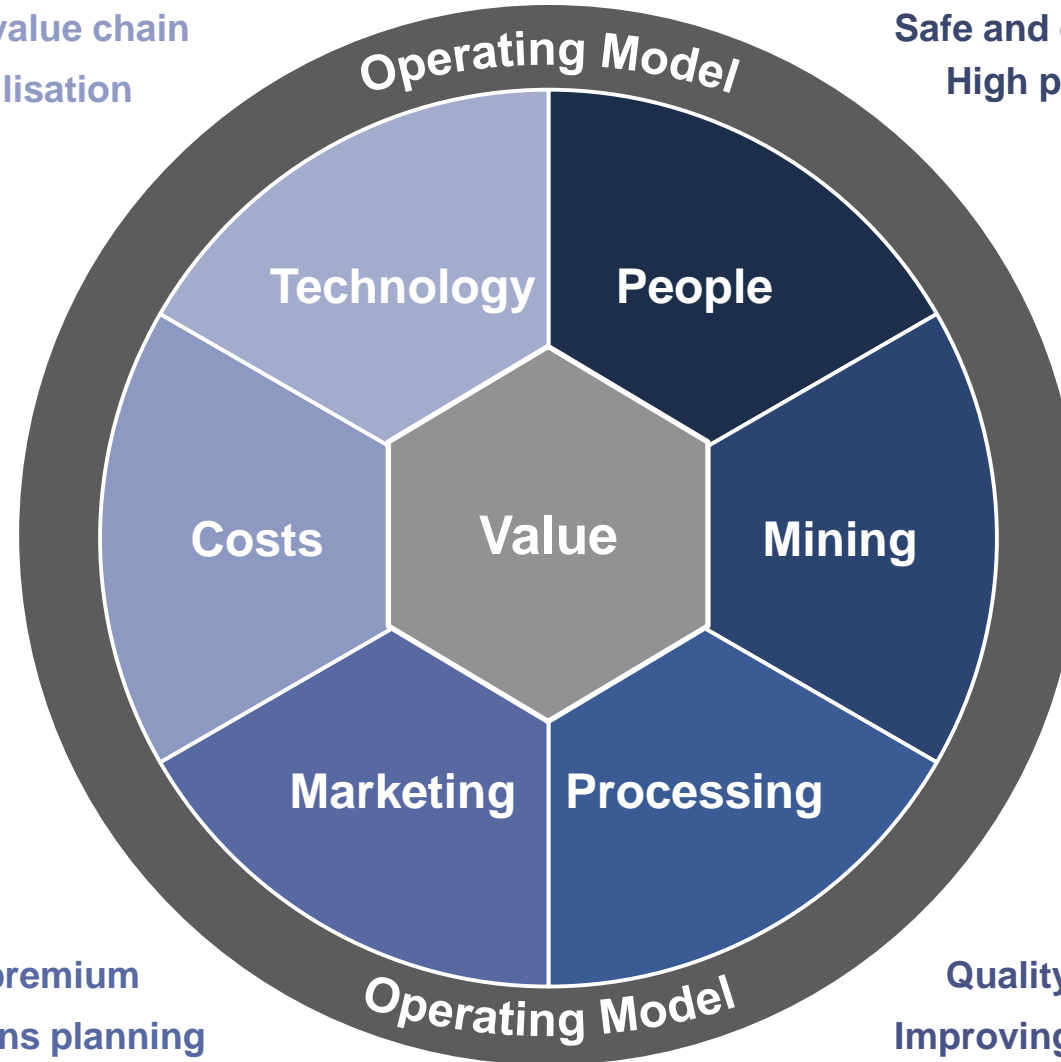
Safe and energised workforce
High performance culture

Offset inflationary pressure
Cost conscious culture

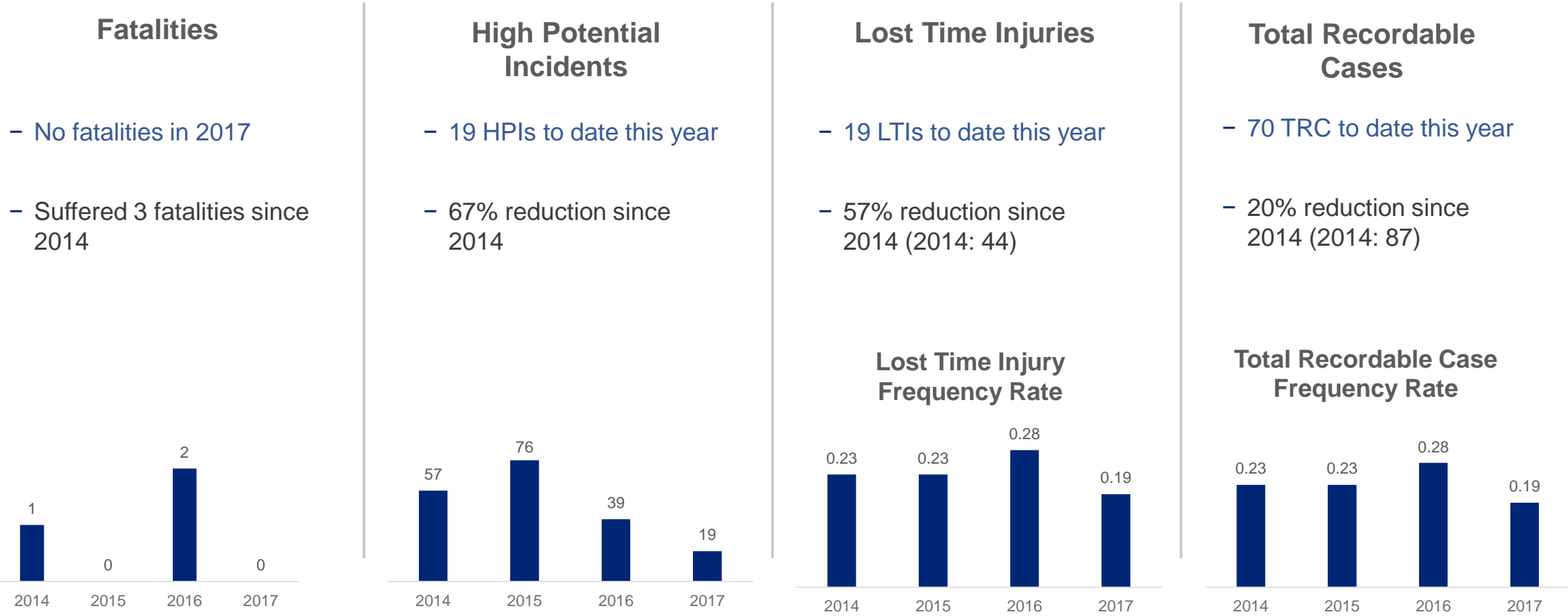
Consistent and predictable delivery
Mining equipment efficiency
Productivity

Realise value-in-use premium
Integrated sales and operations planning

Quality focus
Improving throughput



CRITICAL INTERVENTIONS IMPROVE SAFETY INDICATORS





IRON ORE MARKETS OVERVIEW

TIMO SMIT

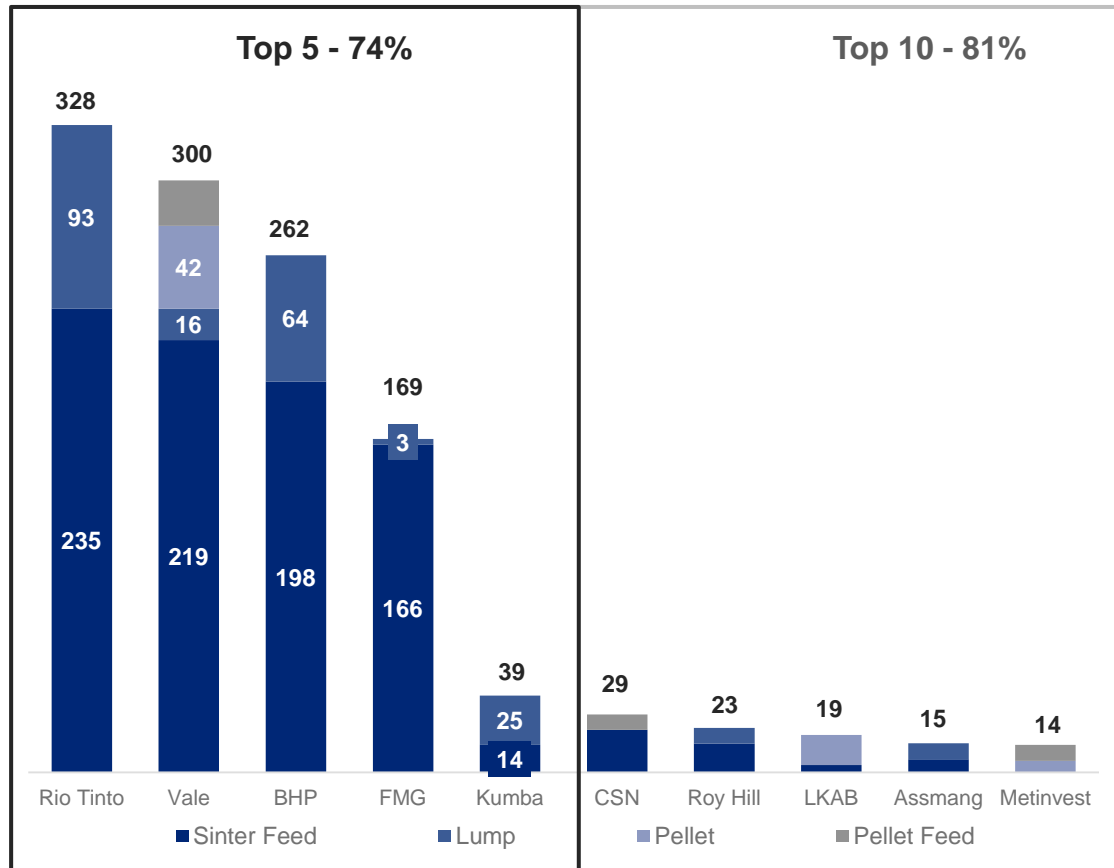
KEY TAKEAWAYS

- ✓ Kumba produces high quality iron ore products that command premium prices
- ✓ Demand for high-grade ores is supported by steel capacity rationalization and continued environmental restrictions
- ✓ Lump premia are supported by moderate supply growth and a positive demand outlook
- ✓ Iron ore market highlights in 2017
 - ✓ Iron ore and steel prices have diverged on policy driven steel production cuts in China
 - ✓ Over the next 3-6 months (into 2018), iron ore prices to remain supported due to tight steel markets and a stable macro economic situation in China

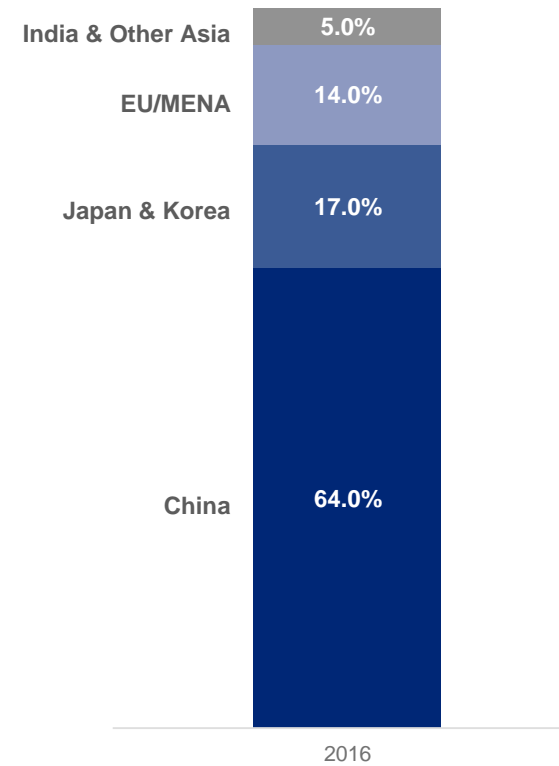
KUMBA'S POSITION IN THE SEABORNE MARKET

Full year view - 2016

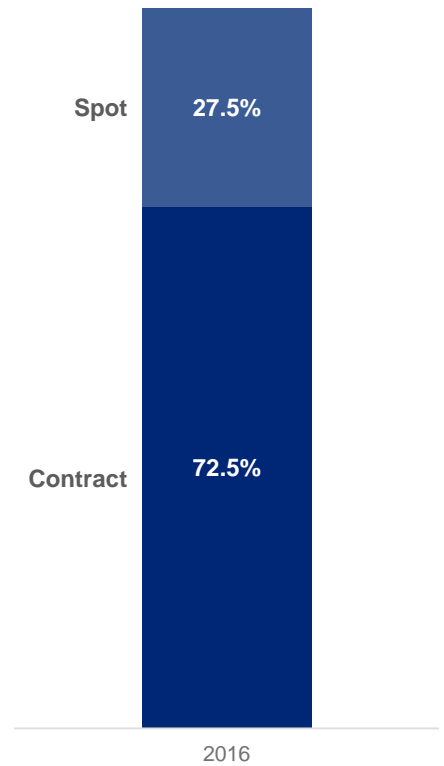
Market Share and Size Of The Top 10 Iron Ore Exporters
(Seaborne Exports 2016, Mt)



Kumba's Overall Sales Portfolio



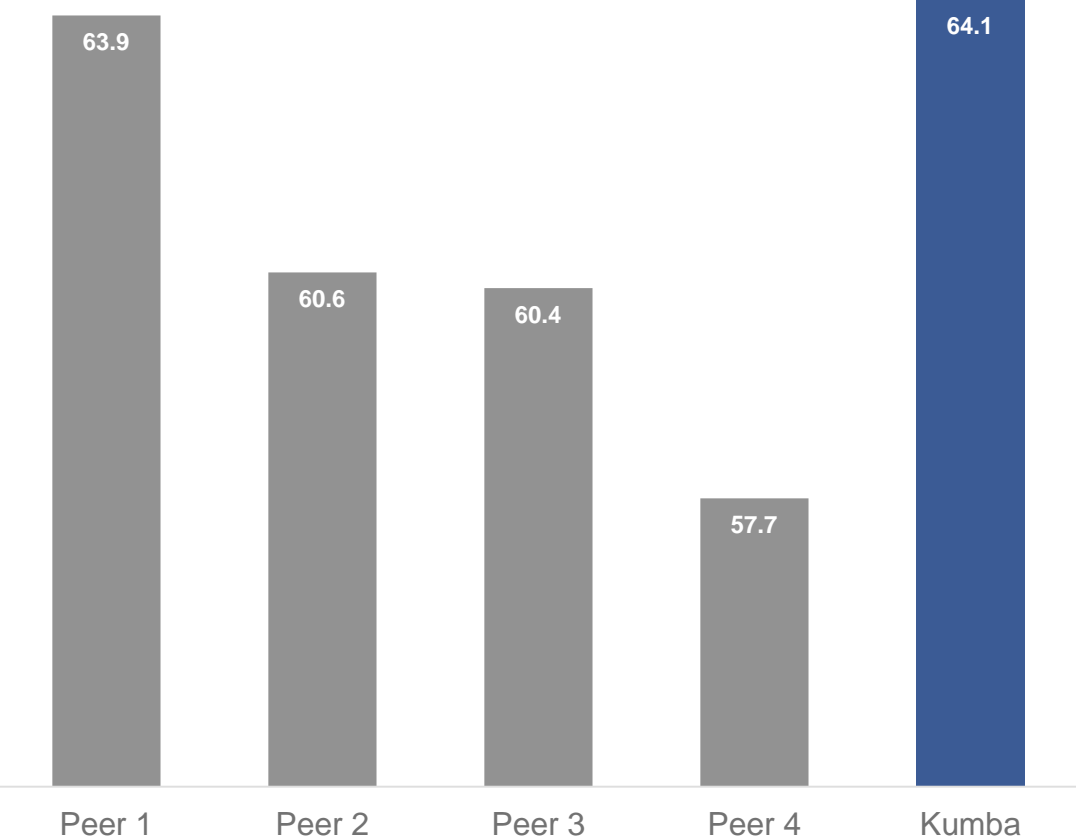
Kumba's Sales Contract vs Spot



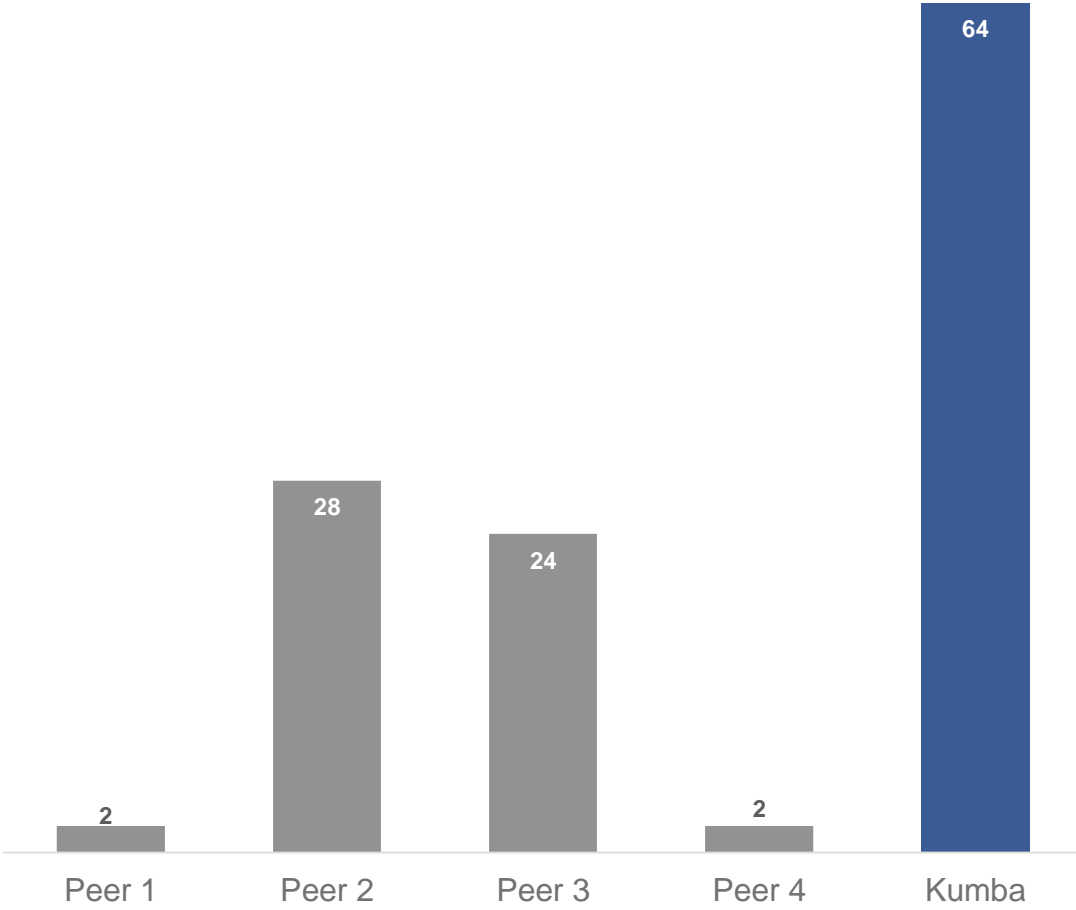
Source: Company reports, Kumba Market Intelligence (MI)

KUMBA PRODUCES HIGH QUALITY IRON ORE PRODUCTS

2016 Average Fe Content (%), Peer Comparison



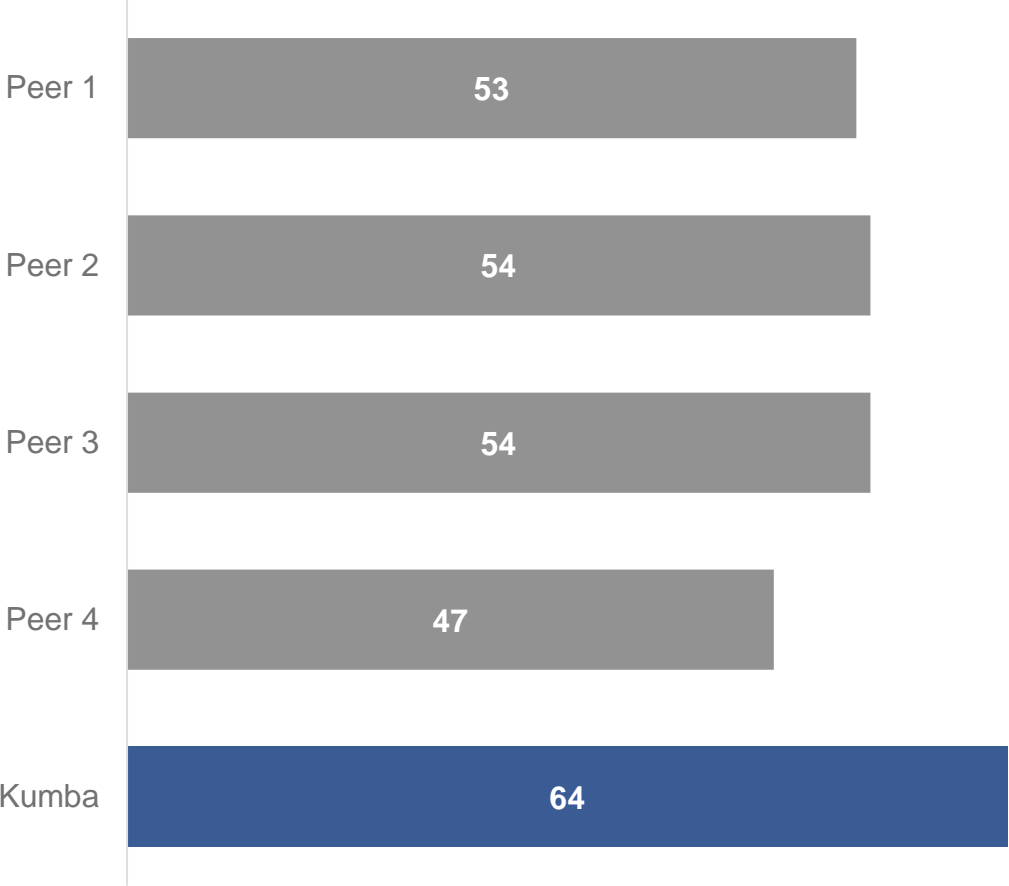
2016 Lump : Fine Ratio, Peer Comparison



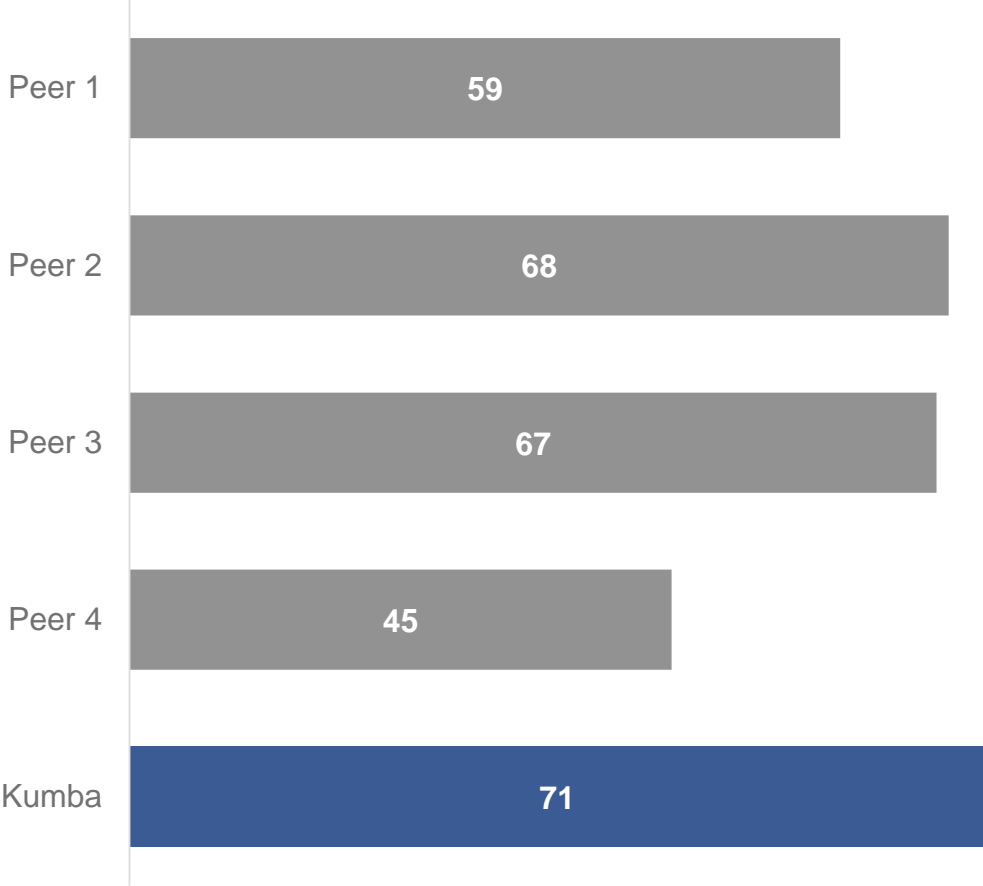
Source: Company reports, Kumba Market Intelligence (MI)

KUMBA PRODUCTS COMMAND PREMIUM PRICES

2016 Achieved price (US\$/dmt, FOB)
peer comparison



1H17 Achieved price (US\$/dmt, FOB)
peer comparison

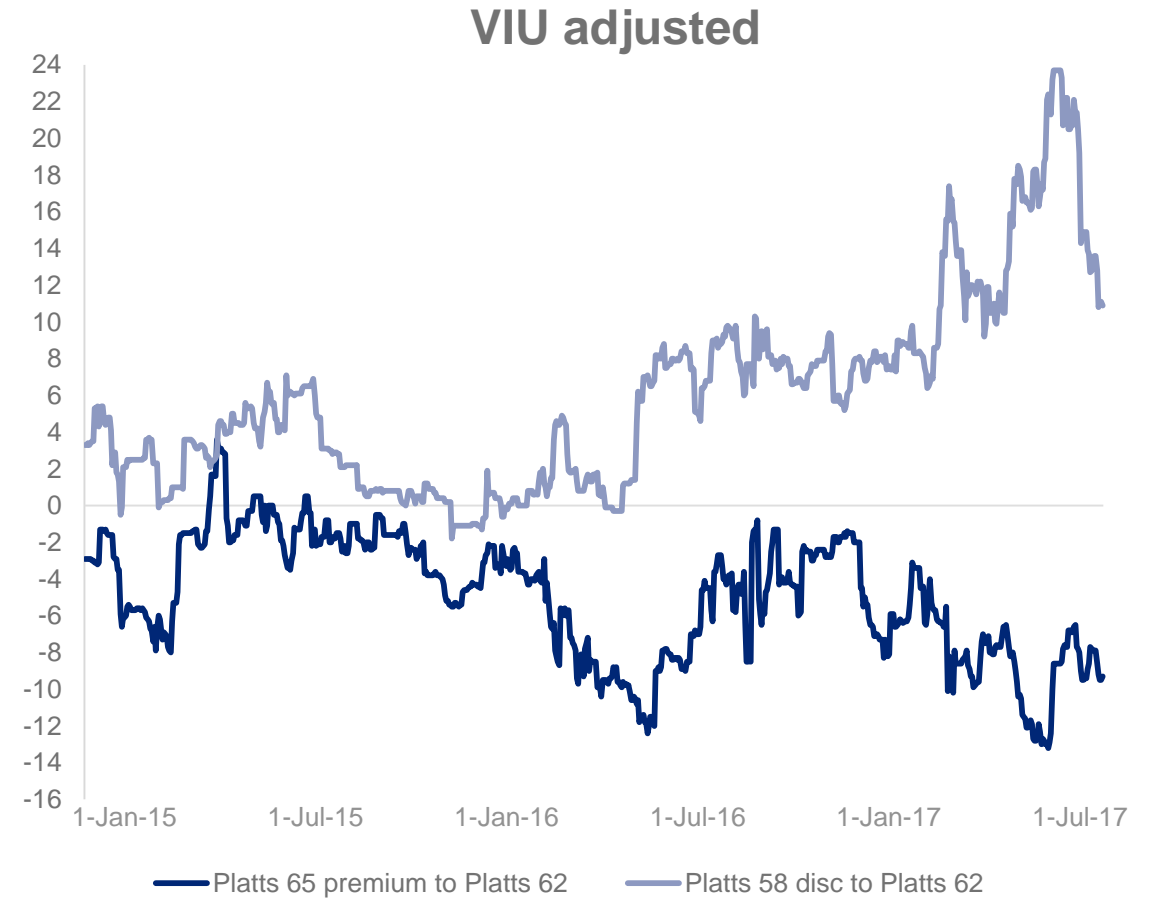
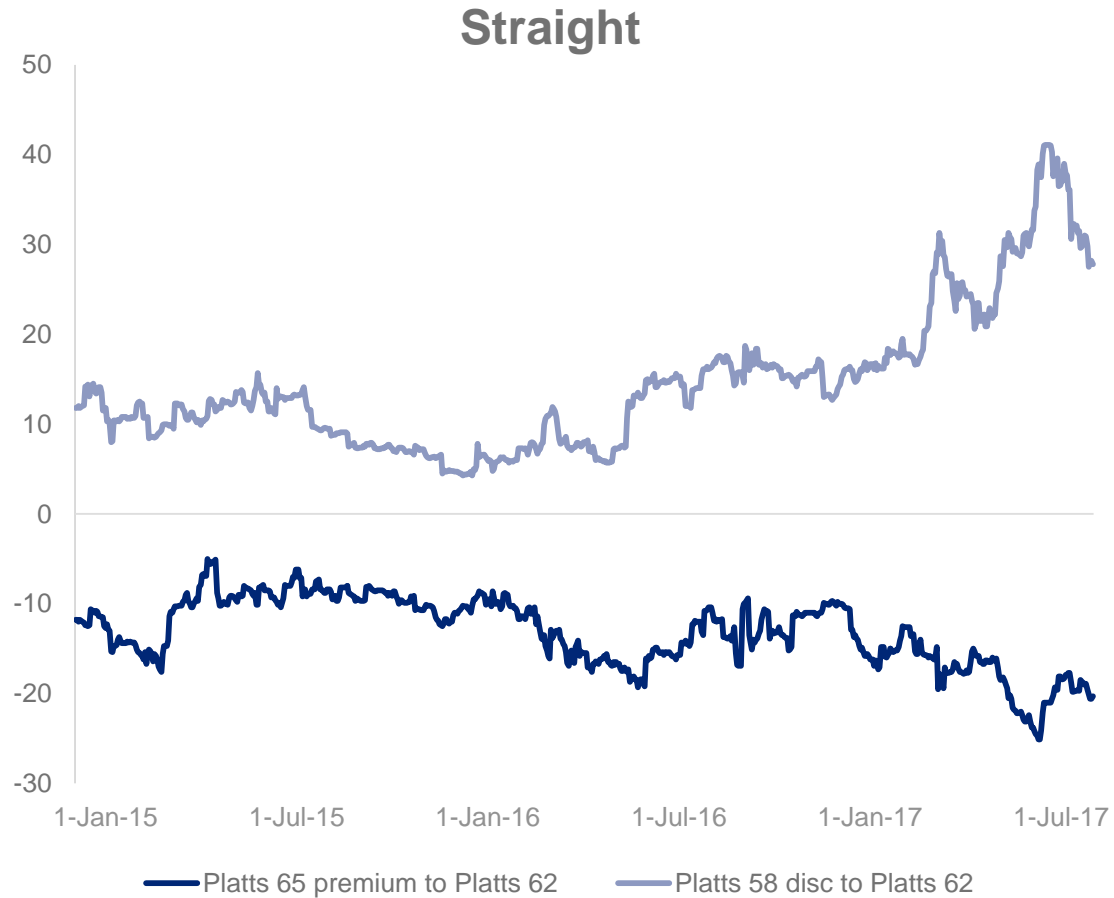


Source : Company reports, Kumba Market Intelligence (MI)

DISCOUNTS AND PREMIA ARE AT RECORD LEVELS

Platts 65 Premium and Platts 58 (Low Alumina)
Discount To Platts 62 Index

Platts 65 Premium and Platts 58 (Low Alumina)
Discount To Platts 62 Index



DEMAND FOR HIGH GRADE PRODUCT EXPECTED TO REMAIN STRONG

- The P65/P62 differential is driven by a combination of structural, seasonal and cyclical factors

Structural factors

- **Steel capacity reductions:** Supply side reforms have resulted in an elimination of ~200Mt of Chinese steel capacity since early 2016
- **Bigger Blast Furnaces (BFs):** Recent BF capacity reductions largely removing smaller BFs (<1000m³) which tended to use relatively high proportions of low grade ores

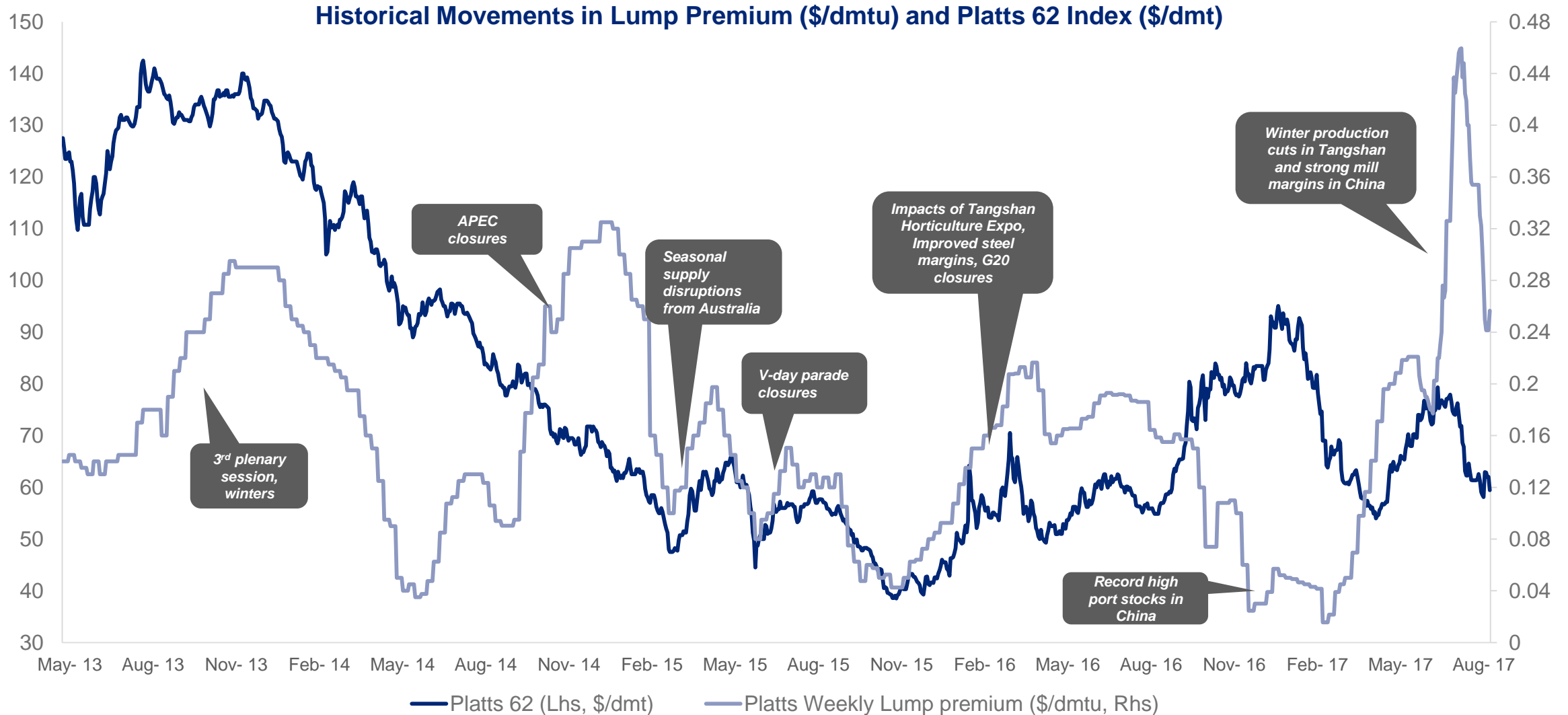
Structural/seasonal factors

- **Environmental restrictions & winter production cuts:** Mills that are unaffected by winter production cuts are chasing productivity gains to maximise steel output

Cyclical & temporary factors

- **Robust steel demand in China:** Apparent steel consumption up 3% YoY YTD 2017, buoying steel prices and mill margins at near record highs. Mills focus on productivity and seek high-grade ores
- **Supply tightness for high grade ores:** Vale blending much of its Carajas ore with high silica Southern System fines to produce BRBF product. This should ease as S11D ramps up further

LUMP PREMIA REACHED NEW HIGHS (AND LOWS) IN 2017



LUMP PREMIUM OUTLOOK IS POSITIVE

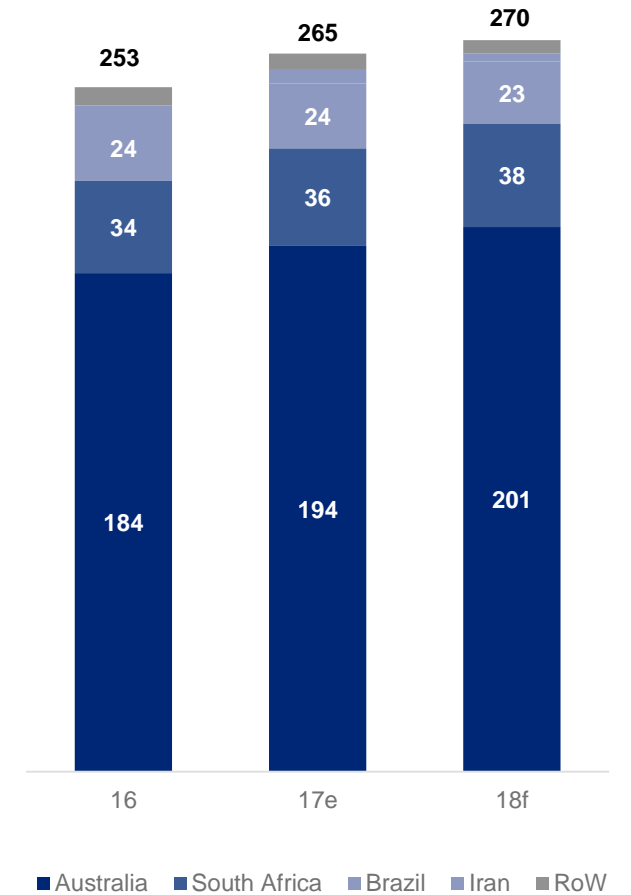
Lump premium to remain supported in Q4 and early 2018 due to:

- Reasonably low port stocks in China
- Weaker domestic concentrate supply during winter
- Chinese sintering closures from mid-Nov to mid-Mar
- Record Chinese pellet premia (~\$60/dmt) increase the cost of alternative direct-charge material
- Higher marginal sintering costs from desulphurization

Lump Seaborne Supply Outlook (Mt)



Lump Premium and Port Stocks in China





IRON ORE MARKET HIGHLIGHTS IN 2017

STEEL & IRON ORE PRICES DIVERGED...

- YTD 2017 iron ore prices have fallen by ~20% while Chinese steel prices have risen by 30% to trade at near 5 year highs
- Consequently, the implied steel to iron ore price ratio has risen to a record 9x as steel prices continue to outperform iron ore

**Steel (Billet, Yuan/t) and iron ore
(Platts 62% Fe Index, US\$/t) in China**



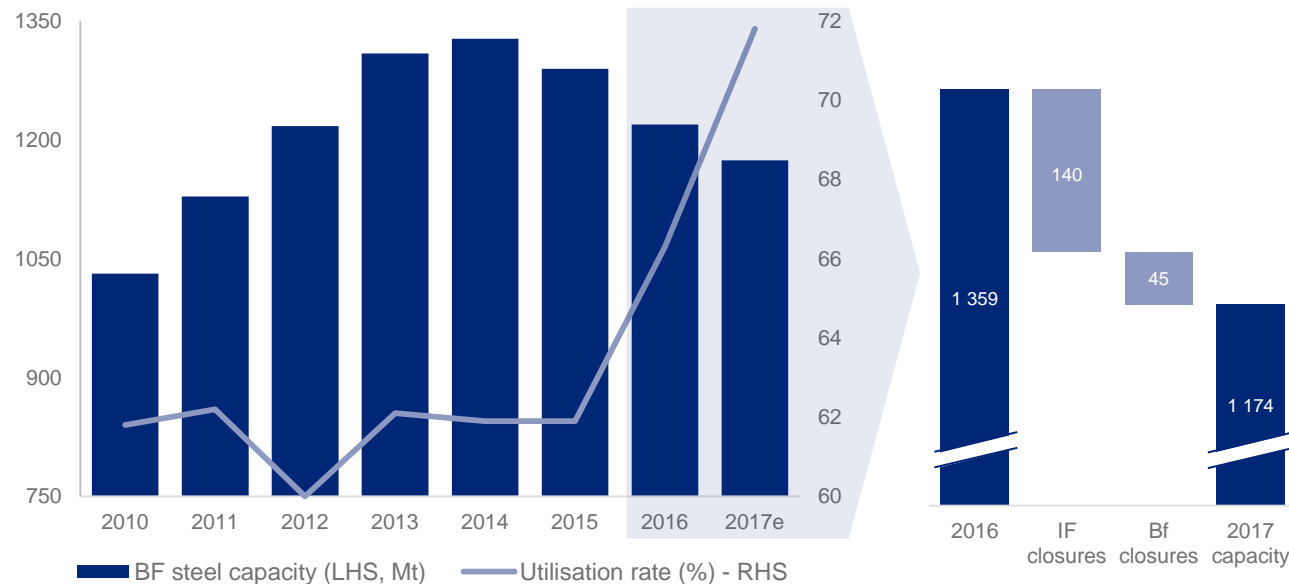
**Steel vs iron ore prices
(Indexed, Jan 1 2017 = 100)**



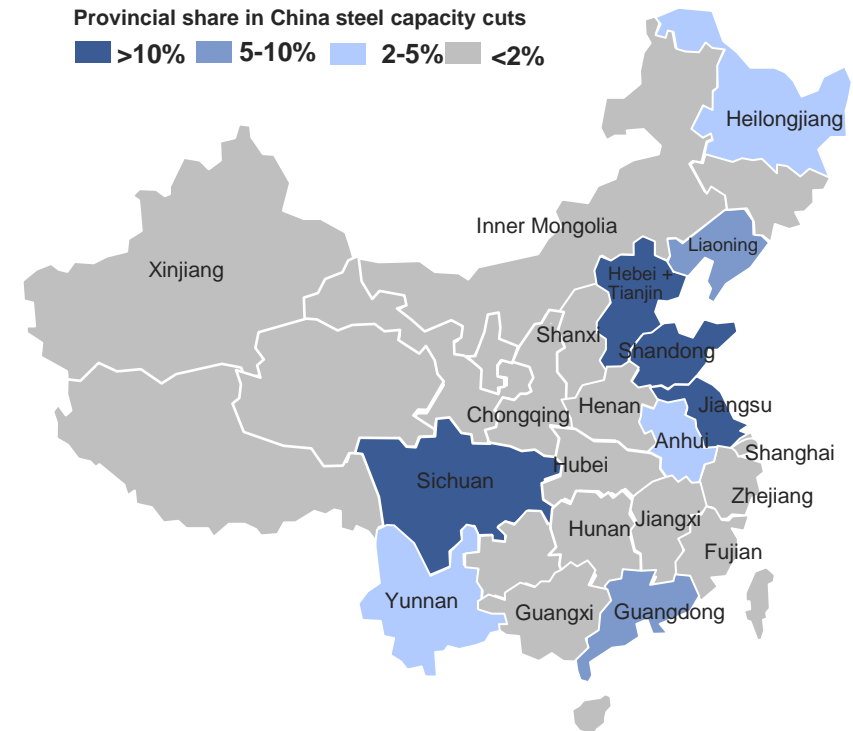
...ON POLICY DRIVEN STEEL PRODUCTION CUTS...

- Steel outperformance primarily on the back of implementation of 'supply side reforms' in China
- Over the last ~24 months, China has eliminated ~200Mt of induction furnace and blast furnace capacities resulting in tighter steel markets

**Steel capacity evolution in China
(Million tonnes)**



China's 2017 steel capacity cuts by province



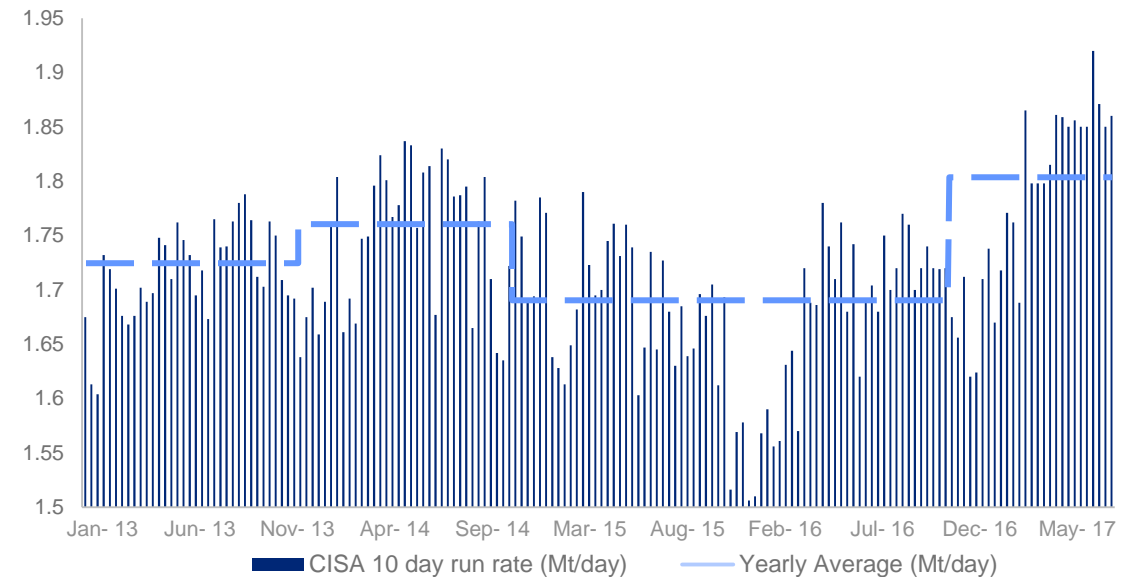
...PUSHING MILL MARGINS TO MULTI YEAR HIGHS...

- Meanwhile, end user demand has remained strong, up ~3% YoY during YTD2017, on the back of buoyant infrastructure and construction activity in China
- With mill margins at record highs (HRC¹ margin ~\$400/t), mills are incentivised to raise steel output pushing CISA¹ member mills run rate to a record 1.8Mt per day

Spot Rebar and HRC margins in China (US\$/t)



CISA 10 Day operating rates (Mt/day) and yearly averages (Mt/day)



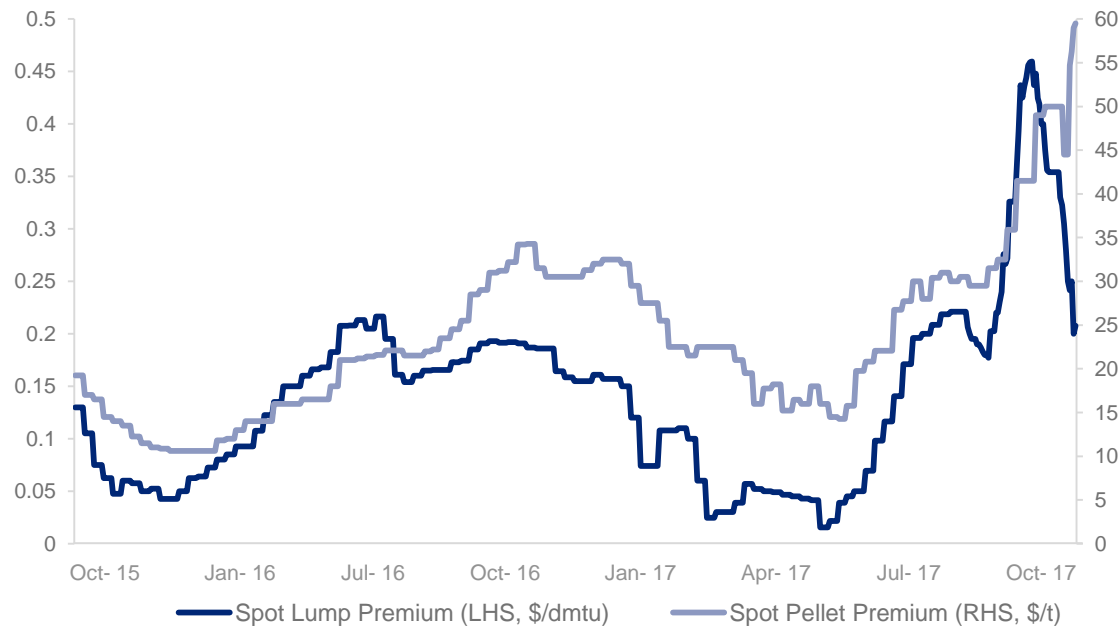
1 - HRC - Hot Rolled Coil, CISA – China Iron & Steel Association,
 2 - Mill margin = (Product price (\$)) – (1.6 * Platts 62 index + 0.72 * HCC price)

...BUOYING DEMAND FOR PREMIUM PRODUCTS & DIRECT CHARGE MATERIAL

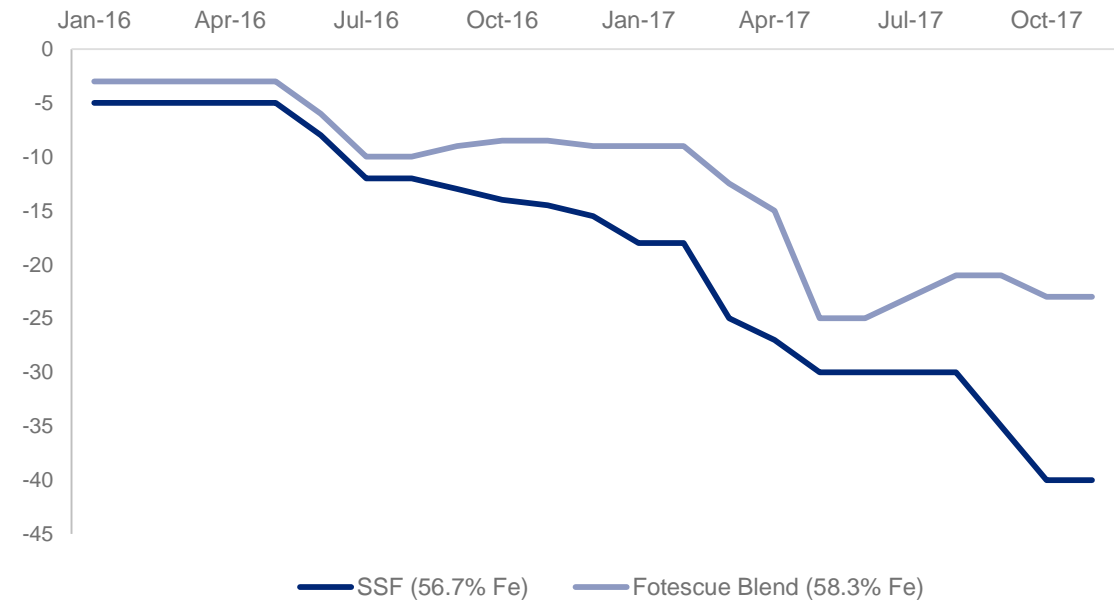
Demand for direct charge ores boosted by 'winter production cut' policy in China which targets 50% reduction in steel output over Nov17 – Mar18 period in 2 + 20 cities

Mills are chasing productivity gains, boosting demand for high grade ores whilst shunning purchases of low grade ores

Lump (\$/dmtu) and pellet premiums (\$/dmt) in China



Monthly discounts announced by FMG % of Platts 62 FOB Australia Index

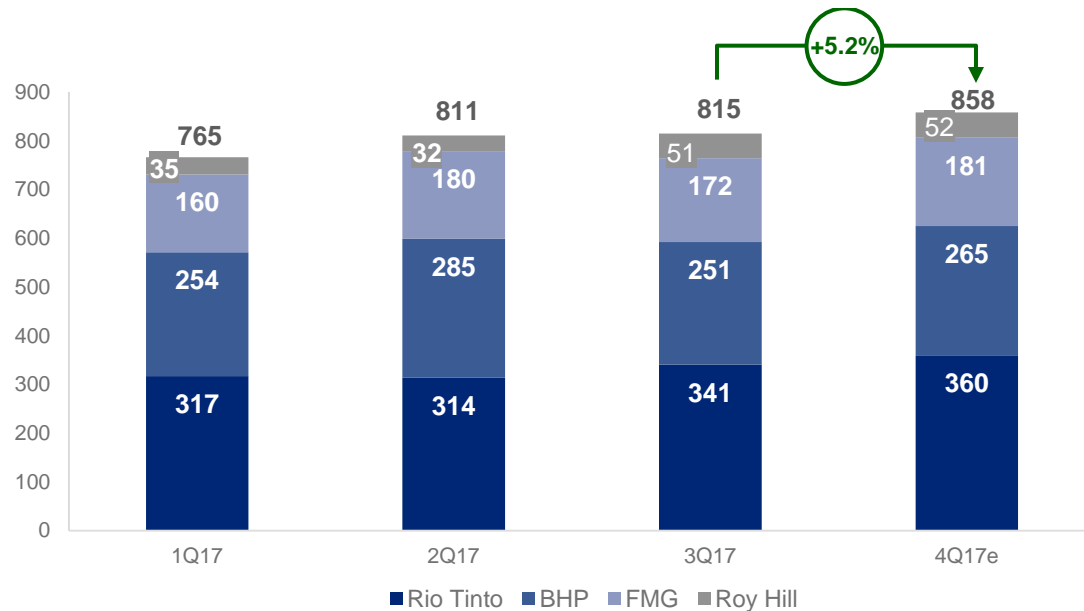


Source : Platts, Kumba Market Intelligence (MI)

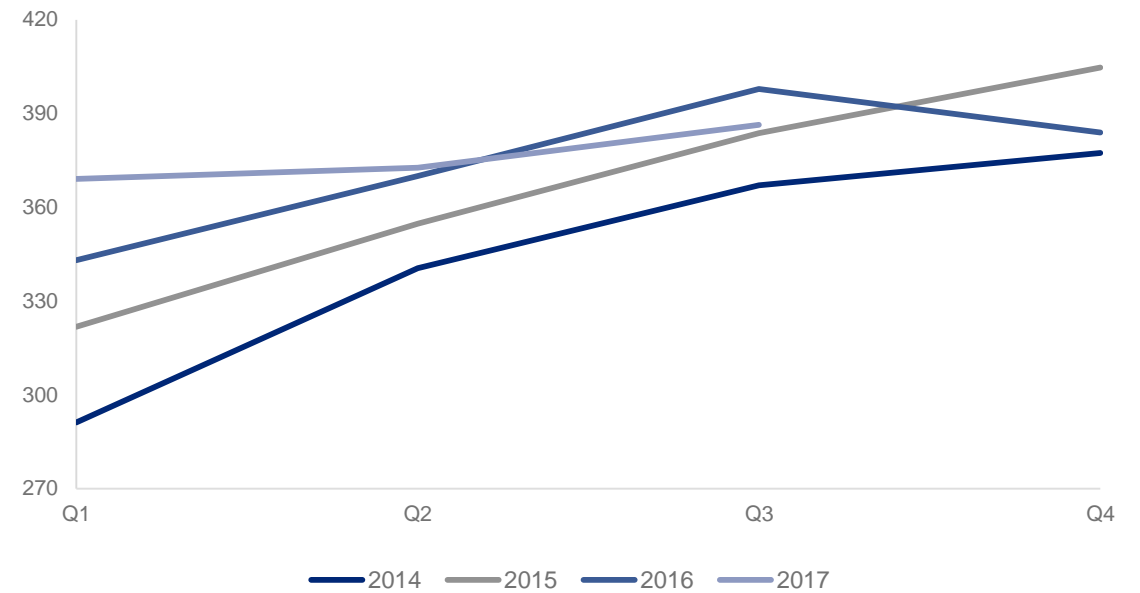
IRON ORE SUPPLY, HOWEVER, GIVES US A REASON FOR CAUTION...

- Australian shipments from majors (Rio, BHP & FMG) and Roy Hill expected to jump by 5.2% QoQ to add ~40Mt annualised iron ore supply in 4Q17
- Brazilian YTD shipments have been largely flat YoY and Vale's 19Mtpa reduction of high silica ores in Q3 suggest it may end 2017 on lower end of its 360-380Mt guidance

Expected iron ore shipments from BHP, Rio Tinto, FMG and Roy Hill in 4Q17 (Mtpa)



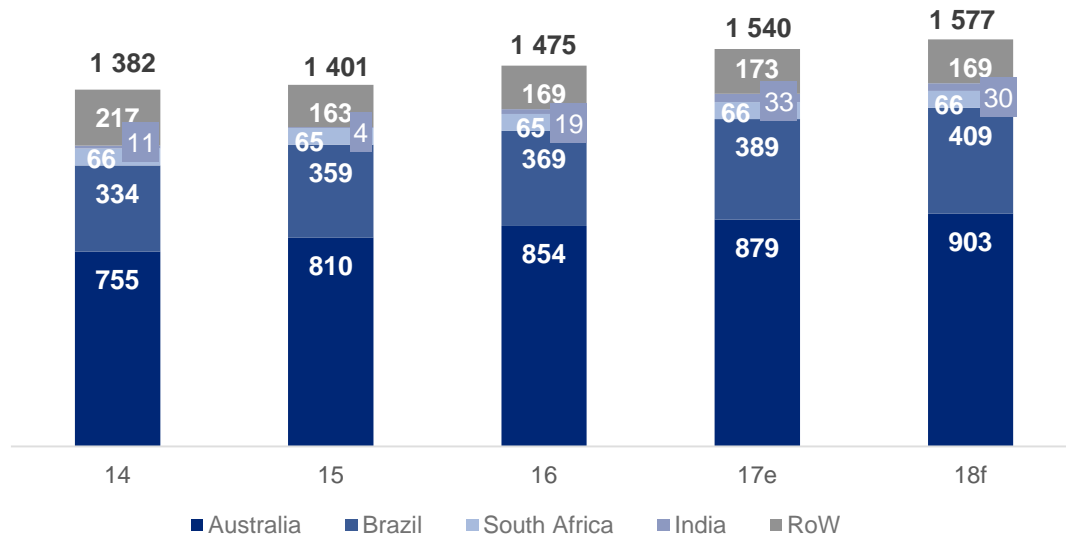
Brazilian iron ore shipments, YTD run rates (Mtpa)



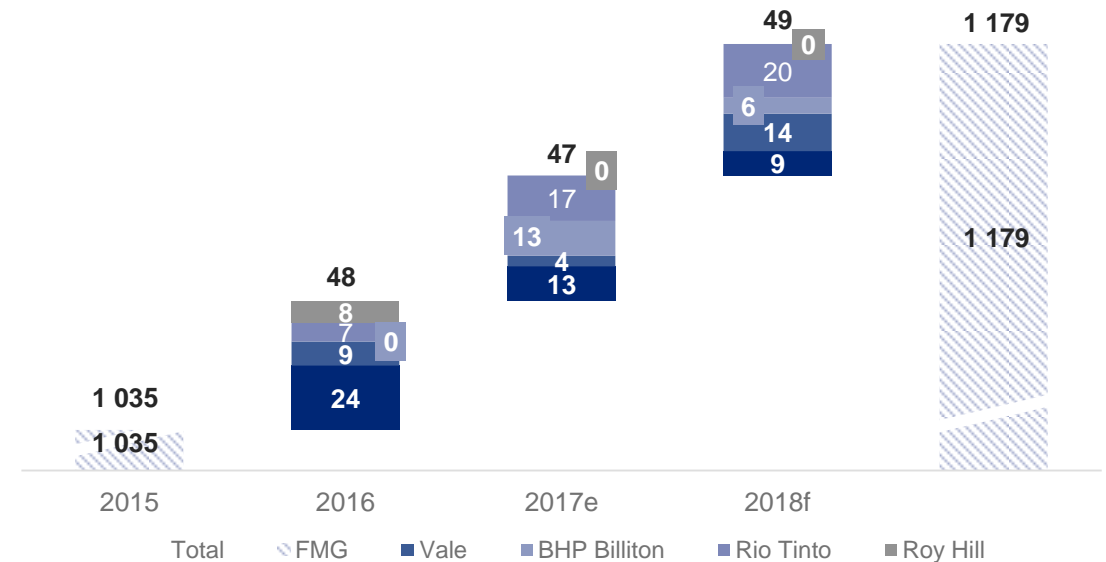
IN 2018, SUPPLY GROWTH SLOWING WITH PROJECTS REACHING EXECUTION

- Despite 47Mt additional supply from top 4 majors and Roy Hill in 2018, overall supply growth will be 37Mt ~50% of the total supply growth in 2017
- Despite higher iron ore prices YTD 2017, marginal suppliers of low grade ores are struggling to breakeven due to record discounts

Seaborne iron ore supply by country (Wmt)



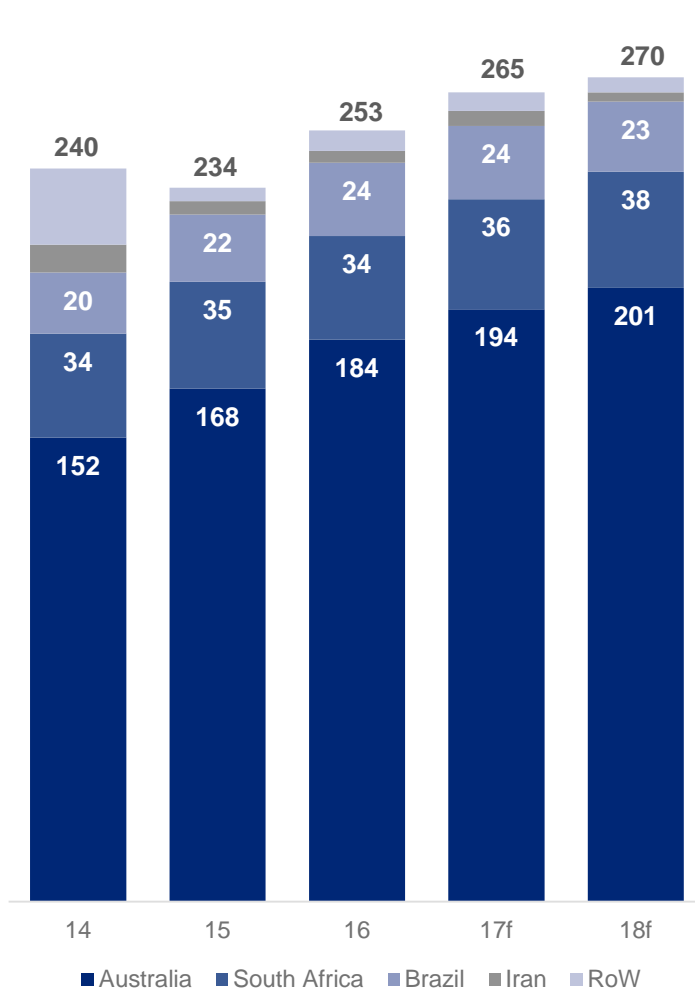
Supply growth from top 4 producers and Roy Hill (Wmt)



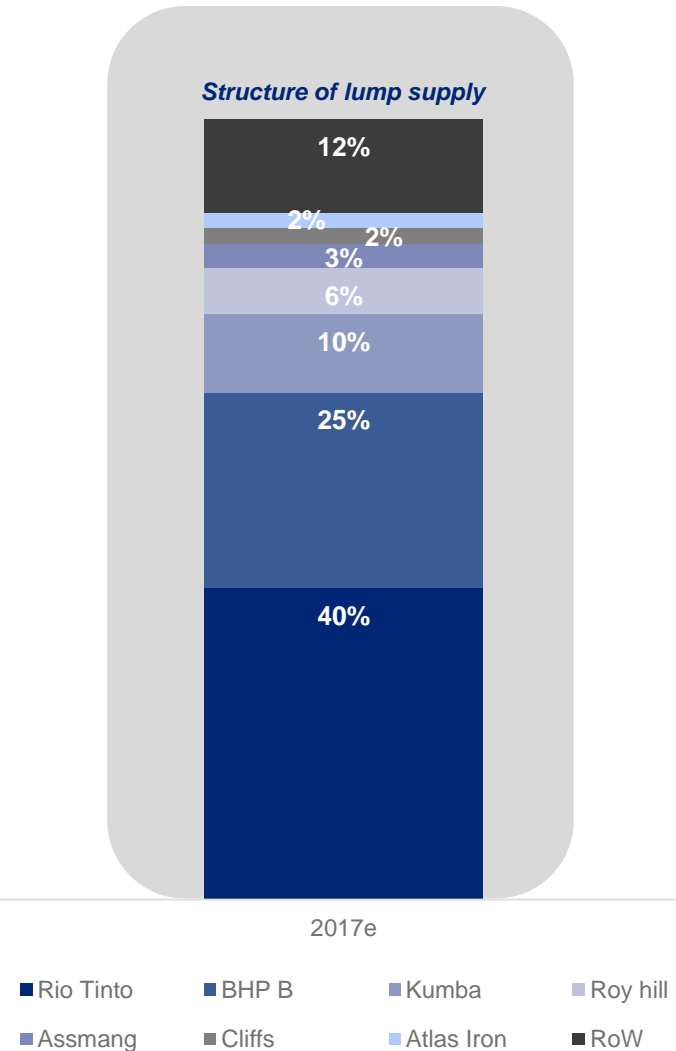
Source: Company Reports, Kumba Market Intelligence (MI)

SEABORNE LUMP SUPPLY GROWTH IS EXPECTED TO BE LIMITED

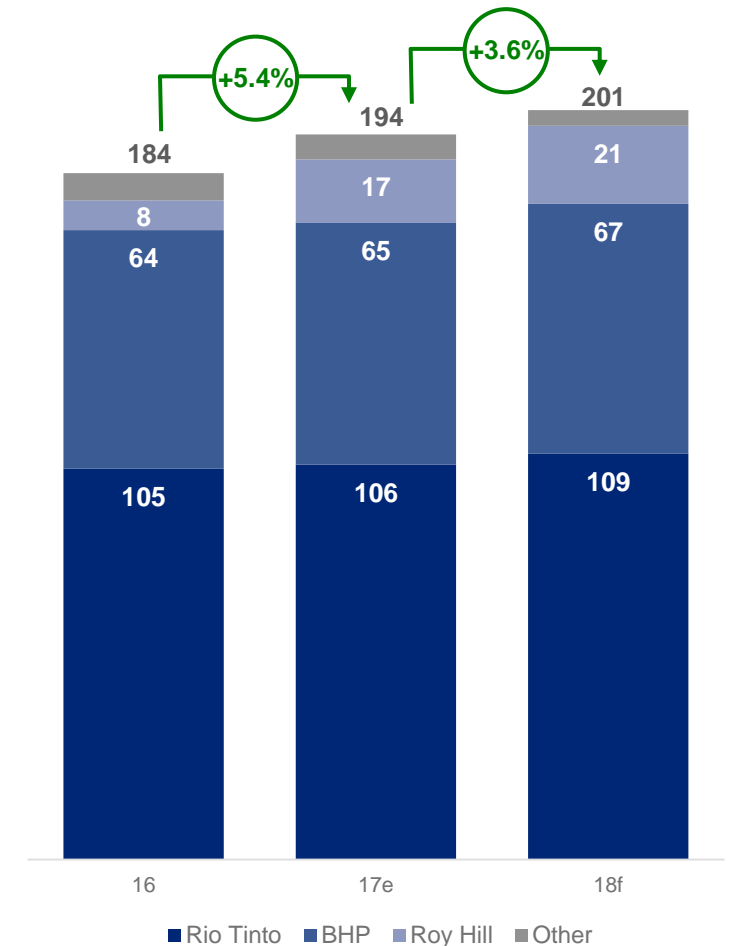
Seaborne lump iron ore exports (Mt)



Structure of lump supply



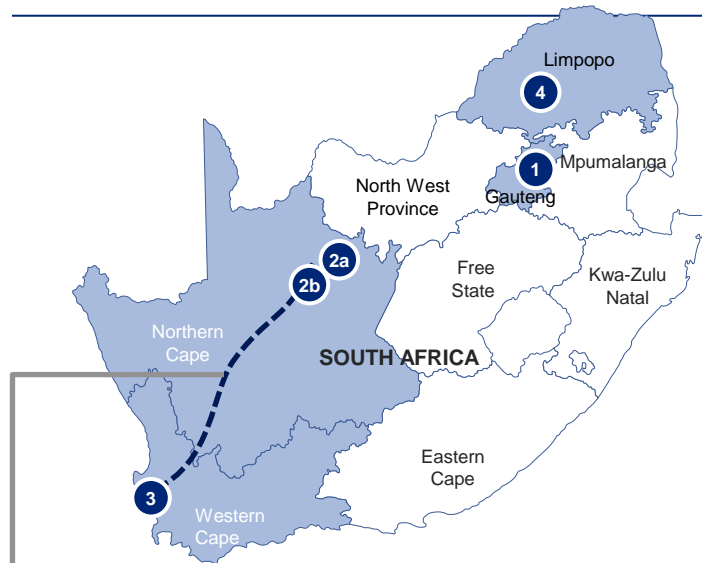
Lump supply forecast growth by major producer in Australia (Mt)





**KOLOMELA
MASALA MUTANGWA**

KOLOMELA OVERVIEW



Where we operate

Export rail line

Current capacity of 60Mtpa of which Kumba has 44Mtpa allocation

Corporate office

1 Centurion

Mining operations

2a Sishen mine

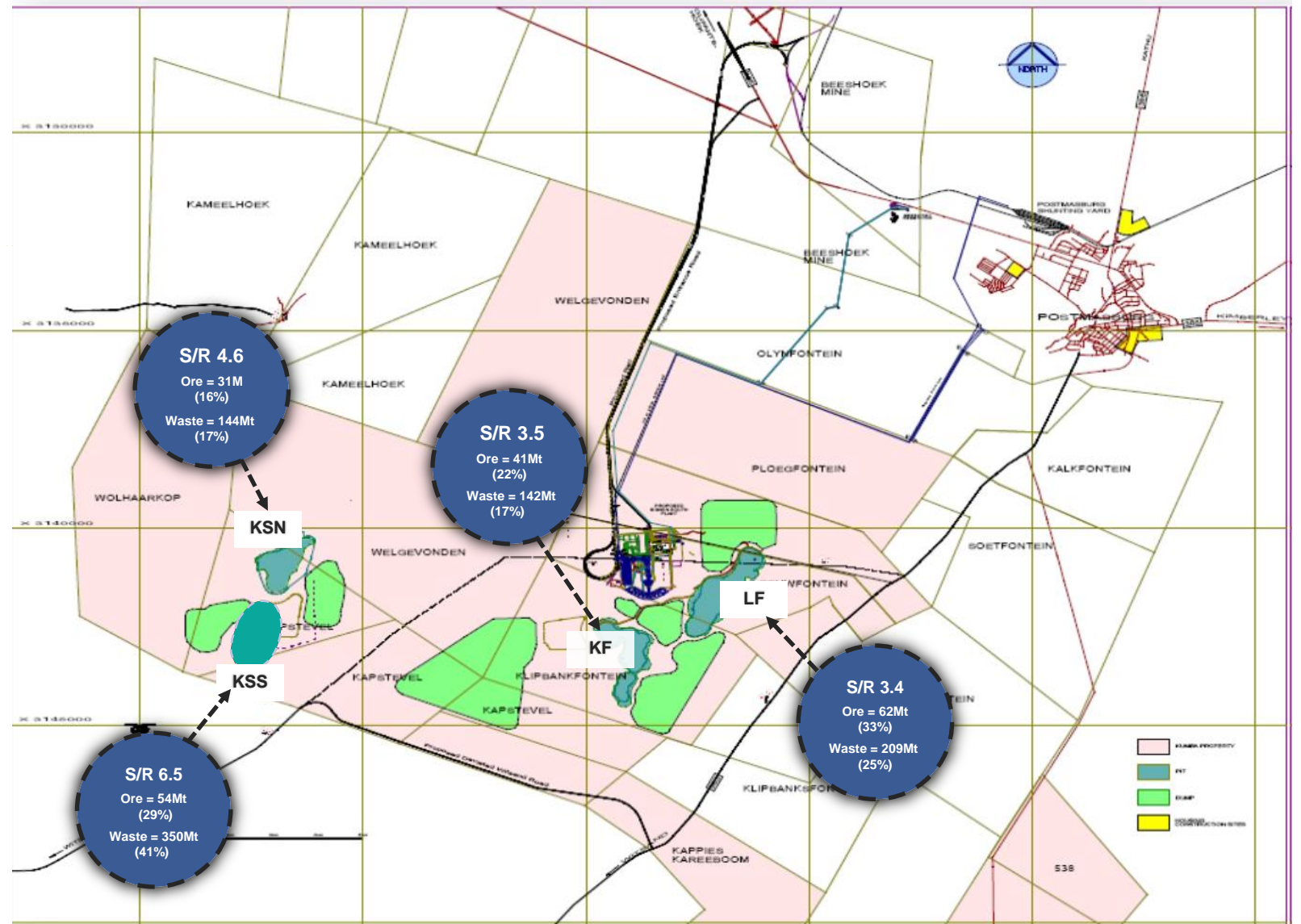
2b Kolomela mine

Port operations

3 Saldana Bay

Discontinued operations

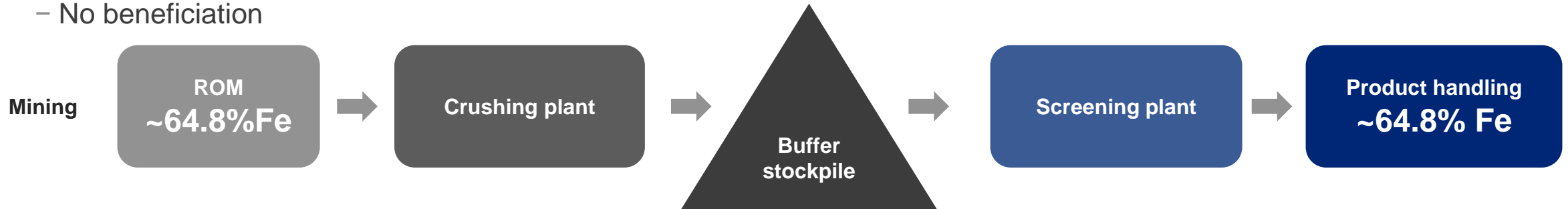
4 Thabazimbi mine



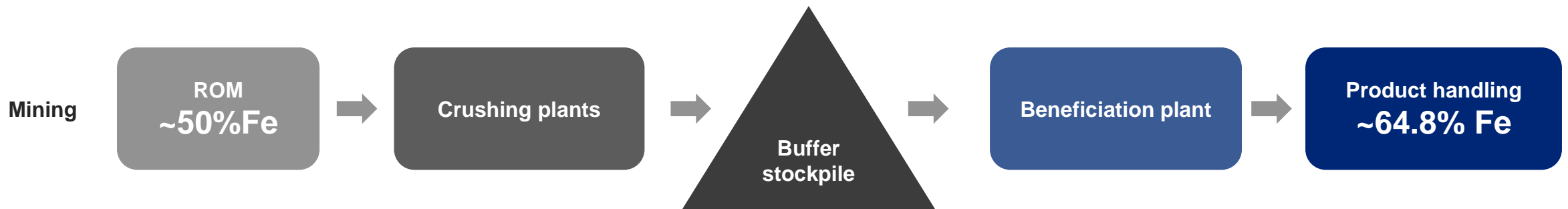
PROCESSING CAPACITY

Processing capacity

- Dry Direct Shipping Ore (DSO) plant ~13.2Mtpa
 - No beneficiation



- Dense Media Separation plant commissioned in 2017 ~ 0.8Mtpa
 - Beneficiation of lower grade orebody
 - Capital ~R280 (\$21) million invested in 2016/2017



KOLOMELA BY NUMBERS

Saleable Tonnes **13 – 14Mt per annum**

Ex-pit Waste **55 – 65Mt per annum**

Total Tonnes handled **73Mt per annum**

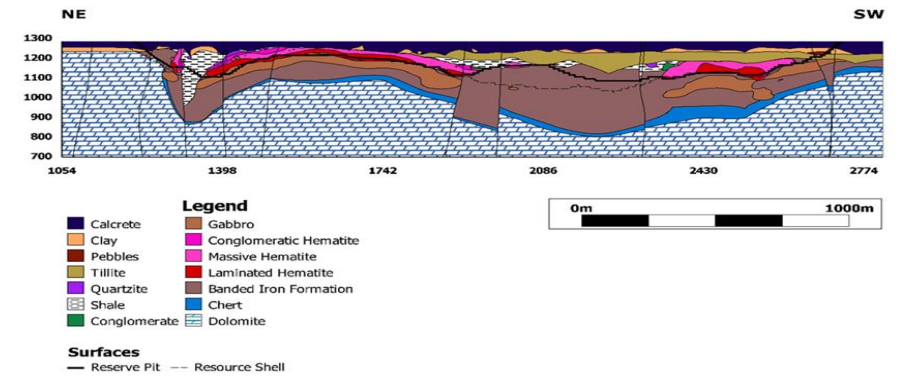
People **1 219 Permanent**
 1 260 (core) contractors

Cost **R240 – 250/t**

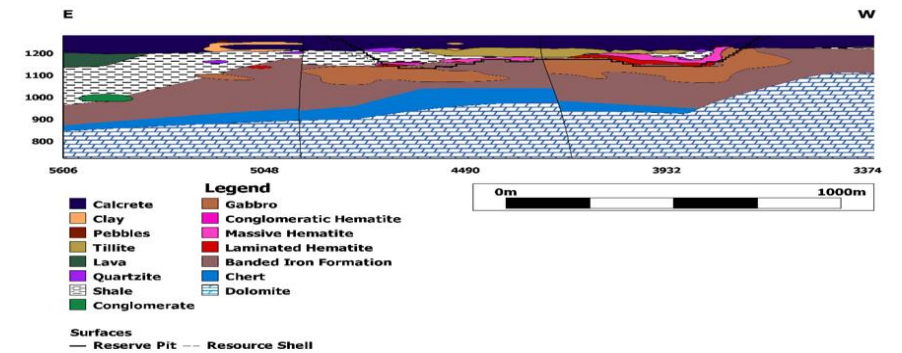
Life of Mine **14 Years**

Reserves **Total high grade reserves: 176Mt @ an average in-situ grade of 64.4%**

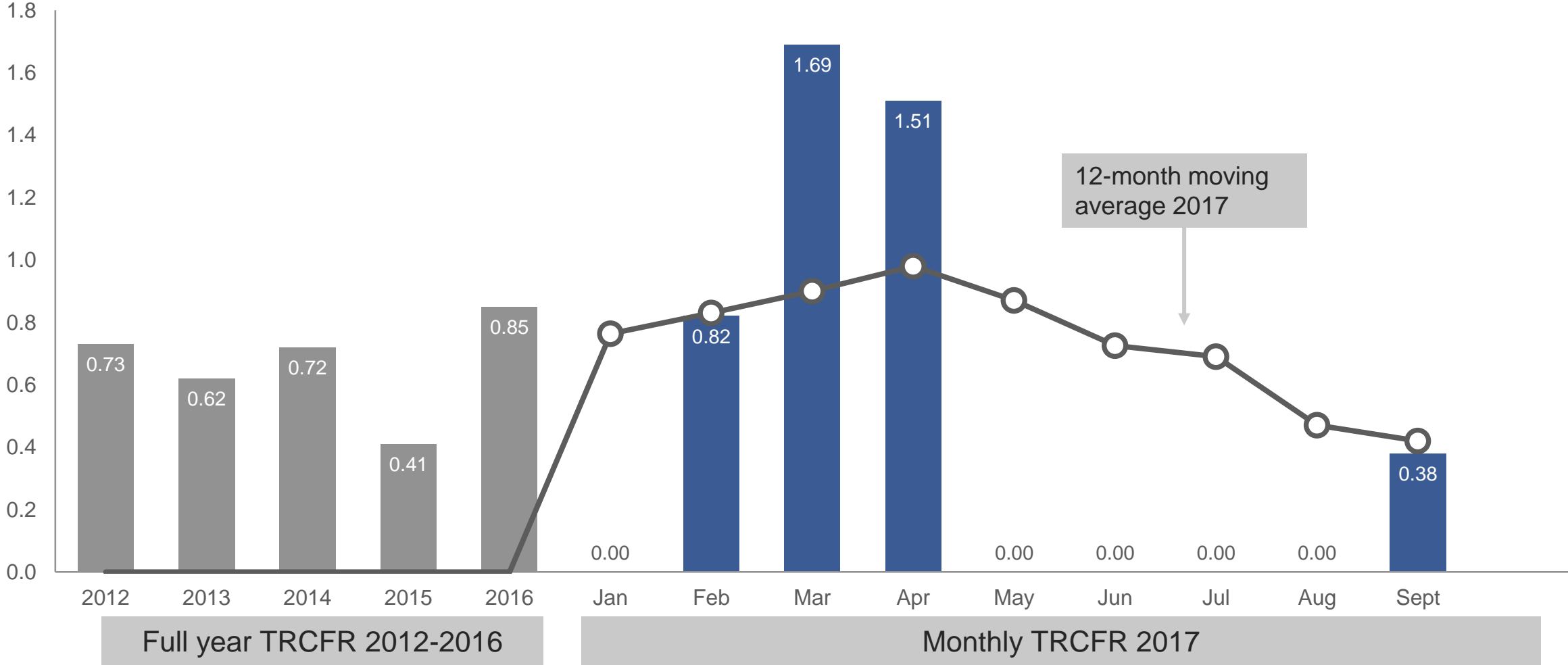
Leeuwfontein Section showing the variance in geology



Klipbankfontein Section showing the variance in geology

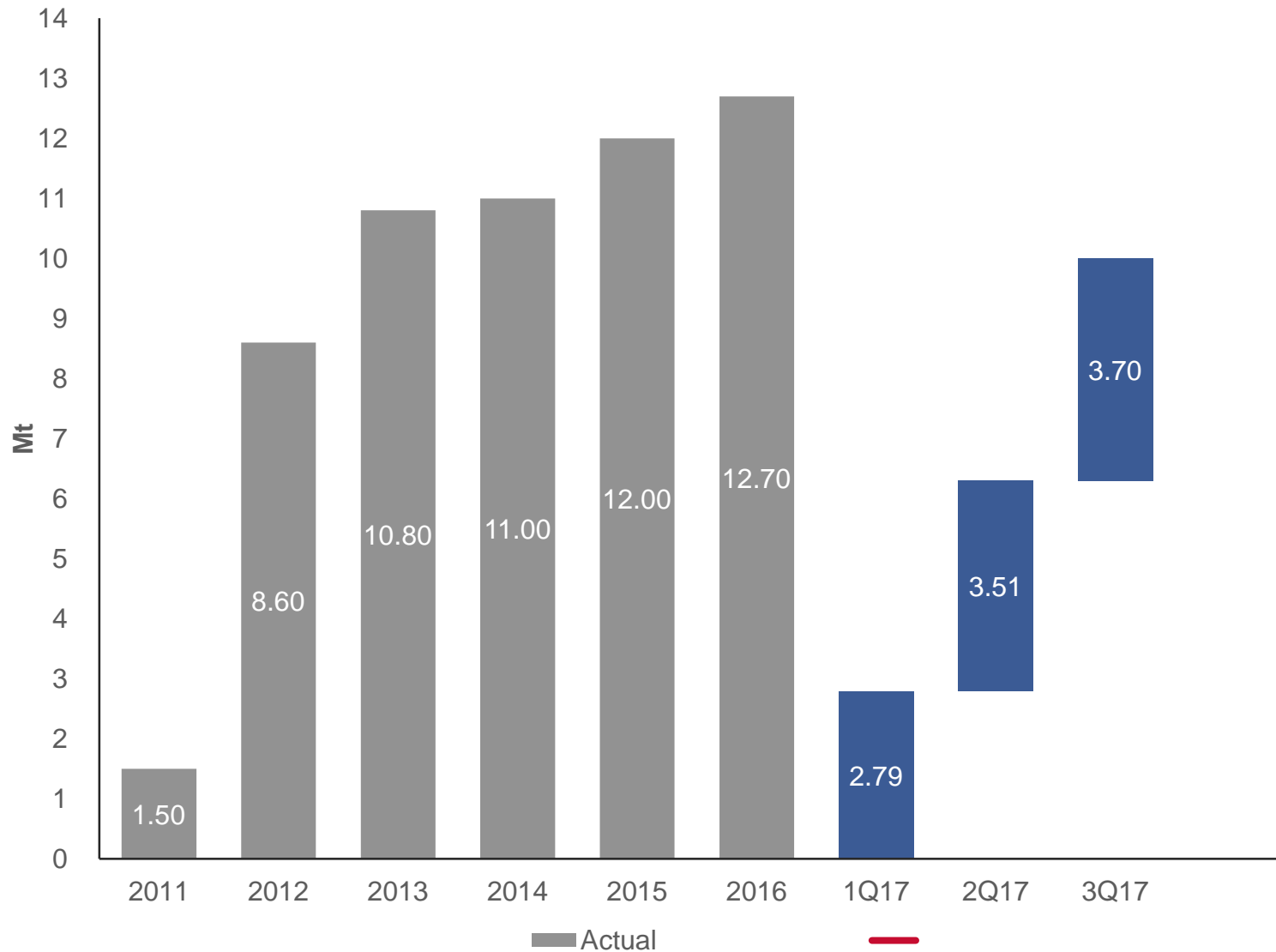


SAFETY



KOLOMELA HIGHLIGHTS

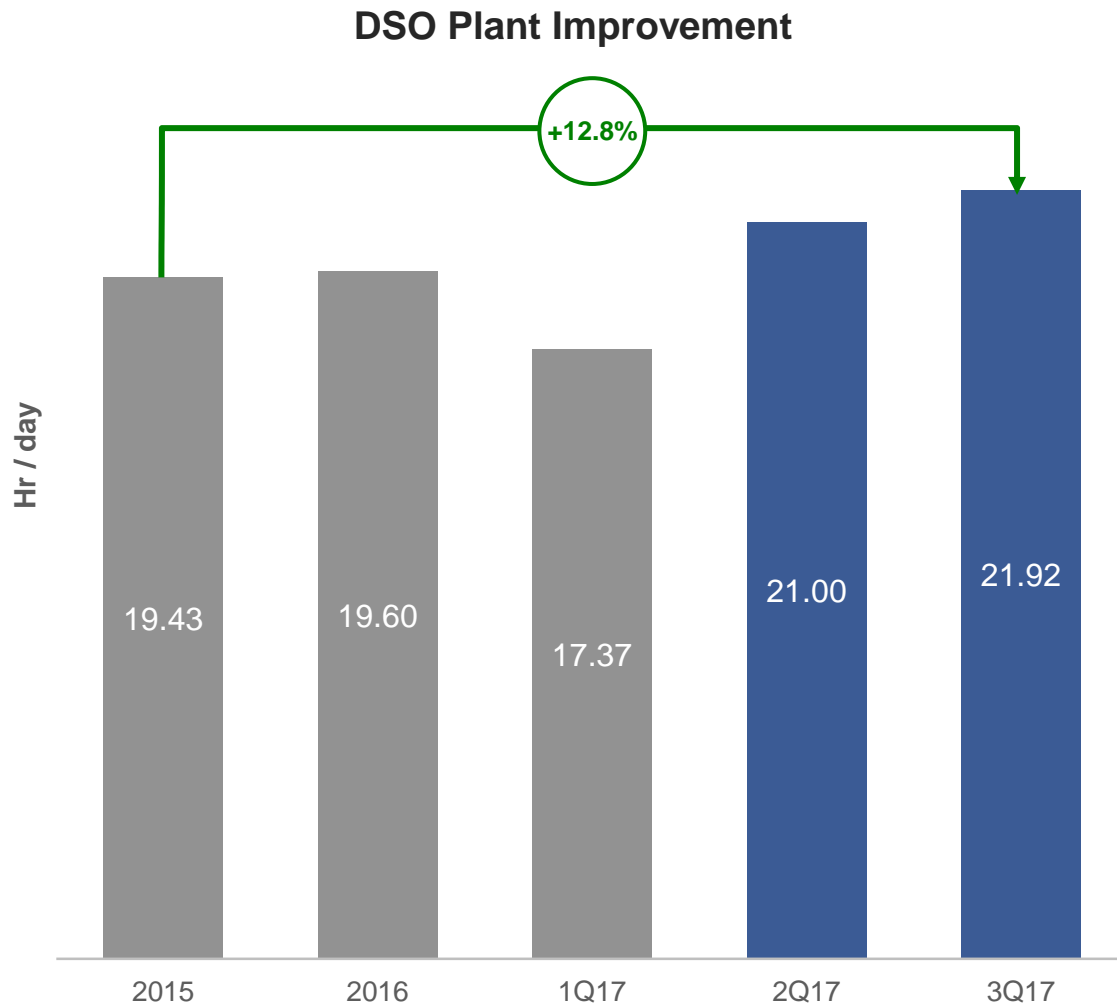
Exceeded nameplate capacity by 47% (9Mtpa to ~13.2Mtpa)



Actions that led to improvements

- Technology adoption
 - Advance Process Control in the plant
 - Autonomous drilling (**~70% of metres**)
- Implementation of the Operating Model
 - DSO plant fully rolled out
 - Heavy Mining Equipment in process

OPTIMISATION TO INCREASE PRODUCTION TO >14Mtpa



Focus area to increase production >14Mtpa

- DSO plant improvement
- Ramp up of DMS plant
- Load and haul efficiency improvement
- Implementation of the Operating Model

Actions for DSO plant

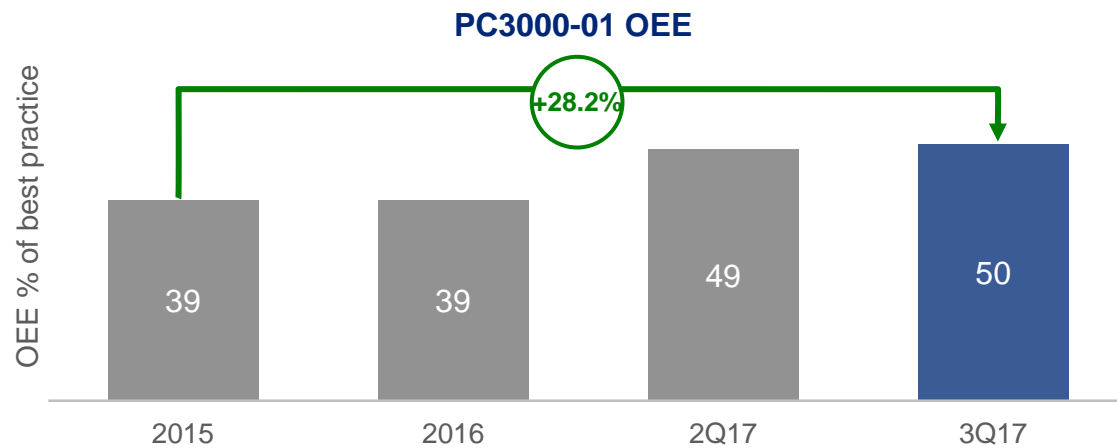
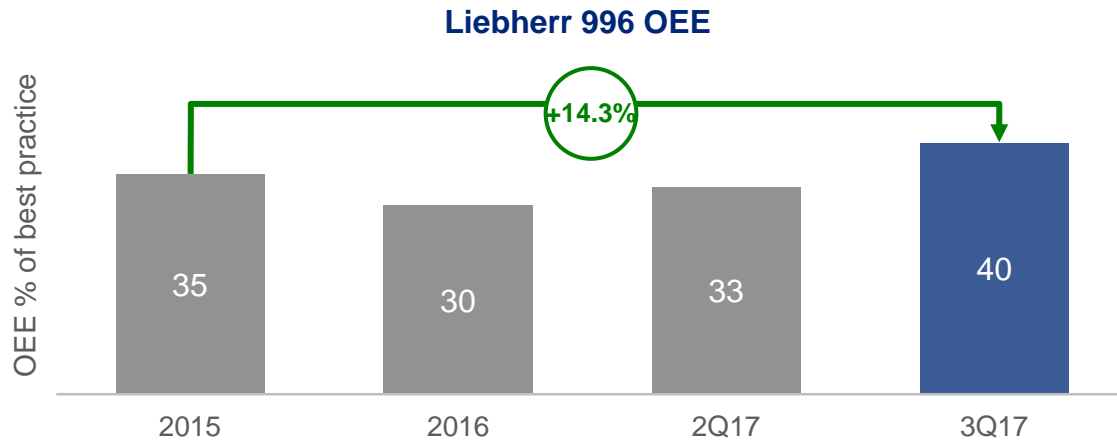
- Improved direct operating hours
- Technology efficiency improvements
- Completion of implementation of Operating Model

Actions for DMS plant

- Improved direct operating hours for crushing and beneficiation plant
- Production rates (t/h) for beneficiation plant

OPTIMISATION TO INCREASE PRODUCTION TO >14Mtpa

Rapid change delivering results...



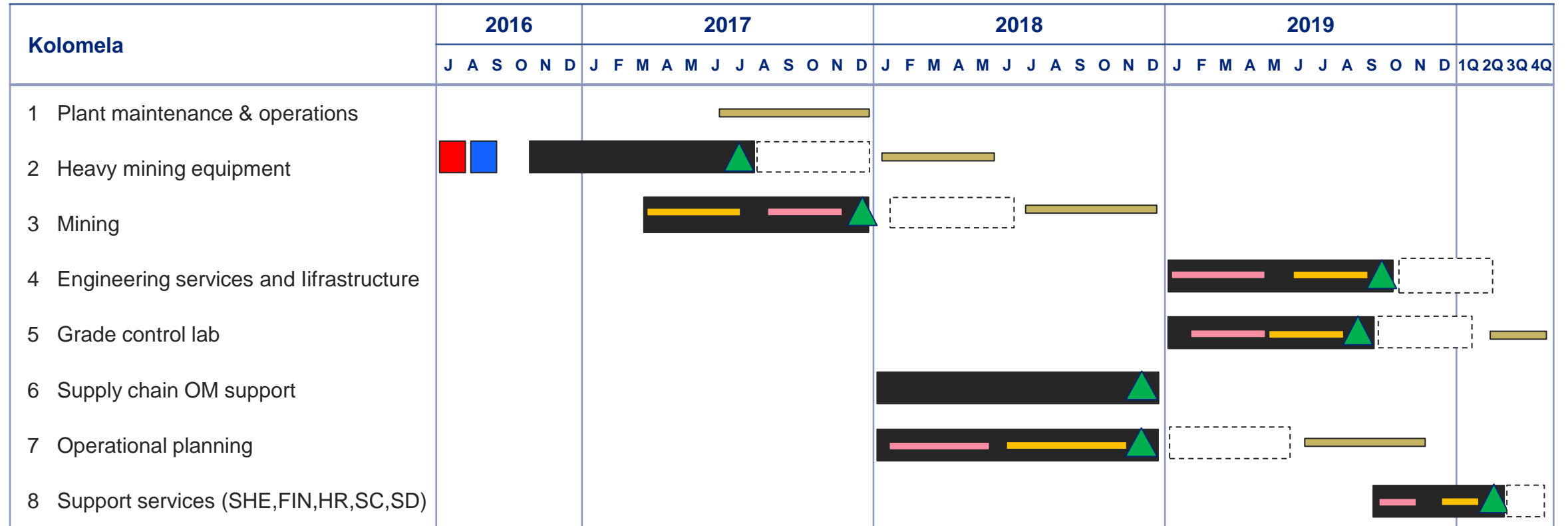
Load and haul efficiency improvement

- Improved reliability of the equipment
- Optimised operator efficiency
 - Hot seat change
 - Reduced shift change time
 - Improvement in direct operating hours

Actions for PC3000 shovels

- Improvement of loading rates (t/h)
- Improvement in direct operating hours

OPERATING MODEL IMPLEMENTATION SCHEDULE





**SISHEN
MAPI MOBWANO**

SISHEN LEADERSHIP TEAM



Mapikwa Mobwano
General Manager



Tony Power
Assistant General Manager



Mike Carney
Manager Mining Technical Services



Tshidiso Mokgatla
Manager North Mine



Jan Gerber
Manager South Mine



Christo le Grange
Manager Plant



Ernest Stonestreet
Manager Engineering



Marinus Hanekom
Manager Services and Central Workshop



Ngwako Khunwane
Manager SHE



Prajay Maharaj
Manager Finance



Gisela Gips
Manager Business Improvement



Justice Nkosi
Manager Human Resources



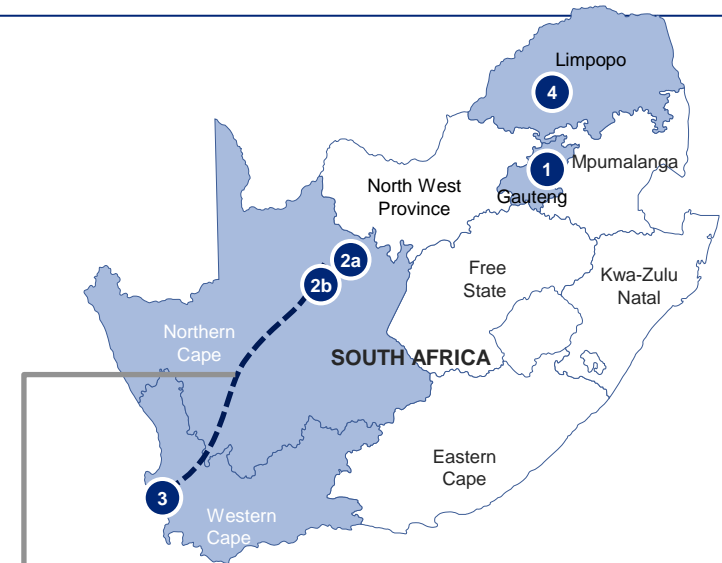
Humbulani Tshikalange
Manager Public Affairs

SISHEN OVERVIEW

- High quality mine
 - Premium products
 - Competitive on margin basis
- 16 year LoM, options exist to extend
- Focus is on improving operational productivity and lowering cost position

Sishen overview

Ore reserves	540Mt
Life of mine	16 years
Annual Waste Stripping	155 – 165Mt
Annual production 2017	29 – 30Mt
Employees & contractors	4 000 1 400



Where we operate

Export rail line

Current capacity of 60Mtpa of which Kumba has 44Mtpa allocation

Corporate office

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Mining operations

- 2a Sishen mine
- 2b Kolomela mine

Port operations

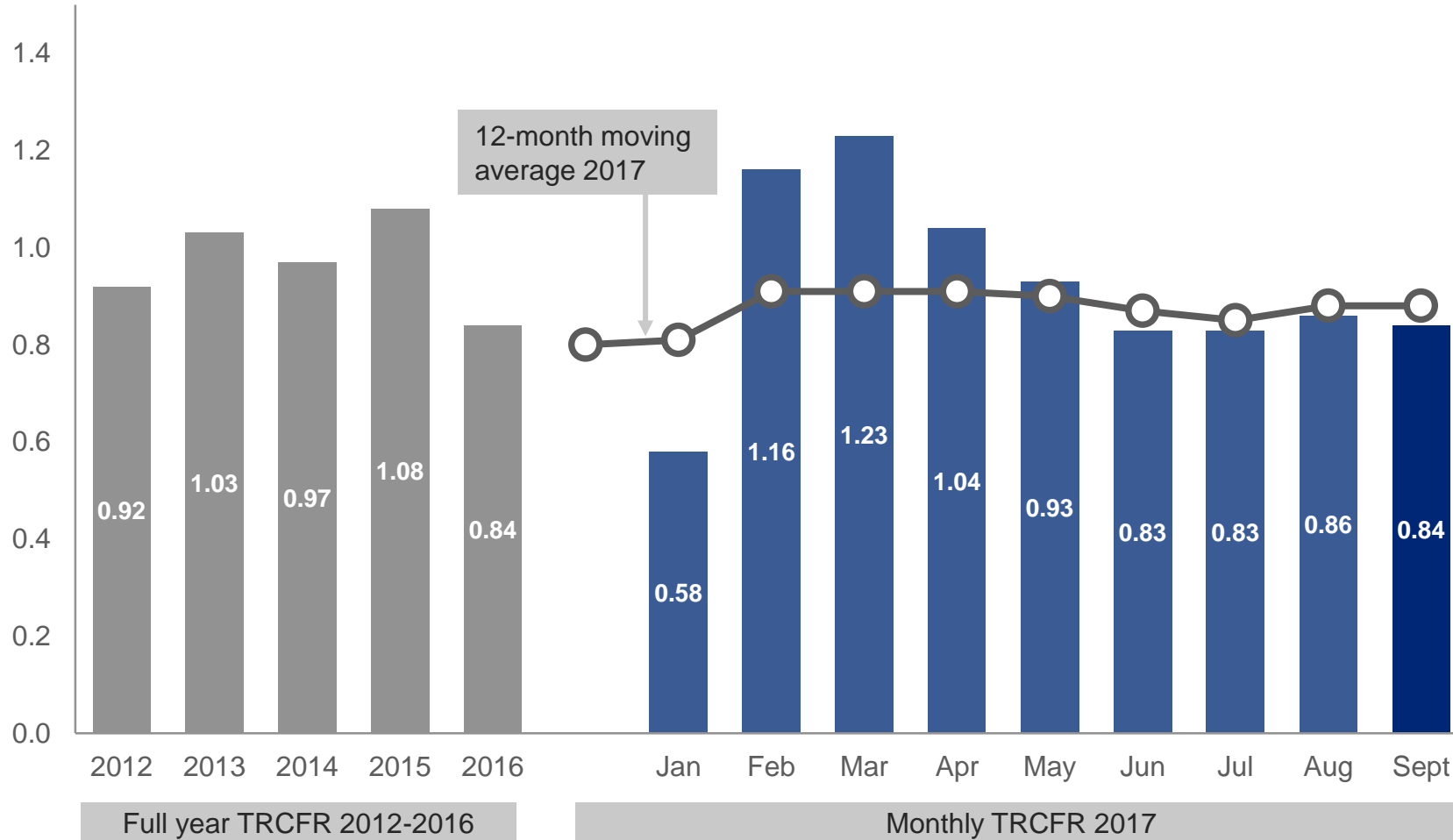
- 3 Saldana Bay

Discontinued operations

- 4 Thabazimbi mine

SAFETY PERFORMANCE

Total Recordable Case Frequency Rate (TRCFR)



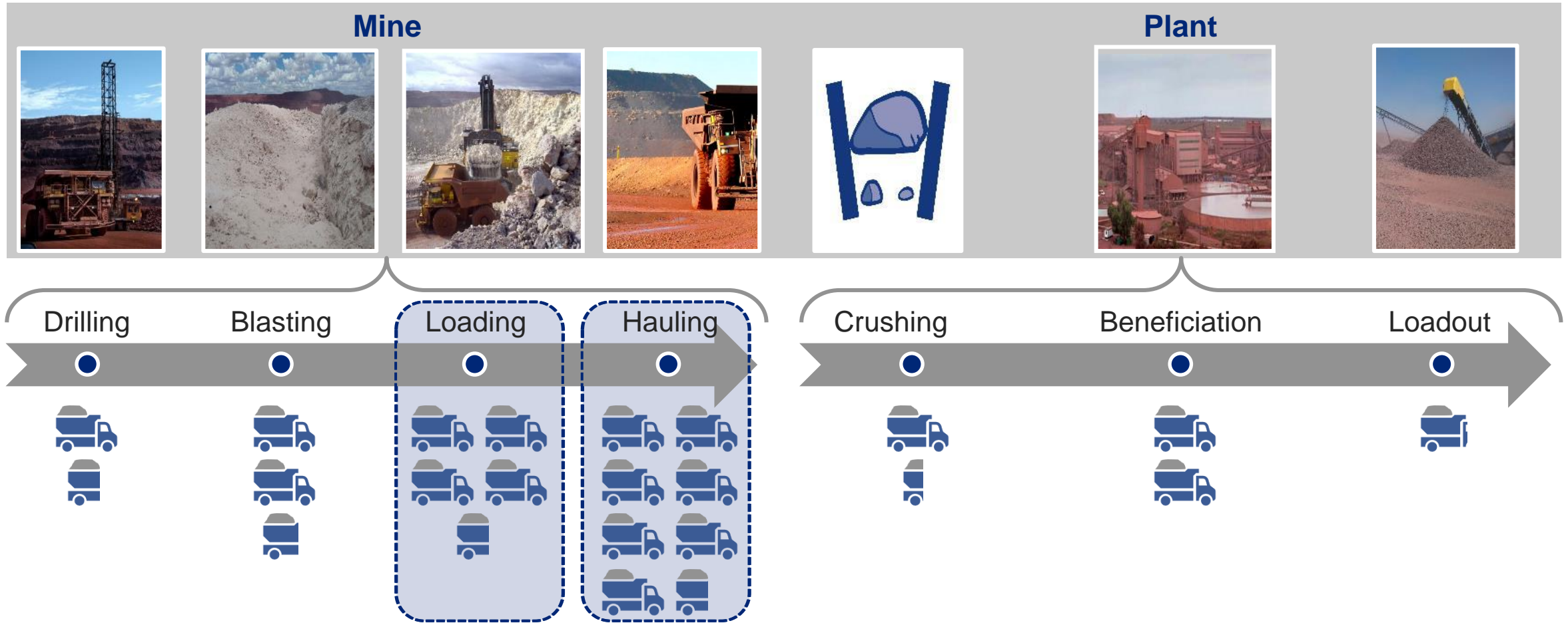
Elimination of Fatalities Top Priority

- **HPHs** (High Potential Hazards): Circumstances and behaviour that can kill
 - >1000 reported in 2017
 - 96% closed-out (made safe)
- **VFL** (Visible felt leadership acts): Engaging employees in the field
 - >10 000 conducted in 2017
- **Critical Controls:** Controls that save lives
 - Critical control monitoring
 - High risk work verification

Major focus: Musculoskeletal injuries (big portion of recordable cases)

SISHEN VALUE CHAIN

Focusing improvement on high cost processes



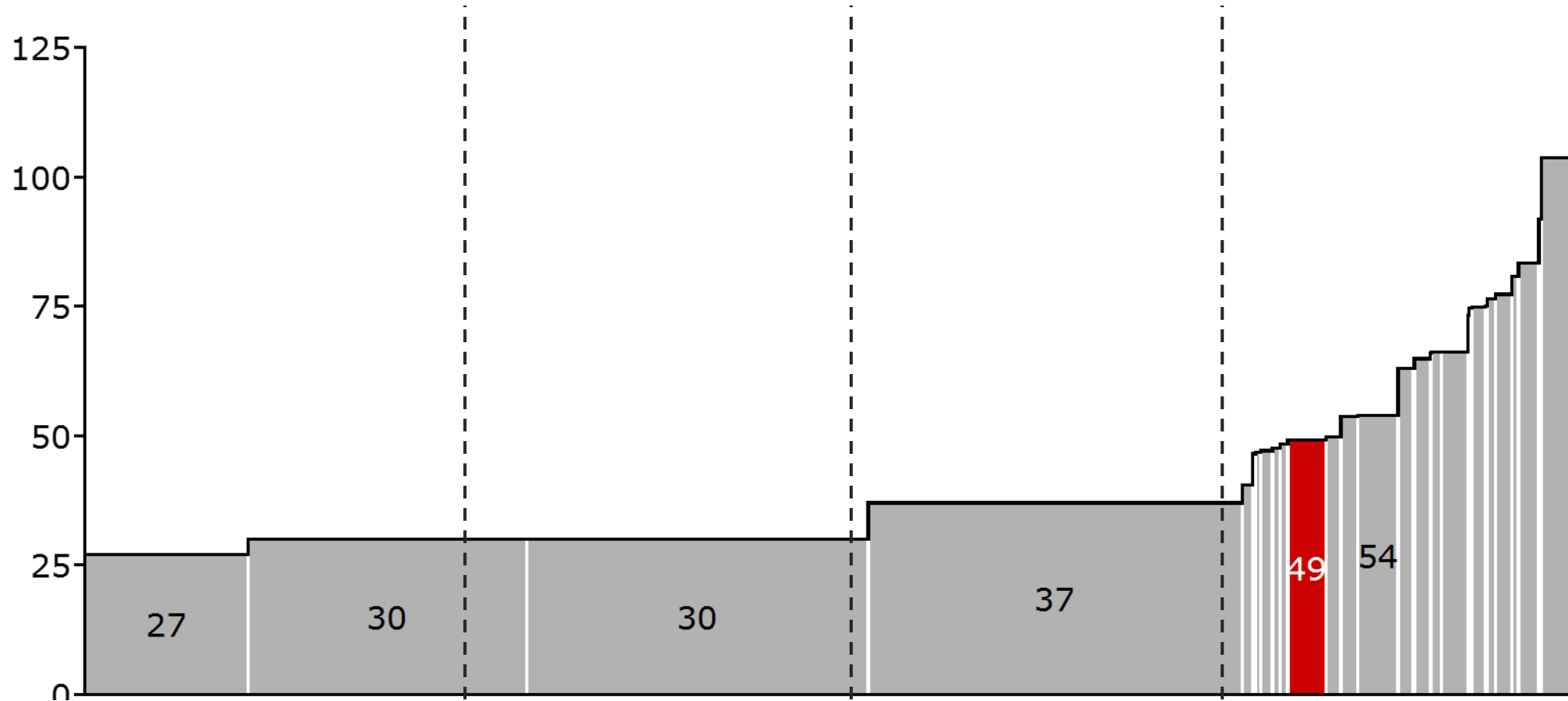
Focused programmes to improve efficiencies and reduce cost

 = 5% Unit cost

COST CURVE

High strip ratio and ore body positions Kumba in the 4th quartile

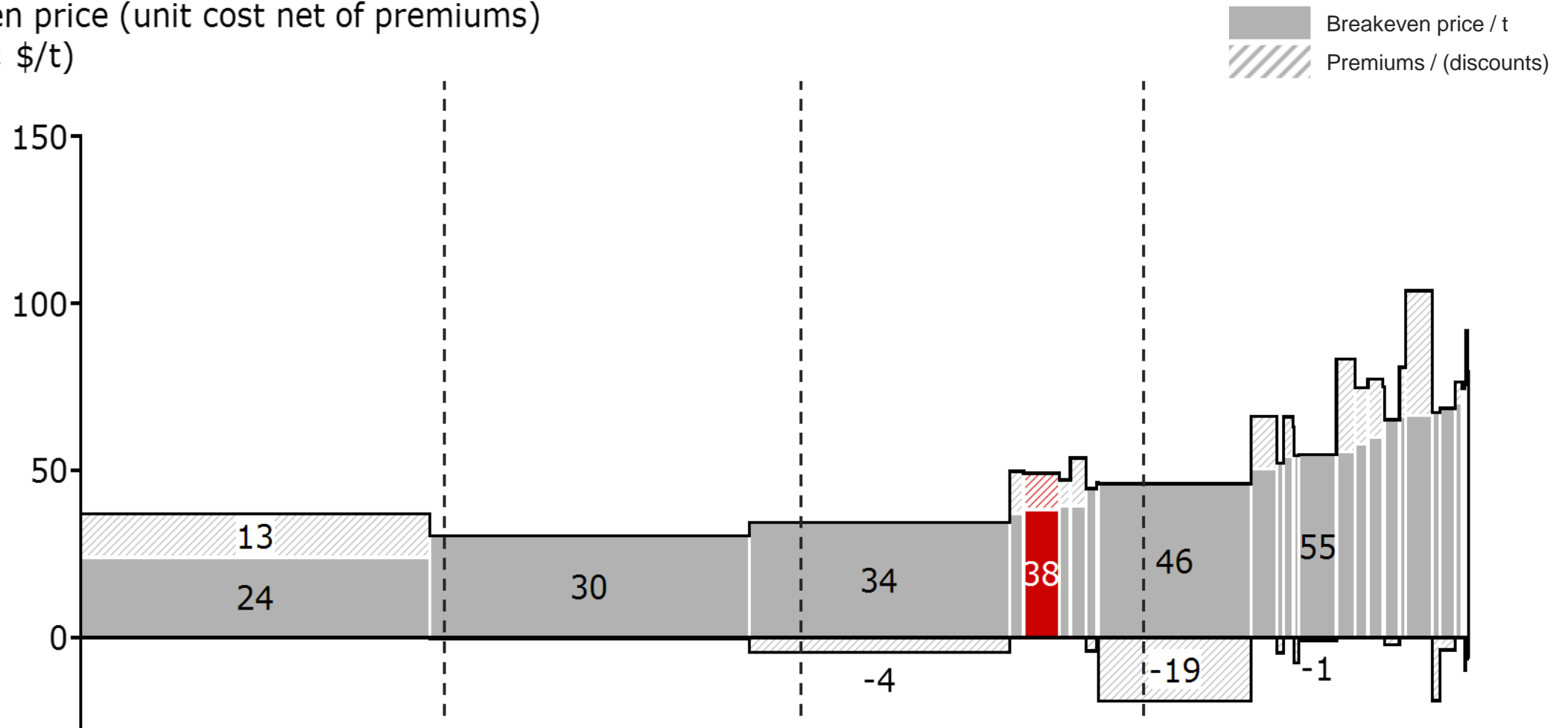
Unit cost
(Q2 2017; \$/t)



MARGIN CURVE

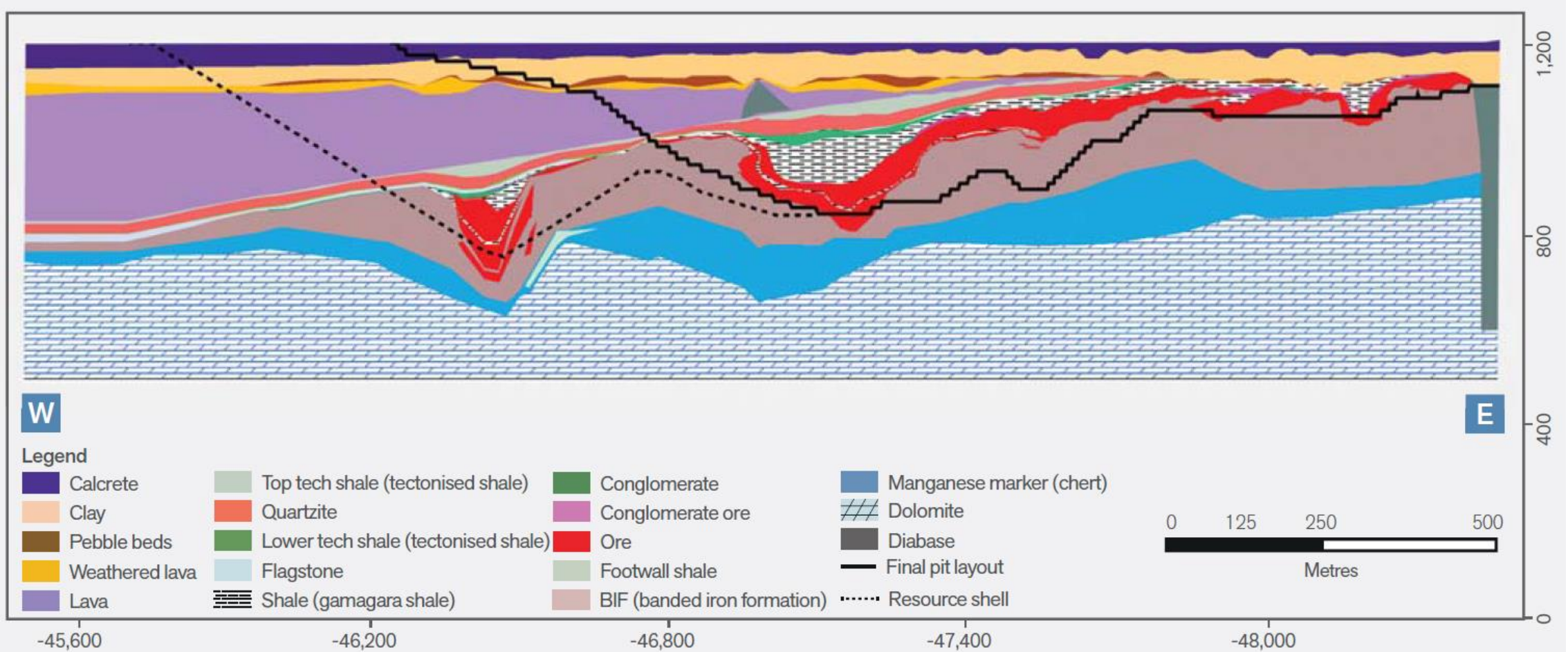
Premium quality products position Kumba more competitively

Break-even price (unit cost net of premiums)
(Q2 2017; \$/t)



GEOLOGY

North Mine Section



SISHEN ORE TYPES

Different qualities and physical characteristics make processing complex

Breccia Ore



Dominant Impurities: P, Si

Conglomeratic Ore



Dominant Impurities: K₂O, Al₂O₃, Si

Massive Ore

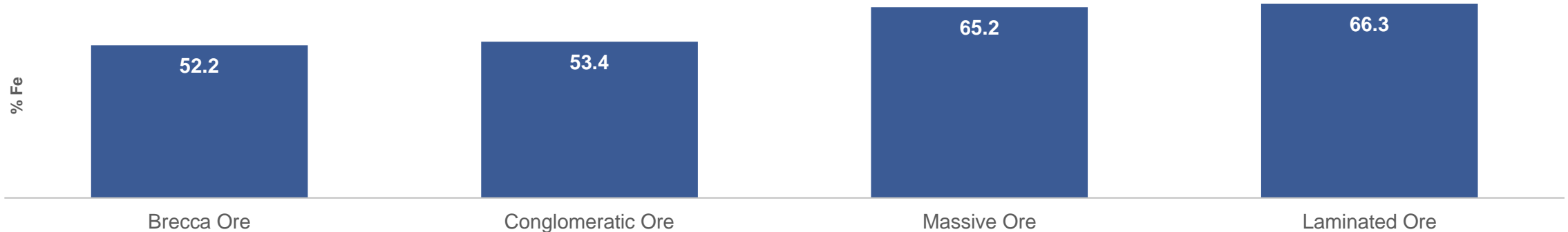


Low Impurities

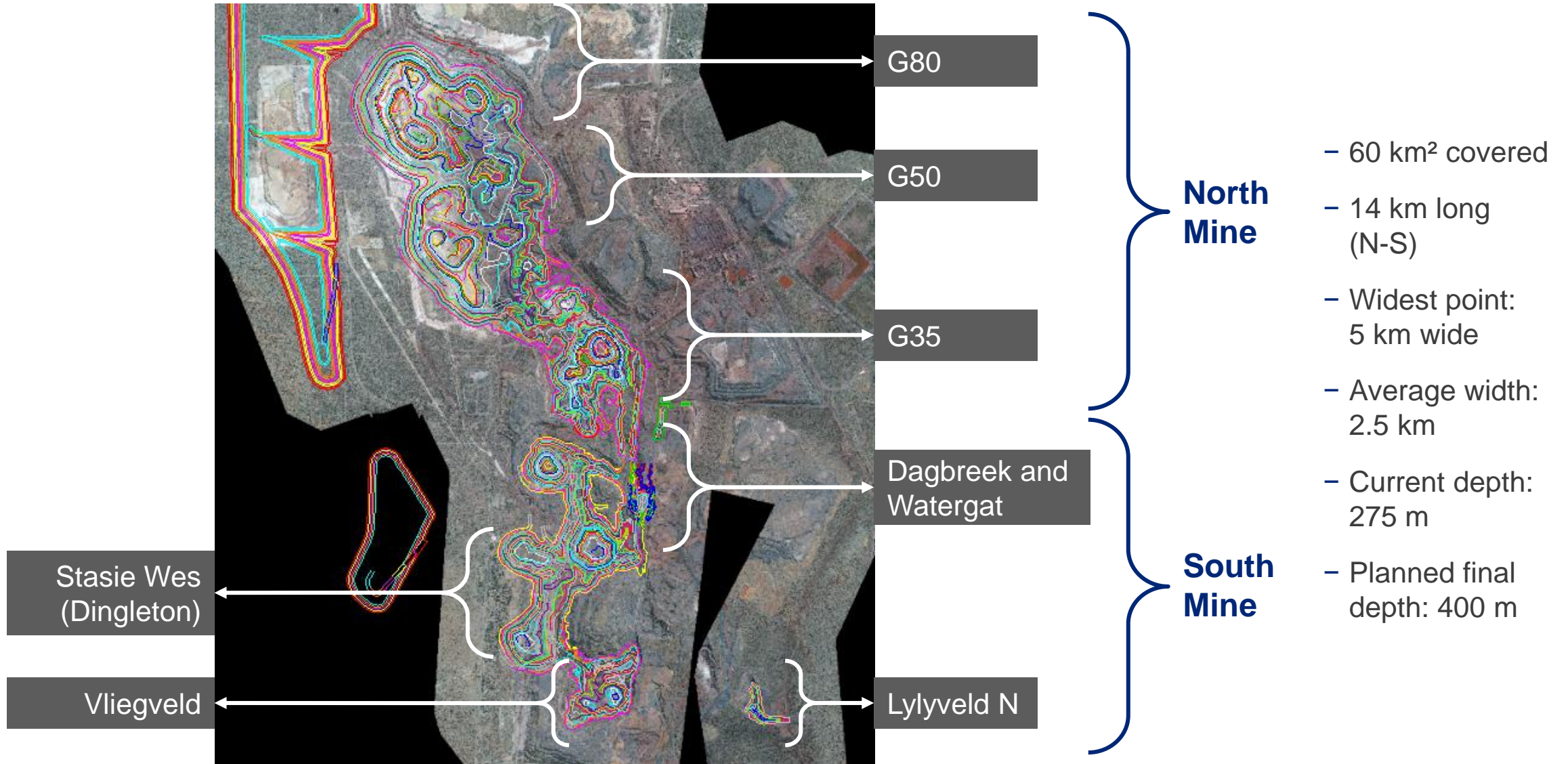
Laminated Ore



Low Impurities



SISHEN MINE AERIAL VIEW



MINE REDESIGN

		2014	2015	2016
Ore Reserve	(Mt)	716.6	Transition to lower cost pit	552.5
LoM production	(Mtpa)	~37		~27
LoM	(years)	16		17
FY actual production	(Mt)	35.4		28.4
FY strip ratio		4.4		3.3
LoM strip ratio		3.9		4.0
FY Kumba Breakeven	(\$/t)	63		29
FY Kumba Unit cost	(\$/t)	73		42

2014 – 2015:

- Iron ore price dropped from \$97/t to \$56/t (FY average) placing our margins under significant pressure

2015 – 2016:

- Sishen was reconfigured to a lower cost pit shell in order to ensure long term sustainability at lower prices
- Adopted a strategy of value (quality) over volume
- Significant restructuring to right size the organization
- Focus on executing the operating model and compliance to plan

MINE REDESIGN

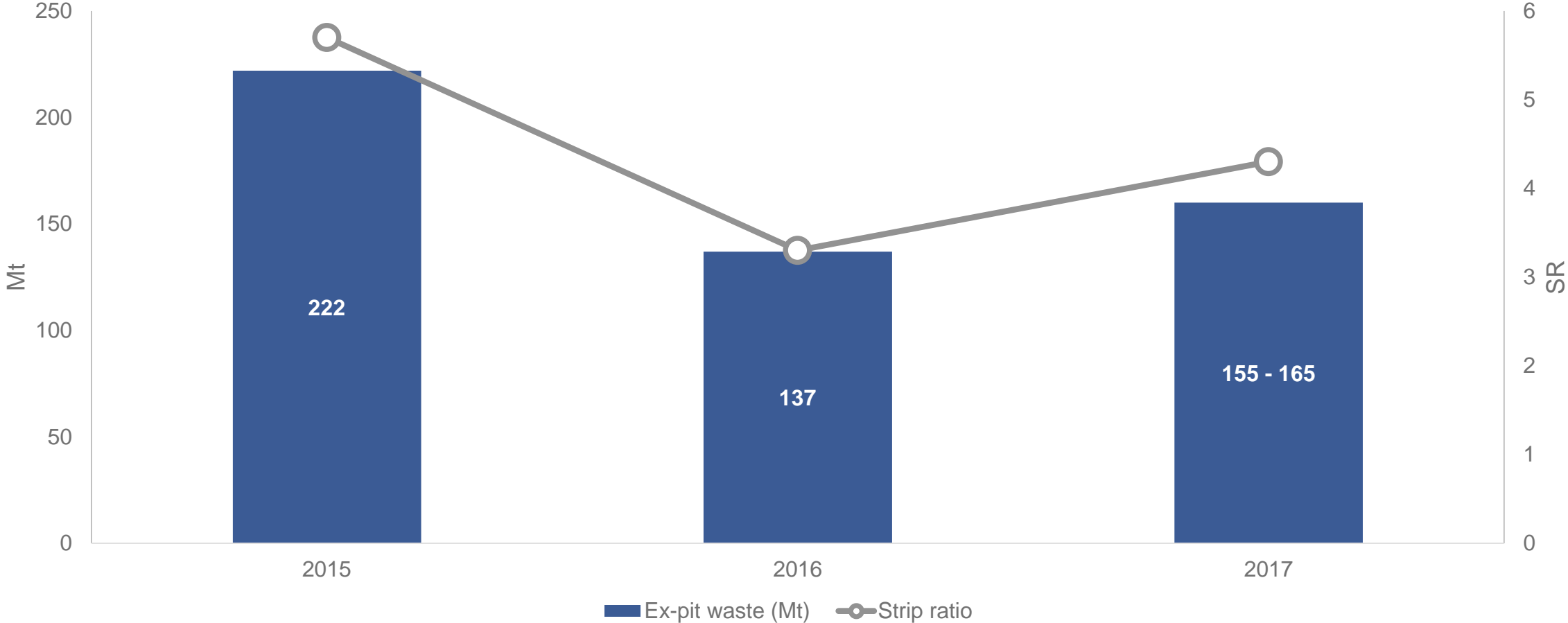
- Current Sishen pit boundary
- 2016 indicative LoM pit boundary
- 2015 LoM pit boundary (high stripping areas to be excluded)



MINE REDESIGN

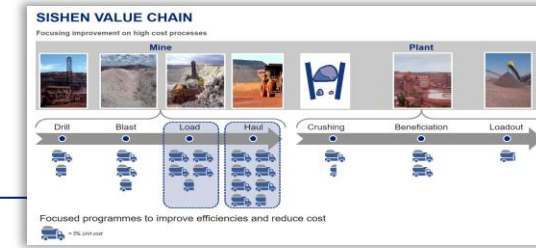
New mine plan optimising economy and enabling improved productivity...

Sishen production

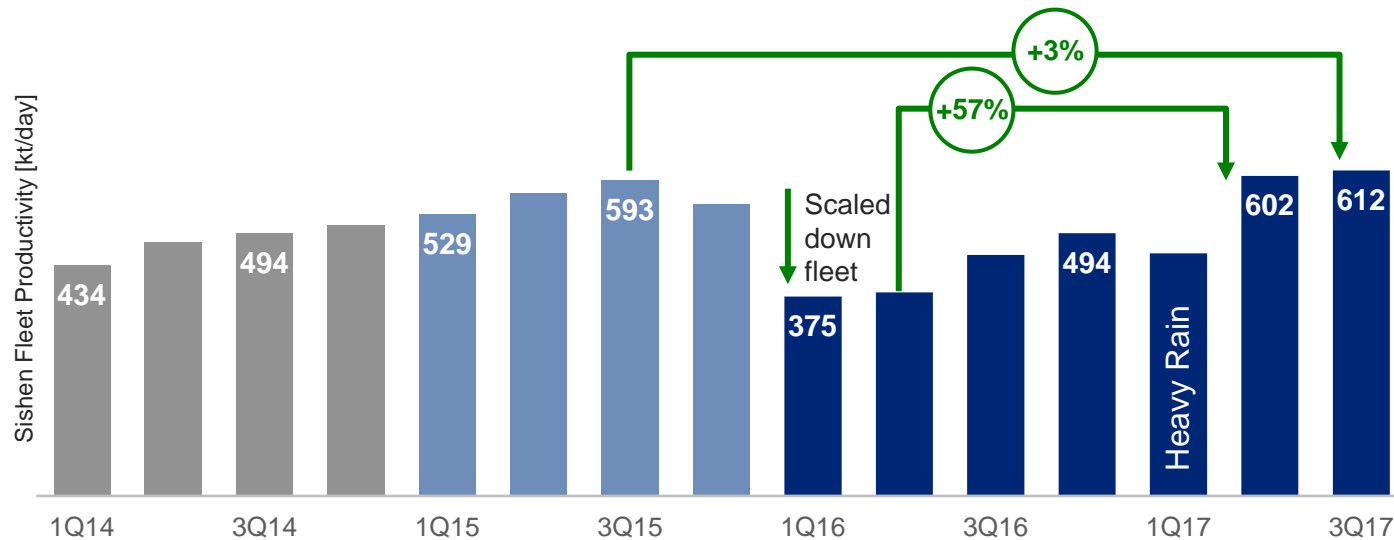


LOAD & HAUL IMPROVEMENT

Producing more with 72% of the fleet...



Sishen Owner Fleet Productivity



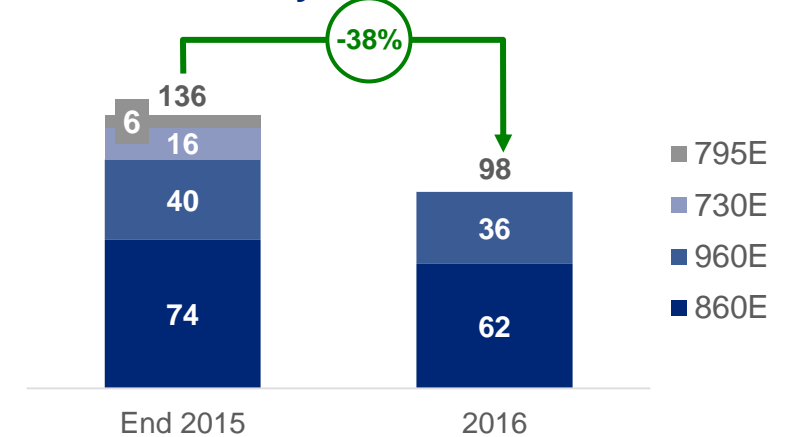
2Q16 vs 2Q17 Headlines

- 4100s handle twice as much material per day per shovel
- 960s move 1.6 times as much material per day per truck
- Trucks' direct operating hours increased by 5 hours per day
- Shift-change duration reduced by 88%

1Q16: Radical Steps Taken

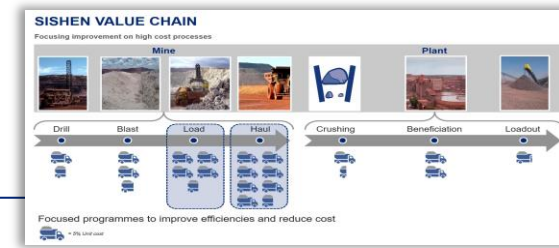
- ✓ Reduced fleet size significantly
- ✓ Announced restructuring – reduced head count by 30%
- ✓ Started developing a new mine plan
- ✓ Halved contractor contribution

Primary Trucks Reduced

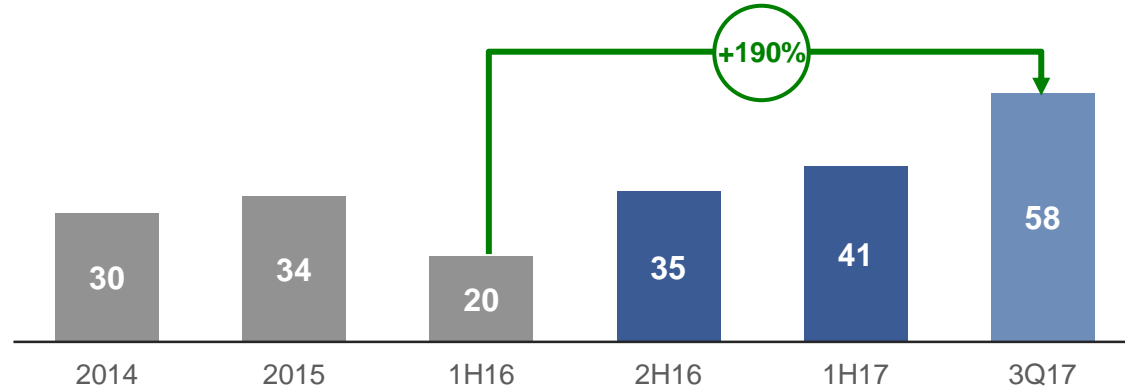


LOAD & HAUL IMPROVEMENT

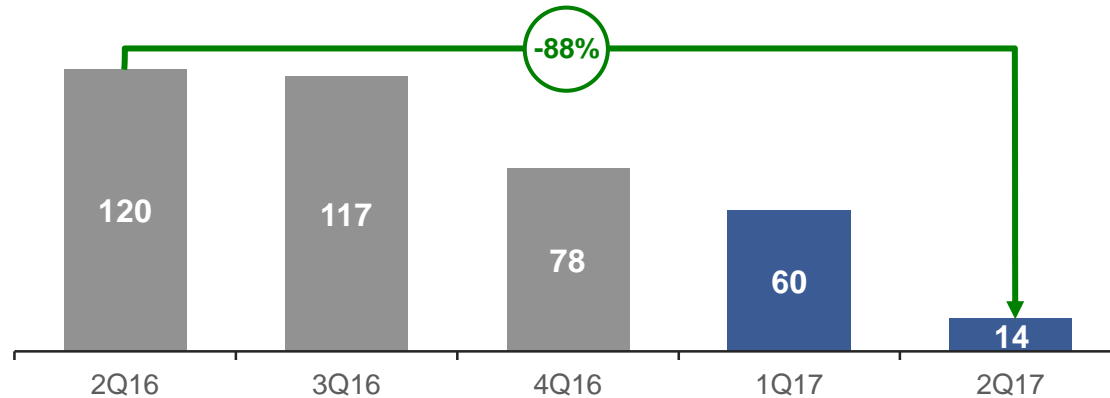
Rapid change delivering results...



4100 Shovels OEE vs best practice (%)



Shovels shift-change duration (min/day)

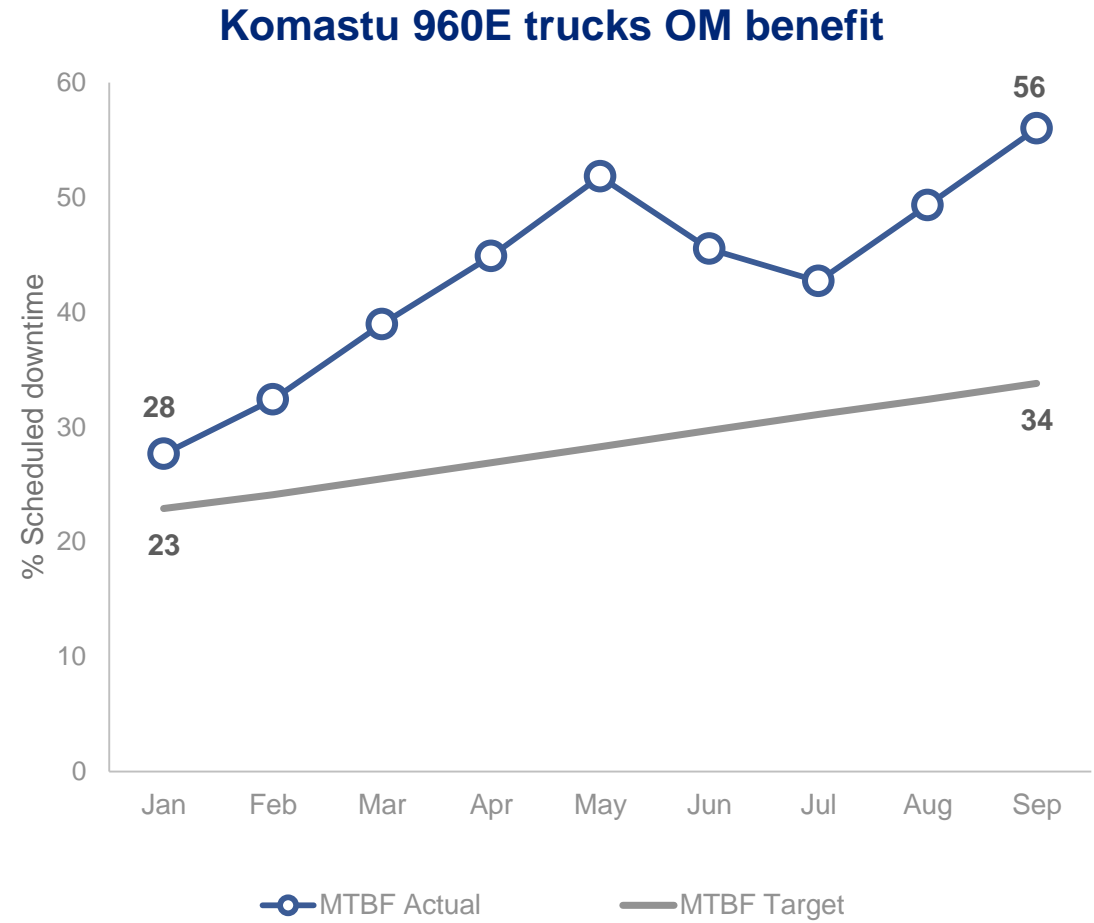
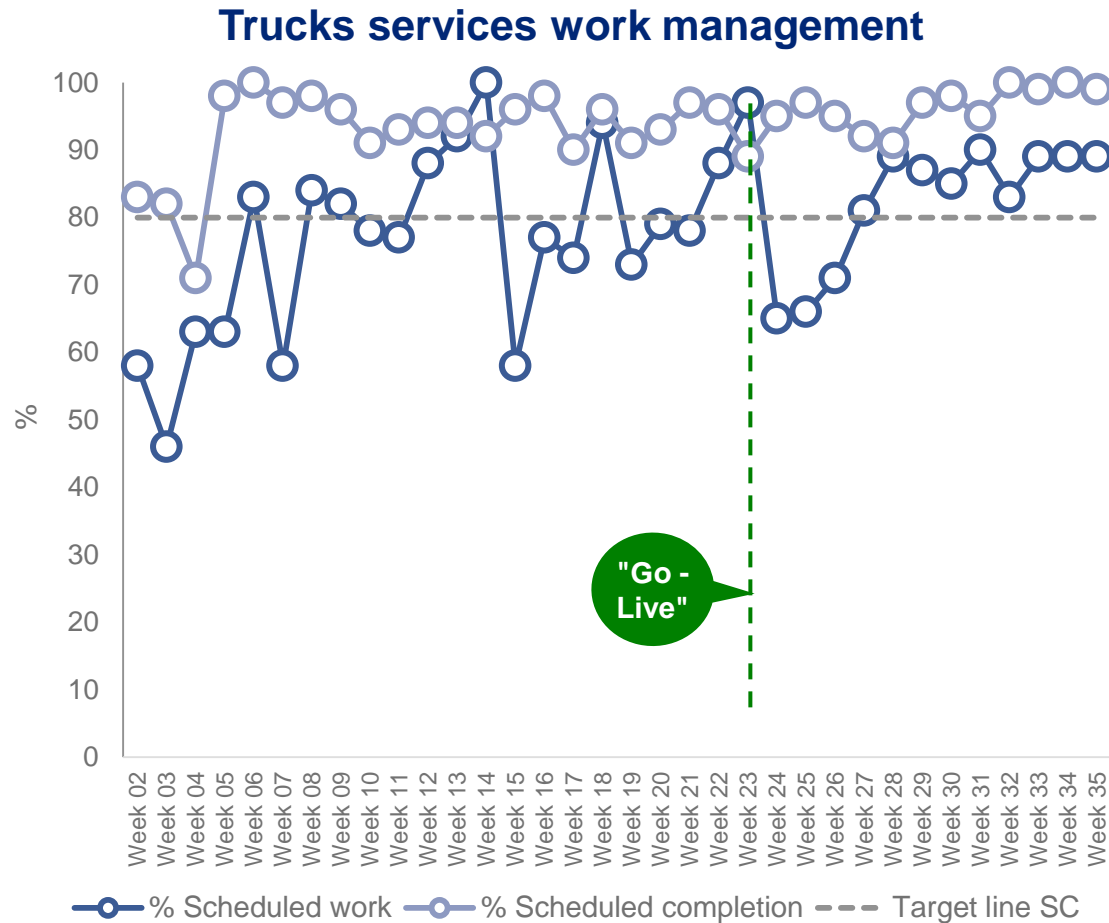


Actions that led to the transformation...

- Redesigned shift system
- Optimised operator efficiency
 - Motivation and engagement
 - Incentives
 - Improved shift change design
- Implemented best loading practices
 - Double sided loading
 - Wider benches
- Improved fragmentation through design trials
- Payload improvement through short interval control

WORK MANAGEMENT – TRUCK MAINTENANCE

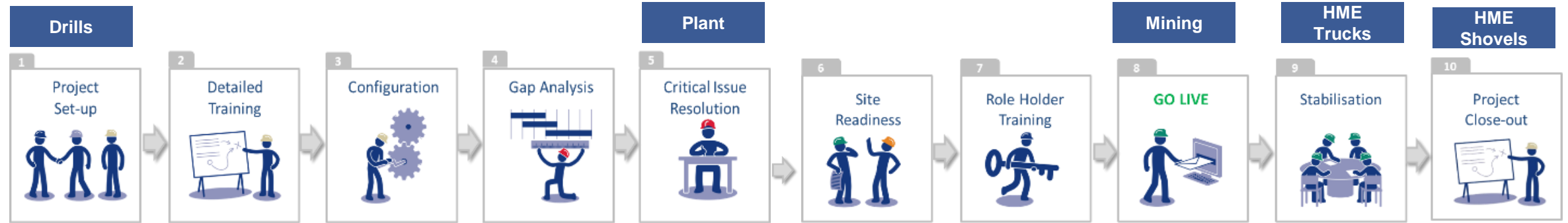
Creating stability and improving performance...



World class truck availability of >92%

OPERATING MODEL IMPLEMENTATION

Operating model is embedding and sustaining the productivity improvements...



Department	Go-Live Date
Shovels maintenance	✓ Jun 2017
Trucks maintenance	✓ Jun 2017
Mining operations	✓ Oct 2017
Drills maintenance	Feb 2018
Plant operations & maintenance	Jun 2018
Operational planning	Sep 2018
Support services	1H2019

SISHEN PLANTS

	DMS Plant	Jig Plant	Modular Plant
Year Constructed	1975	2007	2014
Yield	78 – 86%	55 – 65%	
Annual Product	18 – 18.5Mt	11 – 11.5Mt	
Feed Quality (%Fe)	>59%	49 – 59%	25 – 45%
% Lump	68 – 72	66 – 70	39 – 42
Average Product Quality (%Fe)	Lump 64.8% Fine 63.8%	Lump 63.2% Fine 63.2%	Lump 63.5% Fine 64%

DMS Plant

- Dense Media Separation technology
- Old plant
- Processes high Fe content ore
- High yield and high quality product
- Maintaining good efficiencies

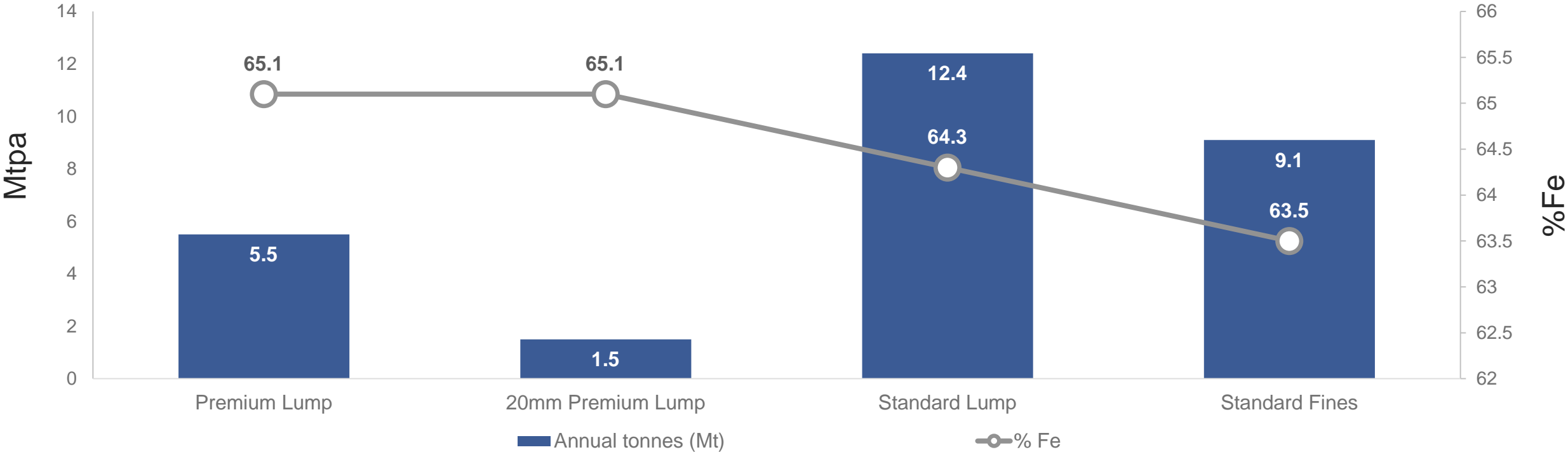
Jig Plant

- Gravity separation (jigging) technology
- Designed to process lower grade reserves
- Modern and efficient

Modular Plant

- Ultra High Density Media Separation
- Processing Jig discard
- UHDMS technology unlocking the future for Sishen and Kumba through lower grade beneficiation

PRODUCT PORTFOLIO



DINGLETON



Overview

- Provide access to >161Mt of ore as per LoM plan
- Capex of R2.5bn



Objectives

- Relocate 517 households, businesses and municipal infrastructure
- Deproclaim town into mine town
- Decommission and demolish infrastructure



Status

- 496 homes replaced
- Schools, clinic, Government and municipal offices relocated

COMMUNITY DEVELOPMENT

Strategic Focus Areas	Projects
Health & Welfare	<ul style="list-style-type: none"> - Batho Pele Mobile Clinic - Dingleton Soup Kitchen
Youth Development	<ul style="list-style-type: none"> - Kuruman Field Band
Education	<ul style="list-style-type: none"> - Ya Rona Early Child Development centre - Sishen High School bursary programme
Enterprise Development (since 2008)	<ul style="list-style-type: none"> - 119 SMMEs supported - 1 094 jobs created - Turnover of R536 million - R33.2 million Zimele loan repayments
Partnerships	<ul style="list-style-type: none"> - Manyeding Cultivation Project - Organic Honey Bee Project

Batho Pele Mobile Clinic



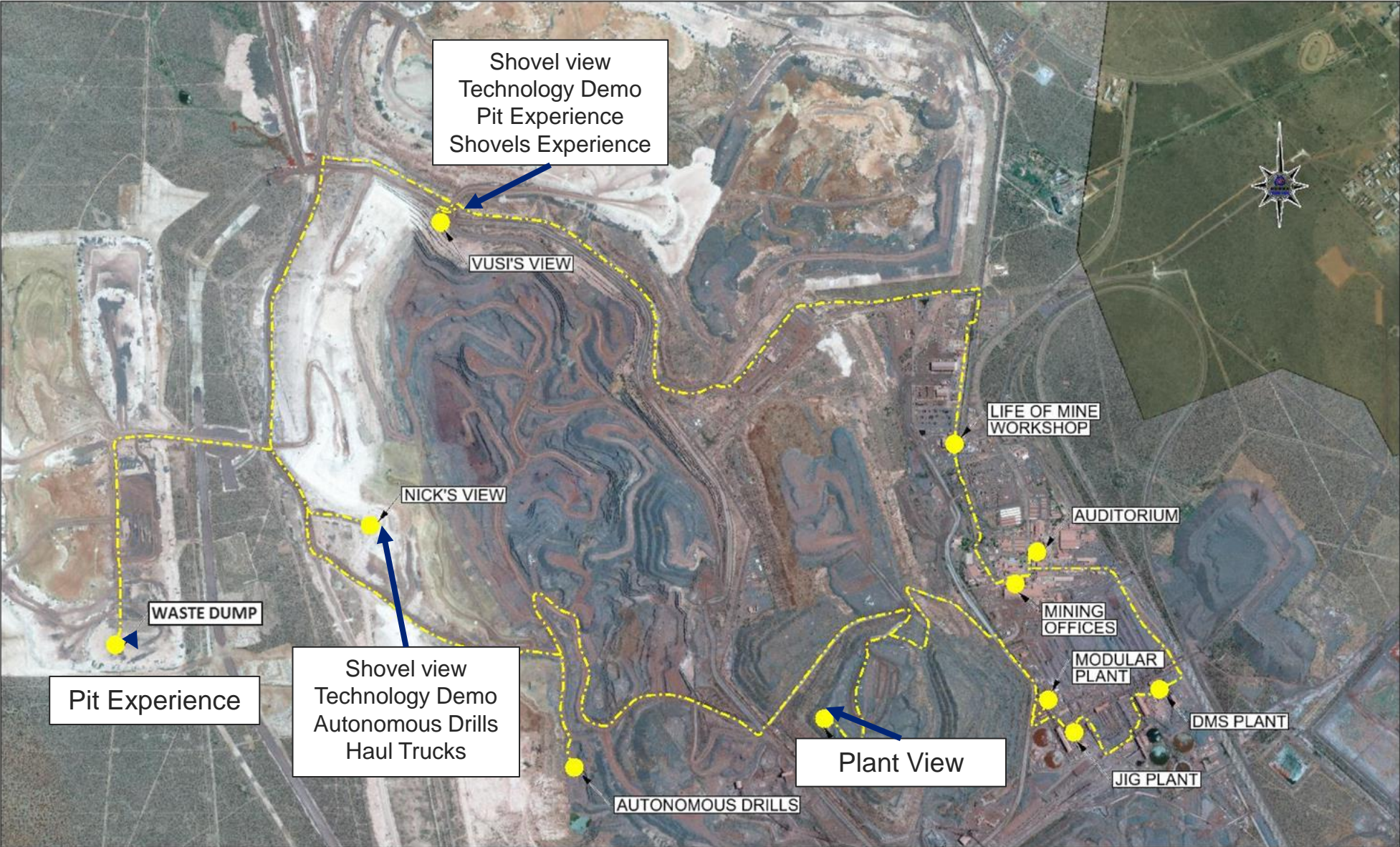
The Batho Mobile health clinic at Gasese Village (80km from Kathu) in the Northern Cape. The mobile clinic provides primary health care to poorer villages in the JTG District

Kuruman Field Band



Kuruman Field Band was established in 2012 and currently has 150 youth participating from poor backgrounds

TODAY'S PIT VISIT





**TECHNOLOGY
GLEN MCGAVIGAN**

KUMBA'S JOURNEY 2015 - FUTURE



Crisis

2015

- Business under pressure
- Significant restructuring underway to reduce breakeven price



Restructuring

2016

- Restructuring completed
- Mining run rates improved
- Reduction in breakeven price



Step-up performance

2017

- Continued implementation of Operating Model and **technology rollout**
- Mitigate inflation and higher waste cost pressures to embed resilient low cost delivery culture
- Reinstating dividend



Leveraging endowment

Medium term

- **Technology adoption for cost, productivity and safety gains**
- **Sishen upgrade to UHDMS and low grade beneficiation**
- Exploration opportunities
- Value accretive growth options

KUMBA'S TECHNOLOGY JOURNEY 2014 - 2017















- Developed fit for purpose technology strategy in 2014 to improve **safety, productivity and reduce cost**.
- The automation of critical value chain equipment in the mine & plant improve efficiencies, resulting in driving down operating costs
- Implementation of data integration systems and the upgrading of industrial information technology (IIT) has created a technology ready business

1	Horizon One (Near)	2	Horizon Two	3	Horizon Three
	Best possible today		Integrated autonomous operations		Smart mining
	Operator assist <ul style="list-style-type: none"> - Visibility - Efficient integrated systems - Optimised value chain 		Removing people from harm <ul style="list-style-type: none"> - Seamless - Remote training - Intelligent system 		Sustainable clean mining <ul style="list-style-type: none"> - Selective mining - Minimal impact - Market driven
	<ul style="list-style-type: none"> - Lower operating costs, stabilise operating model and drive efficiency 		<ul style="list-style-type: none"> - Real time efficiency management 		<ul style="list-style-type: none"> - Sustainably market driven mining
	Assisted employees		Up skilled and safer employees		Progressive employees
	Enabled community		Transformed community		Advanced community

PROJECTS 2014 - 2017

Sishen

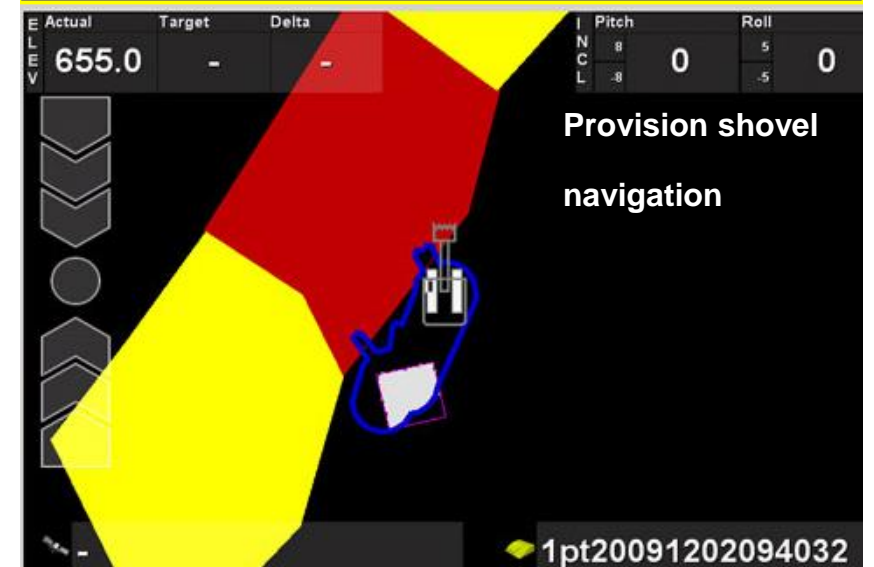
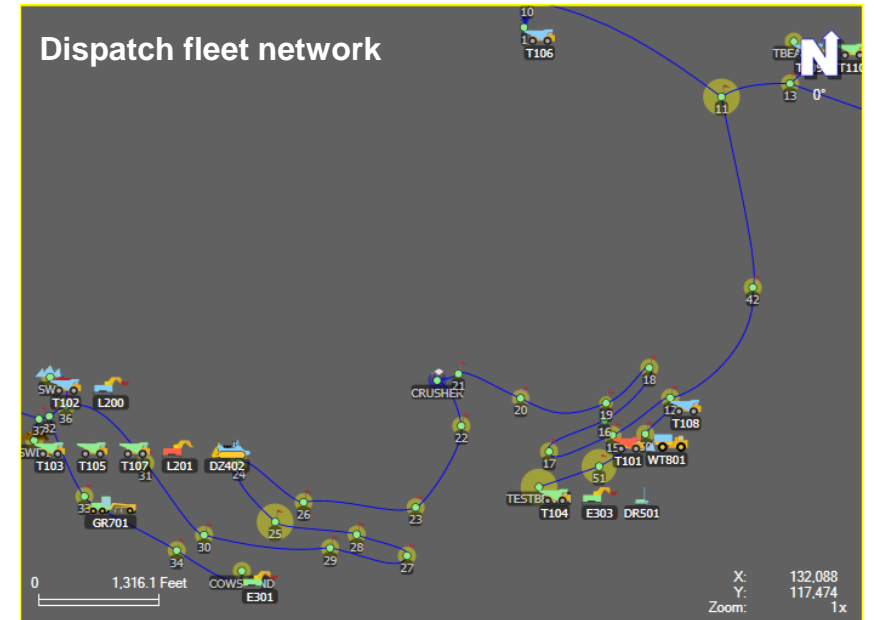
Kolomela

Dispatch Fleet upgrade		
Automated Drilling		
Operator Assist		
Advanced Process Control		
Upgrading information systems		
Geo-Spatial Data Capturing Tool		
Mining Information Systems (MIS)		

FLEET MANAGEMENT SYSTEM UPGRADE

- Upgrade fleet management system (Dispatch)
- Optimise load and haul cycles to **maximise productivity and efficiencies**
- High precision GPS shovel guidance system (Provision) to dig the right material, keep the designed bench grade, respect dig limits, and work within the machine's optimal operating specifications.
- Real time monitoring including asset health (MineCare)

Results (960E truck fleet)	Aug 2015	Sep 2017
Queuing time (mins)	5.7	4.9
Average speed (km/h)	21.2	29
Hang time	2.81	2.05



AUTOMATED DRILLING

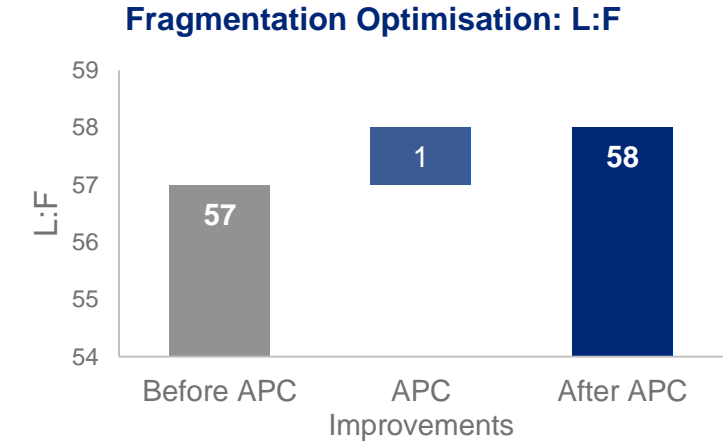
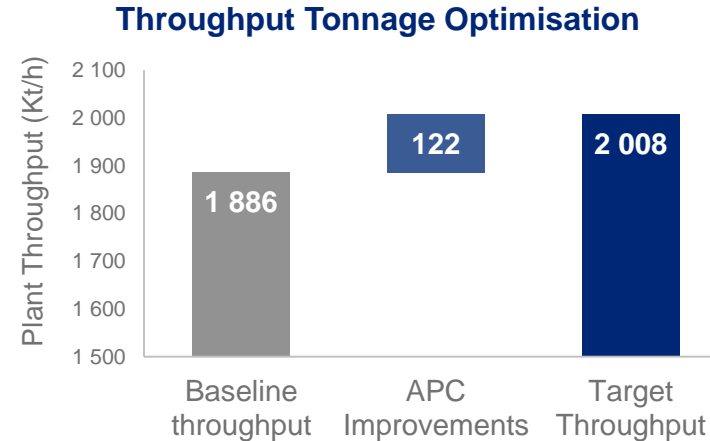
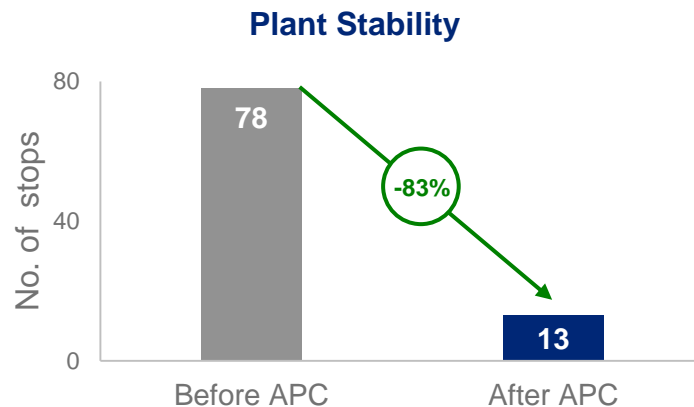
- Kolomela blast hole drilling fleet fully autonomous
- Benefits realised (Sep 2015 base to Aug 2017):
 - Improved safety
 - Drill hole quality
 - Increased direct operating hours **from 17.3 to 18.6hrs** per day
 - Reduction in levelling time from **1.3mins to 0.4mins**
 - Improvement in tramming time **2.4mins to 0.9mins**
- 2 Atlas Copco Pit Vipers converted at Sishen



ADVANCED PROCESS CONTROL (APC)

- Improved measurements and control of the processing plants through automation
- Rolled out at Kolomela
- Jig plant to be completed at Sishen in Dec 2017 followed by washing and screening plant in 2018
- Kolomela benefits realised (before and after APC):
 - **83%** improvement in plant stability
 - **6.5%** increase in plant throughput
 - **1%** improvement in lump:fine ratio

Actual benefits



MINE INFORMATION SYSTEM (MIS) AND GEO-SPATIAL TOOLS

Mine Information System (MIS)

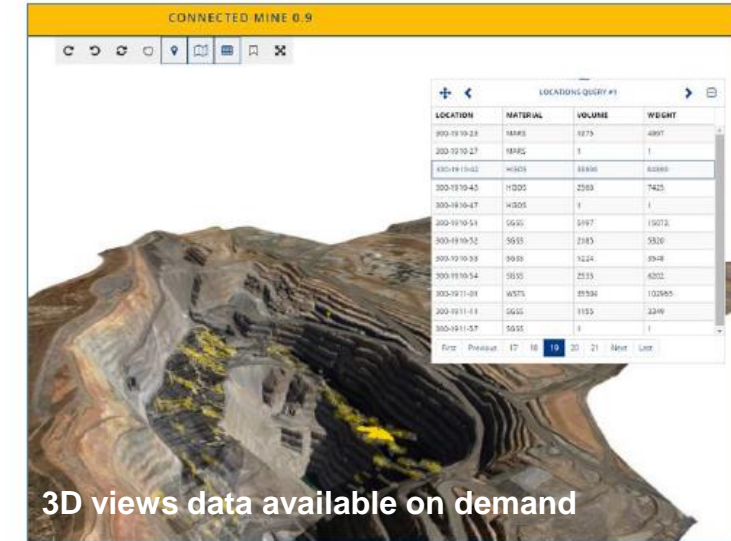
- Enable the connected mine by providing central data warehousing, reporting and analytics tools to integrate all the data for use and value across operations, business units and the enterprise

Anticipated benefits:

- One source of the truth
- Standardise
- KPI variance dashboards
- Eliminate data silos
- Moving towards integrated operations and big data analytics

Geo-spatial tools and Remote Piloted Aircraft Systems (RPAS)

- To be more efficient and effective in the way in which we capture spatial data in open pit mining operations
- An enabler for near real time remote sensing of geo-spatial data





ULTRA HIGH DENSE MEDIA SEPARATION

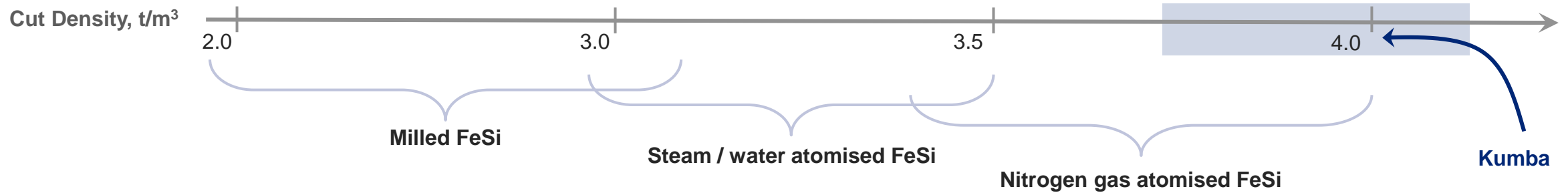
SISHEN RESOURCE UTILIZATION

	Technology	Separation density (g/cc)	In-situ grade cut-off (%Fe)	Estimated Value unlock
1970	DMS	≤ 3.6	>60	2016 Ore Reserves 552Mt ¹
2009	JIG	~4.2	>48	
2015	UHDMS	>4.2	>40	2016 Exclusive Mineral Resource 213Mt ²
Future	Beneficiation		>30	Under investigation ³

#1, 2 and 3 – refer to appendix

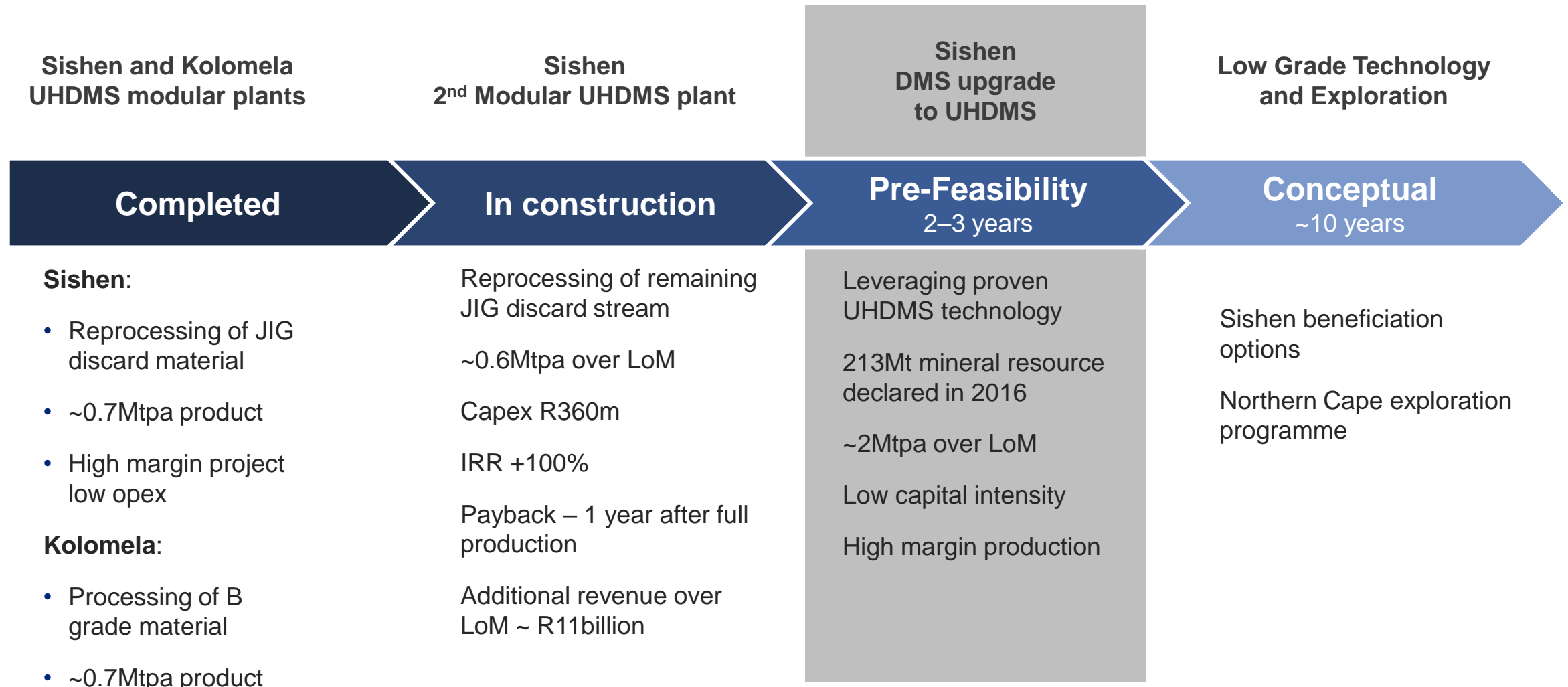
ULTRA HIGH DENSE MEDIA SEPARATION

- Ferrosilicon (FeSi) is used to prepare a dense media to separate valuable iron ore from waste
- Kumba currently uses water and nitrogen gas-atomised (NGA) FeSi
- NGA FeSi is a requirement for ultra high dense medium separation (UHDMS)



PROGRESSING OUR VALUE ACCRETIVE PROJECT PORTFOLIO

Full implementation of UHDMS has the potential to increase saleable production by approx. 4Mtpa





2018-2022 TECHNOLOGY STRATEGY

PROCESS FOLLOWED FOR REVIEW OF TECHNOLOGY ROADMAP 2018 - 2022

1. Bottom up consultation



2. Benchmark study



3. Technology roadmap



4. Prioritise on

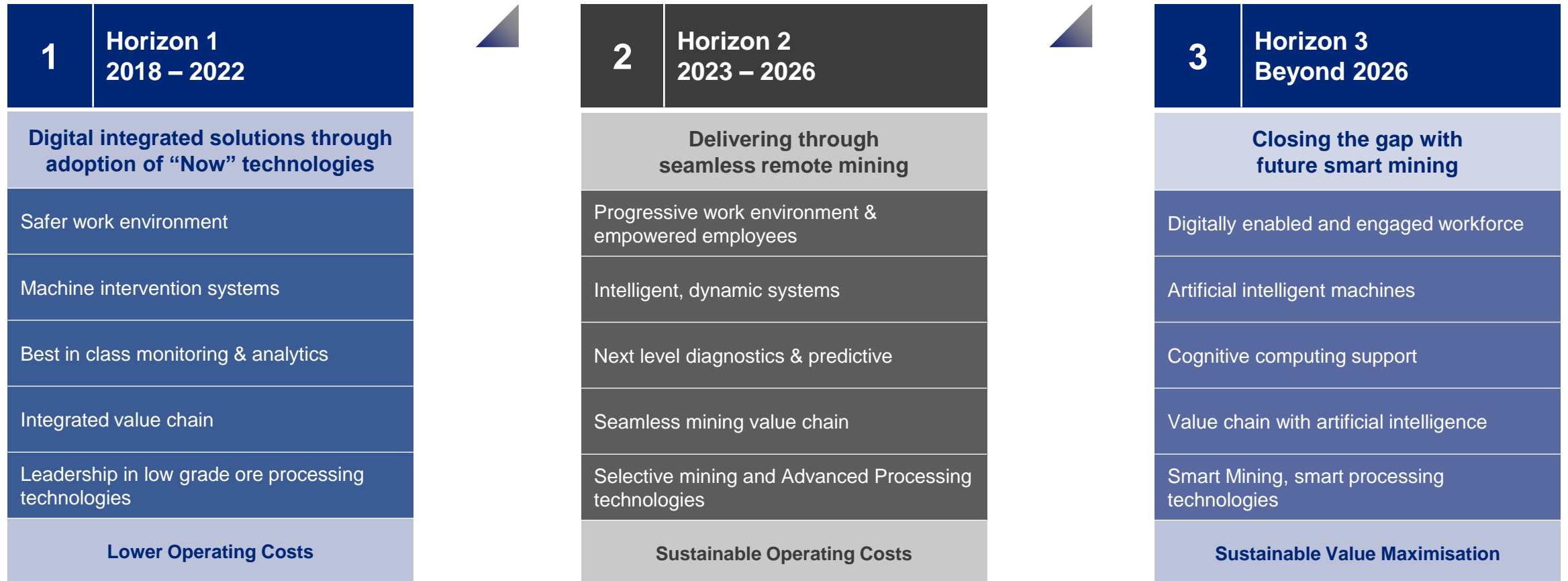
- ▲ Value add
- ▼ Capex
- ▲ Site alignment
- ▲ Business skills levels and competency
- ▲ Industry maturity

Revised technology roadmap

1	Horizon 1 2018 – 2022	2	Horizon 2 2023 – 2026	3	Horizon 3 Beyond 2026
	Digital integrated solutions through adoption of "Now" technologies		Delivering through seamless remote mining		Closing the Gap with Future Smart Mining
	Safer work environment		Progressive work environment & empowered employees		Digitally enabled and engaged workforce
	Machine intervention systems		Intelligent, dynamic systems		Artificial intelligent machines
	Best in class monitoring & analytics		Next level diagnostics & predictive		Cognitive computing support
	Integrated value chain		Seamless mining value chain		Value chain with artificial intelligence
	Leadership in Low grade ore processing technologies		Selective mining and Advanced Processing technologies		Smart Mining, Smart processing technologies
	Lower Operations Costs		Sustainable Operating Costs		Sustainable Value Maximisation

TECHNOLOGY REMAINS A GAME CHANGER FOR KUMBA

2018 – 2022 Strategy: **Rapidly implement appropriate and proven** technologies across the iron ore value chain to achieve safer, more productive and lower cost operations





CONCLUSION
THEMBA MKHWANAZI

KUMBA 2017 GUIDANCE

	2017 guidance
Production	
Kumba	42 – 44Mt
Sishen	29 – 30Mt
Kolomela	13 – 14Mt
Waste	
Kumba	205 – 220Mt
Sishen	155 – 165Mt
Kolomela	50 – 55Mt
Sales	
Kumba	42 – 44Mt
Unit cost	
Sishen	R310 – 320/t
Kolomela	R240 – 250/t
Strip ratio	
Sishen	~4 LoM
Kolomela	~3.8 LoM

2017 AND BEYOND



Crisis

2015

Business under pressure

Significant restructuring underway to reduce breakeven price



Restructuring

2016

Restructuring completed

Mining run rates improved

Reduction in breakeven price



Step-up performance

2017

Continued implementation of Operating Model and technology rollout

Mitigate inflation and higher waste cost pressures to embed resilient low cost delivery culture

Reinstating dividend



Leveraging endowment

Medium Term

Technology adoption for better operations, cost, productivity and safety gains

Sishen upgrade to UHDMS and low grade beneficiation

Exploration opportunities

Value accretive growth options



QUESTIONS



APPENDIX

1. Sishen Mine Ore Reserve (run-of-mine) estimates as at 31 December 2016 (please refer to R&R Section of 2016 Kumba Integrated Report): 353.8Mt (@55.8% Fe) Proved and 198.4Mt (@ 54.5% Fe) Probable
2. Sishen Mine exclusive low-grade Mineral Resource estimates as at 31 December 2016 (apportioned as part of total Sishen mine exclusive Mineral Resources as stated in R&R Section of 2016 Kumba Integrated Report: 48.9Mt Measured (@ 43.4% Fe), 123.1Mt (@ 44.1% Fe) Indicated and 41.3Mt (@ 44.1% Fe) Inferred. Due to the uncertainty that may be attached to some Inferred Mineral Resources, it cannot be assumed that all or part of an Inferred Mineral Resource will necessarily be upgraded to an Indicated or Measured Resource after continued exploration.
3. The Sishen Mine future potential is dependent on the company's success in identifying and or developing beneficiation methodologies to beneficiate low-grade Haematitic iron ore material. The low-grade ore ($30\% \leq \%Fe < 40\%$) has already been spatially defined in a classified three-dimensional geological model. No tonnages figures can be quoted at this stage due to the fact that reasonable prospects for eventual economic extraction must still be proved via project studies, especially considering beneficiation methodologies and market requirements, which is at pre-concept level at this point in time.