

# METALLURGICAL COAL

Tyler Mitchelson, CEO

Bulks Seminar & Site Visit: Brisbane, 12 November 2019



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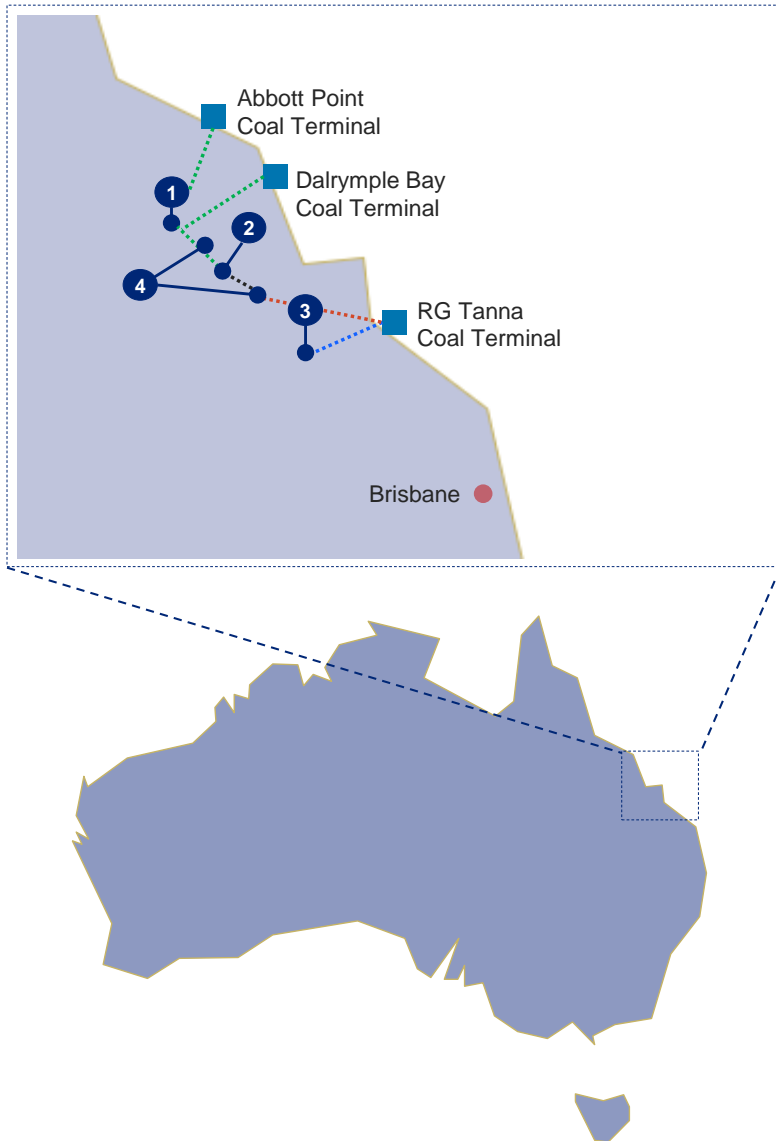
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# OUR HIGH QUALITY ASSETS



## 1 Moranbah-Grosvenor (88%/100%)

Underground longwall, high quality HCC

## 2 Capcoal (70%)

Grasstree underground longwall, high quality HCC

Open cut operations, HCC, PCI & thermal

## 3 Dawson (51%)

Open cut, HCC, PCI & thermal

## 4 Jellinbah (23% JV, non-managed & independently marketed)

Open cut, HCC, PCI & thermal

2019F met coal production

**22-24Mt**

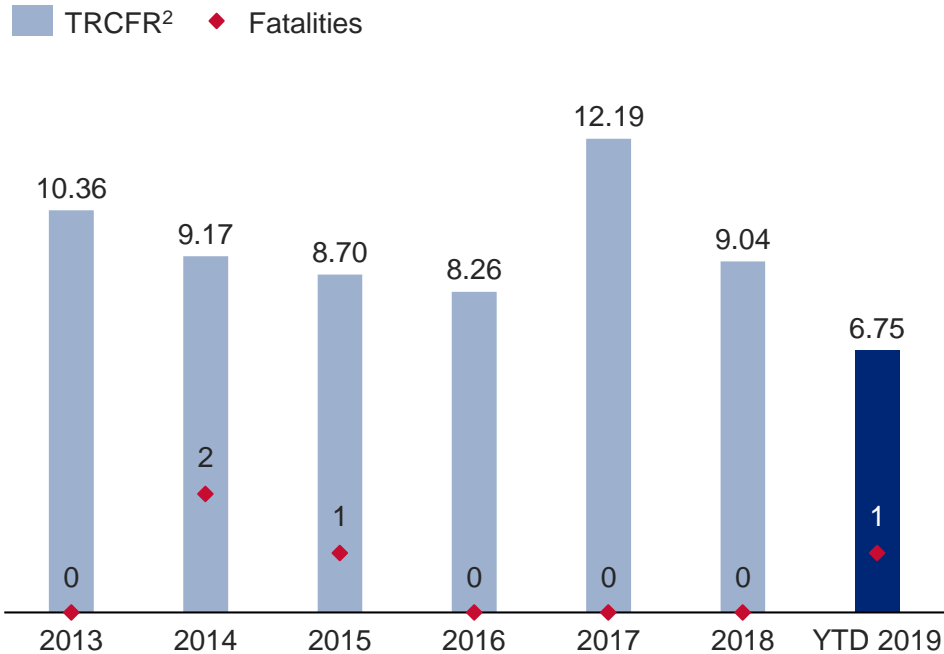
~85% HCC

2019F FOB unit cost<sup>1</sup>

**~\$62/t**

# SAFETY IS OUR PRIMARY VALUE

## Performance



Elimination of Fatalities Taskforce

Sharing of learnings key to reducing high potential incidents

Operating Model delivering safer outcomes through planned work

## Elimination of Fatalities



## Focus areas

Cultural and behavioral change through leadership development and employee engagement

All work planned and scheduled across all operations, with focus on compliance to plan, including contractor work

Improving critical control management and compliance

# RELENTLESS FOCUS DRIVES GROWTH

## Transformed portfolio

Product & asset quality



## Operational excellence

Industry leader



## Value adding growth

~30% growth potential



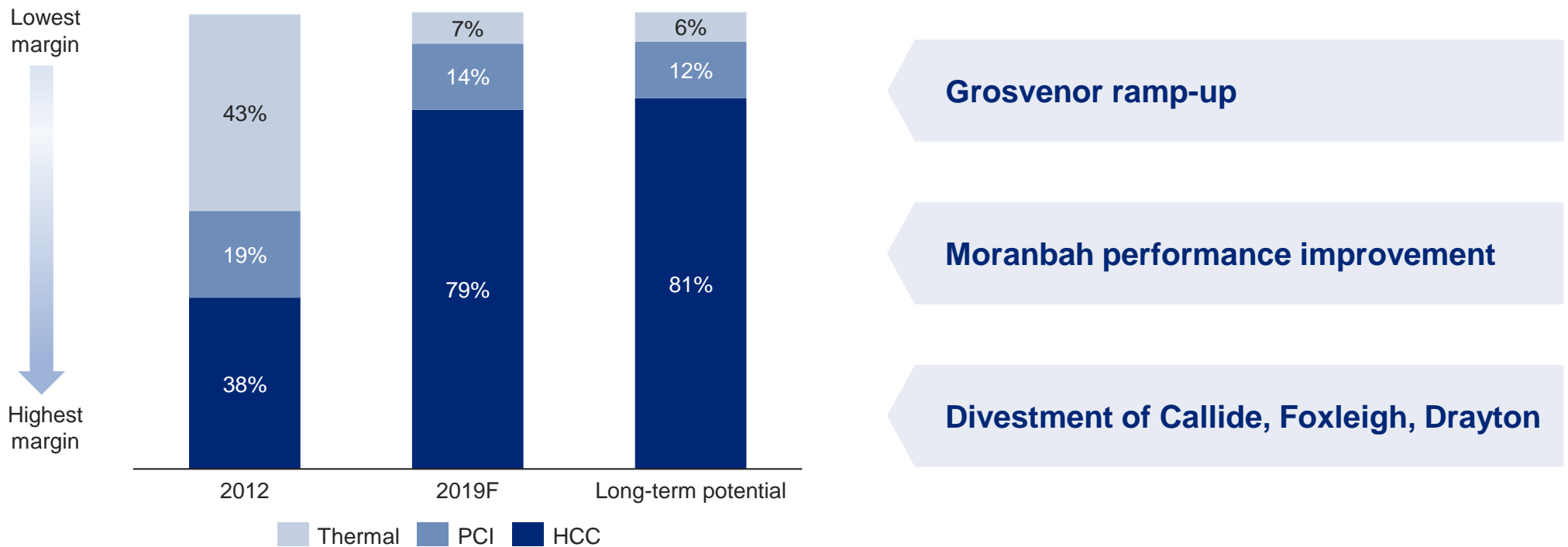
# A TRANSFORMED BUSINESS



Capcoal

# PORTFOLIO SHIFT TOWARDS QUALITY

## Increasing contribution from high margin products

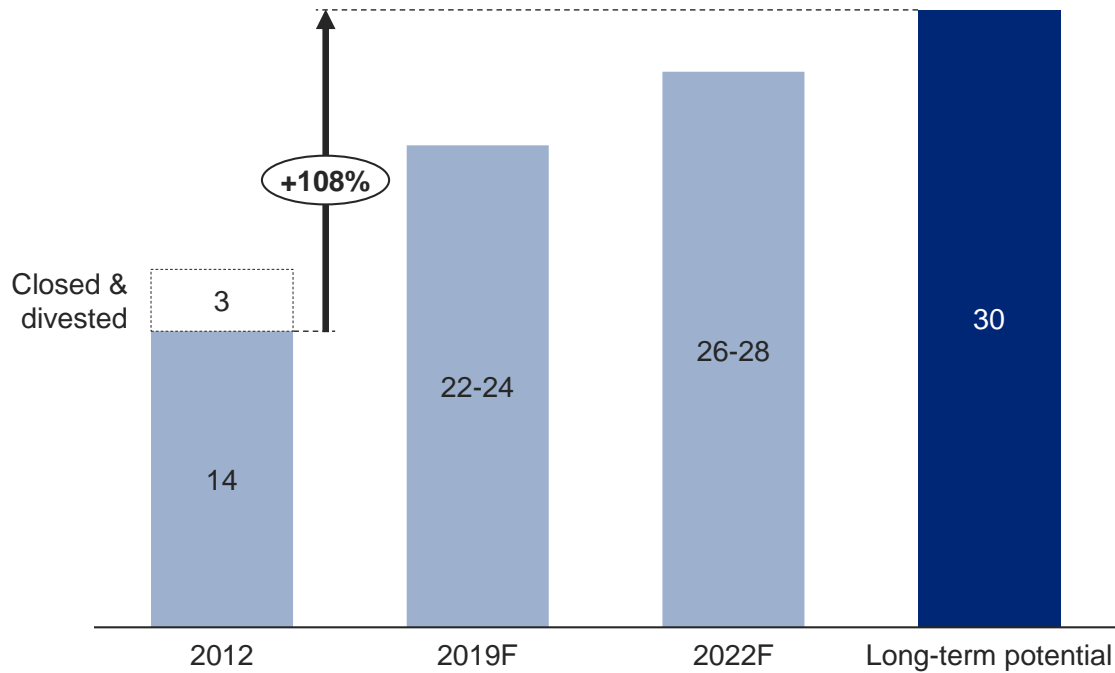


Anglo American share (including our share of Jellinbah)

# VALUE ADDING QUALITY GROWTH

Quality production targeted to double in 10 years

Met Coal production (Mt)<sup>3</sup>



Operating Model & 'Longwall 100'

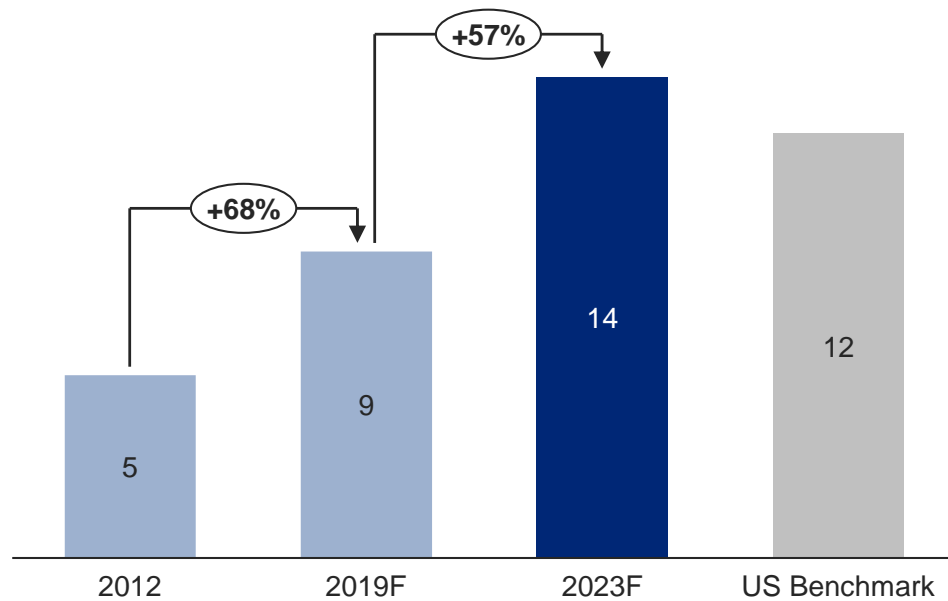
P101

Moranbah-Grosvenor debottlenecking

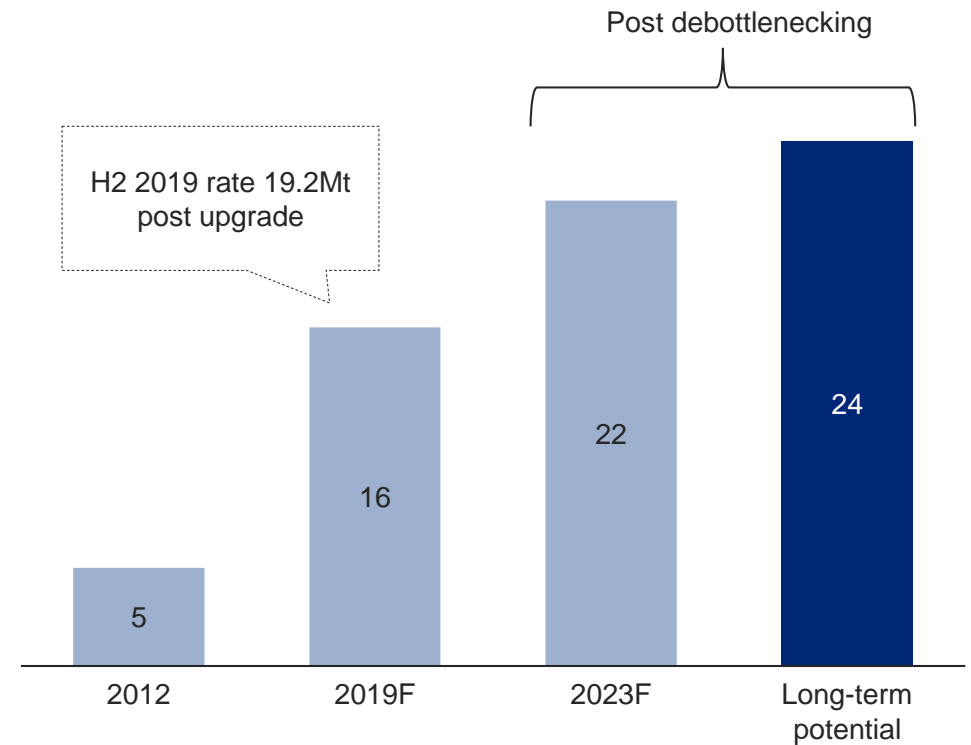


# MAXIMISING POTENTIAL OF BENCHMARK PRODUCER

## Moranbah ROM (Mt)



## Moranbah Grosvenor ROM<sup>4</sup> (Mt)



# P101 FOCUSED ON KEY COST DRIVERS

## Underground longwall mining



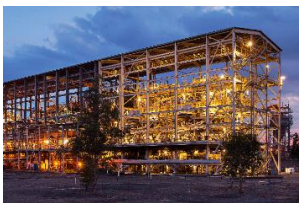
### Underground development



Cost capitalised



### Longwall




### Washplant



### Distribution



 ~5% unit cost

## Open pit mining

### Drill & blast



### Truck, shovel & dragline



### Washplant

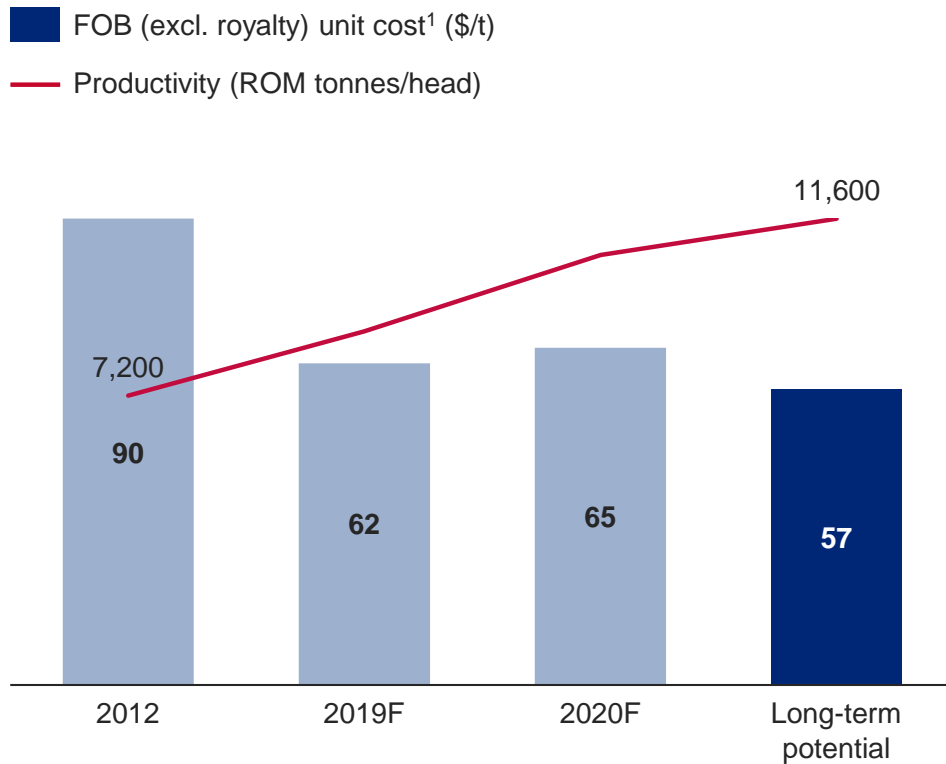


### Distribution

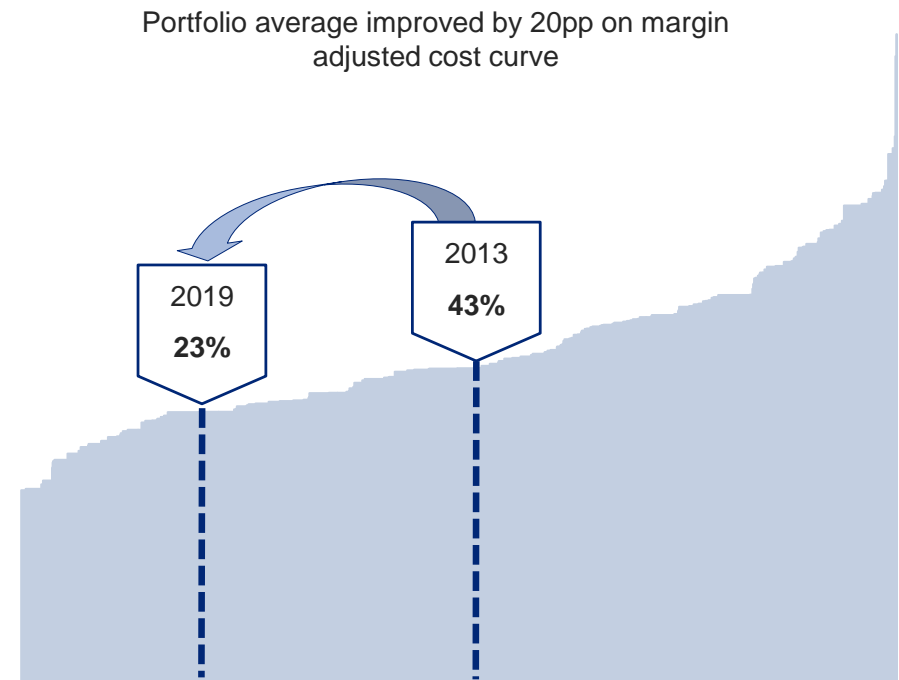


# DISCIPLINED COST MANAGEMENT

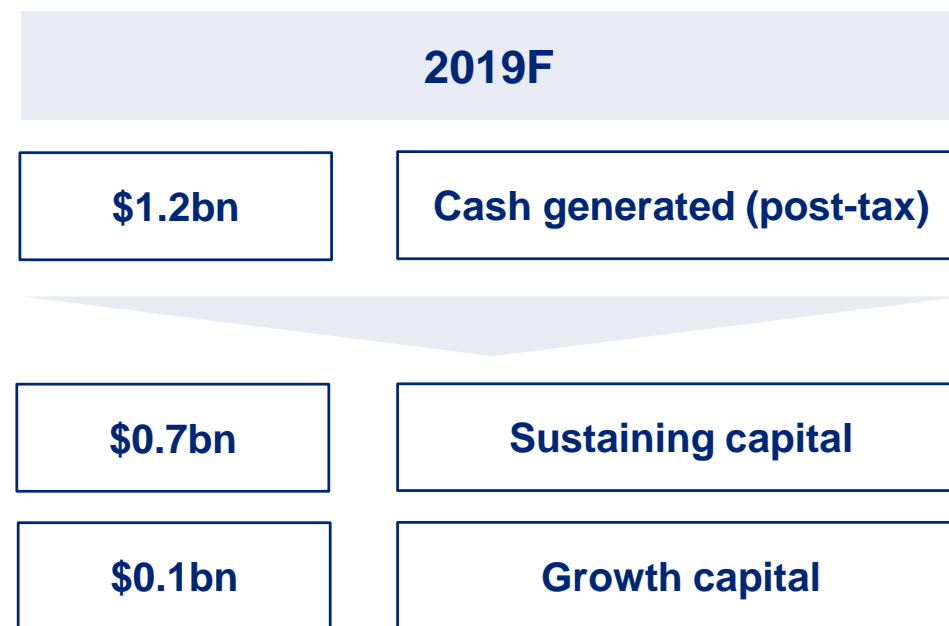
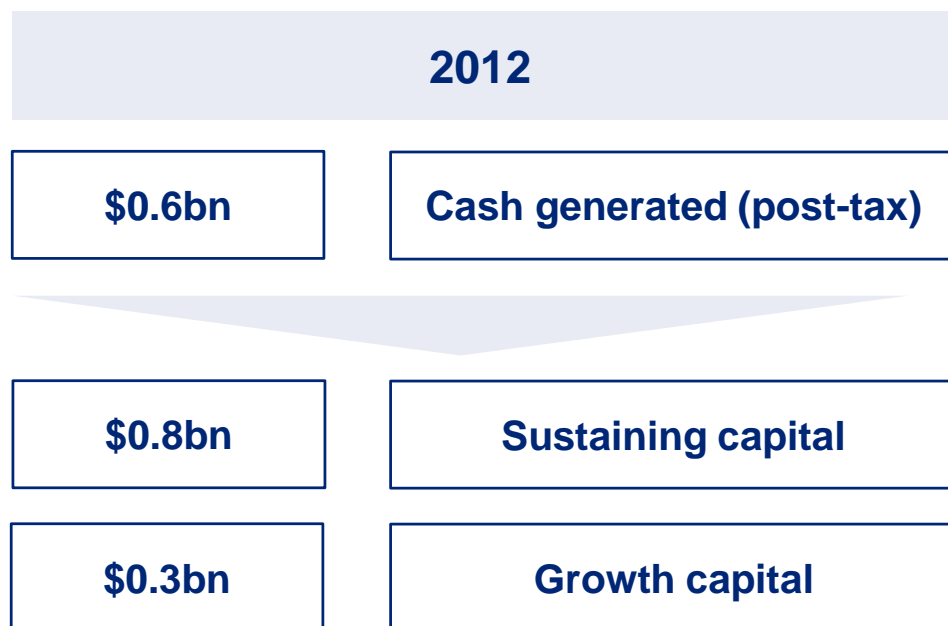
## Ongoing cost discipline



## Driving improved competitive position



# EFFICIENT CASH CONVERSION AND BALANCED CAPITAL ALLOCATION



**9%** ROCE

**22%** Mining EBITDA margin

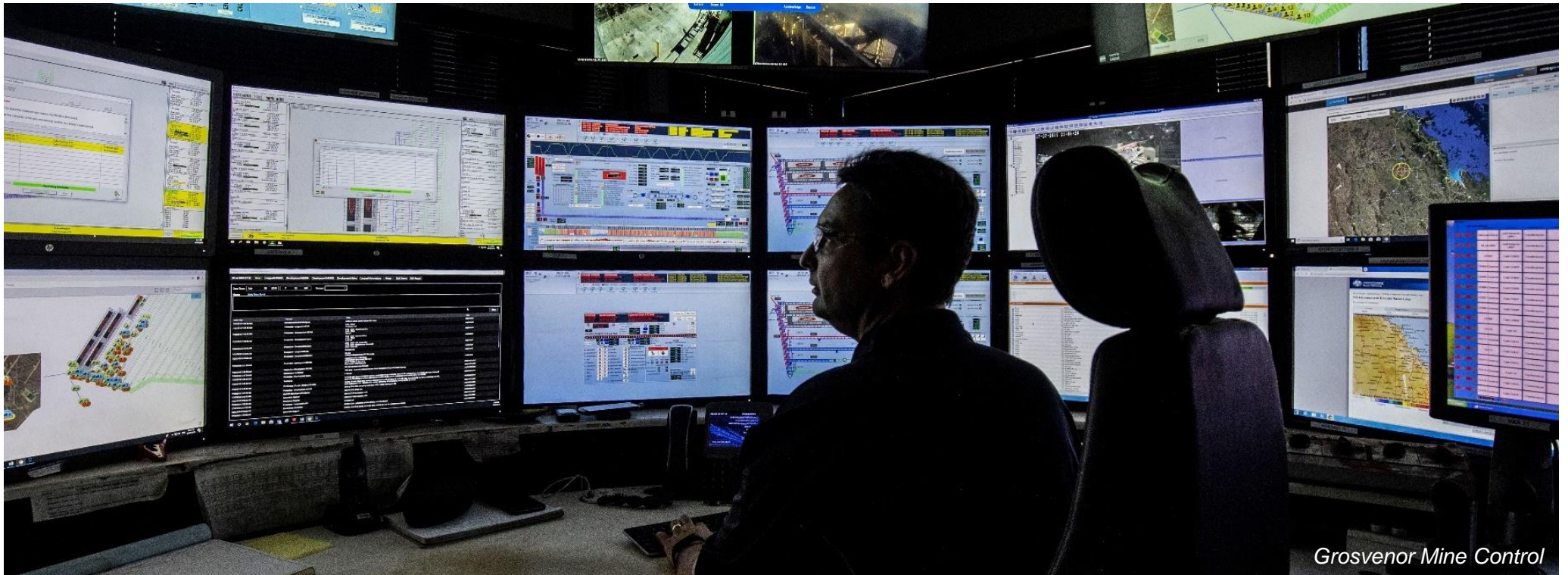
**\$210/t** Ave HCC price

**~45%** ROCE

**~55%** Mining EBITDA margin

**\$185/t** Ave HCC price YTD

# SUSTAINABLE IMPROVEMENT



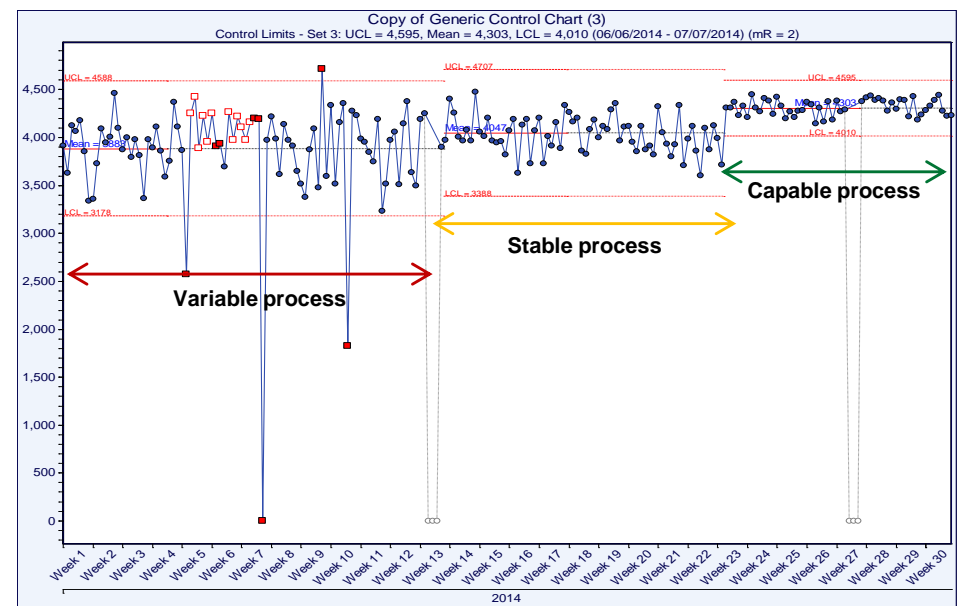
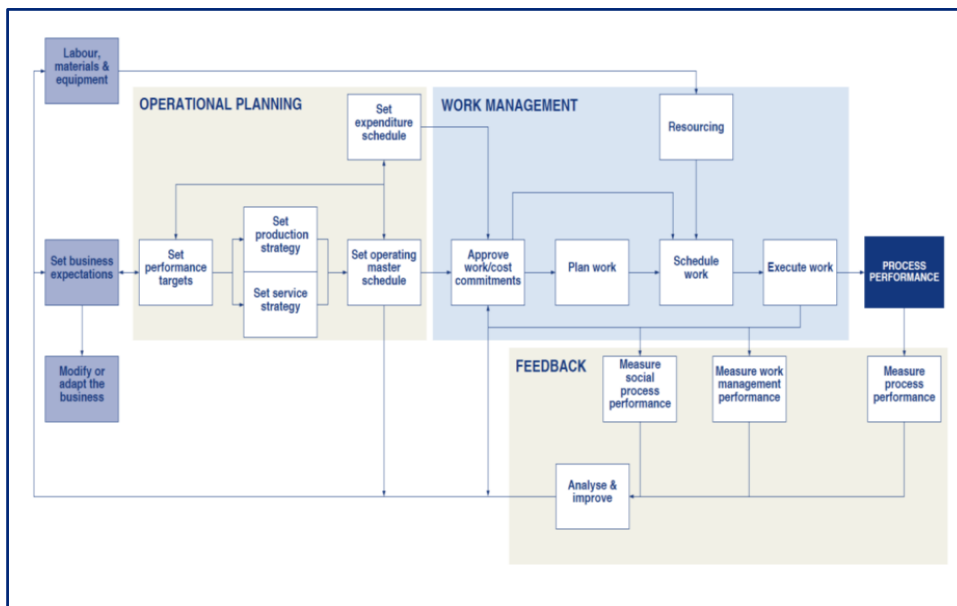
*Grosvenor Mine Control*

# OPERATING MODEL DRIVES SUSTAINABLE IMPROVEMENT

Stable and predictable processes

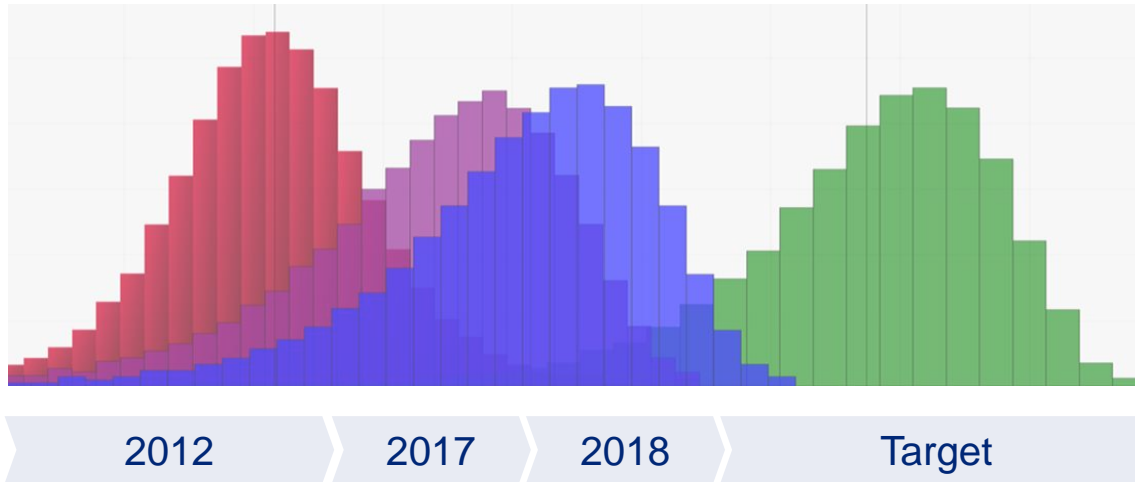
Reduce variability

Foundation for improved performance



# DRIVING SUSTAINABLE IMPROVEMENT

## Operating Model: A foundation for improvement



Operational planning

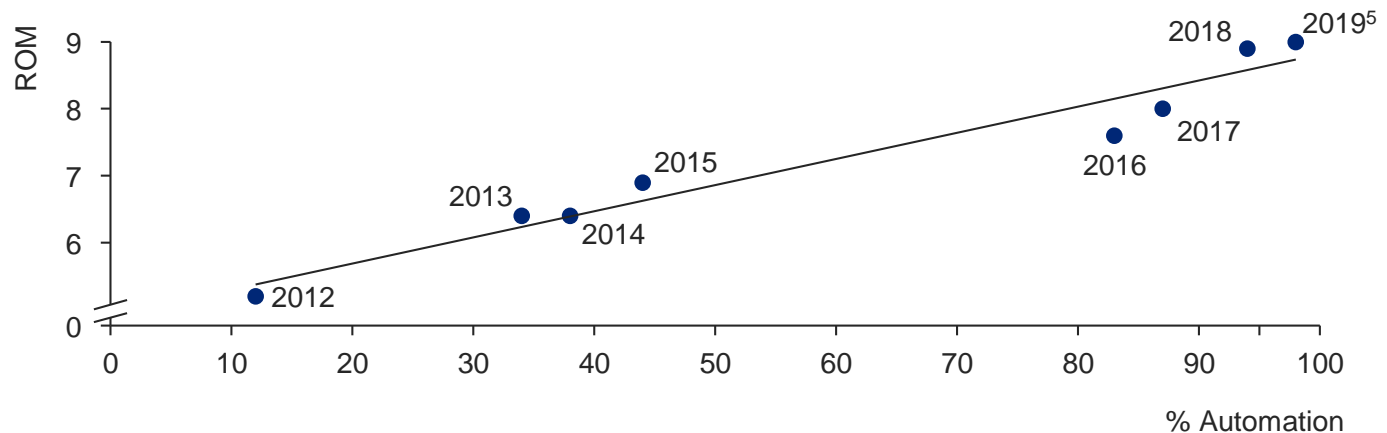
Work management

Feedback & data analysis

## Automation of longwalls drives improvement

Reduced variability

Greater control



# ON THE STEP-CHANGE JOURNEY: MORE TO COME

## P101

Exceeding industry best-in-class process & equipment performance



Longwall face extension

Remote operation of longwalls

Shovel and dragline dig geometries

Gas and strata management

## FutureSmart Mining™

Game-changing technology; data analytics; sustainability



Exploration

Longwall mine of the future

Opencut automation and technology

Coal processing innovation

Digitalisation

Incremental improvement

Step-change



# TECHNOLOGY INITIATIVES KEY LEVER TOWARDS STEP-CHANGE GROWTH

## Remote longwall operations

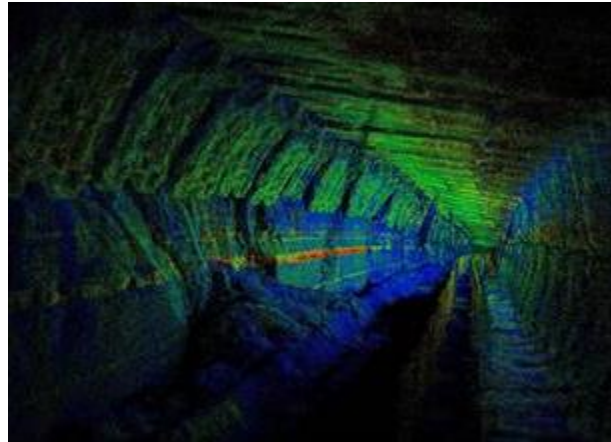


Advanced machine learning and steering technology

Reduces exposure to underground operational hazards by ~50,000 hr/yr

Additional 3 hours operations and +/- 150tph increased rate

## LIDAR 3D scanning



Improved mapping, real time monitoring and dilution

~3% recovery increase through precise mining and horizon control

Removes people from frontline operations by ~6,000 hr/yr

## Underground tablets & tech



Underground wireless connectivity

Real time communication and access to safety and hazard information

Increased productivity through >25% reduction in repair times

# SUSTAINABILITY AT THE HEART OF THE BUSINESS



**20% reduction in  
water abstraction  
by 2020**



**~\$160m mine  
rehabilitation plan**



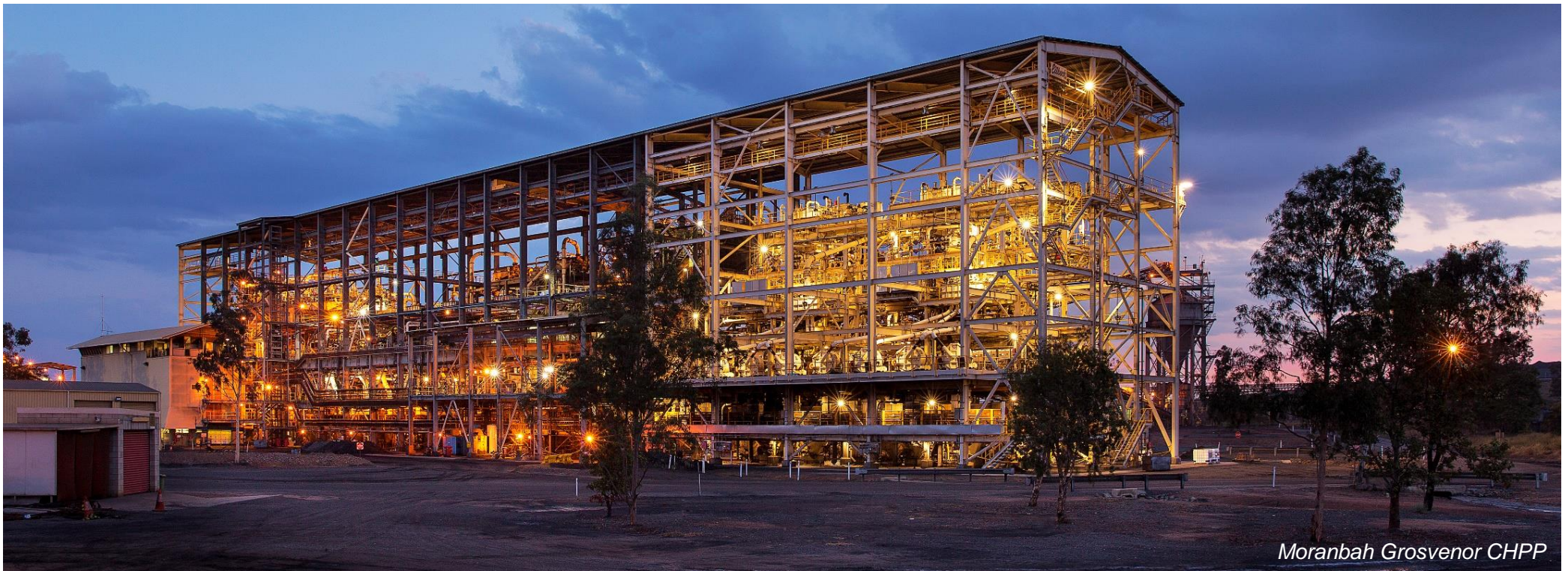
**Reduce net GHG  
emissions by 30%  
by 2030**



**Best practice social  
performance**

**Our Sustainability approach is integral to FutureSmart Mining™**

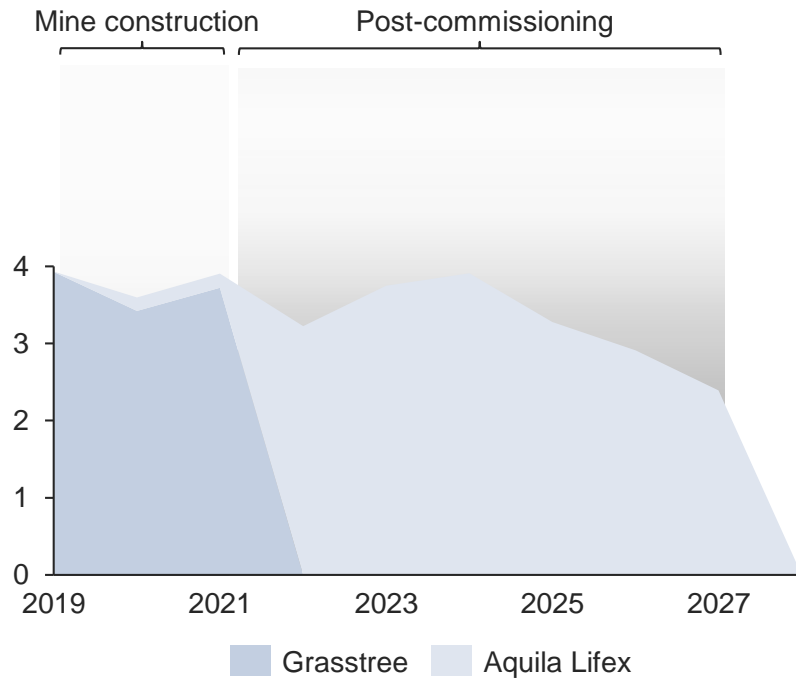
# DISCIPLINED GROWTH POTENTIAL



*Moranbah Grosvenor CHPP*

# AQUILA: QUALITY GRASSTREE LIFEX

## Saleable (Mtpa)



Approved July 2019

Grasstree lifex, high quality metallurgical coal

~2.5 year construction leveraging existing infrastructure

Saleable production

**3.5Mtpa**

IRR

**>30%**

Mine life

**6 years**

Margin

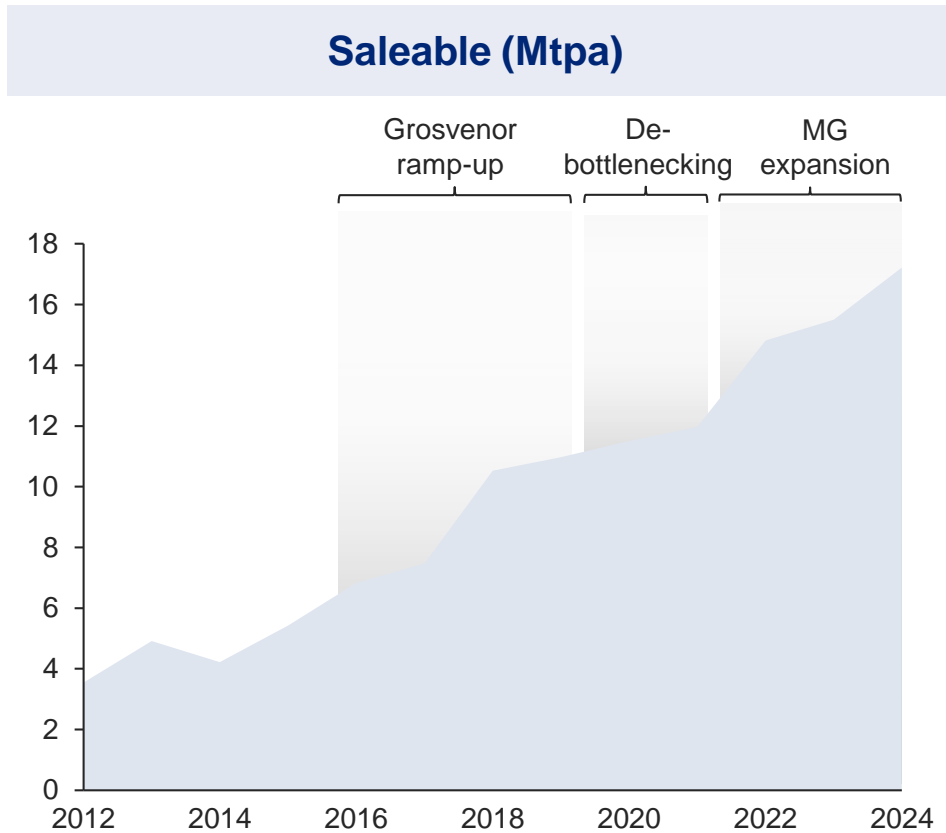
**>40%**

Capex

**\$226m**

(Anglo American 70% share)

# UNLOCKING POTENTIAL OF MORANBAH-GROSVENOR



Plant upgrade, stockpile extension & load out expansion

Approval targeted mid-2020<sup>6</sup>

~12-18 months construction

Saleable production

**4-6Mtpa**

IRR

**>30%**

Payback

**~3-4 years**

Margin

**>50%**

Capex

**\$0.3-0.4bn**

(Anglo American share)

# MORANBAH HUB: MULTIPLE OPPORTUNITIES OF SCALE

## Moranbah South

2.3bt HCC deposit adjacent to Moranbah Grosvenor

50% Anglo American share

Concept study incorporating Grosvenor learnings

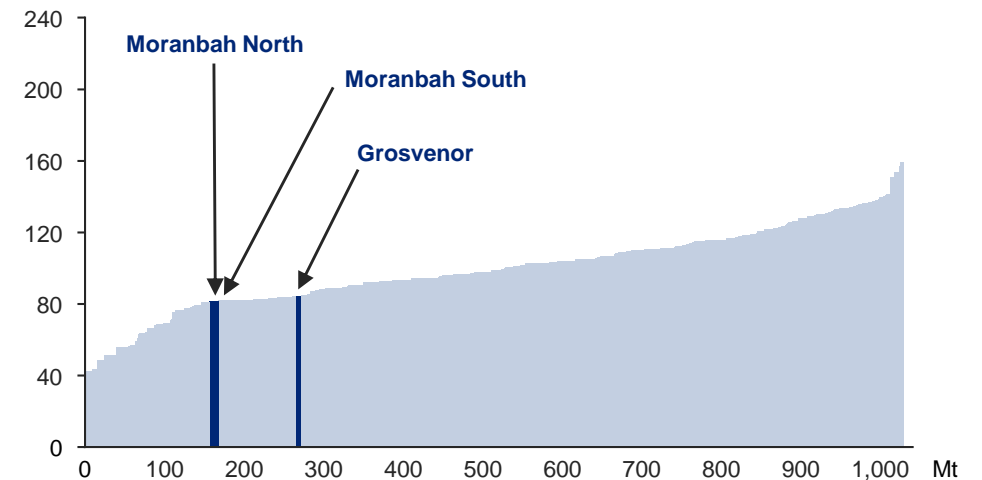
Environmental approvals in place

## Moranbah secondary seams

4 additional seams of premium HCC

Low cost, low risk, lifex projects

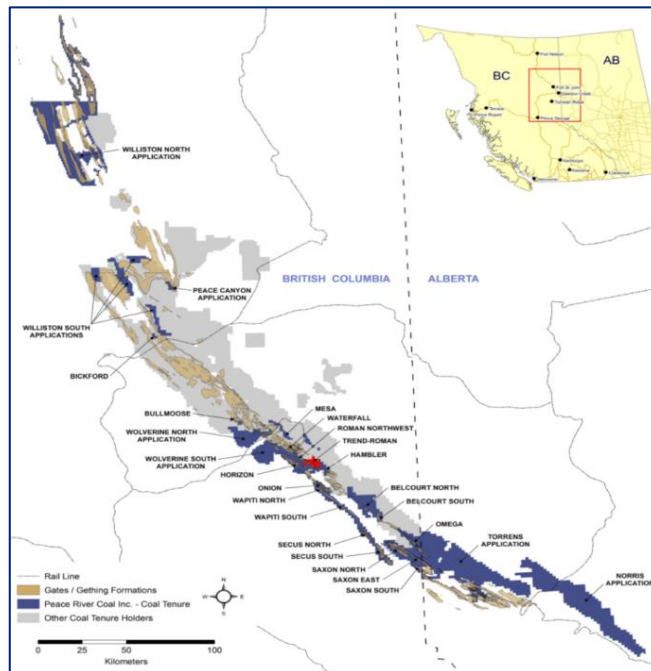
## Reinforces Q1 cost position



Inverse margin cost curve (2029)  
real 2019 US\$/t FOB AUS

# PRC BASIN COMPARABLE TO BOWEN BASIN

## Peace River Basin - Canada



■ Anglo American tenure

Existing large footprint in PRC Basin

Currently on care & maintenance

Logistics infrastructure in place

Similar in scale to Bowen Basin

Studies underway

# QUALITY BUSINESS WITH POTENTIAL FOR GROWTH

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| Assets                   | Capabilities         | Returns                     |
|--------------------------|----------------------|-----------------------------|
| High quality product     | Operating Model      | Low cost producer           |
| Growth potential         | FutureSmart Mining™  | Capital discipline          |
| Attractive jurisdictions | Integrated marketing | Sustainable cash generation |

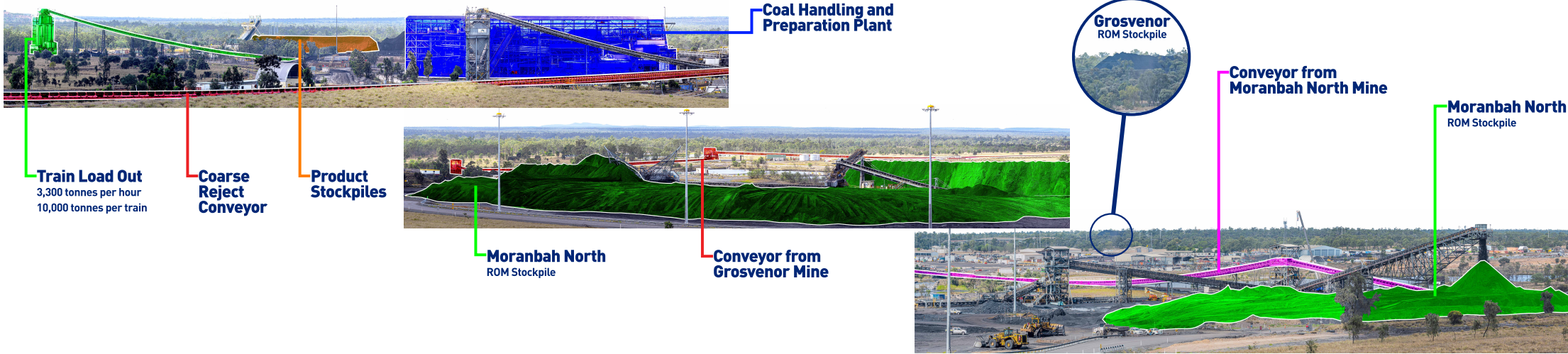


# FOOTNOTES

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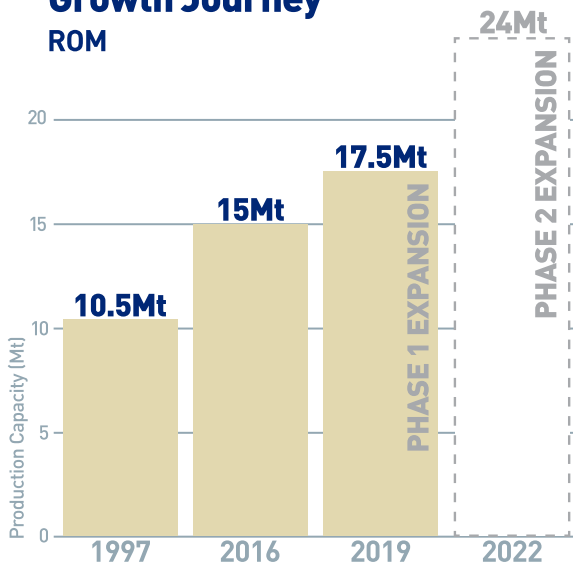
1. Unit costs exclude royalties, depreciation, study costs and include direct support only.
2. Total Recordable Cases Frequency Rate per million hours. Please note that in 2017 there was a redefinition of TRFCR, which resulted in a significant increase through 2017, 2018 and 2019.
3. Anglo American share including our share of Jellinbah. In 2012, the annual tonnages exclude amounts attributable to operations that have since been divested or placed into care and maintenance.
4. Moranbah Grosvenor combined complex total feed. 2012 comprises Moranbah feed only with Grosvenor commencing production in 2016.
5. Excluding dyke at the beginning of panel.
6. Subject to Board and joint venture partner approval.

## The metallurgical coal journey



# MORANBAH GROSVENOR COAL HANDLING AND PREPARATION PLANT

## Growth Journey ROM



## Original Construction



1997

**10.5Mt ROM**

Production capacity (3-5Mt saleable)

**1,500tph**

Production rate

### Coal Handling and Preparation Plant

- Coal Preparation Plant
- Raw coal handling and product stockpile system
- Train loading facility

## Grosvenor Integration



2016

**15Mt ROM**

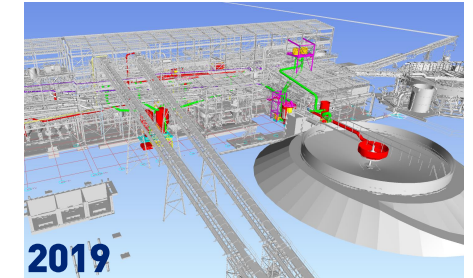
Production capacity (8-10Mt saleable)

**2,000tph**

Production rate

- Construction of overland conveyor and new raw coal handling and product stockpile system
- Upgrade of existing Coal Preparation Plant infrastructure

## Phase 1 Expansion



2019

**17.5Mt ROM**

Production capacity (12-14Mt saleable)

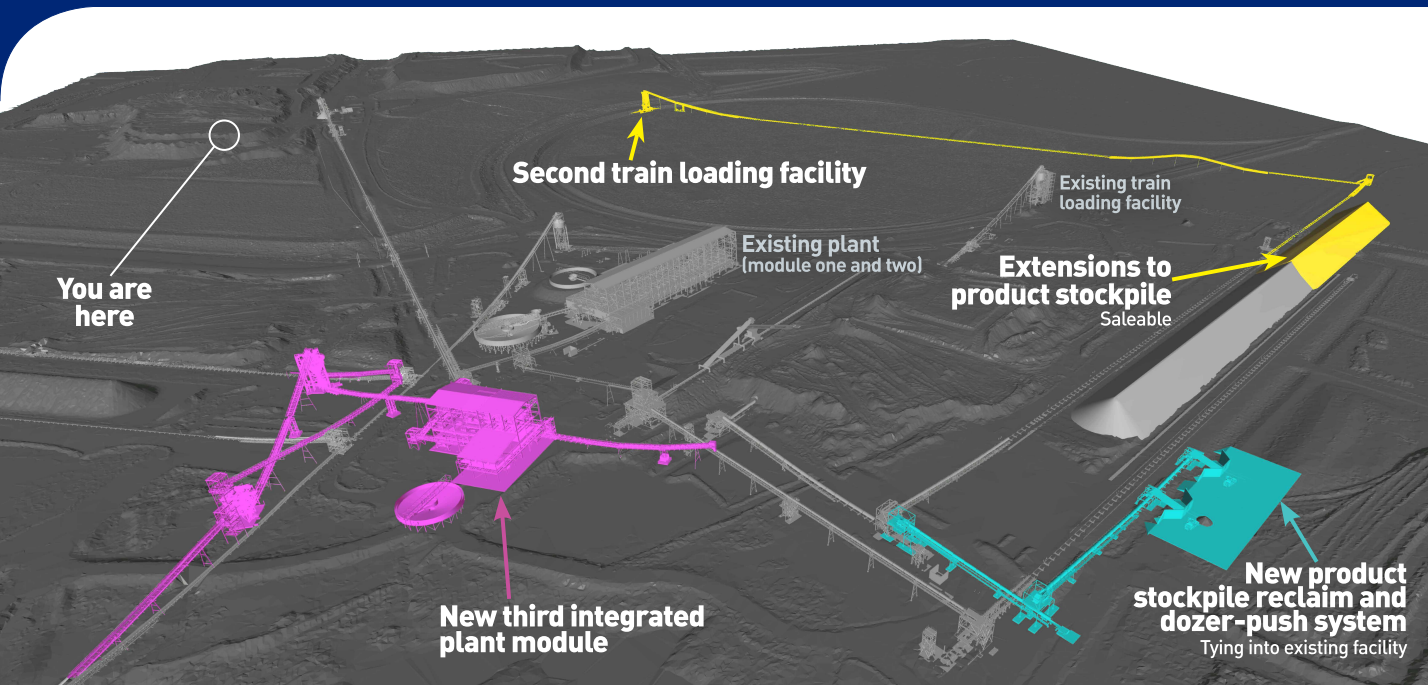
**2,250tph**

Production rate

**US \$20m**

Capex

- Coal Preparation Plant upgrade to increase the maximum sustained production rate.



**30-40%**  
Capacity increase



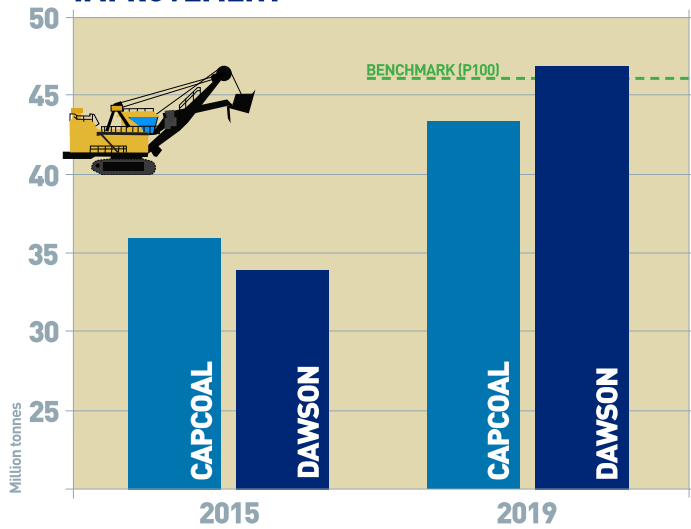
**2022** | **24Mt ROM**  
Project completion | Production capacity

**US \$300 - 400m**  
Capex

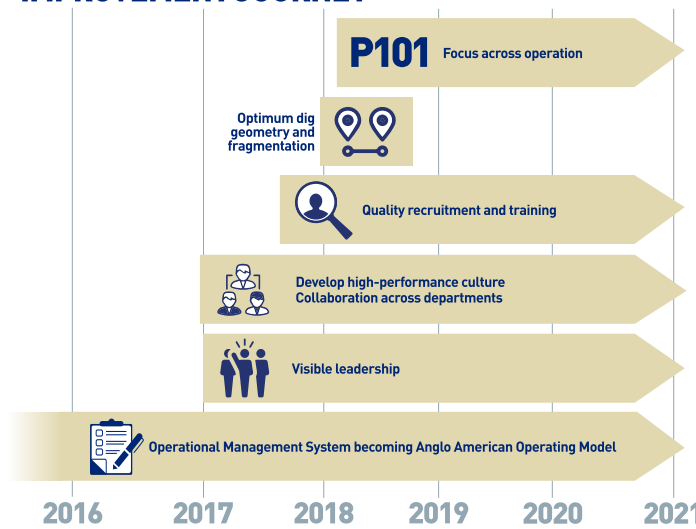
**18-20Mt** | **3,450tph**  
Saleable | Production rate

SUBJECT TO BOARD APPROVAL

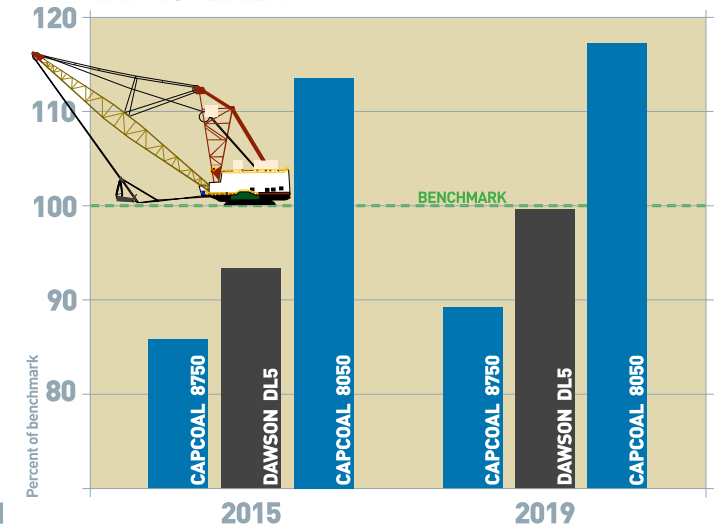
## SHOVEL PERFORMANCE IMPROVEMENT



## CAPCOAL'S CONTINUOUS IMPROVEMENT JOURNEY



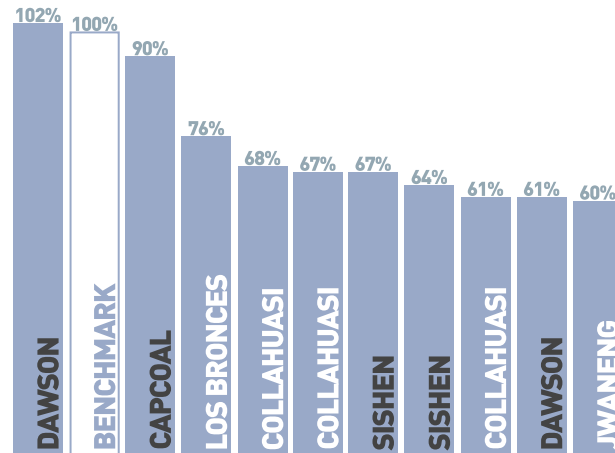
## DRAGLINE PERFORMANCE IMPROVEMENT



## ANGLO AMERICAN'S APPROACH

|  |   |
|--|---|
|  | <ul style="list-style-type: none"> <li>Benchmarking</li> <li>Value driver trees</li> <li>Assessments against framework</li> <li>P101 improvement plans</li> <li>Reconciliation</li> </ul> |
|  | <ul style="list-style-type: none"> <li>Central expertise</li> <li>Embedded support</li> <li>Improving site capability</li> <li>One solution, one team</li> <li>Follow-up</li> </ul>       |
|  | <ul style="list-style-type: none"> <li>Community of practice</li> <li>Sharing best practices and lessons</li> <li>Rapid replication</li> <li>Constructive competition</li> </ul>          |
|  | <ul style="list-style-type: none"> <li>OEM engagement &amp; initiatives</li> <li>External expertise</li> <li>Technology</li> </ul>  |

## TOP 10 LARGE ROPE SHOVEL PERFORMANCE 2019



## WHAT WE HAVE ACHIEVED

**31%**  
Production increase across Anglo American large rope shovel fleet since 2017

## AREAS OF FOCUS

|  |   |
|--|---|
|  | <ul style="list-style-type: none"> <li>Design for performance</li> <li>Equipment path &amp; schedule</li> <li>Interactions</li> <li>Bench access</li> <li>Collaboration with operations</li> </ul>                  |
|  | <ul style="list-style-type: none"> <li>Operating hours</li> <li>Shift change &amp; breaks</li> <li>Fleet management systems</li> <li>Blasting inventory</li> </ul>  |
|  | <ul style="list-style-type: none"> <li>Fragmentation</li> <li>Best operator &amp; team</li> <li>Double side loading</li> <li>Payload and passes per truck</li> <li>Truck speeds</li> <li>Execute to plan</li> </ul> |
|  | <ul style="list-style-type: none"> <li>Light weight truck trays</li> <li>Shovel buckets</li> <li>Shovel/truck match</li> <li>Operate for reliability</li> <li>Shutdown management</li> </ul>                        |

# MORANBAH NORTH

Paul Stephan, General Manager

Bulks Seminar & Site Visit: 13 November 2019



*Moranbah North surface infrastructure*

# MORANBAH NORTH IN NUMBERS



**431**

Employees



**1**

Longwall system



**136km**

Roadways



**501**

Contractors



**4**

Continuous miners



**335m**

Mining depth



**10 yrs<sup>1</sup>**

Life of Mine, + 10 yr extension potential<sup>2</sup>



**51**

Mobile equipment



**64MW**

Gas power generated

## 2019 key performance indicators

**8.93**

TRCFR YTD

**~7.7Mt**

ROM production<sup>3</sup>

**~6.1Mt**

Saleable production<sup>3</sup>

**~10.8Mt**

MG Saleable production<sup>3</sup>

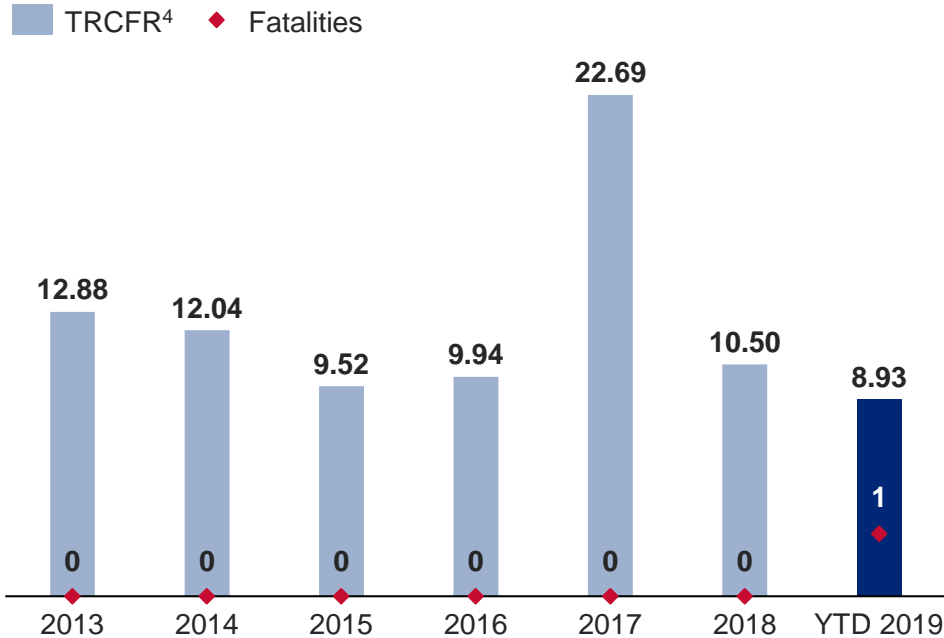
**~\$51/t**

FOB unit cost



# SAFETY IS OUR PRIMARY VALUE

## Performance



### Elimination of Fatalities Taskforce

Trialing fully automated Underground In Seam (UIS) drill rig with water recirculation system

Trialing safety systems on tablet and phone on surface and underground

## Elimination of Fatalities



### Focus areas

Cultural and behavioral change through leadership development and employee engagement

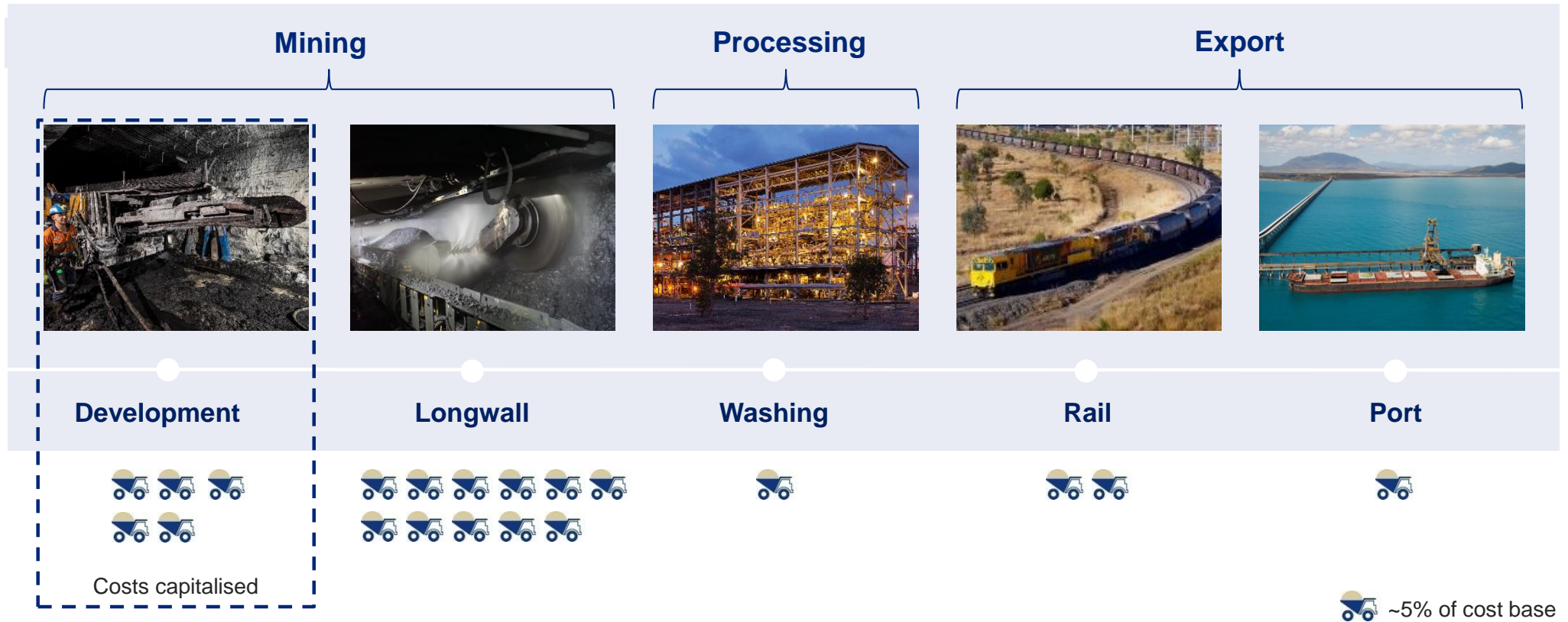
Surface zoning plan across all surface activities completed with full integration into planning and scheduling process

Improving critical control management and compliance with alignment across underground sites

# MORANBAH NORTH SITE



# INTEGRATED VALUE CHAIN



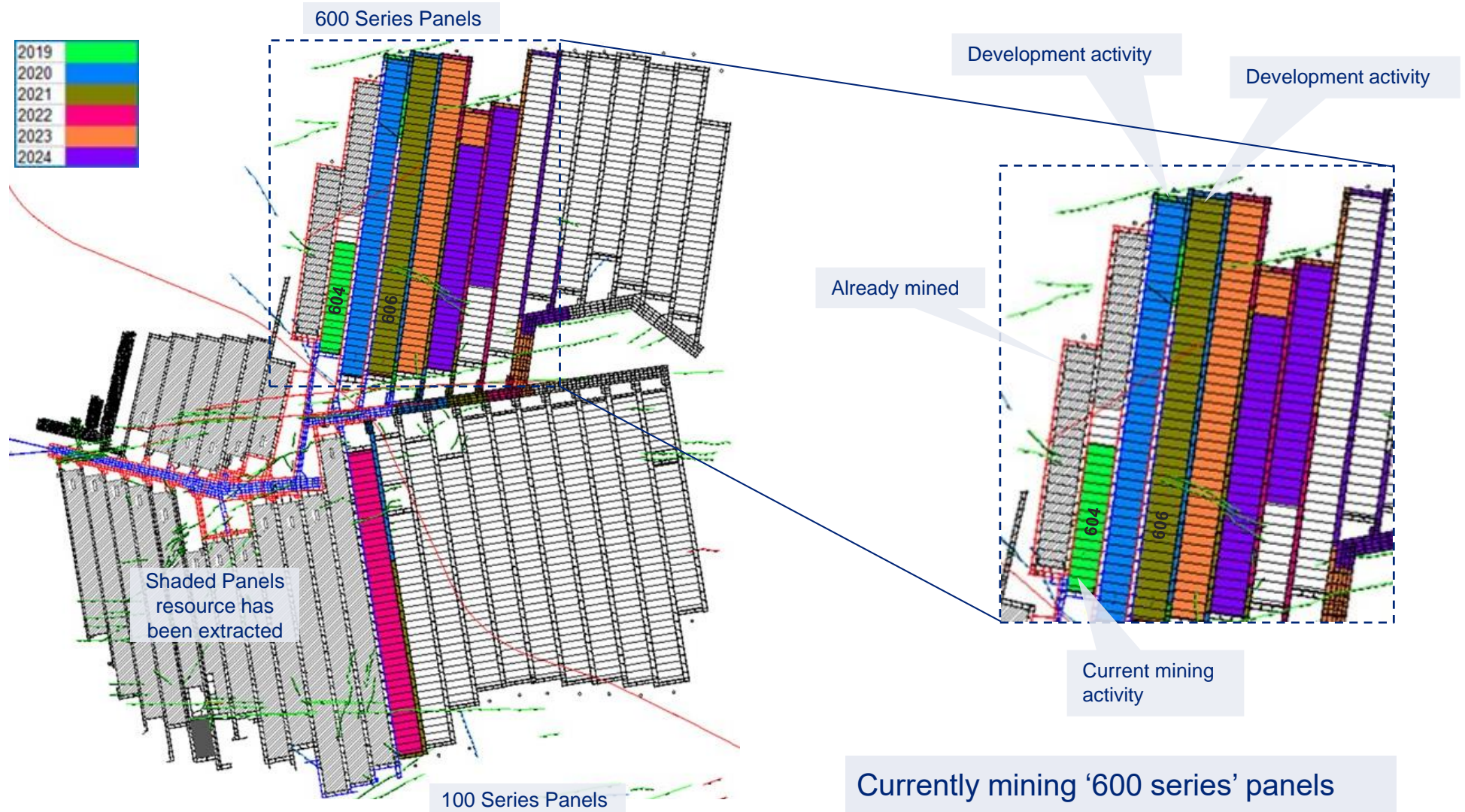
**~21 km**  
Development

**~7.7 Mt**  
ROM production<sup>3</sup>

**~6.1 Mt**  
Saleable production<sup>3</sup>

**~6.1 Mt**  
Export sales<sup>3</sup>

# MORANBAH NORTH MINE PLAN



Currently mining '600 series' panels

600 series mining continues after 2024

# UNDERGROUND MINING

## Development



*Installing roof support*

Preparation for longwall to commence mining

Each development pillar ~120m in length and 60m width. ~45 pillars per panel (4.5 km). Cut height 3.5m with roadway width of 5.4m. 8 x 1.8m roof bolts and 7 x 1.8m rib bolts each metre installed when in optimum mining conditions.

## Longwall



*Longwall shearer cutting hard coking coal*

Longwall shearer cuts coal using bi-directional method.

Width of the longwall panel is 300m with 1m advance per shear. Extraction height 4.2m to 4.7m.

# COAL HANDLING AND PREPARATION

## Coal Handling and Preparation Plant



Washes coal from both Moranbah North and Grosvenor operations to remove non-coal particles, ensuring quality for customers

Current capacity: 17.5Mt ROM (12–14Mt saleable)

## Stockpiles



Grosvenor ROM stockpile capacity of 840kt on-site and 160kt at CHPP

Moranbah North ROM stockpile capacity is 1Mt

Saleable product is stored in stockpiles for train load out and export

Saleable stockpile 1 capacity is 300kt; stockpile 2 is 100kt & stockpile 3 is 300kt

# OPERATING MODEL

**Operating Model drives significant productivity improvements**

Fully integrated master schedule of activities, initiatives and work

All work is planned, resourced and scheduled, with risks assessed, therefore safer

Clarity of priorities, targets set using data-driven process

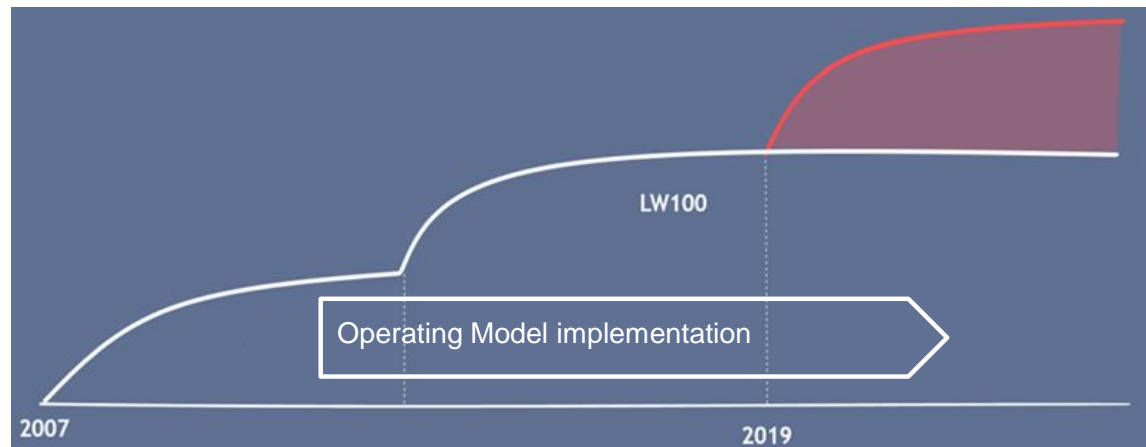
Improved data analytics and effective and efficient feedback loops

Digitisation and automation of work processes and upgrading hardware and software

Right people, right roles, right work.

**Foundations introduced in 2010**

**Final implementation steps underway**



# FUTURESMART MINING™ & P101

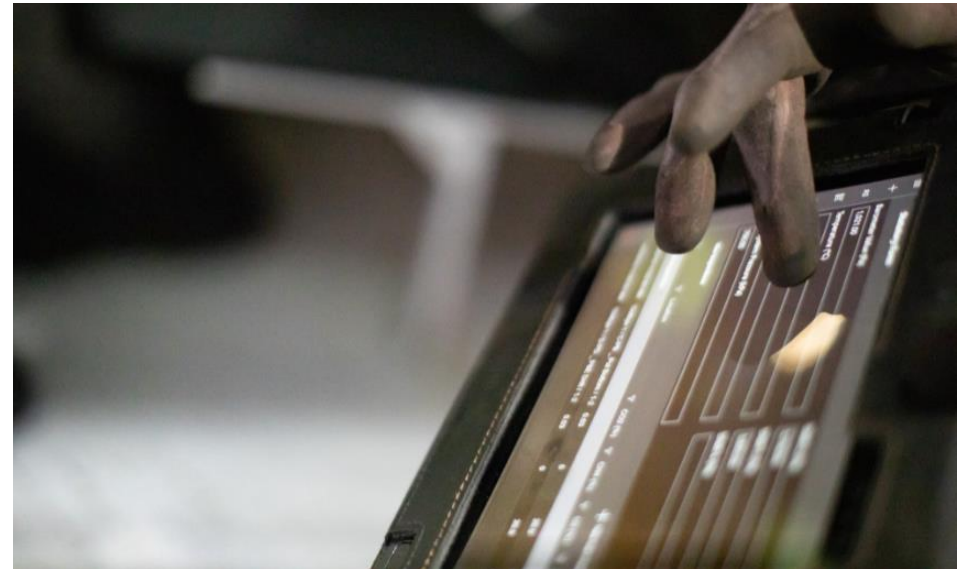
## Variable Speed Drive technology



First Australian longwall to implement Variable Speed Drive (VSD) technology

3 x 1000kW motors that control longwall speed – improved safety, increased productivity and reduced downtime

## Underground tablet devices

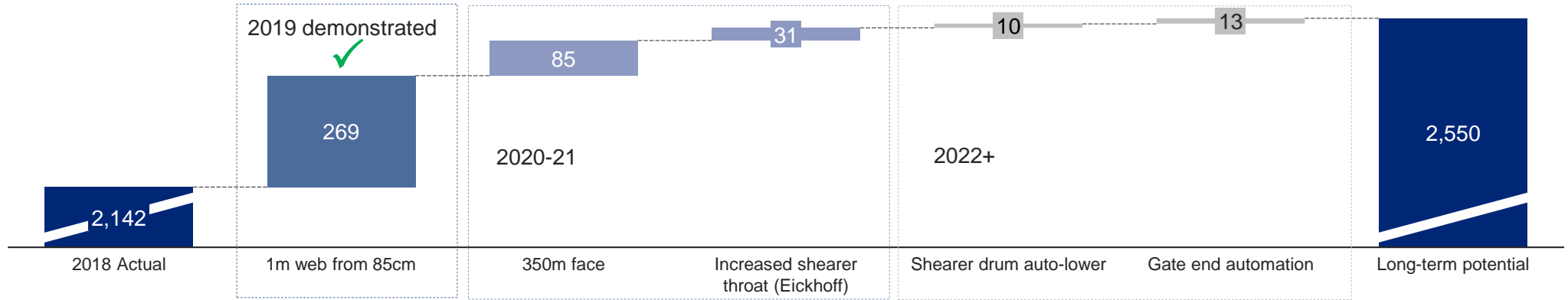


Introduced at Moranbah North Mine in early 2019. Devices capture and share real time safety, production and environmental monitoring data; provide direct access to Safety Health Management System; allow remote video communication; and enable immediate technical advice to be provided reducing downtime

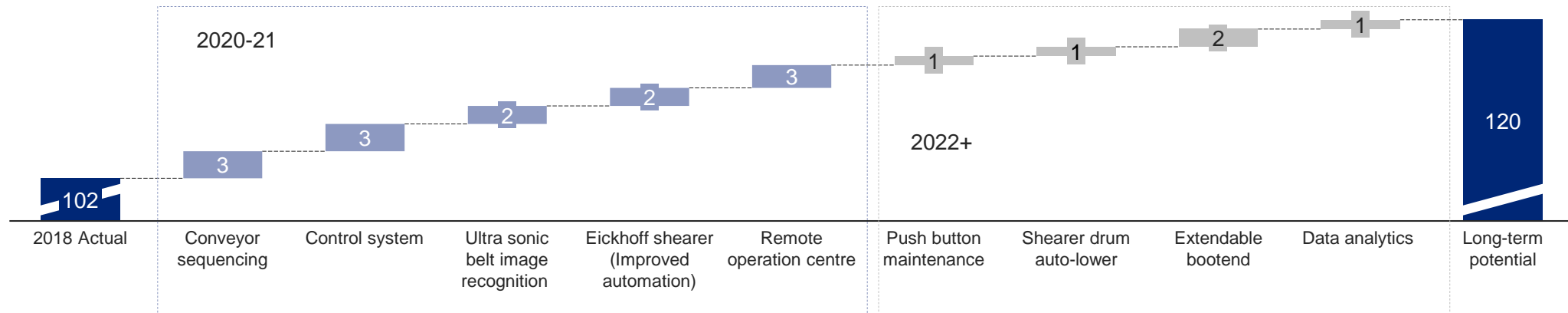


# RAMPING UP TO BENCHMARK PERFORMANCE

## Moranbah North cutting rate (tonnes/hr)



## Moranbah North longwall operating hours



10Mtpa annualized ROM production

14Mtpa

Assumes 45 operating weeks (excl moves and ramp-up)

# FURTHER IMPROVEMENT TO COME

## Real time respirable dust monitoring



PDM 3700 device provides additional functionality and accuracy, allowing workers to make decisions based on real time data

## Increased use of automation



Remote operation of longwall from surface will drive improvements in safety, productivity and efficiency

# SUSTAINABLE MINING PLAN

## Continuous rehabilitation



297 hectares of rehabilitation this year

Uses of rehabilitated land include agriculture

## Waste gas



Waste coal mine gas infrastructure including one power station (with our partner, EDL)

64 MW power generation into grid, powering 65,500 homes

## Social performance



Best practice Anglo American social performance system

Local community partnerships including with rescue helicopter service

# WHAT YOU WILL SEE

---

## Longwall underground operations



Travel down personnel and equipment drift, which is ~900m in length at a grade of 1:8

Travel ~7.6km to view longwall cutting, conveyor and other activities

Cut and bolt sequence in panel 606

## Coal Handling and Preparation Plant



Overview of components that feed into CHPP, stockpiles and train loadout

# FOOTNOTES

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1. Please refer to the AA plc Ore Reserves and Mineral Resources Report 2018 for the tonnes, grades and a breakdown of the classification categories.
2. Potential reserve life extension with Teviot Brook.
3. Attributable share (Grosvenor: 100%; Moranbah North: 88%).
4. Total Recordable Cases Frequency Rate per million hours.

# GROSVENOR

Trent Griffiths, General Manager

Bulks Seminar & Site Visit: 13 November 2019



*Grosvenor surface infrastructure*

# GROSVENOR IN NUMBERS



**173**

Employees



**1**

Longwall system



**39km**

Roadways



**597**

Contractors



**4**

Continuous miners



**220m**

Mining depth



**29 yrs**

Life of Mine<sup>1</sup>



**37**

Support vehicles



**36MW**

Gas power generated

## 2019 key performance indicators

**9.76**

TRCFR YTD

**~7.6Mt**

ROM production<sup>2</sup>

**~4.7Mt**

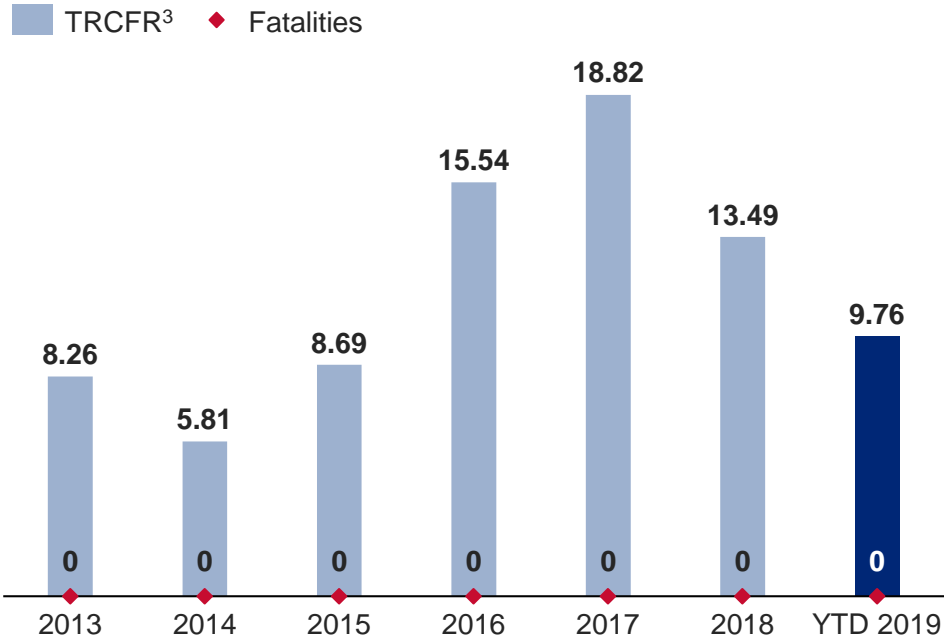
Saleable production<sup>2</sup>

**~\$61/t**

FOB unit cost

# SAFETY IS OUR PRIMARY VALUE

## Performance



Elimination of Fatalities Taskforce

Underground laser monitoring of roadway side wall conditions – measures displacement to 3mm accuracy

Grosvenor Mines Rescue Team – 1<sup>st</sup> place at the Queensland Mines Rescue Competition and the Australian Mines Rescue Competition

## Elimination of Fatalities



## Focus areas

Cultural and behavioural change through leadership development and employee engagement

Implementing surface electronic tag board and personnel monitoring system

Improving critical control management and compliance with alignment across underground sites



# GROSVENOR PROJECT

*Tunnel Boring Machine used in construction*



**Delivered \$100m under budget  
and 7 months ahead of schedule**

**\$1.6bn**

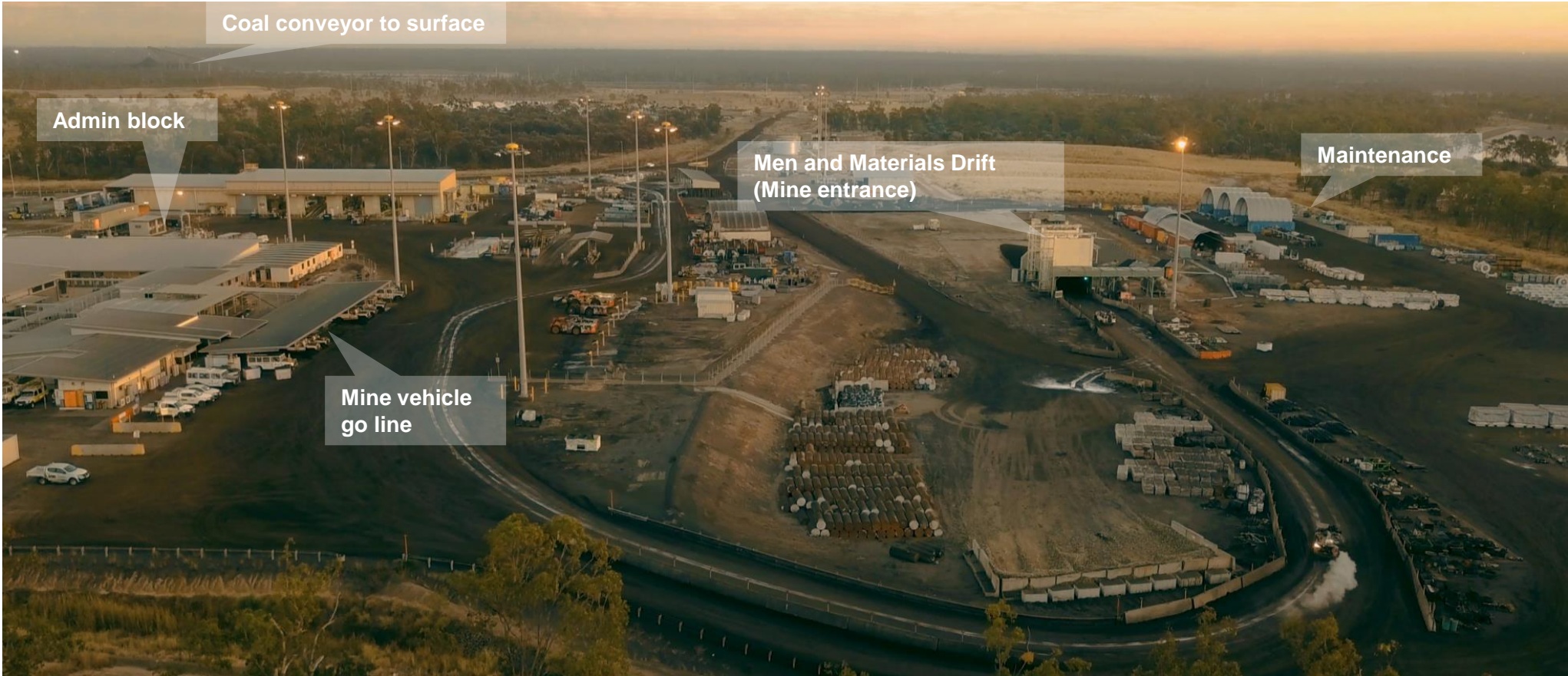
Capex

**54 months**

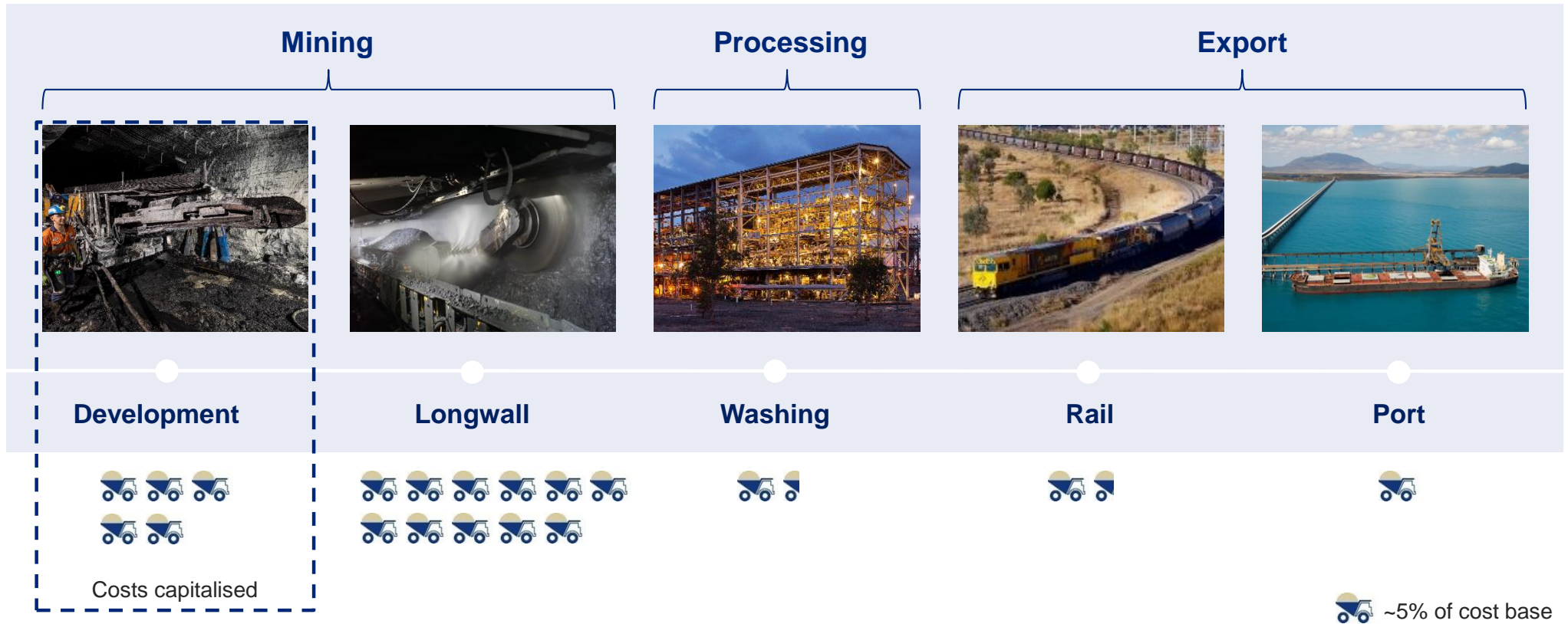
Build time

**Production in line with  
investment case**

# GROSVENOR SITE



# INTEGRATED VALUE CHAIN



**~16km**

Development

**~7.6Mt**

ROM production<sup>2</sup>

**~4.7Mt**

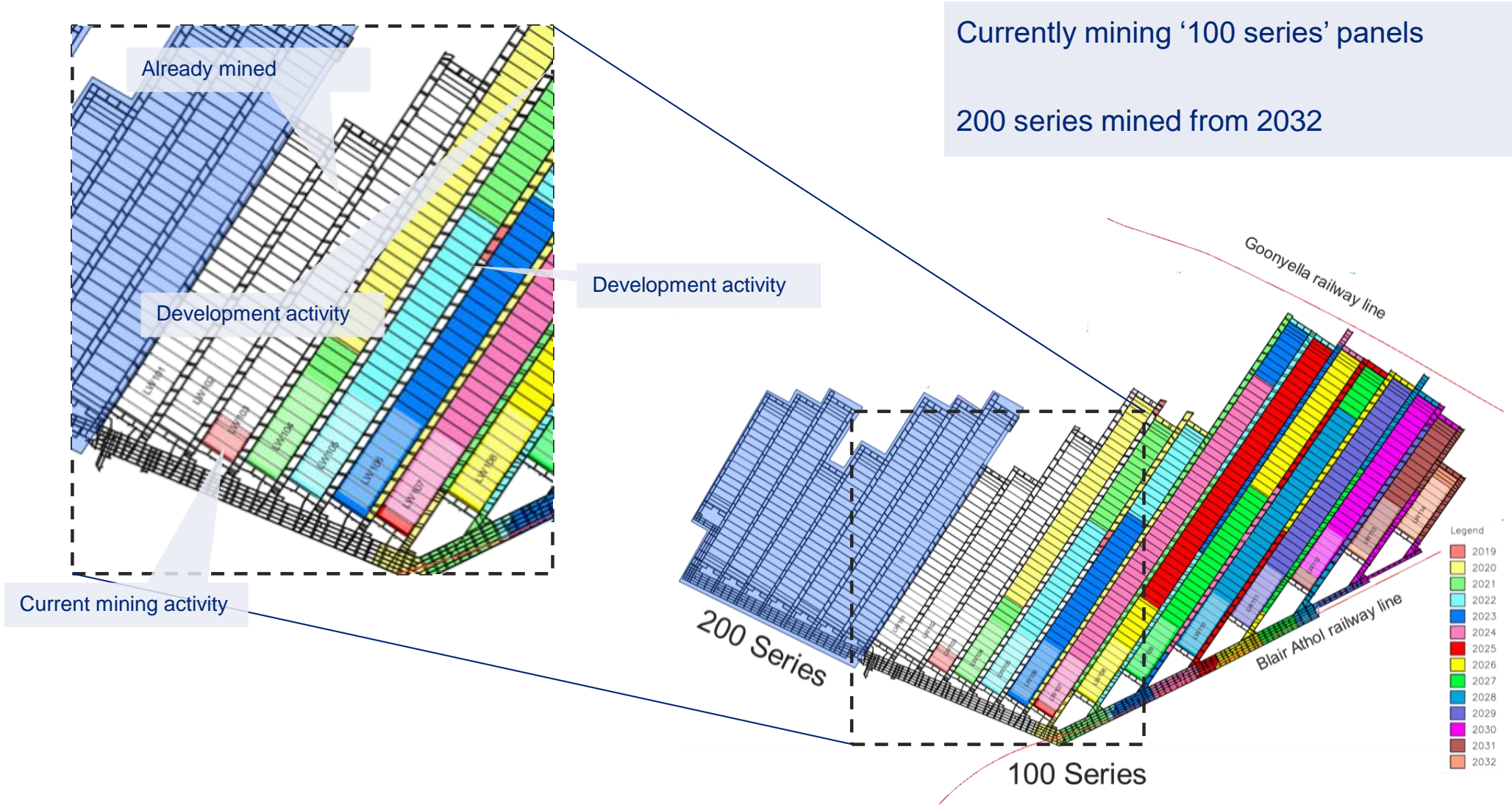
Saleable production<sup>2</sup>

**~4.7Mt**

Export sales<sup>2</sup>

~5% of cost base

# GROSVENOR MINE PLAN



# UNDERGROUND MINING

## Development



Development roadways are mined 3.7m high by 5.4m wide

Two roadways are mined with cross access roads every 125m so the longwall can be adequately operated and maintained

8 x 2.1m roof bolts and 6 x 1.8m rib bolts each metre installed when in optimum mining conditions (with 2 x 8m roof cable bolts every four metres)

## Longwall



Longwall panels average ~4km long and are 300m wide

Coal is cut by the shearer using primarily bi-directional method with 1m advance per shear

Extraction height ranges from 4.7m to 3.8m

# OPERATING MODEL

**Operating Model drives significant productivity improvements**

Fully integrated master schedule of activities, initiatives and work

All work is planned, resourced and scheduled, with risks assessed, therefore safer

Clarity of priorities, targets set using data-driven process

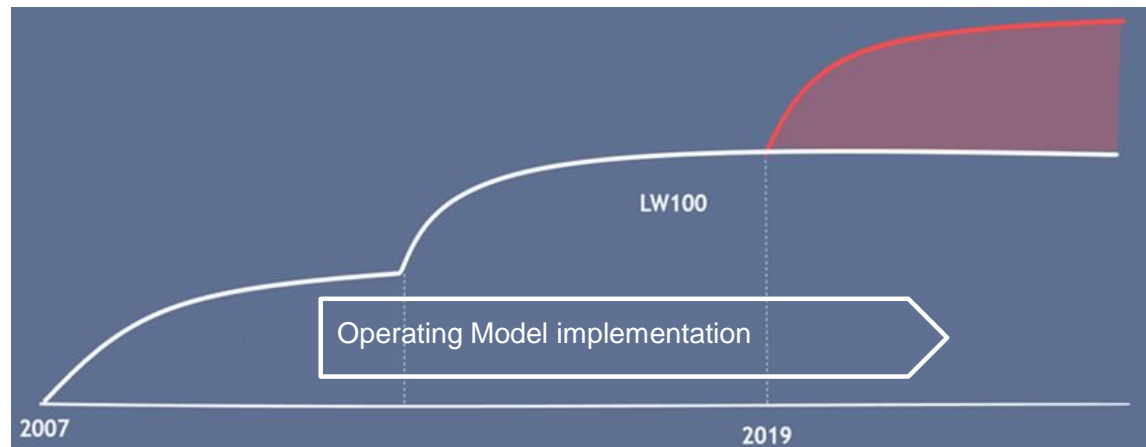
Improved data analytics and effective and efficient feedback loops

Digitisation and automation of work processes and upgrading hardware and software

Right people, right roles, right work.

**Foundations introduced in 2010**

**Final implementation steps underway**



# FUTURESMART MINING™ & P101



## Remote operation

Removing personnel from harm's way: dust, heat and equipment interaction



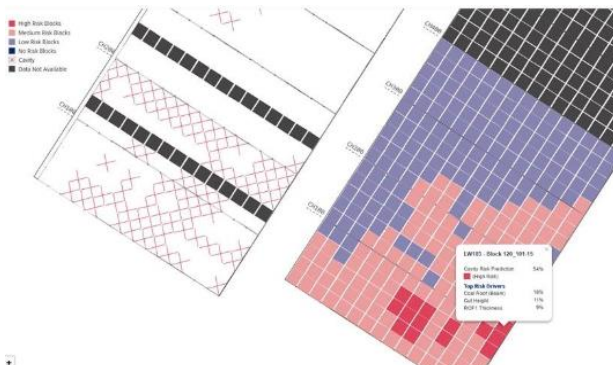
## Shotcrete rib support

Remote application of shotcrete to mined roadways to improve strata stability



## Airoduster: Stonedust Application

Incombustible content applied with no harm to personnel downstream



## Cavity prediction

Data analytics to help predict increased longwall strata risk



## 3D Laser scanner

3D imaging of underground mined roadways for monitoring deformation

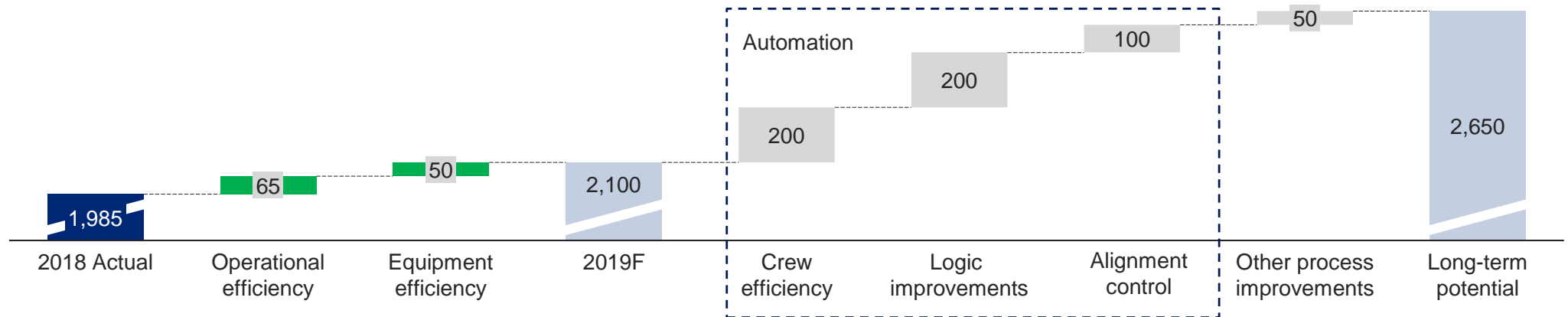


## Underground communications and digitisation

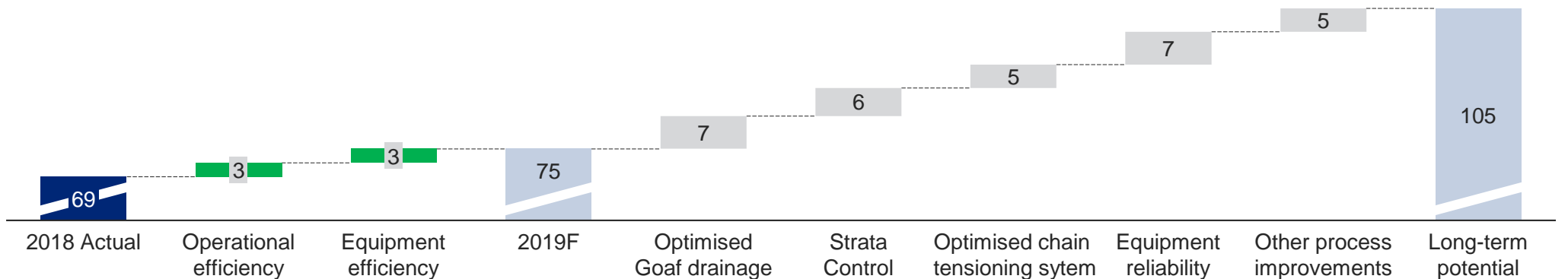
State of the art technology using tablets and wifi phones

# RAMPING UP TO BENCHMARK PERFORMANCE

## Grosvenor longwall cutting rate (tonnes/hr)



## Grosvenor longwall operating hours



6.0Mtpa ROM production

7.0Mtpa

12.5Mtpa

Assumes 45 operating weeks (excl moves and ramp-up)



# FURTHER IMPROVEMENT TO COME

## Battery-powered UG equipment



Trials to be conducted in 2020 with battery powered underground personnel transporters

Fully battery powered producing no diesel emissions

## Proximity detection implementation



Trials to be conducted in 2020 installing proximity detection systems on continuous miners and shuttle cars to minimise risk to personnel

## Advancements in automation



Longwall improvements: increased accuracy via horizon control and removing personnel from harm's way

# SUSTAINABLE MINING PLAN

## Continuous rehabilitation



Rehabilitation of ~130 hectares per year

Uses of rehabilitated land include cattle grazing

## Waste gas



Waste coal mine gas infrastructure including a power station (with our partner, EDL)

36MW power generation into national electricity grid, powering 37,000 homes

## Social performance



Social investment and community consultation

# WHAT YOU WILL SEE

## 3D Laser Scanner



3D scanner setup on the surface allowing personnel to see the full scanner functionality in action and how we have adopted it to our underground operation. A top 10 finalist in the 2019 Queensland Mining Safety Innovation awards

## Technology Room



State of the art underground coal mining technology room containing fully certified underground tablets, personal gas detectors and wifi mobile phones

## Remote Operating Centre (ROC)



Used to fully operate the longwall from the surface. On 8 November, 5 shears were cut on the longwall face from the surface ROC including shearer, roof support and the longwall coal clearance system operation – an Australian first

# FOOTNOTES

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1. Please refer to the AA plc Ore Reserves and Mineral Resources Report 2018 for the tonnes, grades and a breakdown of the classification categories.
2. 100% share.
3. Total Recordable Cases Frequency Rate per million hours.

# CAPCOAL

Tom Cobcroft, General Manager

Bulks Seminar & Site Visit: 14 November 2019



*Dragline DL105 at Capcoal Open Cut*

# CAPCOAL IN NUMBERS



**464**

Employees



**6**

Primary production equipment



**45km**

Roadways



**525**

Contractors



**16**

Ancillary equipment



**17Mt**

CHPP Production Capacity



**20 yrs**

Life of Mine<sup>1</sup>



**30**

Haul fleet

## 2019 key performance indicators

**3.75**

TRCFR YTD

**~3.7Mt**

ROM production<sup>2</sup>

**~2.8Mt**

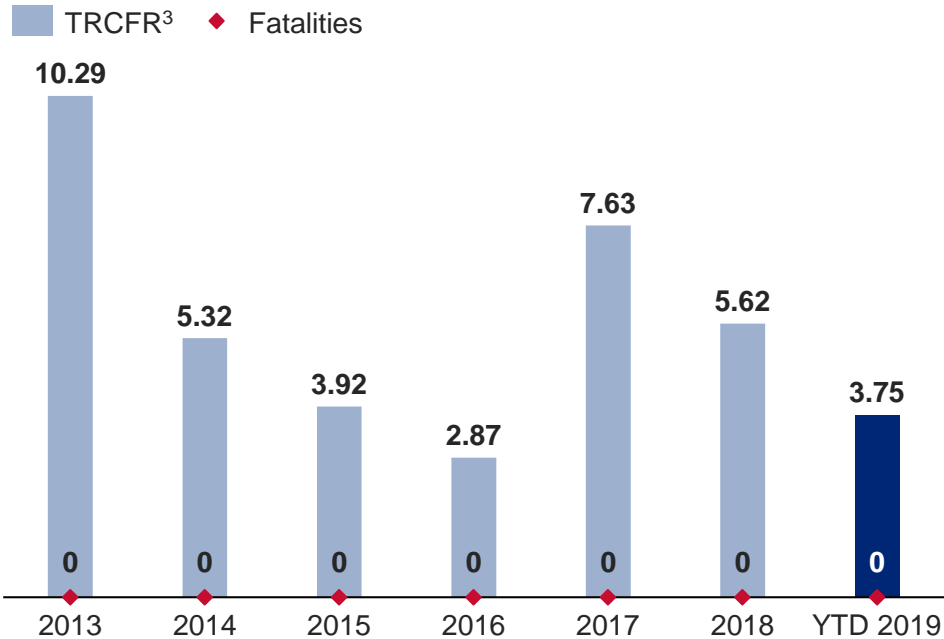
Saleable production<sup>2</sup>

**~\$75/t**

FOB unit cost

# SAFETY IS OUR PRIMARY VALUE

## Performance



Elimination of Fatalities Taskforce

Winner of “Highly Commended” Award for Innovation at Queensland Mining Industry Health & Safety Conference – Real Time Bund Monitoring

Site electricians 10,700 days LTI free (almost 30 years)

## Elimination of Fatalities



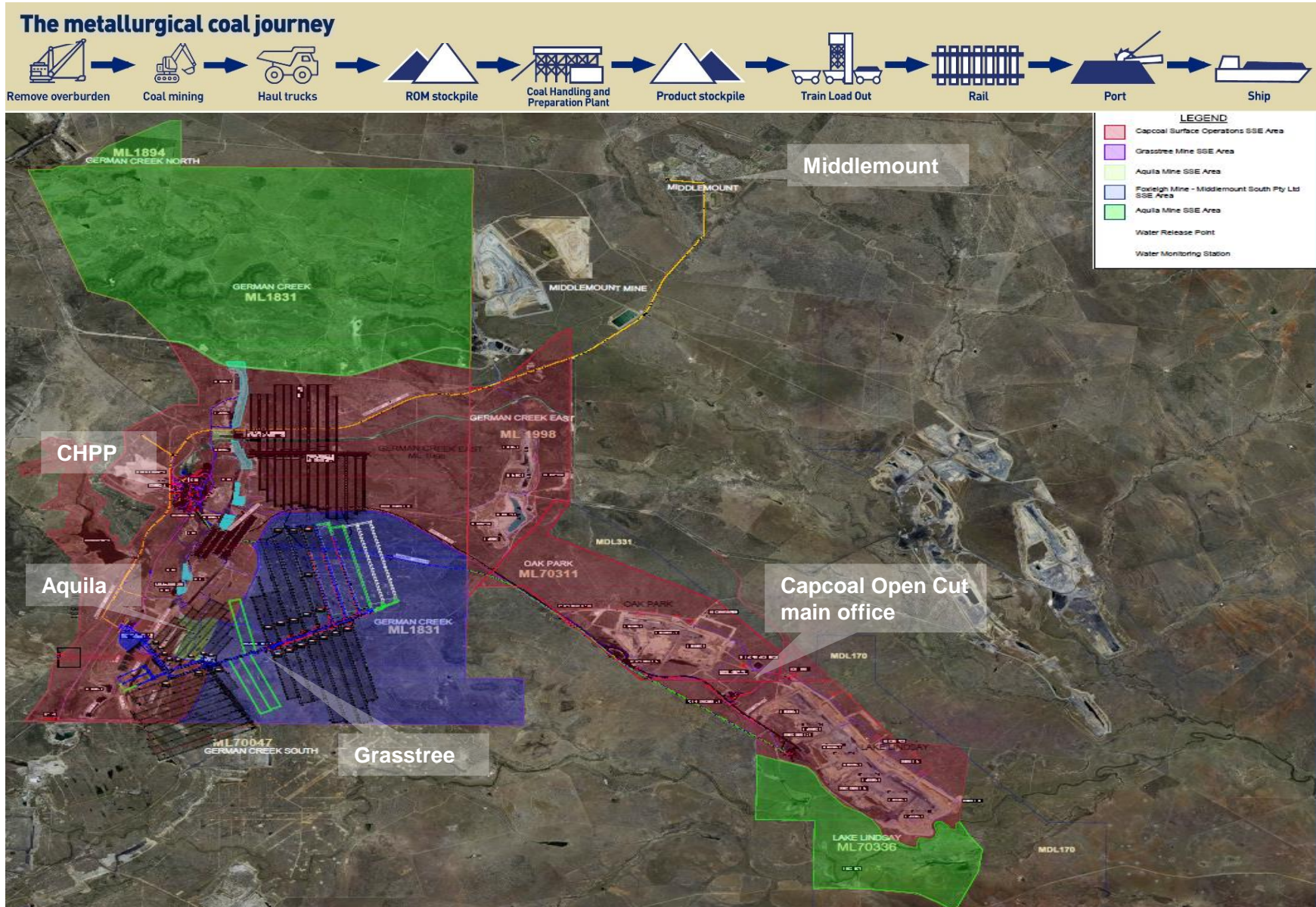
## Focus areas

Cultural and behavioural change through leadership development and employee engagement

Alertness technology implementation for HME fleet

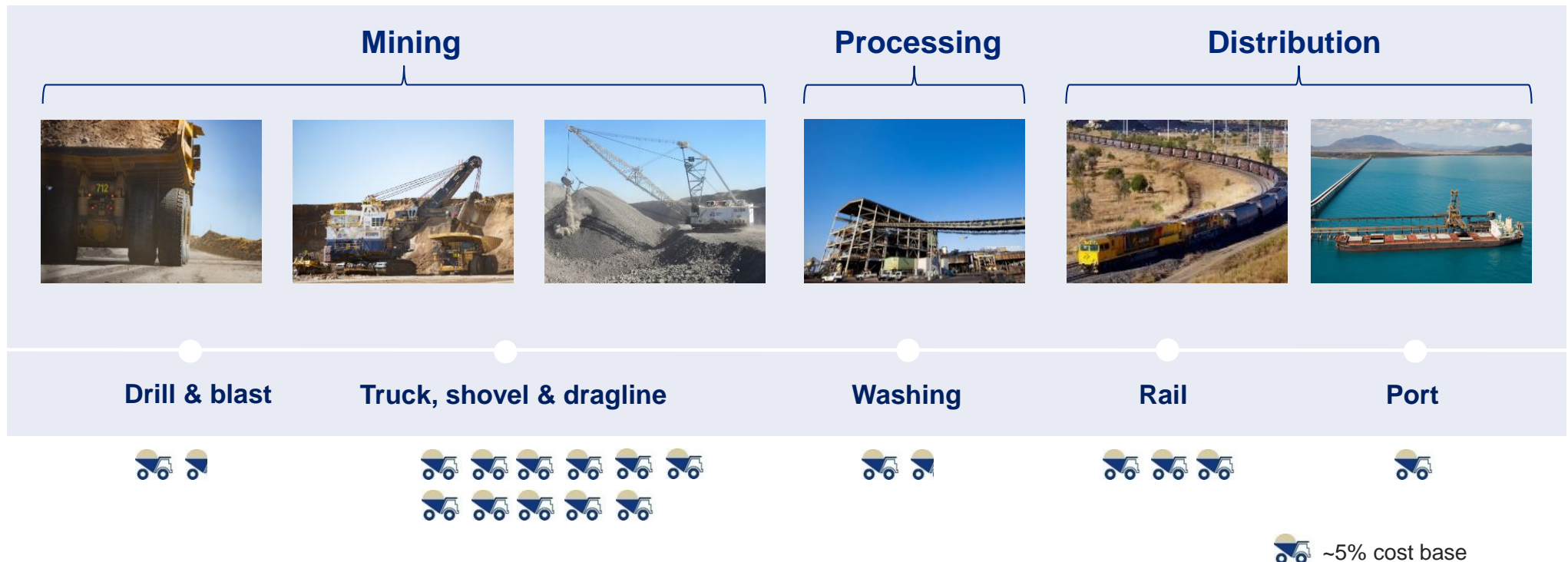
Improving critical control management and compliance – open cut alignment by end 2019

# CAPCOAL COMPLEX OVERVIEW





# INTEGRATED VALUE CHAIN



**~3.7Mt**  
ROM production<sup>2</sup>

**~2.8Mt**  
Saleable production<sup>2</sup>

**~2.8Mt**  
Export sales<sup>2</sup>

# MINING SEQUENCE & EQUIPMENT

## Pre-strip mining activities – Rope shovel



# MINING SEQUENCE & EQUIPMENT

## Drill and blast



Drill holes to a depth of 72m

Explosives laid in overburden

## Dragline uncovering coal



Main dragline (Bucyrus 8750AC) uncovers lower coal seams

Operating weight of 5,613t; bucket capacity of 90-100m<sup>3</sup> to move 100,000bcm per day

# MINING SEQUENCE & EQUIPMENT

## Uncovering coal with excavators



RH340 hydraulic excavators support the shovel in pre-strip operations and mine uncovered coal

34m<sup>3</sup> bucket moves 32,000bcm per day

## Pit set-up by dozers



Three Caterpillar D11 dozers used for bulk pushing material after blasts in dragline dig areas

# COAL HANDLING AND PREPARATION

## Coal Handling and Preparation Plant



Capcoal Coal Handling and Preparation Plant processes hard coking coal from Grasstree and Capcoal Open Cut.

Current production capacity: 17.5Mt CHPP (100%, our share 70%)

## Rail and Export



Saleable Product is railed to Dalrymple Bay Coal Terminal near Mackay and RG Tanna near Gladstone

# OPERATING MODEL

**Operating Model drives significant productivity improvements**

Fully integrated master schedule of activities, initiatives and work

All work is planned, resourced and scheduled, with risks assessed, therefore safer

Clarity of priorities, targets set using data-driven process

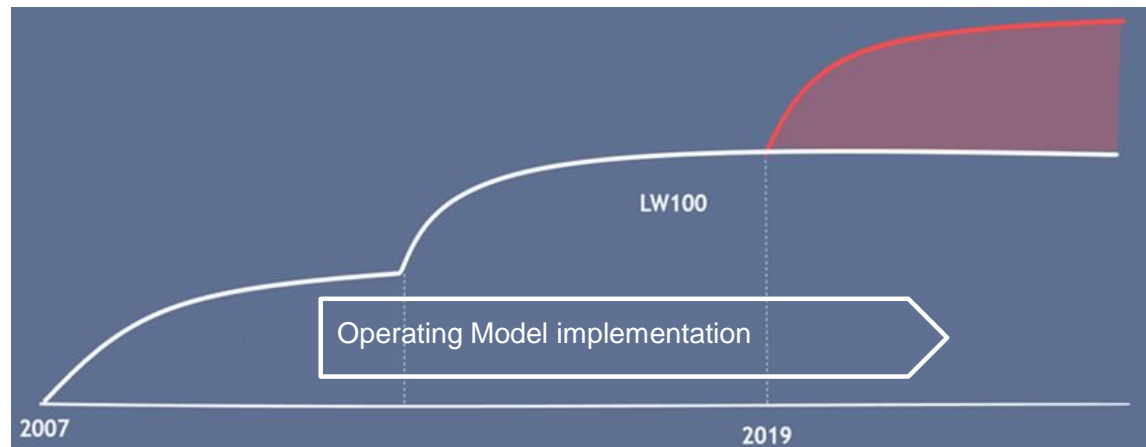
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Digitisation and automation of work processes and upgrading hardware and software

Right people, right roles, right work.

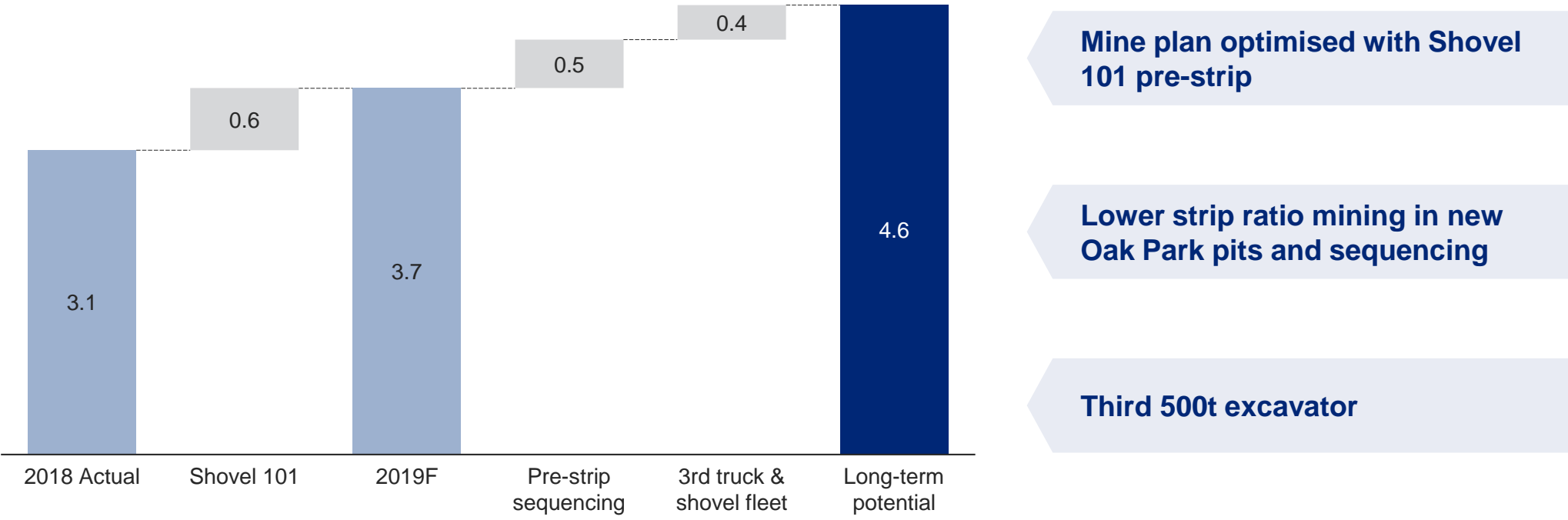
**Foundations introduced in 2010**

**Final implementation steps underway**

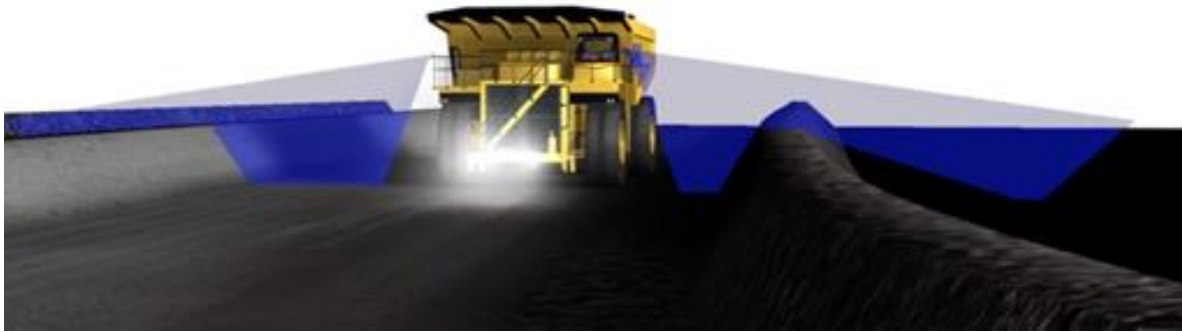


# BEYOND BENCHMARK PERFORMANCE

## Capcoal Open Cut ROM (Mt)<sup>2</sup>

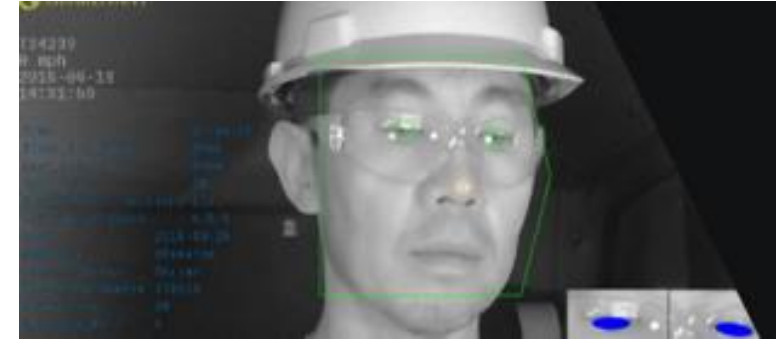


# DRIVING SAFETY & PRODUCTIVITY THROUGH TECHNOLOGY & P101



## Real time bund monitoring

Bunds are critical safety control in open pit mining mitigating HME risks. New system using laser sensors provides cost and time efficient solution that monitors and audits bunds compliance to standard in real time.



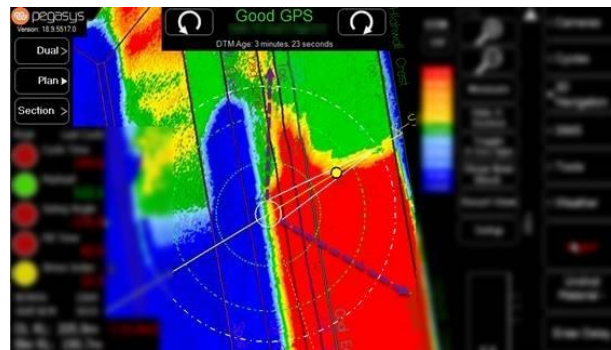
## Alertness technology

In-cab system being installed to reduce alertness and distraction incidents



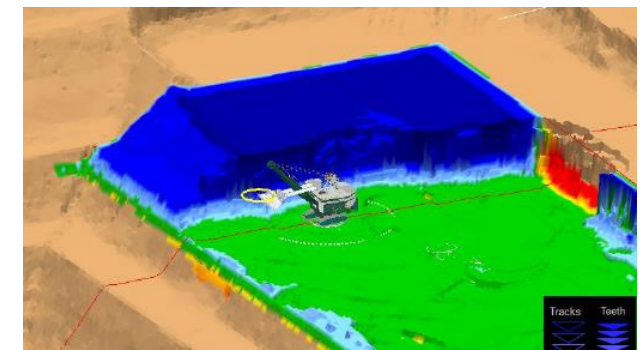
## Hurricane buckets

Advanced bucket technology with refinements in bucket shape, weight and angle of attack gives lower fill time so more material moved per hour



## Real time digital terrain mapping

High-definition laser scanners allow real-time digital terrain mapping and feedback to operators, so pits can be dug more precisely to design— limiting rework and rehandle.



## Payload optimisation

Real-time measurement of shovel loads allow operators to target specific payload weights, so haul-trucks filled to capacity with less variation



# SUSTAINABLE MINING PLAN

## Continuous mine site rehabilitation



Progressive, industry-leading mine rehabilitation undertaken across site

## Reducing raw water consumption



Proposed reverse osmosis water treatment plant will reduce usage of imported freshwater by >70%

## Social performance



Schools-based apprenticeships and traineeship programs supporting female & indigenous trainees

# WHAT YOU WILL SEE TODAY

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## Open pit tour



Tour of Capcoal's open cut operations

## 2018 'Golden shovel'



Capcoal's 4100 shovel produced at a 42Mt annualised run rate in 2018 - Anglo American's best performing shovel for the year

# FOOTNOTES

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1. Please refer to the AA plc Ore Reserves and Mineral Resources Report 2018 for the tonnes, grades and a breakdown of the classification categories.
2. Anglo American 70% share.
3. Total Recordable Cases Frequency Rate per million hours.

# AQUILA

**Marc Kirsten, General Manager & Tony Willmott, Project Director**

**Bulks Seminar & Site Visit: 14 November 2019**



# SAFETY IS OUR PRIMARY VALUE

## Performance

**10.91**

TRCFR<sup>1</sup> YTD 2019

Safety focus: Removing people from harm's way

Automation technology key to success

Aquila will be most technologically advanced underground operation

## Elimination of Fatalities



LEADERSHIP



CARING CULTURE



PLANNING & SCHEDULING



RISK & CHANGE MANAGEMENT



MONITORING & ASSURANCE



LEARNING ORGANISATION

## Focus areas

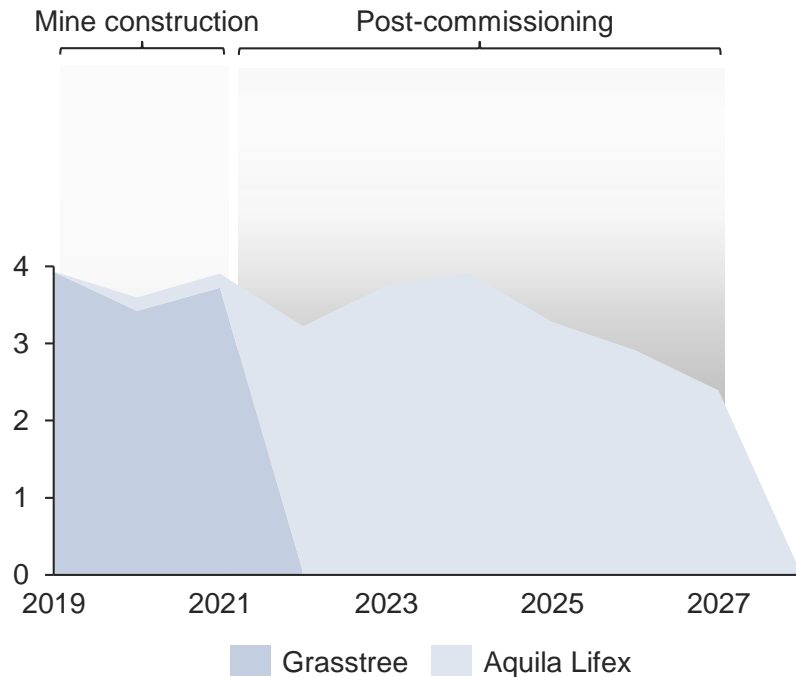
Cultural and behavioral change through leadership development and employee engagement, including through on-boarding

Implement robust planning processes with contractor focus

Improving critical control management and compliance with process alignment across underground sites

# AQUILA: QUALITY GRASSTREE LIFEX

## Saleable (Mtpa)



Approved July 2019

Grasstree lifex, high quality metallurgical coal

~2.5 year construction leveraging existing infrastructure

Saleable production

**3.5Mtpa**

IRR

**>30%**

Mine life

**6 years**

Margin

**>40%**

Capex

**\$226m**

(Anglo American 70% share)

# AQUILA PROJECT OVERVIEW

**First longwall production  
early 2022**

**Low capital intensity  
using existing infrastructure from  
adjacent Grasstree Mine**

**Staged transition of Grasstree's skilled  
and award-winning workforce to Aquila**

**Latest underground innovations and  
Operating Model in place from outset**



# MINING EQUIPMENT

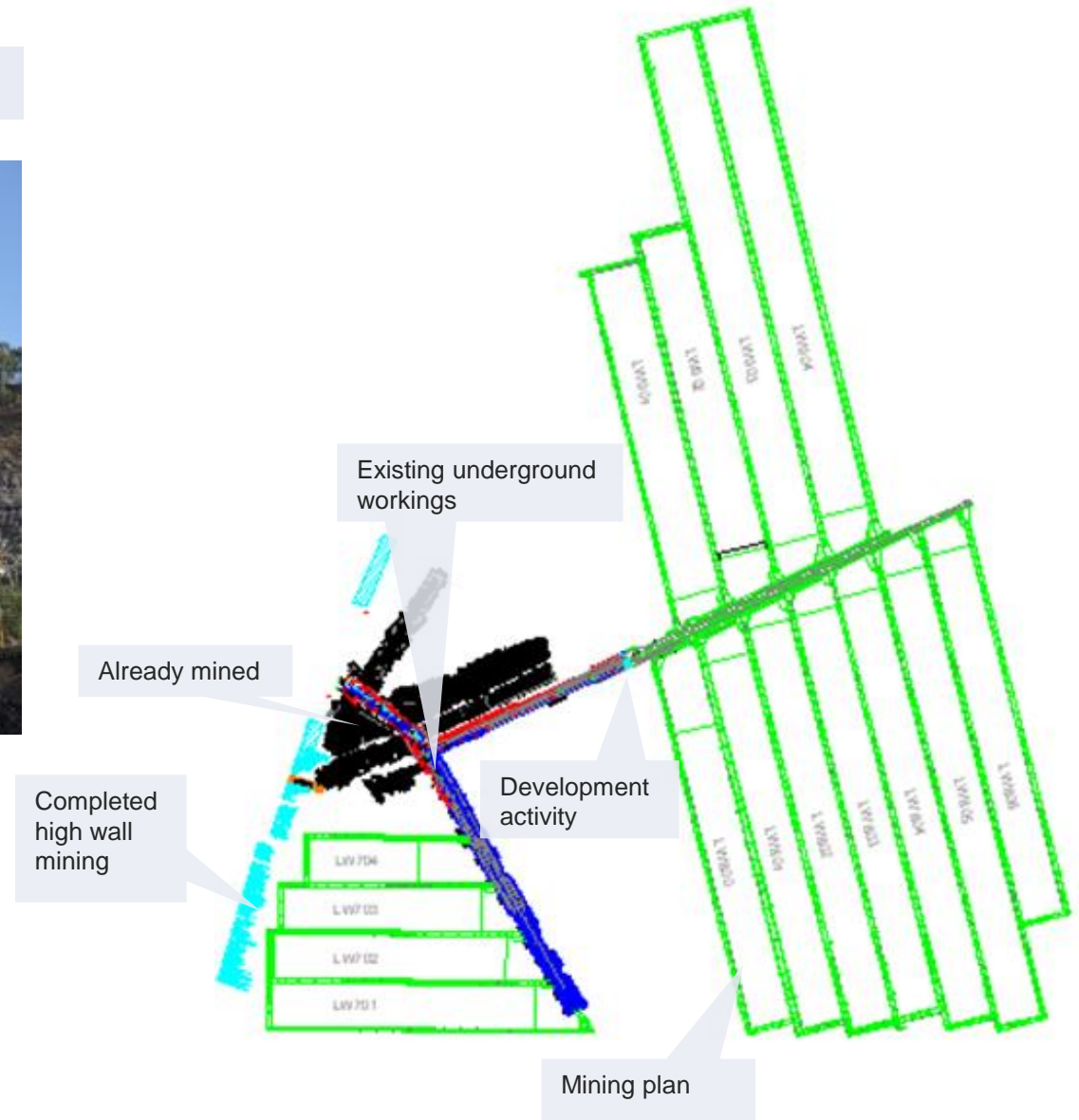
## Development activity underway



Continuous miner in place with first coal cut

'Walk on – walk off' longwall: No move time

Operation is ~110m above mined out Grasstree





# DEVELOPMENT ACTIVITY UNDERWAY

Continuous miner



Continuous miner overhauled and underground for development mining and roadways

Current location of continuous miner



First development unit in place (above), with first coal cut late September 2019

Second unit in place by end 2019 and third unit ~mid-2021

# FUTURESMART MINING™ & P101

## Remote operation



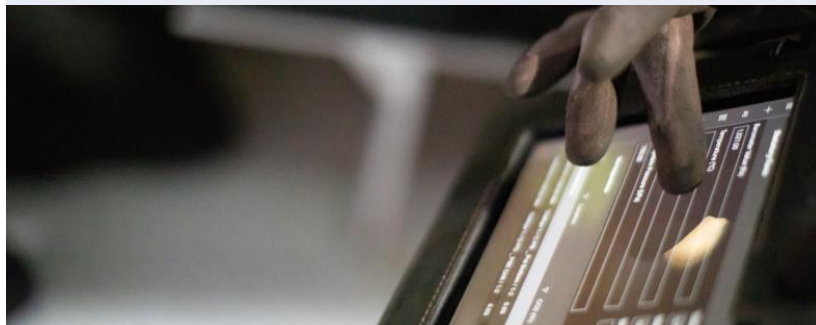
All automation advances from other undergrounds incorporated, including remote operation of longwall

## 3D Lidar scanning



Real time strata and longwall management

## Underground technology



Digitisation and sensing technology to provide real time information and equipment location

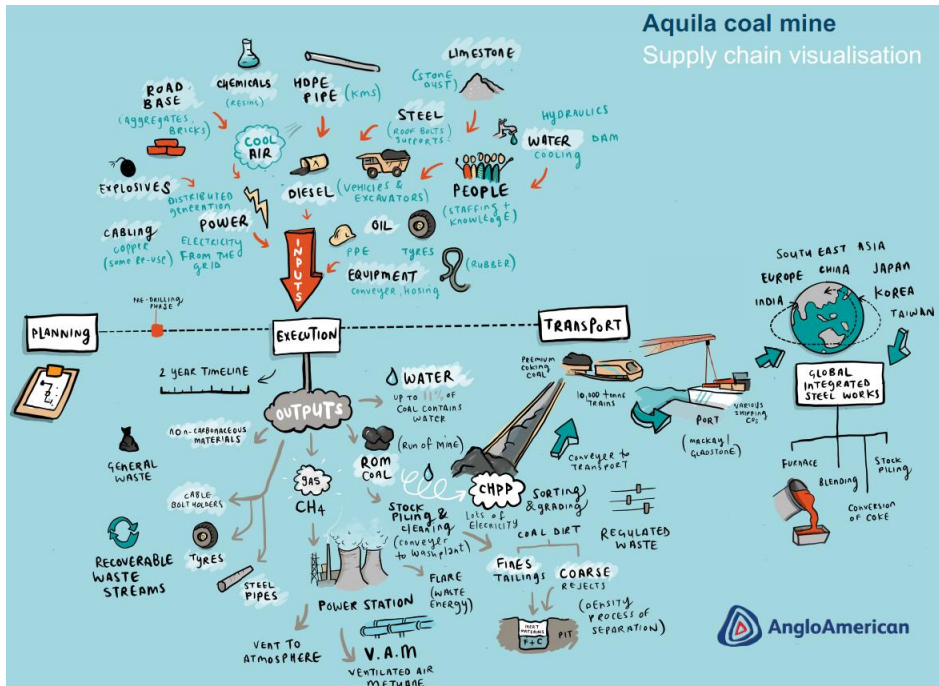
## Dust suppression technology



Featuring revolutionary application of biodegradable foam

# SUSTAINABLE MINING PLAN

## Circular economy



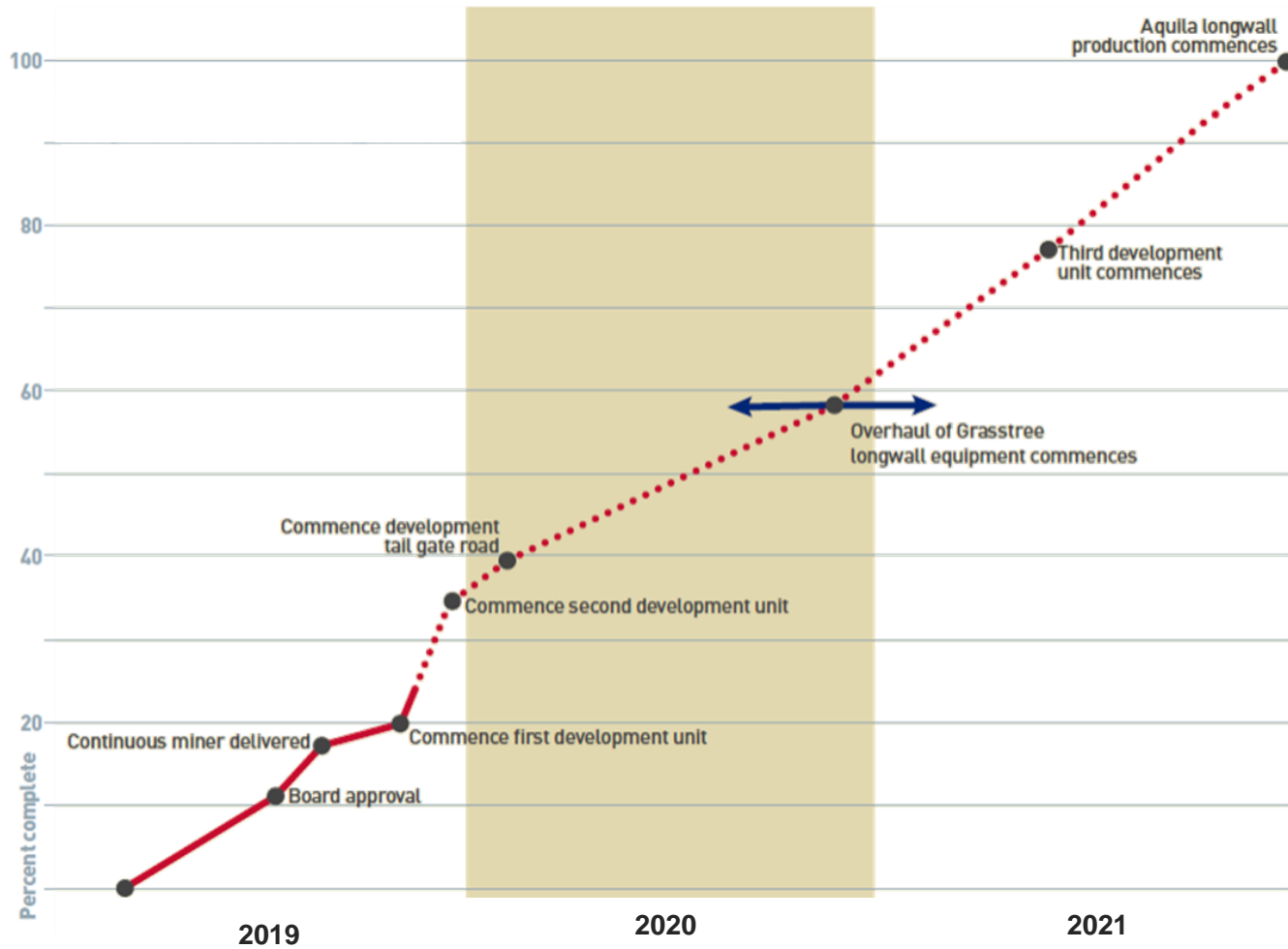
Circular economy lens across the operation, with focus on full value chain and optimal use of resources in operations

## Social performance



Best practice Anglo American social performance system, including engagement with communities and supplier networks

# PROJECT TIMELINE



No permitting requirement

Key priorities

Planning and alignment – integration with Grasstree

Delivery of major equipment

# FOOTNOTES

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1. Total Recordable Cases Frequency Rate per million hours.