



# FUTURESMART MINING™

BAML Smart Mine Conference - Big Ideas in Mining – June 2019

Real Mining. Real People. Real Difference.

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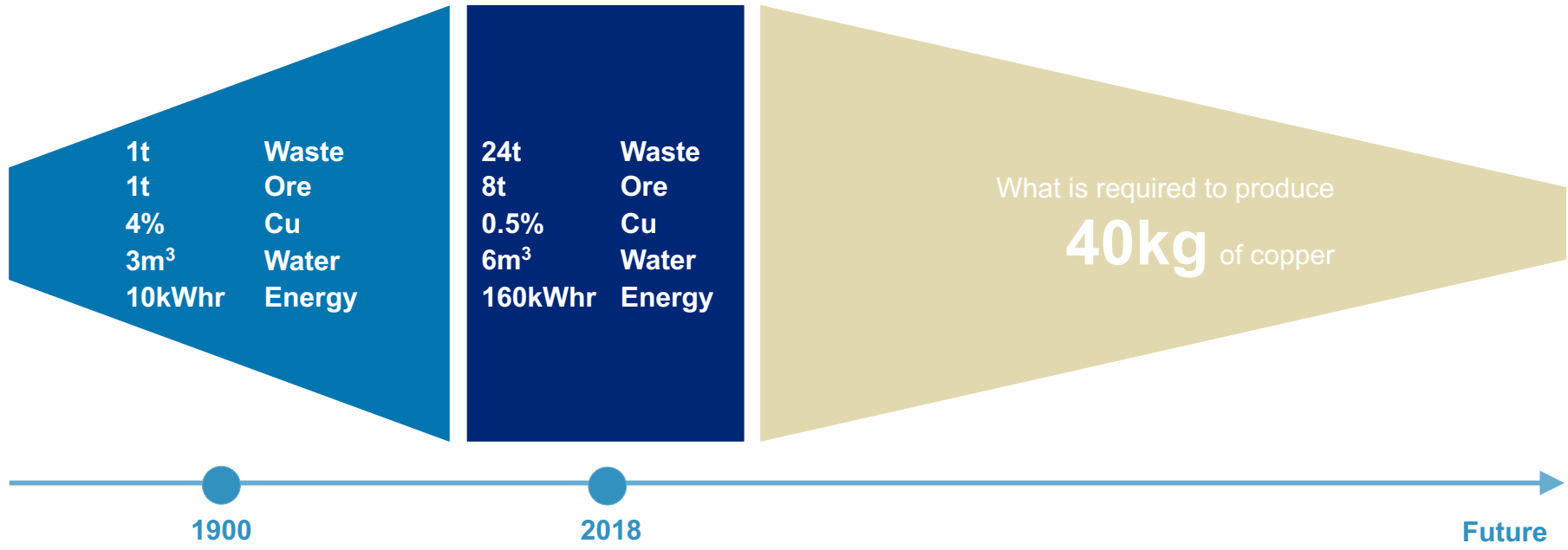
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Throughout this presentation a range of financial and non-financial measures are used to assess our performance, including a number of financial measures that are not defined or specified under IFRS (International Financial Reporting Standards), which are termed 'Alternative Performance Measures' (APMs). Management uses these measures to monitor the Group's financial performance alongside IFRS measures to improve the comparability of information between reporting periods and business units. These APMs should be considered in addition to, and not as a substitute for, or as superior to, measures of financial performance, financial position or cash flows reported in accordance with IFRS. APMs are not uniformly defined by all companies, including those in the Group's industry. Accordingly, it may not be comparable with similarly titled measures and disclosures by other companies.

# INNOVATION ESSENTIAL TO ENSURE SUSTAINABILITY

## Unsustainable trajectory

## Precision trajectory



# WE ARE RE-IMAGINING MINING

## Operating Model

P101

## FutureSmart Mining™

### Digitalisation

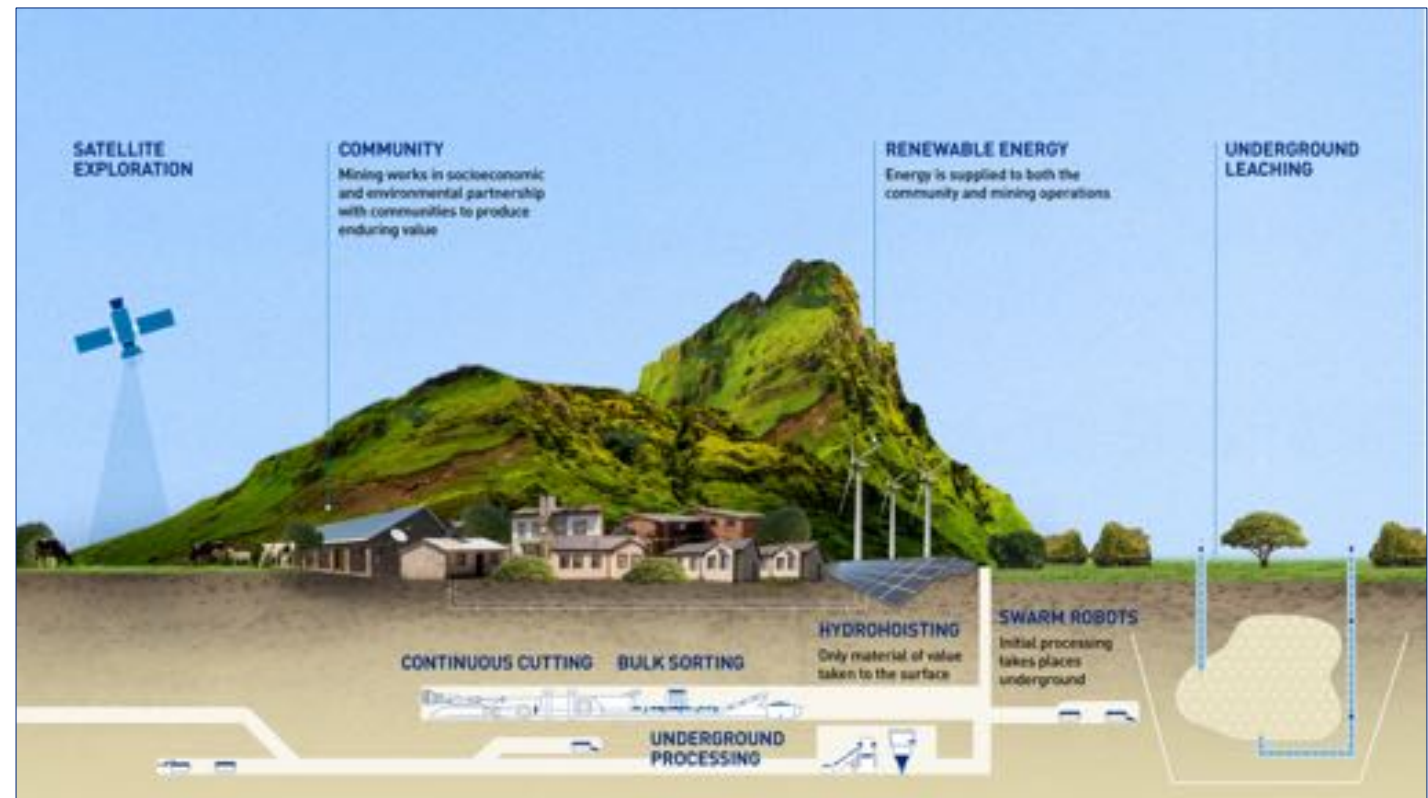
The Intelligent Mine

### Technology Innovation

The Concentrated Mine  
The Waterless Mine  
The Modern Mine

### Sustainability

Sustainable Mining Plan



# STEP-CHANGING THE INTENSITY EQUATION

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## Challenge

Precision mining with minimal energy, water and capital intensity

## Approach

Concentrate the Mine™ concept:

1. Coarse particle recovery
2. Bulk sorting
3. Grade Engineering™
4. Precision classification
5. Ultrafine recovery
6. Novel leach

## Value

CPR: 20% increase in throughput, 85% recovery of water

Bulk sorting: 5% grade improvement, 20% more throughput

Ultrafine recovery: 2-4% recovery improvement

Novel Leach: 60-80% recovery



# RECOVERING AND AVOIDING WATER

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## Challenge

~75% current portfolio located in water constrained regions

## Approach

1. Coarse particle recovery
2. Dry stacking
3. Dry processing

## Value

Reduced footprint

Increased water recovery

Reduced TSF risk

Removal of expansion constraints



# DELIVERING ENDURING VALUE THROUGH SMART ENERGY

## Challenge

Transformational use of renewables

## Approach

1. Oversize PV
2. Plant tariff demand arbitrage
3. Produce H2 with excess PV
4. Consume H2 in trucks

## Value

Reduce GHG on large site by 30% in plant and 100% in trucks

Increase truck power by 5%

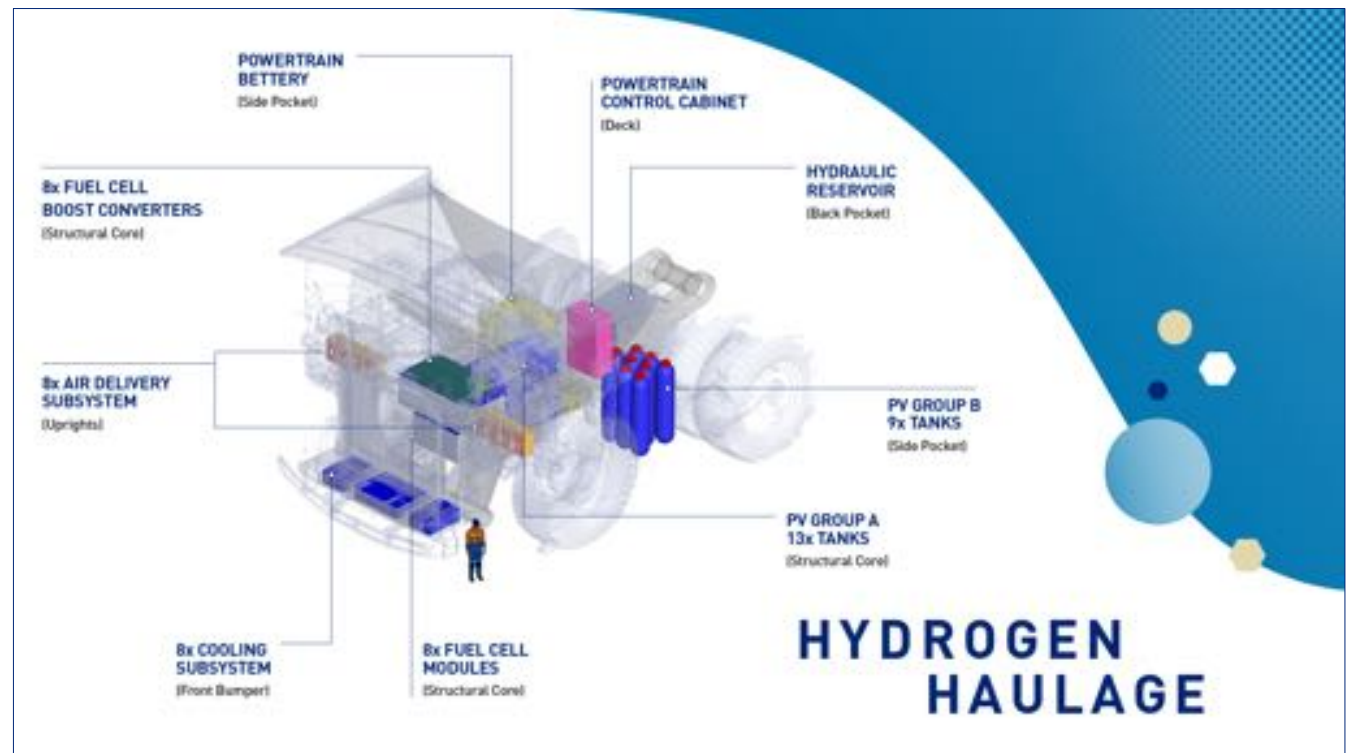
Energy security

Price resilience

Move to hydrogen economy

Next generation mining vehicles

Host community participation



# RE-DEFINING THE RISK PROFILE

## Work

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### Challenge

Everyone goes home safely every day

### Approach

1. Modernise – Electro-hydraulic drills, gel explosives, no scraper-winchies
2. Mechanise – Remote operated ultra-low-profile equipment
3. Continuous cutting – Hard rock cutting machines
4. Swarm robotics – Small self-organising intelligent machines

### Value

Safer and more efficient working environment

Transition pathway in existing operations





# RE-DEFINING THE RISK PROFILE

## Tailings

### Challenge

Eliminate wet tailings

### Approach

Reduce risk

1. Fibre-optic sensing
2. Satellite monitoring

Eliminate

1. Coarse particle recovery
2. Unsaturated stacking
3. Dry processing

### Value

Increased water recovery >80% for similar cost

Reduced footprint

Increased water recovery

New value options



# AUTHORING THE OPTIMAL MINING SYSTEM WITH DIGITALISATION

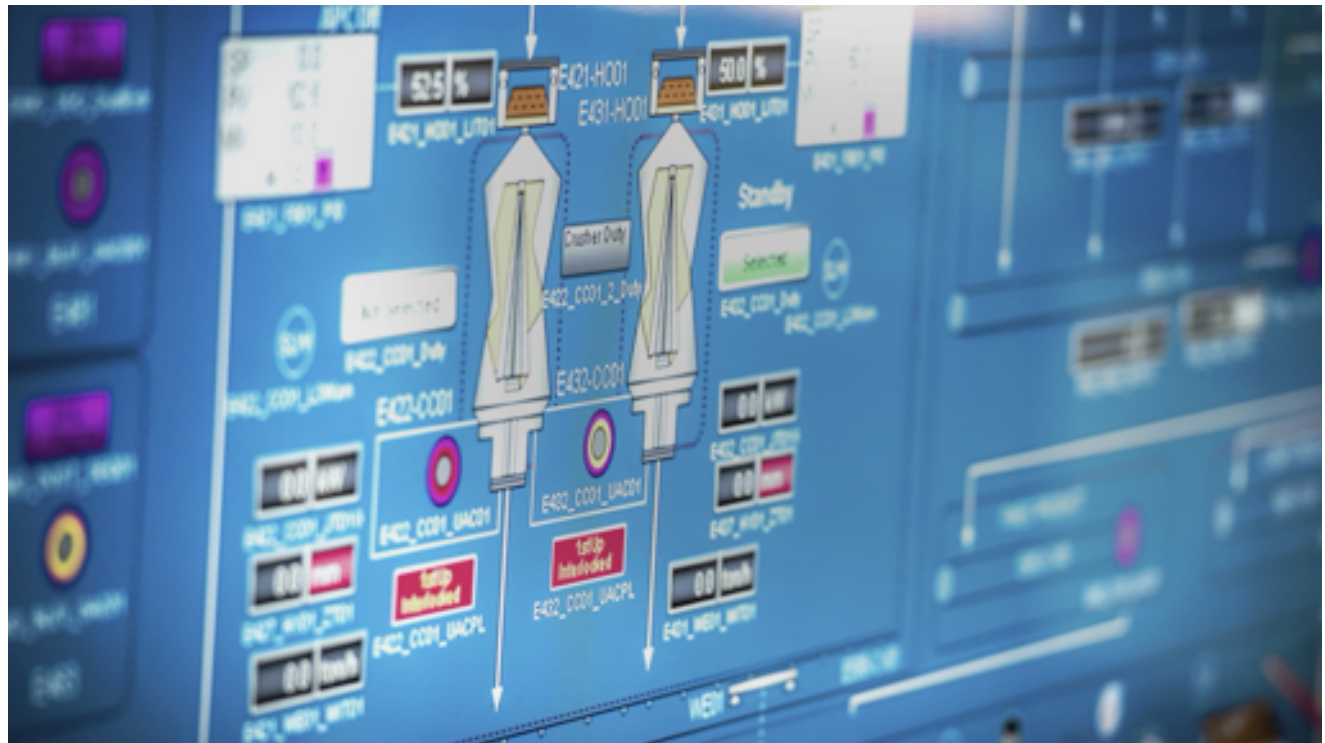
## Advanced Process Control

2% recovery/yield

5% process throughput

30% process stability

5% energy efficiency



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**THANK YOU**

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