Transforming BHP: Technology unlocking value from pit to port

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SmartMine conference
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Our strategy to maximise value and returns

To have industry-leading capabilities applied to a portfolio of world-class assets in the most attractive commodities

Culture and capabilities that enable the execution of our business strategy

- Market intelligence
- Access, discovery and appraisal
- Value conversion in operations and marketing

Best culture and capabilities

Highly attractive commodities, matched to our capabilities

- Attractive supply / demand fundamentals
- Large market sizes
- Steep cost curves
- Upstream value chains
- Differentiated demand drivers

Best commodities

World class assets, uniquely suited to our capabilities

- Large
- Long-life
- Upstream
- High-margin
- Expandable

Best assets

Value and returns

Driven by a commitment to transformation, capital discipline and social value
Unlocking value for BHP through transformation

The world is undergoing significant change… we will be bolder and adapt faster to take advantage of this

<table>
<thead>
<tr>
<th>Transformation</th>
<th>Current programs</th>
<th>Outcomes</th>
<th>Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ways of work</td>
<td>World Class Functions • Reduce bureaucracy, fewer silos • 30% reduction in overhead costs&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Centres of Excellence • Centrally defined global best practice • Equipment consistently to exceed benchmark</td>
<td>Operational stability</td>
</tr>
<tr>
<td>Culture and capabilities</td>
<td>BHP Operating System • Front-line-led continuous improvement • Deployed across seven locations by end-FY19</td>
<td>Enhancing our access to capability • Flexible partnerships to access talent • Technical and engineering excellence</td>
<td>Quantum shift in safety, performance and value</td>
</tr>
<tr>
<td>Strategic and innovative partnerships</td>
<td>Value Chain Automation • Equipment automating • Decision automation</td>
<td>Innovative solutions for operations • Address sustainability challenges (e.g. carbon capture, water, tailings)</td>
<td>Continued increase in productivity</td>
</tr>
<tr>
<td></td>
<td>Shared social and environmental value • Strategic partnerships for mutual benefit</td>
<td></td>
<td>Flexibility to rapidly capture opportunities</td>
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</tbody>
</table>

Note: IROC – Integrated Remote Operating Centre; WAIO – Western Australian Iron Ore; TLO – Train Load Out; OBN – Ocean Bottom Node.

1. Represents potential reduction from FY18 in scope Global Function costs. 2. Represents safety incidents reduction in heavy vehicles.

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Our vision is to be fully integrated and highly automated

Opportunities to replicate from other industries and accelerate mining specific breakthrough technology

Advanced car manufacturing technology…

…to inform the future of mining
The transformative power of Technology

Systems approach to the integration and automation of our value chains to unlock resources and drive a step change in safety, volume and cost

EXPLORE & PLAN

- Optimised planning and reduced resource uncertainty

EXTRACTION

- Autonomous and higher productivity systems reduce variability

PROCESS

- Improved throughput from advanced process control

LOGISTICS

- Improved scheduling and automated loading with less unplanned events

CUSTOMERS

- Meet specific customer demand while maximising realised price

INTEGRATED PROGRAMS

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Value Chain Automation

Getting a clearer view of our ore bodies’ future

• Machine learning helps with data interpretation

• Oak Dam copper discovery: uncover additional information in historical data with the help of advanced geophysics modelling and improved data interpretation

Unlocking future opportunities with advanced seismic imaging

• Ocean Bottom Node survey helps us to navigate the technically challenging and underexplored Western Gulf of Mexico

Shifting data acquisition and analysis to real time

• Live 4D model to update resource knowledge; accessible by other processes along the whole value chain
Value Chain Automation

Safety and productivity through equipment automation

• Autonomous blast hole drill fleet at West Australian Iron Ore
  – 40% reduction in maintenance cost in Autonomous Drill

• Autonomous Haulage at Jimblebar
  – 80% reduction in heavy-vehicle safety incidents
  – 18% increase in truck productivity

Autonomous truck hauling program (feasibility studies phase)

• Automating up to 500 haul trucks across WAIO and Queensland Coal

• First of several investment decisions expected in CY19; total capex of <US$800m (represents full amount)

• Staged rollout between CY20 and CY23
Trialling Precision Mining to unlock value
Sensors and detailed analytics inform extraction decisions at Escondida
Value Chain Automation

Patented leaching technologies at Spence to replicate across assets

• Increased metal recoveries by 10 - 12%
• Shortened the processing time by almost 50%
• Utilise the full 200 kt of tankhouse capacity

Potential to replicate at Olympic Dam

• Heap leach technology development program successfully completed

Spence leaching performance

Olympic Dam heap leach pilot plant
Value Chain Automation

EXPLORE AND PLAN

EXTRACTION

PROCESS

LOGISTICS

CUSTOMER

Volumetric Train Load Out

Rail scheduling algorithms

Autonomous ship loader

Brand Relativity Evaluation Tool

Ore car volume productivity

Rail network efficiency

Loading productivity

Product strategy optimisation
Social value secures our strategy

Drives transformation and the shift from social ‘licence’ to ‘value’
A look into our Fully Integrated and Highly Automated future