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Nothing in this presentation should be interpreted to mean that future earnings per share of Rio Tinto plc or Rio Tinto Limited will necessarily match or exceed its historical published earnings per share.
Why innovate?

Improve productivity, to ..

- Improve safety
- Improve capital productivity
- Improve labour productivity
- Improve recovery rates
- Remove process waste
- Reduce energy use
- Find new ore bodies
- Recover from difficult ore bodies
- Extend resource life
Demand outlook

Shenzhen 1982

Shenzhen 2007
Supply picture
Productivity - the Australian example

Multifactor productivity (MFP) index - mining

Implementation of technologies is key

Our Mine of the Future™ is shaped by four significant value levers

<table>
<thead>
<tr>
<th>Find</th>
<th>Develop</th>
<th>Mine</th>
<th>Recover</th>
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</thead>
<tbody>
<tr>
<td>• Find future tier one ore bodies</td>
<td>• Develop future block cave mines safer, faster, better</td>
<td>• Optimise resource productivity</td>
<td>• Recover more from mineral deposits</td>
</tr>
<tr>
<td>• VK1 in initial flight trials</td>
<td>• Tunnel boring system trials to commence at Northparkes in 2012</td>
<td>• Expansion of driverless truck fleet</td>
<td>• IronX™ iron ore recovery pilot plant to be scaled up in 2012</td>
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<td>• Complex testing programme in 2012</td>
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<td>• NuWave™ copper sorting pilot plant being commissioned at KUC</td>
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Rio Tinto innovation network model

**Rio Tinto centres**
Formal long term (around 5 years) alliances with world class institutions provide Rio Tinto access to stable research resources to pursue targeted Rio Tinto programmes.

1. Centre for Underground Mine Construction
2. Centre for Advanced Mineral Recovery
3. Centre for Materials and Sensing
4. Centre for Advanced Mineral Sorting
5. Centre for Mine Automation
6. Rio Tinto Innovation Centre

**Technology partnerships**
Strategic partnerships and MoUs with leading global suppliers to help develop technology to commercial outcomes.

1. Komatsu
2. Aker Wirth
3. Atlas Copco
4. e2v
5. Tomra
6. University of Nottingham
7. University of Western Australia
8. Herrenknecht
Protecting our intellectual property

- Structured control & governance
- Data management & security
- Rigorous investment proposals
- Freedom-to-operate
- Patent families and walls
- Trade secrets, copyright & trademarks, individual contracts

Innovation without intellectual property protection is philanthropy
Surface - innovation timeline

- **2007**: Trials start on the Operations Centre, Automated truck project starts in Western Australia.
- **2008**: Atlas Copco Alliance, Automated train trial.
- **2008**: Automated trucks Pilbara 'A Pit' trial.
- **2009/10**: Automated trucks Pilbara 'A Pit' trial.
- **2010**: Operations Centre commissioned.
- **2010**: Komatsu MOU for 150 autonomous trucks deployment.
- **2010/11**: Automated trucks Pilbara 'A Pit' trial.
- **2012**: Cab-less Drill, Advanced Survey.
- **2012**: Automated Train Deployment.
Surface mines of the past, present and future

Circa 1970

Circa 2005

Circa 1970

Circa 2012
Holistic operational view

- Holistic view of the operations
- Integrated, near real-time information
- Improve decision making
- High levels of predictability
- Improved productivity and profitability
Our future: mine automation system
Operations Centre: aligning systems

“Mission Control” for entire Pilbara network:

- 14 mines (some 31 pits)
- 1,500km of rail network
- 3 port terminals
- Power & other infrastructure

End-to-end visibility for:

- 200 controllers & schedulers
- More than 230 technical planning & support staff
The “A Pit” trail commenced late 2008 ran for ~900 days.

Trial with AHS trucks (plus drills/comms).

Designed to build up our safety, operational, and regulatory experience.

Late 2011 MoU signed with Komatsu for a minimum of 150 Autonomous Haul Trucks in the Pilbara by 2015.

Intent is to underpin Rio Tinto Iron Ore growth with autonomous trucks.

Technology operationally deployed in the Junction South East pit (~25 Mt/a) at Yandicoogina mine with 10 trucks.

Rio Tinto Iron Ore managing deployment.
Autonomous haulage roll-out
AutoHaul™ and autonomous drills

• Investment of US$518 million to introduce autonomous train operations (AutoHaul™) across our integrated Pilbara rail network

• First long-distance heavy-haul system of its kind in the world

• Supports Pilbara expansion

• Greater efficiency and productivity

• Autonomous drill being trialled across Pilbara network

• First cableless drill has arrived and is undergoing testing

• Efficiency benefits as single operator can operate multiple drills

• Consistency in drilling outcomes
Automation brings productivity increases

Reduce schedule variability (2008 = 100)

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<tr>
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<th>2008 Average</th>
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<th>2011 Average</th>
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<tbody>
<tr>
<td></td>
<td>100</td>
<td>66</td>
<td>52</td>
<td>53</td>
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Example: Safety benefits of autonomous trucks, A Pit Trial before close out ....

Significant AHS incidents: Zero
Safety incidents: Zero

Days in full production: 897 days
TMM to date: 57,026,160 t
Number of cycles: ~190,000
Total distance travelled: ~570,000 km

Improved train dumper productivity (2008 = 100)

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<td></td>
<td>100</td>
<td>115</td>
<td>127</td>
<td>131</td>
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...and benefit the mining services industry

The mining industry is a community comprising miners, suppliers and stakeholders. All members of this community can benefit through new jobs and new opportunities as we pursue productivity improvement through innovation.

Example Between 2006/07 and 2008/09:

- Global revenue for the Australian MTSE industry grew by an annual rate of 19.5%
- Export revenue grew by 25.1%
- Australian revenue grew by 17.4%
- Export revenue was 40% of Australian revenue in 2008/09, up from 35% in 2006/07
- The technology applications sector of the MTSE industry grew by 10.8%

Source: ABARE-BRS research report “An economic survey of companies in the Australian mining technology, services and equipment sector, 2006 – 07 to 2008 – 09”
Productivity enhancement - excellence centres
Operations & Excellence Centre

Operations Centre

• Aligning and integrating systems
• Value chain and logistics optimisation
• RTIO Operations Centre in Perth controlling Pilbara mines

Excellence Centre

• Optimisation of mine to metal, “experts-on-line”
• Real time (24x7) remote optimisation of our production systems
• Prototype operational H2 2012
People are, and will remain, the “glue”
Rio Tinto’s Mine of the Future™
Questions