MAJOR COMMODITY PRICES: 2005 - 2015

Coal: Australian thermal coal USD/metric ton FOB Newcastle/Port Kembla port
Iron Ore: China Import iron ore, 62% FE spot USD/dry metric ton

Source: Indexmundi.com,
Minerals Council of Australia
CHALLENGES FOR SUSTAINABLE MINING

Mineral resources
- Deeper
- More remote
- Lower grades
- More complex

Environmental resources
- Water scarcity
- Energy costs
- Fragile ecosystems
- More waste

Human resources
- Ageing workforce
- Skill shortages
- Hazardous workplaces
- Technical complexity

Social & corporate resources
- Accountability
- Community development
- Sovereign risk
- Scrutiny
- Slow development cycle

Increasing...
- Costs
- Technical Complexity
- Social & political complexity
- Risk
- Capital requirement

Find high quality resources
Win license to operate
Mine & refine efficiently
Capital constraints

Source: MCA Report, Don Scott-Kemmis 2013
Australian METS - Adding Value from Cradle to Cradle

Exploration  Feasibility  Design & Construct  Operations  Remediation
AUSTRALIAN METS

$15b in EXPORTS

386,000 EMPLOYEES

$90 BILLION

GROSS REVENUE ANNUALLY

AUSTRALIAN METS

JOBS
NETWORK
VALUE-ADDED
DEVELOPMENT
WORLD-LEADERS
INNOVATION
GROWTH
METS
INTEGRIED
NATIONAL
INTERNATIONAL
AUSTRALIAN
WORKFORCE
COLLABORATION
EXCELLENCE
TECHNOLOGIES
MANUFACTURING
FINANCE
CHAINS
EXPORT
CONTRIBUTION
HIGH-TECH
INVESTMENT
R&D
SUPPLY
RAPID
GLOBAL FIRMS
WHOLE OF ASSET LIFECYCLE MANAGEMENT

- Research and product development
- Geological mapping
- Advanced mineral processing and research – gold, nickel and coal
- Autonomous mining systems and remote control
- Safety management, services and technology
- **Environmental management**
  - Water and wastewater management
  - Energy management
  - Tailings and waste management
- Maintenance systems and equipment
- Customised engineered equipment and parts – dump bodies, conveyors, buckets
- Education and training
- Contract services
- Mine development and mine management software
- Advanced communications technology
- Mine site closure and remediation
The Mount Morgan Opportunity

Utilising technology innovation to unlock significant metal value left behind after 100+ years of operations
2015 + STRATEGIC ALIGNMENT

Maximizing Value

Sustainability

Fast technology adoption

Suppliers are true partners

Innovation
KEY INGREDIENT - COLLABORATION
SMART MINING
R&D COLLABORATION

Base: Total Sample
Q34. Is your company involved in any collaborative R&D projects or product/service development initiatives with other organisations?

Source: Austmine survey 2015
R&D COLLABORATION

**Base: Involved in collaborative R&D Projects**

**Q36 With which types of organisations does your company collaborate?**

- **Other suppliers to the mining/minerals industry**
  - 2015: 60% (58% ± 95% confidence interval)
  - 2013: 16% (14% ± 95% confidence interval)
  - Significantly higher than average at the 95% confidence interval

- **Mining companies**
  - 2015: 45% (40% ± 95% confidence interval)
  - 2013: 53% (50% ± 95% confidence interval)
  - Significantly lower than average at the 95% confidence interval

- **Universities**
  - 2015: 40% (40% ± 95% confidence interval)
  - 2013: 40% (40% ± 95% confidence interval)

- **Government entities**
  - 2015: 18% (16% ± 95% confidence interval)
  - 2013: 29% (28% ± 95% confidence interval)
  - Significantly lower than average at the 95% confidence interval

- **CRC (cooperative research centres)**
  - 2015: 16% (15% ± 95% confidence interval)
  - 2013: 37% (36% ± 95% confidence interval)

- **Private research organisations**
  - 2015: 15% (14% ± 95% confidence interval)
  - 2013: NA

- **Public research organisations**
  - 2015: 14% (13% ± 95% confidence interval)
  - 2013: NA

- **Other suppliers to the mining/minerals industry**
  - 2015: 8% (7% ± 95% confidence interval)
  - 2013: 16% (15% ± 95% confidence interval)
INNOVATION DRIVERS

External, customer-focussed product, process or service innovation as core to your business strategy
- 65%

Staying ahead of the competition
- 64%

Our customers ask us to solve their problems
- 59%

Internal operational improvements to increase productivity, reduce costs, increase safety, etc.
- 51%

Changing industry trends
- 35%

Survival
- 24%

Our collaborators and partners drive us to innovate
- 14%

Market research to find the problems that companies was solved
- 12%

Other
- 4%

Base: Total Sample (n=350)
Q37. What are your major drivers for innovation
**BARRIERS TO INNOVATION**

Base: Total Sample (n=350)

Q38. What are your major barriers to realising a commercial return from your innovations, new products or services?
NEW INNOVATION MODELS
CAN AUSTRALIA DELIVER NEW VALUE FROM RESOURCES?

- Traditional research and commercialisation process - university research – spin off – commercialisation
- CRC’s eg CRC Mining, CRC Ore, CRC DET
- Accelerators eg Blue Chilli, Innovis, Poloniser
- Incubators
- Corporate lab eg Woodside
- Open Innovation
- Internal Innovation Supplier collaboration eg VCI, AngloGold
- Open Innovation – eg Anglo American
- Protected innovation eg Rio Tinto
- Ideation, Problem Solving and Funding – Hackathon - eg Unearthed
- Research/solution funding by end users eg Mining companies fund capital in business rather than own/control IP
- Collaborative research eg CSIRO, UWA, Curtin, National Science Precinct
- Crowd funding
- Open Innovation Platforms eg online problem solving competition platforms
THANK YOU

www.austmine.com.au