Vision 2040 – Innovation in Mining & Minerals: update

Damien Giurco
Institute for Sustainable Futures
University of Technology, Sydney

Tim Prior, Jane Daly, Aleta Lederwasch, Leah Mason

Brisbane, 31 January 2011

Mineral futures collaboration cluster
Rationale

- Global and local drivers are changing benefits/risks
- Explore the future, beyond current trends
- Multi-stakeholder, cross-scale process (local/global) along the minerals/metals value chain

Strategies for improved resource use and governance to underpin long term national benefit

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Exploring drivers and approaches to the future

Sustainability challenges & opportunities

• Commodities
  • Forecasts
    • More tonnes, considered better

• Technologies
  • Roadmaps
    • More technology, considered better

• Regions
  • Mixed (where done)
    • More tonnes and technology not always considered better

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SUMMARY

To position the minerals industry within a sustainable economy:
1. Technological advances
2. Structures for long term decision making
3. Australia as mineral services hub
4. Impacts balanced by better distribution of wealth
Mining and Metals Scenarios
Australian Workshop Session Summary
Melbourne, Australia, 28 September 2010

Mining & Metals
Scenarios to 2030

Green Trade Alliance
Rebased Globalism
Resource Security
Australia joins the Green Trade Alliance

- Strong societal expectations for sustainability drive political change
- Australia considers joining a Green Trade Alliance
- Multi-national companies lose confidence in Australia, move offshore

Rebased globalisation in Australia

- Australia’s minerals are fully exported
- Australia is losing power as an exporter because of falling ore quality and quantity
- No wealth from minerals is transferred to the national benefit

Australia seeks resource security

- Australia hoards what is left of its resources
- Declining global markets foster greater vertical integration in the mining sector

Australia’s Great Transition

- Australia is a world-leader in sustainable resource processing, use and consumption
- Sovereign wealth is used to address changing demographic and health issues, and moderate a transition to a sustainable Australian economy
Key issues

- Community engagement strategies
- Practical action on sustainability
- What will underpin Australia’s future global competitiveness?
  - innovation, services, infrastructure, technology, access to capital

Practical actions

- Framework for National Mining Strategy – linking mining to a sustainable Australia
- Rating system for mining operations
Vision 2040: Innovation in mining & minerals
Brisbane, 14-15 November 2010, Customs House

Mining services and technology development are a rapidly growing export for Australia, representing $2.5 billion last year; more than the export value of refined copper, or zinc and uranium combined. What new business opportunities can bring even more benefits with less impacts? What will make Australia a leader in sustainable minerals, and a location of choice as a future industry hub?
Vision 2040: Innovation in mining & minerals

Brisbane, 14-15 November 2010, Customs House

Prof. Göran Roos Chairman, VTT International, Finalnd
Göran is a world expert in the areas of strategy and innovation management as well as industrial and innovation policy.

Mr Darryl Pearce General Manager, Lhere Artepe Aboriginal Corp
Darryl was Director of Northern Land Council, he is experienced in securing long term benefits from minerals for communities.

Dr. Joe Herbertson Principal, Crucible Carbon
Joe brings extensive experience from industry and academia to addressing the challenge of sustainability for mining & minerals.
## Shaping the future – a complex systems problem

### Generic vision of success

1. **Business success:**
   
   To fulfil our purpose and prosper by delivering the value of minerals and metals to society without systematic degradation of social or ecological systems.

2. **Address legacy issues**

3. **Build positive future legacy**

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### The Natural Step framework is based on the five level system hierarchy and fundamental Level 2 sustainability principles.

**Slide courtesy Dr Joe Herbertson AM for Sustainable Futures**

<table>
<thead>
<tr>
<th>Level 1</th>
<th>The System</th>
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<td>Actions</td>
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<td>Metrics</td>
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Think new business models!

- Renting the material and charging for lost material
  - The Car rental / Petrol Tank model
- Mining waste
  - Applying the mining eco-system approach to the waste cycle
- Develop valuable side streams, move towards biotechnology, tie up carbon, and manage the resource base
  - The Paper & Pulp model
- Life-cycle based value stream – fish farming in old shafts
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The goal of a good business model is: That you get paid more than once for everything you do!
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<td>Two speed economy (stunting growth +/- degrading, inhibiting all non-traditional mining industries)</td>
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<td>Re-distributing wealth is about ensuring local communities get financial benefit via jobs and infrastructure</td>
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| SYSTEMIC CAUSES | • Two speed economy  
• Governance structures not enabling long-term, strategic planning  
• Redeployment at affordable rates = used to standard of living  
• Lack of infrastructure, education and resources to enable successful transition to other industries | • Employment, income  
• Systems reinforce that these are important  
• Tax regimes  
• New technology  
• Minerals Policy | • Comparative advantage  
• Historical terms of trade  
• Market for Australia’s minerals is primarily external |
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<td>WORLDVIEW</td>
<td>Short term view • Market driven worldview overall • GDP vs “happy” — purely economic measurement of wealth</td>
<td>Money • Sensible to have a primary industry as Australia’s main economic engine</td>
<td>Australia’s wealth resides in its natural resources • More is more • Australia has a duty to ensure mineral wealth is distributed globally to facilitate global development</td>
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<td>MYTH</td>
<td>People only value money</td>
<td>If you have money and material goods you are successful • Money = happiness • Comparative advantage</td>
<td>Killing the ‘Golden Goose’</td>
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- **Net positive benefits**: (sequesters carbon, adds to biodiversity, clean water/energy)
- **Indigenous leadership and investment**
- **Brand Australia**: clean solutions for the planet
- **Prosperity from new business models to unlock value along commodity chain**
- **Energised regional towns/centres**

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Vision 2040: Innovation in mining & minerals

**Net positive benefits**
- sequesters carbon
- adds to biodiversity
- clean water/energy

- Indigenous leadership
- and investment

- Brand Australia – clean solutions for the planet

- Prosperity from new business models to unlock value along commodity chain

- Energised regional towns/centres

**A focus on people:**
- mining communities
- Australian community

**Invest in new technologies and innovation:**
- reduce negative impacts
- increase positive impacts

**Develop appropriate metrics:**
- reporting/monitoring company and national indicators

**Greater investment in skills, education and human capital**

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Timeline

Peak Minerals:
A review of changing impacts & benefits

WEF Mining & Metals Australian Workshop, Melbourne

Elaborated Vision 2040

Stakeholder Consultation

Mineral Futures Discussion Paper: Sustainability Challenges and Opportunities

National Peak Minerals Forum, Sydney

Vision 2040 Workshop: Innovation in Mining and Minerals, Brisbane

Final Vision & Strategies for Implementation
For further information

Contact
Damien Giurco,
Institute for Sustainable Futures,
University of Technology, Sydney
Tel: 02 9514 4978

Damien.Giurco@uts.edu.au

www.isf.uts.edu.au

www.resourcefutures.net.au