Understanding risks and lessons from sustainability: ICMM and its role

Presentation: Camborne School of Mines
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30 January 2015

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President
1. Turbulence up.
Geopolitical, economic; human migration/refugees increasing; stretched international agencies; shocking unemployment in some countries

2. Growing concerns.
Inequity, poverty alleviation indigenous people, mine safety and community health and safety, water, climate change, overall biodiversity loss, cultural diversity loss

3. “Concerns” shifting to “rights”.
Examples: water, royalties/taxes. Move to environmental court of justice; environment assigned “rights”

Leading performance up (laggards remain) but so too is company – community conflict fed by stronger global communications and resulting community empowerment
5. Understanding down. Little understanding of the full range of benefits, costs and risks of the mining and metals industry; responsibilities and accountabilities not well defined.

6. Antagonism up. Strong belief that the world is being controlled by evil, out-of-control multi-national corporations.

7. Mining-related NGO activity up. 30% increase from 2011 - 2014; major focus is the environment. Influence of “western” NGOs slipping in Latin America, local groups growing.

8. Cyber-threats: growing misinformation on line; internet security an increasing priority.
9. **Collaboration up.**
No one party can address issues; need to bring alternate values to the table; formal multi-interest mechanisms growing (e.g. EITI)

10. **Increasing pressure for transparency and accountability.**
Growing anti-corruption movement; pressure for certification; responsible investment criteria hitting the mainstream; consumer values driving corporate performance; liability rules changing to increase the personal responsibility of board members

11. **Demand up.**
Increasing demand for metals and minerals; growing middle class; urbanization, 1 billion more in 100 years; China setting the agenda for mining and metals

12. **Development role up.**
Growing role of mining in low and middle-income countries; agencies now seeing that mining as a development engine; major opportunity to link to delivery of the Sustainable Development Goals; new business models emerging
We must consider the full sustainability perspective: the wellbeing of people and the environment.

Now and over the long-term.
Understanding ends and means, key considerations

ECOSYSTEM WELL-BEING
(ends)

CONSIDERATIONS
Process plus substance
Short- and long-term
Continuous learning

HUMAN WELL-BEING
(ends)

GOVERNANCE AND SUCCESS OF MARKET (THE ECONOMY) AND NON-MARKET ACTIVITIES TO GENERATE WELL-BEING
(means)
Towards effective integration

**CITIZEN VALUES**
- Safety from harm
- Responsibility
- Adaptability
- Stewardship
- Knowledge
- Inclusion
- Accountability & Transparency

**ETHICAL PRINCIPLES**
- Sensitivity to value differences
- Respect for future generations
- Respect for people & cultures
- Respect for life
- Justice
- Fairness

**ENGINEERING DESIGN OBJECTIVES**
- Environmental integrity
- Public health & safety
- Worker health & safety
- Community well-being
- Fairness
- Security
- Economic viability
- Adaptability
Definitions

**Sustainability**
the persistence of certain necessary and desired characteristics of both people and the enveloping ecosystem (of which people are a part) over a very long time – indefinitely

Robinson et al., 1990

**Development**
to expand or realize the potentials of; bring gradually to a fuller, greater, or better state.

Daly, 1989

**Sustainable Development**
the human and, most importantly, the ACTION part of the above idea set – it covers what and how people do.

The result is not a “fixed state of harmony.” Rather, it is an ongoing process in which people take actions leading to development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Brundtland 1987, Milos Decl. 2003).

Conversely, actions that reduce the ability of future generations to meet their own needs should be minimized and if deemed essential to continue with today, at least done so with the explicit recognition of and sensitivity to future implications.
The role of mining in national economies – 2014 update

An updated Mining Contribution Index (MCI)

Mining Contribution Index score:
- Above 80
- Above 60, less than 80
- Above 40, less than 60
- Above 20, less than 40
- Zero to 20
## Mining company overall structure

<table>
<thead>
<tr>
<th>Category</th>
<th>Approximate asset base, $USD</th>
<th>Approximate numbers of companies</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global giants</td>
<td>Exceeds $10 billion</td>
<td>50</td>
<td>Global giants and seniors control the majority of available capital, their focus is on the industry; they have multiple operations</td>
</tr>
<tr>
<td>Seniors</td>
<td>$3 - $10 billion</td>
<td>100</td>
<td>Often on their way up; their focus is on growing their reserves</td>
</tr>
<tr>
<td>Intermediates</td>
<td>$1 - $3 billion</td>
<td>350</td>
<td>Often on their way up; their focus is on growing their reserves</td>
</tr>
<tr>
<td>Juniors: small (often one mine) producers</td>
<td>$500 million - $1 billion</td>
<td>1,000</td>
<td>Some growing, some shrinking; their focus is on their mine</td>
</tr>
<tr>
<td>Juniors: exploration</td>
<td>$5 - $500 million</td>
<td>2,000</td>
<td>Volatile and market dependent; they are finders, not producers and their focus is on their exploration project</td>
</tr>
<tr>
<td>Junior juniors</td>
<td>Below $5 million</td>
<td>2,500</td>
<td>Their focus is on accessing venture capital and optimizing their stock price</td>
</tr>
</tbody>
</table>

### Spectrum of corporate behaviour

- **Hostile Avoiders**
  - Opposers
- **Rearguard**
  - Resistors
- **Corporate**
  - Couch Potatoes
  - Slow adapters
- **Vanguard of the Rearguard**
  - Cautious innovators
- **Leading Edge**
  - Doers
# Ranking of Commodities in the world economy

## Mid-2012 to mid-2013

<table>
<thead>
<tr>
<th>Commodities</th>
<th>MINED (’000t)</th>
<th>PRICE (US$/t)</th>
<th>VALUE PA (US$ bn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>7,800,000</td>
<td>85</td>
<td>663</td>
</tr>
<tr>
<td>Iron Ore</td>
<td>1,900,000</td>
<td>130</td>
<td>247</td>
</tr>
<tr>
<td>Copper</td>
<td>17,000</td>
<td>7,100</td>
<td>121</td>
</tr>
<tr>
<td>Gold</td>
<td>2.65</td>
<td>42,300,000</td>
<td>112</td>
</tr>
<tr>
<td>Bauxite</td>
<td>260,000</td>
<td>350</td>
<td>91</td>
</tr>
<tr>
<td>Nickel</td>
<td>1,700</td>
<td>14,000</td>
<td>24</td>
</tr>
<tr>
<td>Zinc</td>
<td>13,000</td>
<td>1,800</td>
<td>23</td>
</tr>
<tr>
<td>Platinum Group Metals</td>
<td>0.48</td>
<td>30,300,000</td>
<td>15</td>
</tr>
<tr>
<td>Diamonds</td>
<td>0.025</td>
<td>580,000,000</td>
<td>14</td>
</tr>
<tr>
<td>Lead</td>
<td>3,600</td>
<td>2,000</td>
<td>7</td>
</tr>
<tr>
<td><strong>Top Ten Total</strong></td>
<td><strong>9,995,000</strong></td>
<td><strong>(132)</strong></td>
<td><strong>1,317</strong></td>
</tr>
</tbody>
</table>

(Source: Intierra/RMG)
Mining’s reality

Daily commodity prices (Jan 2005 = 100)

Volatile commodity prices

Cash Cost (c/lb)

Increasing costs

Source: Rio Tinto
Mining’s reality

Overall, projects are becoming:
  • More complex
  • More capital intensive

- Declining grades – increasing production costs
- Energy use becomes more intensive
Relative activity levels across the project life cycle

Time horizon disconnect
- Mining investments, 30-100 year horizon
- Indigenous peoples, multi-generation
- Government, 3-5 year horizon
- Investors, quarterly/annual results
- Communities, often immediate
- Price, constant change; cost curve trends up
Mine project life cycle

1. Exploration 1-10 years
2. Detailed site investigation, design and estimating
   Typically 1-3 years
3. Construction
4. Operation 2-100 years progressive rehabilitation
5. Final closure and decommissioning 1-5 years
6. Post-closure In perpetuity

Key
- Orange: Mine life cycle 1960s
- Blue: Mine life cycle 1970s +
- Red: Mine life cycle 2000

Suspension Termination
Boundary conditions 3: ripple effect

**DIRECT OUTPUTS**
- **BENEFITS AND COSTS TO PEOPLE**
  (all communities of interest)
- **METAL AND MINERAL PRODUCTS**
- **BENEFITS AND COSTS TO THE ENVIRONMENT**
  (Environmental stress and restoration: chemical, physical, biological)

**INDIRECT OUTPUTS**
- (Benefits and costs to downstream consumers, operations, communities and ecosystems because of enhanced supply of metal and mineral products)

**DIRECT INPUTS**
- (Stakeholder engagement, labour, land, water, energy, feedstocks, reagents and supplies)

**INDIRECT INPUTS**
- (Benefits and costs to upstream consumers, operations, communities and ecosystems because of demand for inputs)
ICMM at a glance

CEO led
21 Company members
(of a global population of about 6,000 companies)

35 Association members
(with reach to another 1500 companies)

Over 1,200 sites in 70 countries
/about 1 million employees of about 2.5 million in the formal mining and metals industry/
ICMM member companies

Canada
- Barrick
- Goldcorp
- Teck

UK
- Anglo American
- Lonmin
- Rio Tinto

Norway
- Hydro

Switzerland
- Glencore

Japan
- JX Nippon Mining & Metals
- Mitsubishi Materials
- Sumitomo Metal Mining

USA
- Freeport-McMoRan
- Copper & Gold
- Newmont

Chile
- Antofagasta Minerals
- Codelco

South Africa
- African Rainbow Minerals
- AngloGold Ashanti
- Gold Fields

Australia
- BHP Billiton
Our vision and its fundamental implication

ICMM Vision
leading mining and metals companies working together and with others to strengthen the contribution to sustainable development

Fundamental implication
creating value for shareholders while simultaneously creating value for the communities and societies in which they operate

Our role: a catalyst for improving environmental and social performance in the mining and metals industry
ICMM member commitments


1. Implement ethical business practices and apply good corporate governance
2. Integrate SD in corporate decision-making
3. Uphold fundamental human rights
4. Manage risks based on sound science
5. Improve environment performance
6. Improve health and safety performance
7. Conserve biodiversity & contribute to integrated land use planning
8. Encourage a life cycle approach to materials management
9. Contribute to community development
10. Publicly report, independently assure and engage openly and transparently

6 Position Statements

- Mining and Indigenous Peoples (2013, 2008)
- Mercury Risk Management (2009)
- Mining and Protected Areas (2003)
Enhanced transparency and accountability

Robust entry criteria and process

Clear performance expectations

Reporting

New member admission process

Transparency of Mineral Revenues

Mining and Indigenous Peoples

Commitments  Public reporting  Independent assurance
Issues

Social and Economic Development
Mining as a development partner
Human rights
Indigenous people

Environment and Climate Change
Water
Biodiversity
Climate change
Closure

Health and Safety
Safeguarding people

Materials Stewardship
Sustainable consumption and production
Responsibility across the full life cycle

Governance
Transparency
Anti-corruption
Increase in mining-community conflicts (ICMM 2014 research)
Current ICMM focus: strengthening operation - community relationships

( graphic from the World Bank Group)

WE ARE ORGANIZING A FULL-DAY WORKSHOP TO DISSEMINATE THIS NEW ESIA DOCUMENT.

IT'S REALLY IMPORTANT TO US TO HAVE YOUR FEEDBACK!

..IDEALLY BY TOMORROW.

Effective community engagement with impacted communities needs to be sustained throughout the project life cycle - from initial contact prior to exploration through to closure – and needs to be respectful of local priorities and constraints.
Communities and Free Prior Informed Consent

New York towns can prohibit fracking . . .
Dryden – the small town that changed the fracking game

In a 5-to-2 decision with far-reaching implications for the future of natural gas drilling in New York State, on June 30, 2014, the New York Court of Appeals ruled that towns can use land use regulations (zoning ordinances) to ban the controversial extraction method known as fracking.

Numerous municipalities across the state have either banned fracking or are considering doing so, and the trend may accelerate because of the court’s ruling.

and see also:
Mount Polley Tailings Failure, Monday 4 Aug 2014
(estimated loss of 10 billion litres of water and 4.5 million cubic metres of tails)
Closure - the Faro Story
Closure - the Faro Story
Closure - Toyoha Mine, JX Nippon
Three lessons

1. **Key success factor for mining moving forward:** establishing relationships that are characterized by integrity, respect and trust (note stalled projects Sierra Gorda, Pascua Lama, Conga – approx. $15 billion USD)

2. **Rules are not enough** – relationships, excellence, and continuous learning/improvement cannot be legislated (change comes from voluntary commitment/action supplemented by peer pressure)

3. **Solutions and insights are at the periphery**, not the centre
Seeing the forest and the trees . . .

. . . and a longer term perspective
For further information:
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