COMMODITY FUTURES
Peak minerals, technology & future scenarios

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Mackay
16 June 2010
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Villagers fuming after their common is handed to mine

NICK O’MALLEY, INVESTIGATIONS
April 16, 2010

Falling reserves and rising costs to end South Africa’s golden age

Carl Mortished, World Business Editor

South Africa’s remaining gold reserves are less than half existing estimates and the cost of bringing the dwindling resources into production may be far more than its value, a new report has found.

India keen to buy Australian mines

New pricing system a bonanza for Fortescue Metals with 19% increase

Ignoring future no way to spend boom

JESSICA IRIANE Economics Writer for The Sydney Morning Herald.

Excess stock and strong dollar flattens
Peak oil – Hubbert curve

Source: adapted from Hubbert, 1956
Peak minerals metaphor: from easy/cheap to complex/expensive

Lower costs/impacts*:
- higher ore grades
- shallower mines
- simple ores
- low mine waste

Higher costs/impacts*:
- lower ore grades
- deeper mines
- complex/refractory ores
- more mine waste

*costs and impacts are social, economic, environmental

Source: adapted from Giurco et al. 2010, Peak minerals in Australia
Ore grades declining: Copper & Nickel

Source: Mudd, 2010
Energy consumption in mining: rising intensity

Source: ABARE, 2008 Trends in Energy Intensity in Australian Industry
Peak minerals: Copper - Australia

Source: Mudd and Ward 2008
Peak minerals:
Gold - Australia

Source: Mudd and Ward 2008

Source: Mudd and Ward 2008
Multiple peaks: Gold - Australia

Source: J. Laherrere
Peak minerals: what role for technology?

Source: Peak Minerals in Australia: a review of changing impacts and benefits, 2010
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
Mineral Resources Landscape

1. Resource (minerals, ocean nodules, metal scrap)

2. Extraction & Processing Technologies

3. Use: Level of Service & Value

4. Consumption Rates & Patterns

Environmental Constraints and Peak Minerals
Corporate social responsibility & Social Licence to Operate
Industry consolidation

Mineral Resources Landscape

Giurco et al, 2010 Australasian Journal of Environmental Management (submitted)
Mineral Resources Landscape

Giurco et al, 2010 Australasian Journal of Environmental Management (submitted)
Research Summary

Peak minerals
- How does peak minerals change impacts/benefits? How do we respond?
- Quantitative modelling of case studies (Fe, Cu, Ni, Au, Li)
- Role for technology, transition planning, new business models

Future scenarios
- How can Australia deliver long term benefit from mineral resources?
- Multi-stakeholder process for national scenario development (2010)
- How will it impact regions? (2011)
Let’s talk more.....

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Acknowledgement
This work is supported by the Minerals Futures Collaboration Cluster, within the CSIRO Minerals Down Under Flagship.

Thank you to our ISF team: Dr Tim Prior, Prof Stuart White, Dr Chris Riedy
Jane Daly, Leah Mason, Reza Memary and at Monash: Dr Gavin Mudd, Steve Moh
http://www.resourcefutures.net.au

SBS World News – Feature on Peak Minerals