



THE UNIVERSITY OF  
NEW SOUTH WALES

SCHOOL OF MINING ENGINEERING

# Developing Education Networks in Sustainable Mining Practices

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## **DEVELOPING EDUCATION NETWORKS IN SUSTAINABLE MINING PRACTICES**

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### **ABSTRACT OF PRESENTATION:**

Education is recognised as an important tool in the continuing goal of sustainability in the mining industry. In particular, the goals of optimum resource utilisation, sound environmental management, effective safety practices, maximum economic outcomes, broad community satisfaction and effective governance can be achieved. Networking is a recognition that single institutions cannot be best in every subject. Furthermore, mining schools are in decline throughout the world and the former prolific producers in the USA, the UK and Australia, are failing to meet the needs of industry. New Zealand for example no longer has a mining school.

The groups that can be targeted included mining industry personnel, government officials and community representatives. Government officials in particular are in an excellent position to influence through their statutory powers, and their mobility.

Various initiatives have taken place in recent times including the Minerals Tertiary Education Council (MTEC) in Australia. MTEC was set up in October 1999 by the Minerals Council of Australia (MCA) to build a world-class tertiary learning environment for the education of professionals for the Australian minerals industry. MTEC fosters the partnership between industry, government and academia. A network of selected university departments and other bodies is dedicated to achieving true 'world class' education by cooperating in the development and delivery of undergraduate and post graduate learning in the specialist disciplines of earth sciences, mining engineering and metallurgy.

Other initiatives include workshops in PECC countries including Fiji and Port Moresby, where networks of universities, government departments and mining and exploration companies combine to share knowledge and build capacity. The example of the Zimbabwe School of Mines provides a model for networking between institutions in the developed and developing worlds.

The outcomes of education networks are generally positive and include improved learning experiences for students as well as professional development opportunities for the educators.



# What are we trying to achieve

- Sustainability
  - Resource optimisation
  - Environmental management
  - Safe practices
  - Economic optimisation
  - Community satisfaction
  - Effective governance



# Why network?

- Single institutions can not be “best” at everything
- Mining schools are shrinking in quantity (& quality?)
  - Image
  - Conditions
  - Funding changes
- If difficult in USA, UK, Australia etc then implications for developing nations?
- Education important to ensure the sustainable extraction of mineral resources



# Target groups

- Industry personnel
- Government officials
- Community representatives
- Large/medium & small scale sectors of the industry

# Characteristics of Key Officials

- in a very good position to influence
  - positions of power
  - location
  - mobility
- lack of resources
- lack of qualifications and experience
- lack of self-confidence

# Examples of initiatives

- Australia
  - MTEC
- PECC
  - PNG
  - Fiji
- Other
  - Zimbabwe



# Delivery methods

- Face to face
  - At institution
  - On site
    - Mine site
    - Other
- Distance learning





# MTEC

- The Minerals Tertiary Education Council (MTEC) was set up in October 1999 by the Minerals Council of Australia (MCA) to build a world-class tertiary learning environment for the education of professionals for the Australian minerals industry.

# MTEC

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# MTEC – Back from the Brink

- 1998 report
  - Closure of mining, geology schools
  - Lack of students and graduates
    - Shortfall used to be filled from UK, NZ etc
  - Lack of competent, well paid academic staff

# Back from the Brink

- “The Australian minerals industry’s main concern is that, in various areas, new industry professionals need to be better equipped to deal with current and emerging challenges such as globalisation of companies, ever-toughening competition, and rapidly changing technologies.
- The industry is seeking to ensure that there are sufficient technically capable graduates available to meet its needs, ..... they are aware of broader issues such as safety, environmental care and commercial aspects of their work.”



# Back from the Brink - 1998

- Current trends include:
  - an acute shortage of talented academic staff, as a result of University remuneration packages having become hopelessly uncompetitive with those in the minerals industry;
  - small student populations and high relative costs, making mineral specific courses vulnerable to closures, when Universities are under extreme cost pressures; this situation will be exacerbated if enrolments drop in response to, say, a cyclical down turn in the industry; and
  - under-resourcing of minerals departments because of their comparatively small size, making these departments incapable of delivering top class teaching in all aspects of their courses, despite being excellent in some areas.



# MTEC

- Current projects
  - Funding new academic staff
  - Sharing resources
  - Building centres of excellence
  - Development new courses – undergrad & postgrad



# Fiji 1998

- Various workshops on sustainable mining practices
  - “best practice environmental management”
  - social and economic impact
- Network of educators (UNSW, USP etc); government, companies, others
- Outcomes
  - Capacity building
  - Knowledge sharing
    - Including set of proceedings
    - Guidelines for minimising environmental damage in exploration
    - Guidelines for minimising community impact during mining and exploration
  - Building trust



# PNG 2001

- Workshop on sustainable mining practices
- 40 personnel
- Companies, government, university, community
- Jointly organised by UPNG and UNSW
- Adoption of the Port Moresby Statement
  - Research
  - Government guidelines
  - “Whilst there have been significant environmental issues generated from past activities participants at the workshop agreed that sustainable mining practices are achievable. This can only happen, however, if all parties, including government, the mining industry, research organisations, community groups and other stakeholders work together to achieve this goal.”





# Zimbabwe School of Mines

- 1993-96
- Funded by CIDA
- Key staffing from Canada – Haileybury School of Mines
- With a project lifespan of three and on-half years, the Zimbabwe School of Mines is expected to sustain itself after the Canadian team finishes its work.



# Zimbabwe School of Mines

- "The heightened international awareness will benefit all three colleges, their staff [and] students, many of whom will ultimately find employment overseas. ... The College has developed strong ties in the mining education area through the process of having ZSM lecturers visit Haileybury campus for extended periods. The Canadian professors who have visited ZSM have gained ... some knowledge of how to work in these areas. The experience has given Northern a sense of pride and accomplishment in its standard of training."

# Conclusion

- Minerals education is in crisis
- Networking can provide a win win for all
- Maximise benefit and minimise cost of educational delivery
- “Students” get benefit of teaching excellence
- Professional development and challenges for educators