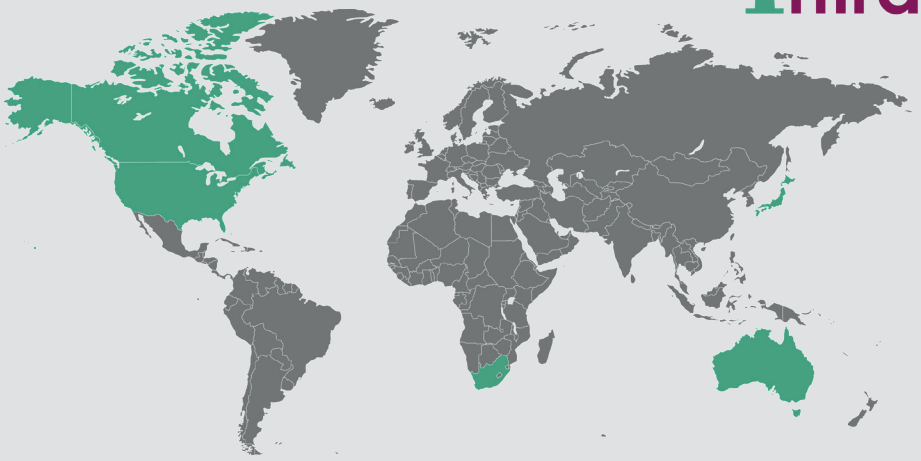
EDUCATION & OUTREACH

International best practice: who is doing what?



The EU has some excellent mining education facilities and training organisations servicing a relatively small indigenous mining industry but larger industrial minerals and construction materials extractive sector. There is however much to learn from the situation in the International Raw Materials Observatory's reference countries.

USA

- The general education standard in the U.S. is one of the highest in the world, and at the tertiary level the U.S. has many large and high quality institutions and excels in many geoscience and minerals engineering related fields.
- However, during the general decline of the mining industry and most importantly, the disbanding of the federal U.S. Bureau of Mines in 1996, there has been a major downwards shift in minerals-related education. This however contrasts with the major drive to provide national energy security through support for the shale gas industry.
- The U.S. minerals education sector has adapted to changes by recruiting more foreign staff, but still faces shortages both in the mining workforce and within universities.
- The mining workforce is "graying" and, on average, is several years older than other occupations. Organisations including the Society for Mining, Metallurgy and Exploration (SME) are actively involved in primary and secondary level minerals education outreach.

Canada

- Canada is home to world class education and training centres for the mining industry that have the capacity to train the next generation of mining staff. It is home to Edumine, an internationally recognised leader in on-line mining education.
- Canada, however, has persisting skills shortages due to workforce demographics and a still modest level of graduate training and recruitment. Canada needs to accelerate its recruitment to address the skills gap. There is, however, still underrepresentation of native peoples in the industry and programmes to address this are being funded by industry and government. The training of trades and graduates demonstrates a classic lag bringing them onto the job market during mining downturns rather than when industry demand is high. Planning for these issues through the mining lifecycle has been identified as crucial to the accuracy of the national workforce planning process. The mining education sector has recruited internationally to try and meet the demand for technical staff.

Japan

- Japan is not a major mining country but is a major consumer of raw materials and exporter of manufactured products. It has few mines.
- Educational and training capacity is based around a life-cycle concept that highlights recycling, mineral and material processing, metallurgy and materials science. Government initiatives are therefore around 'mineral diplomacy', with the negotiation of bi-lateral agreements with major mineral producing countries, especially in South America as a means to ensure raw material supply.
- Mining technology collaborations especially around potential sea floor metal extraction, and the support for increased recruitment of international students has been part of this process.

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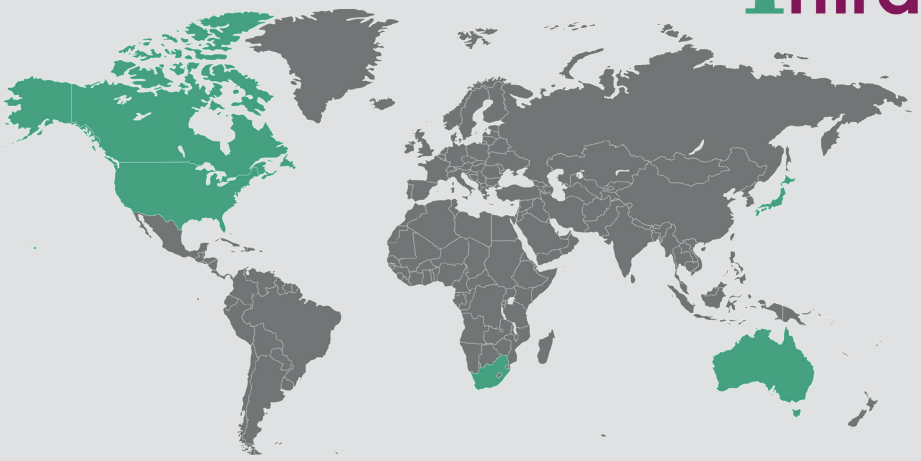

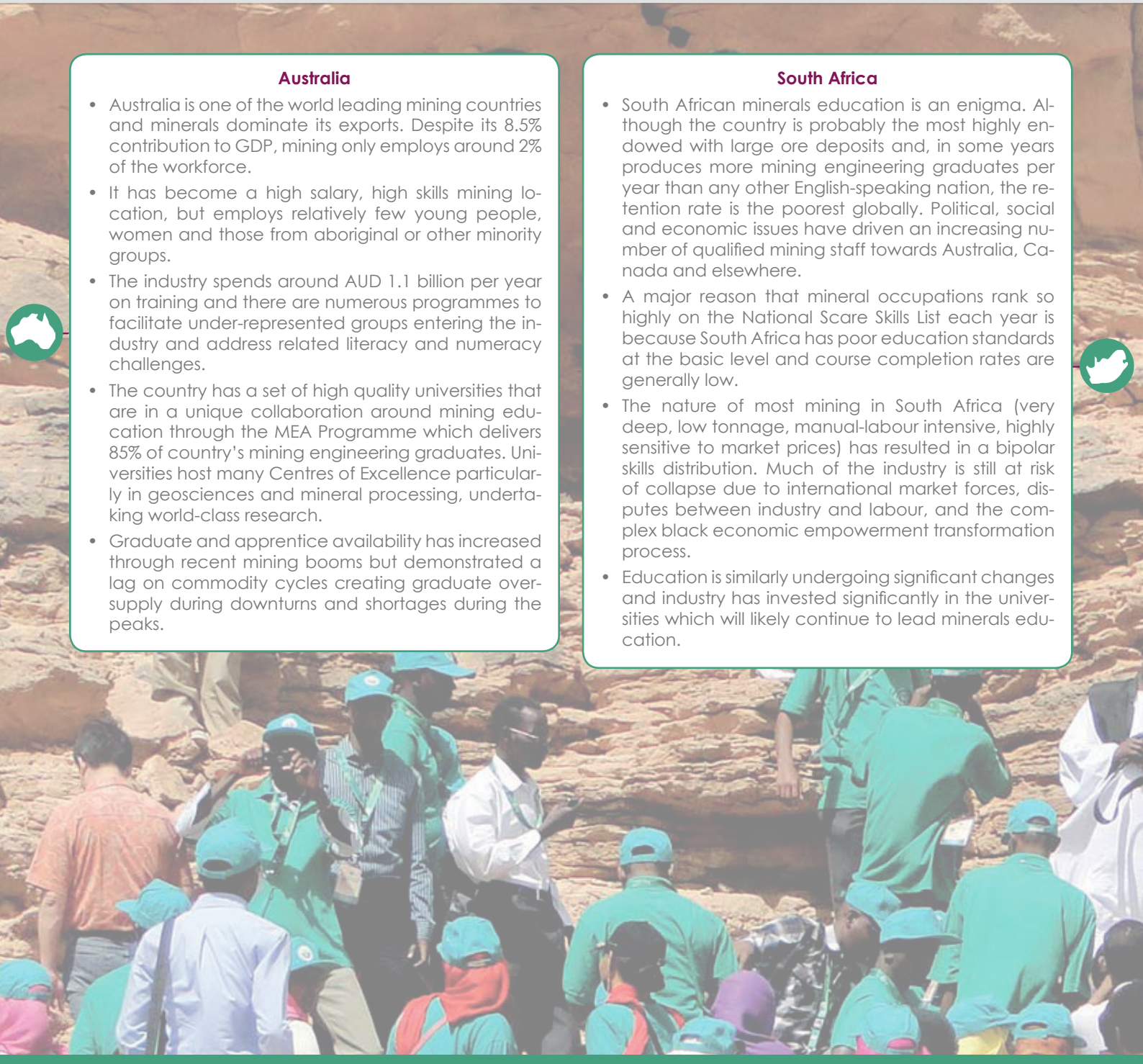

Australia

- Australia is one of the world leading mining countries and minerals dominate its exports. Despite its 8.5% contribution to GDP, mining only employs around 2% of the workforce.
- It has become a high salary, high skills mining location, but employs relatively few young people, women and those from aboriginal or other minority groups.
- The industry spends around AUD 1.1 billion per year on training and there are numerous programmes to facilitate under-represented groups entering the industry and address related literacy and numeracy challenges.
- The country has a set of high quality universities that are in a unique collaboration around mining education through the MEA Programme which delivers 85% of country's mining engineering graduates. Universities host many Centres of Excellence particularly in geosciences and mineral processing, undertaking world-class research.
- Graduate and apprentice availability has increased through recent mining booms but demonstrated a lag on commodity cycles creating graduate oversupply during downturns and shortages during the peaks.

South Africa

- South African minerals education is an enigma. Although the country is probably the most highly endowed with large ore deposits and, in some years produces more mining engineering graduates per year than any other English-speaking nation, the retention rate is the poorest globally. Political, social and economic issues have driven an increasing number of qualified mining staff towards Australia, Canada and elsewhere.
- A major reason that mineral occupations rank so highly on the National Scare Skills List each year is because South Africa has poor education standards at the basic level and course completion rates are generally low.
- The nature of most mining in South Africa (very deep, low tonnage, manual-labour intensive, highly sensitive to market prices) has resulted in a bipolar skills distribution. Much of the industry is still at risk of collapse due to international market forces, disputes between industry and labour, and the complex black economic empowerment transformation process.
- Education is similarly undergoing significant changes and industry has invested significantly in the universities which will likely continue to lead minerals education.