Minerals Council of Australia

MTEC
MINERALS TERTIARY EDUCATION COUNCIL

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Key Performance Measures

Report 2018

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Executive summary

The Minerals Tertiary Education Council (MTEC) was established in 2000 by the MCA to build capacity in Australia's higher education sector and to increase the supply and quality of suitably qualified professionals for the minerals industry.

Minerals higher education in Australia experienced strong growth in enrolments across minerals-related disciplines from 2004 to 2012, as a result of the unprecedented growth within Australia's minerals industry. Since 2012 the industry has moved from the construction to production phase, with consequential lower demand in certain disciplines, mostly in civil and mechanical construction. Decline in labour demand has been exacerbated by falls in commodity prices, which in turn has impacted on the pipeline of new professionals in the key disciplines of mining engineering, metallurgy and minerals geoscience.

Undergraduate intakes for most minerals higher education disciplines in Australia have experienced notable declines. Lower bulk commodity prices, rationalisation at the company level, the rise of anti-mining activism and the way that these issues have been widely covered in news and social media, have likely contributed to a post-boom sentiment that might explain the pronounced drop off in enrolments over the past few years since 2012. Mining engineering enrolments continue to be dramatically lower in the 1st year and are at their lowest since 2000. This will result in significantly decreased graduates in coming years, following consecutive years (2012 and 2013) of highest ever enrolments and ensuing graduates in this discipline. Metallurgy enrolments similarly are at their lowest since 2000 years with fewer graduates expected in forthcoming years.

MTEC modelling for the next four years to 2021 indicates a significant drop in enrolments in the vital minerals-related disciplines of mining engineering and metallurgy.

MTEC network 2017

Minerals Geoscience
University of Adelaide

Mining Engineering
University of New South Wales
University of Queensland
Curtin University
University of Adelaide

Metallurgy
University of Queensland
Curtin University
Murdoch University

Key metrics of MTEC initiatives	2017 Graduates	2018 Actual	2019 Actual	2020 Actual	2021 Actual
Metallurgy Education Partnership (MEP) The MEP program produced **21 graduates in 2017** compared with 34 in 2007.	21	26	31	20	20
Mining Education Australia (MEA) The MEA program produced **156 graduates in 2017** compared with 127 in 2007.	156	107	68	55	53

Mining engineering

The Mining Education Australia (MEA) program is a joint venture between Curtin University (Western Australian School of Mines), the University of New South Wales, the University of Queensland and the University of Adelaide. MEA is supported by MTEC.

Diversity statistics for all years of study show a combined average of 83 per cent being male, 17 per cent female, with no Indigenous Australian students in the program.

There has been a continuing drastic decline in 1st year enrolments, down to 34 in 2018 from 44 in 2017, 50 in 2016 and 127 in 2015; a significant reduction from the highs of 2012 and 2013 (267 and 265 respectively). Enrolments in 2nd year in 2018 also continue this downward trend (down to 42 from 85 in 2017).

The 3rd and 4th year enrolment numbers have peaked in 2016 and 2017, with 2017 graduate numbers expected to be near 200 before they start declining dramatically from 2018 onwards. There are 107 4th year enrolments in mining engineering in 2018 (down from 224 in 2017). However, a sustained decrease in graduates is expected going forward as a flow-through of lower enrolments in the 1st and 2nd years since 2015 (see chart 1).

Chart 2 shows the relationship between the number of first year mining engineering students at Australian universities and the price trends of a number of commodities. Lower enrolments can be expected into the future until prices improve.

While the mining MEA program has resulted in substantial increases in student numbers coinciding with the investment phase in the industry, the moving average trend for mining final year students (and subsequent graduates) going forward is a significant decrease from the peak from 2014 (chart 3).

Diversity statistics for all years of study show a combined average of 83 per cent being male, 17 per cent female, with no Indigenous Australian students in the program.

Almost half of MTEC mining engineering graduates from 2017 took positions in the minerals industry. This is up from one in three in 2016 (chart 4). This reversal of recent trend indicates that students have increasing certainty of employment at the end of their graduating year.

Chart 1 **Mining Engineering MTEC university enrolments, 2005-18**

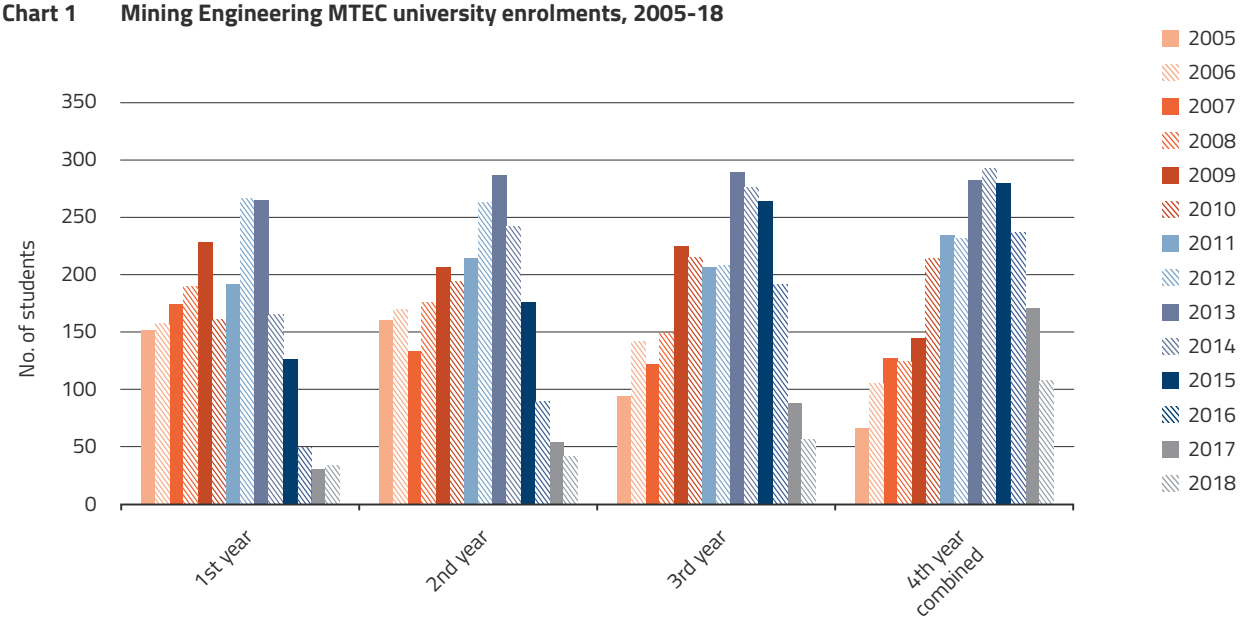


Chart 2 **1st year mining engineering commencements versus commodity prices (indexed 2000)**

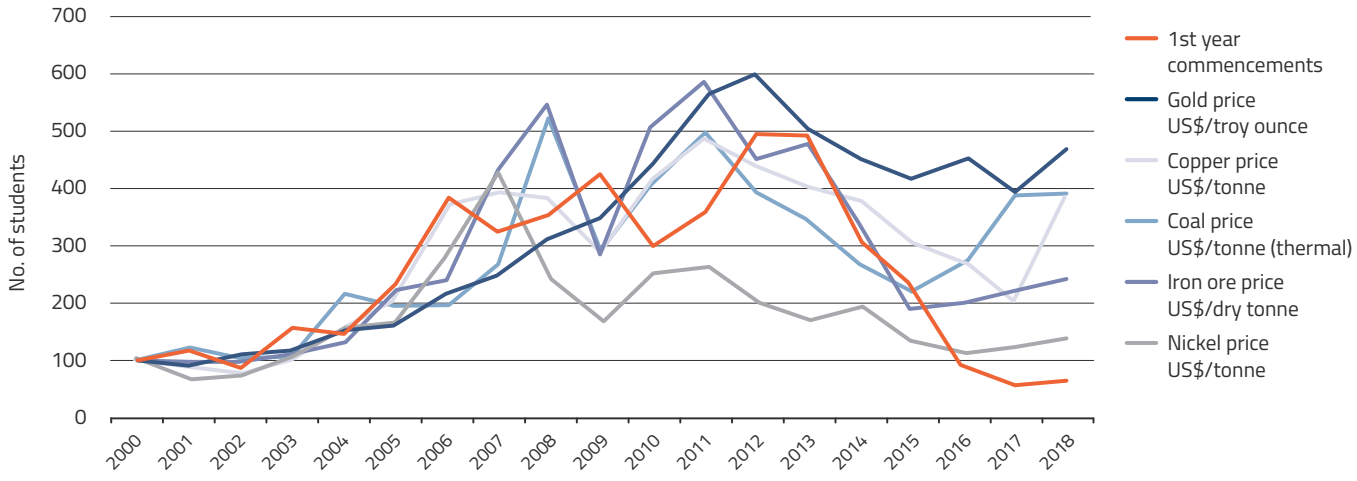


Chart 3 **Mining engineering MTEC university graduates and 4th year projected enrolments, 2004-2021**
(Number of students)

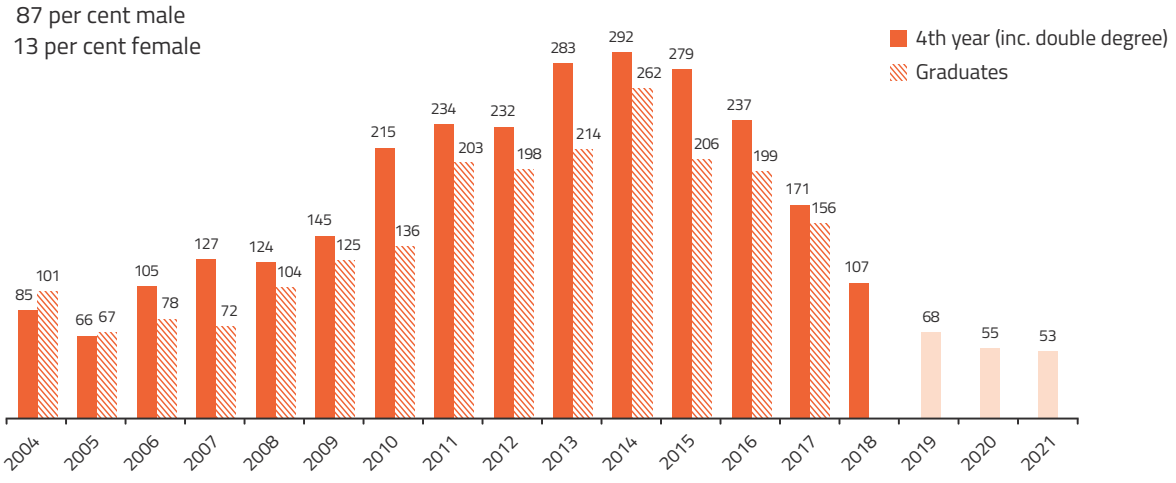
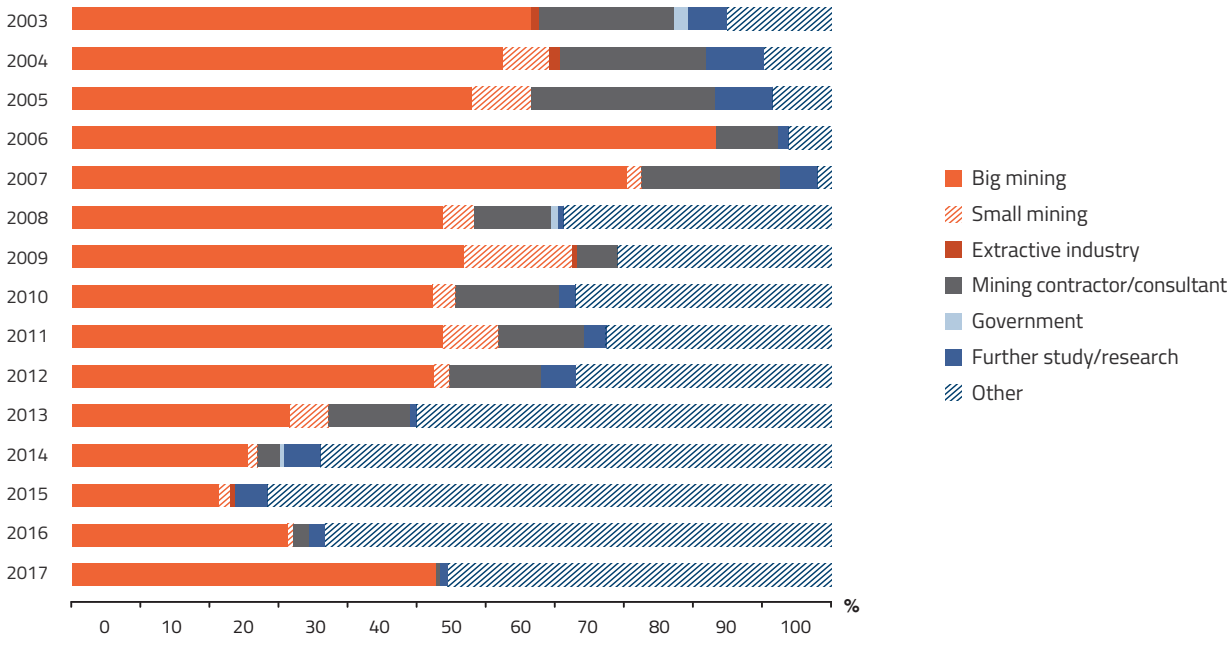


Chart 4 **Mining engineering graduate destinations, 2003-2017**



Metallurgy

The three MTEC Metallurgy partners are Curtin University (Western Australian School of Mines), Murdoch University and The University of Queensland.

1st year Metallurgy enrolments in 2018 (24) remain significantly lower than in previous years (down from 38 in 2017). There were 31 enrolments in 2018 in the 2nd year, down from 35 in 2017. Third year enrolments have increased to 45 in 2017 from 32 in 2017 while final year enrolments have decreased to 26 in 2018 from 35 in 2017 (see chart 5). A decrease in the long term average of approximately 30 final year enrolments is expected (based on enrolments in earlier years of study).

A continuing high rate of attrition into the final (4th) year of the degree remains, with students choosing to graduate to join the industry with three-year BSc qualifications or leaving to complete the other part of a double degree program. This attrition also appears to be a long-term average and is common practice at both Curtin University (Western Australian School of Mines) and Murdoch University, while the majority of the University of Queensland students complete the full four year degree program.

MTEC modelling of future metallurgy graduates indicates a stable albeit reduced number of graduates in forthcoming years (chart 6).

Diversity statistics for all years of study show a combined average of 73 per cent being male, 27 per cent female, with no Indigenous Australian students in the program.

Close on half of MTEC metallurgy graduates from 2017 took positions in the minerals industry. This is an increase from two in five in 2016 (chart 7).

Diversity statistics for all years of study show a combined average of 73 per cent being male, 27 per cent female, with no Indigenous Australian students in the program.

Chart 5 Metallurgy MTEC university enrolments, 2004-18

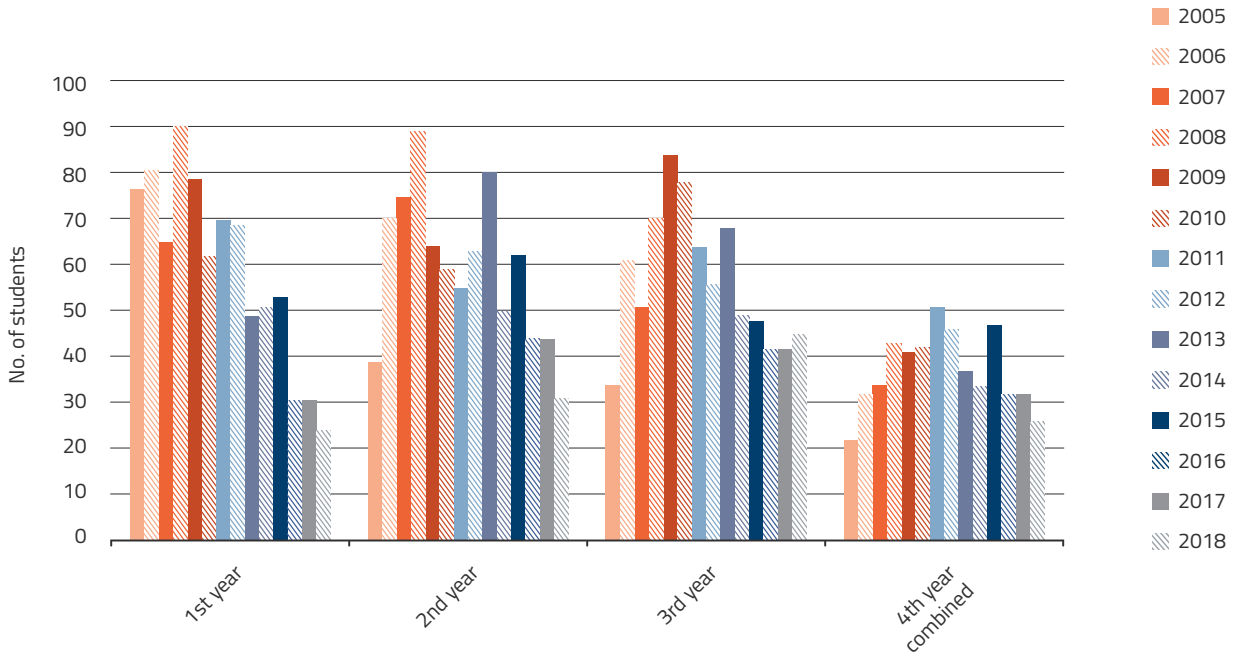


Chart 6 **Metallurgy MTEC university graduates and 4th year projected enrolments, 2004-2021**
(Number of students)

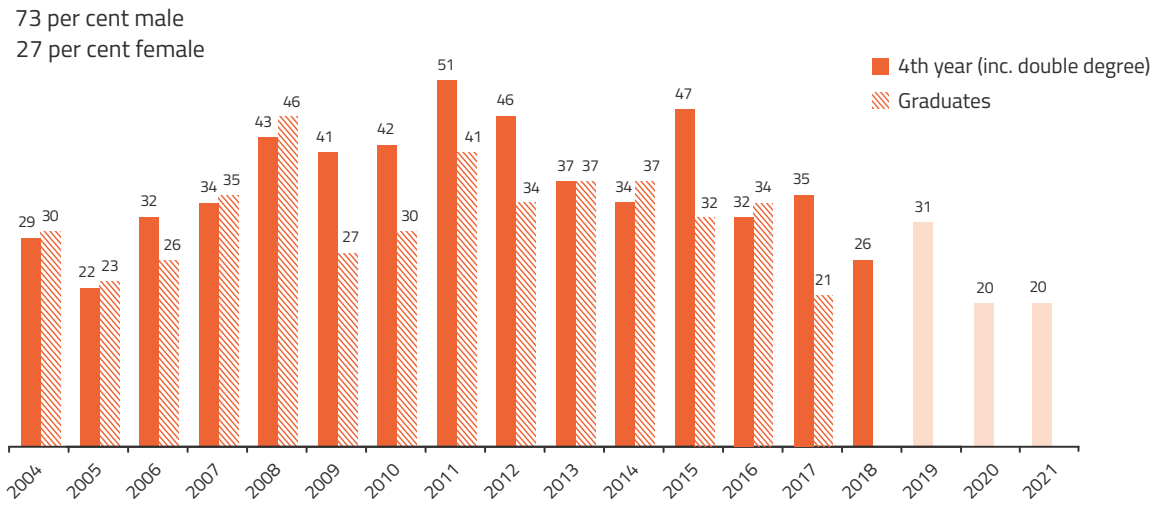
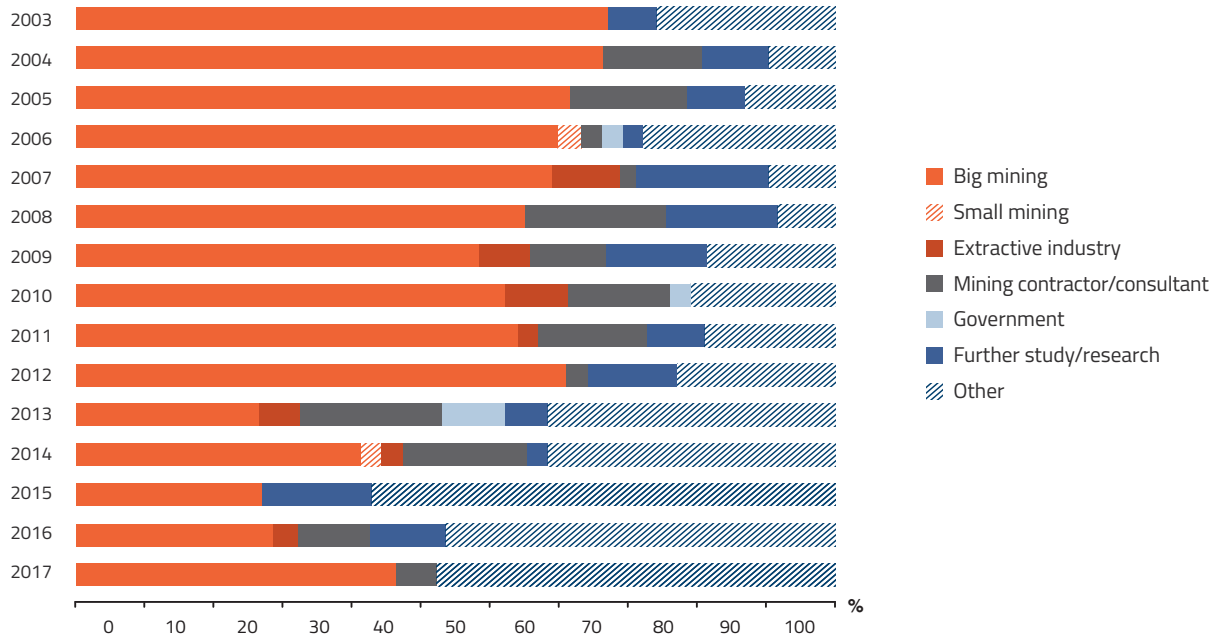


Chart 7 **Metallurgy graduate destinations, 2003-2017**



Minerals geoscience

The industry support of minerals geoscience underwent a significant change in 2016. The Minerals Geoscience Honours (MGH) program concluded in 2015 and has been replaced by the National Exploration Undercover School (NExUS).

NExUS is a prestigious summer school for tomorrow's leading mineral explorers hosted by the University of Adelaide and delivered as a collaboration of universities, government and industry partners. It aims to deliver a truly world-class national program of training for 30 enthusiastic and engaged students wanting to acquire specialist minerals geoscience skills. The industry will benefit from a cohort of students keen to pursue careers in the minerals industry.

The second NExUS program ran over three weeks in November and December 2017, with week-long modules in Adelaide, the Adelaide Hills region, and Yorke Peninsula.

The 30 participating students came from across the country and were selected as part of a competitive application process. More than half the attending participants were female. The program will run again in 2018. See www.nexus.org.au for more information.

In light of the change to a summer-school intensive, MTEC is no longer able to obtain reliable and accurate enrolment and graduate destination for students across the geoscience program nationally.

NExUS aims to deliver a truly world-class national program of training for 30 enthusiastic and engaged students wanting to acquire specialist minerals geoscience skills.

MTEC review 2015

The MTEC review in 2015 resulted in the MCA Board adopting a revised program to support an at-cost rather than the previous demand driven funding model for minerals-related programs.

The primary reason for industry support is to engage with university schools and departments offering specialist minerals-related higher education programs on a nationally collaborative program.

Such financial investment can support, but cannot sustain, these programs and going forward MTEC will build on its role as an intermediary body driving engagement between universities and industry and building collaboration between universities in program development and provision.

MTEC has been awarded funding and awards to further develop its university-industry relationship as follows:

- **Science Lectureships Initiatives (SLI) grant** in to assist in building and delivering collaborative courses in earth science, mining engineering and extractive metallurgy (2001)
- An **Australian Museum Eureka Prize for Industry** in the Research and Innovation category, for the creation of the Minerals Tertiary Education program which encourages cooperation between universities and the minerals industry to provide enhanced education opportunities for students and graduates of geoscience, mining engineering and metallurgy (2001)
- A **Collaboration and Structural Reform (CASR) grant** to establish Australia's first and only four university national undergraduate program in mining engineering - Mining Education Australia (MEA) (2007)
- A prestigious **Australian Teaching and Learning Council (ALTC) award** for Educational Partnerships and Collaborations with Other Institutions. MTEC's flagship mining program Mining Education Australia (2010)
- A **Council on Australia and Latin American Relations (COALAR) grant** to explore the possibility of taking MEA to a global audience based on the teaching of sustainable mining practices (2011)
- An **Australian Commonwealth Government grant** under the Workforce Innovation Program to undertake a feasibility study and prepare for implementation of national Associate Degrees in Mining Engineering and Geoscience, known as the Minerals Industry National Associate Degree Project (2012)
- Recognition of leadership in tertiary higher education management in Australia with the MTEC Executive Director (Dr Gavin Lind) being awarded the **2013 ATEM/Campus Review LH Martin Award for Excellence in Leadership**
- Recipient of the prestigious **Business Higher Education Round Table (B/HERT) award** for Best Higher Education & Training for the Minerals Geoscience Honours Program (2014).

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