



May 26, 2023

Emeritus Professor Sandra Harding AO
Panel Chair
University Sector Review Panel

Sent via email: universityreview.secretariat@education.wa.edu.au

Dear Professor,

About CME

The Chamber of Minerals and Energy of Western Australia (CME) is the peak representative body for the resources sector in Western Australia. CME is funded by member companies responsible for 87 per cent of the State's mineral and energy workforce employment.¹

In 2021-22, the industry reported a record value of \$231 billion, with iron ore the most valuable commodity at \$137 billion.⁴ Petroleum products (including crude oil, condensate, natural gas, liquefied natural and liquefied petroleum gas) followed at \$50.2 billion, with gold third at \$17 billion.

The value of royalties received from the sector totalled \$12.1 billion in 2021-22, accounting for 29 per cent of general government revenue.⁵ The sector is therefore a significant contributor to local, State and Australian economies.

Overview

The demand for skills in the WA resource sector is at record levels not only in the mining industry, but also oil and gas, construction, logistics and civil projects. Demand is being driven by construction, high levels of project activity, and ongoing maintenance and shutdown work across existing projects.

With a combination of projects currently under construction, new projects reaching final investment decision and a consistent demand for shutdown and maintenance workers, WA's labor market is experiencing high level of demand across exploration, mining, construction, and infrastructure development. Low unemployment rates in Western Australia are also a very strong indicator the labour market has effectively been 'tapped out', with current level of workforce supply unable to meet demand.

The university sector is a crucial pipeline for the sector's future workforce needs. However, there is reported to be a decreasing pipeline of graduates in engineering (specifically mining engineers) geology, geophysics and metallurgy across tertiary education providers. These professions are key to the future of the resources sector. The pipeline growth of these professions by tertiary education providers is essential.

Declining ATAR Numbers

Over time it has been well recognised that the number of students taking ATAR exams in WA has declined. Given ATAR is the predominant pathway of entry into engineering (and other science related) undergraduate degrees, this decline is a concerning trend.

Nearly two-thirds (63.1 per cent in 2019) of students across Australia were admitted to engineering bachelor's degrees on the basis of their ATAR scores.¹ The patterns of admission into engineering undergraduate degrees have been stable for several years.

The proportion of students admitted to universities nationally, based on a VET qualification (most usually gained from the TAFE sector), was 6.3 per cent in 2019. The proportion entering based on a HE qualification

¹ Australian Council of Engineering Deans [Australian Engineering Higher Education Statistics 2009 - 2019](#)

(such as an associate degree or Enabling Diploma), or as a transfer from another institution, has stabilised to about 21 per cent².

Relatively more women enter on the basis of completing secondary school, and relatively fewer have a VET qualification. Given the low participation of women in VET engineering qualifications this may imply quite a high proportion of those who do complete VET choose to progress to higher education³. The VET to higher education pathway, could be a small but increasingly popular alternative pathway to increase female participation in engineering higher education⁴

Enrolments in Engineering have not significantly increased.

The engineering skills shortage is ever growing, with continued demand outstripping supply. The enrolments across engineering have not significantly increased year on year from 2018-2021.

Award Course Completions for All Students in WA Higher Education 2020-21 – Engineering and related technologies⁵

	Total 2020	Total 2021
Western Australia		
Curtin University	1053	1144
Edith Cowan University	450	482
Murdoch University	114	104
The University of Notre Dame Australia	0	0
The University of Western Australia	532	428
Non-University Higher Education Institutions	397	322

Supporting International Students to Work and Remain in Australia Post-Study

Since 2008, international student enrolments have tripled across Australia in Architecture and Building (up 203.3 per cent). Information and Technology has risen 150.4 per cent while Engineering and related technologies have risen 146.5 per cent and Agriculture, Environmental and Related Studies rising 106.7 per cent. With the increase in international student enrolments, there is a need to support visa policy settings to enable international students to complete meaningful work placements with industry during their study and to go on to gain employment in Western Australia post-graduation with a pathway to permanent residency.

The recently announced re-introduction of working hours restrictions from July 1 this year appears to be a missed opportunity to accommodate the mutually beneficial work experience relationships in between university students and the resources sector where students gain valuable experience in their areas of study and provide flexibility and additional workforce coverage to resources companies during a period of persistent skills shortages.

Increasing Diversity in Engineering and other Resources Related Professions

The resources sector is committed to diversity and inclusion across our workplaces and it is well recognised gender, culture and socio-economic diversity also leads to enhanced productivity and innovation. The

² Australian Council of Engineering Deans [Australian Engineering Higher Education Statistics 2009 - 2019](#)

³ Australian Council of Engineering Deans [Australian Engineering Higher Education Statistics 2009 - 2019](#)

⁴ Australian Council of Engineering Deans [Australian Engineering Higher Education Statistics 2009 - 2019](#)

⁵ <https://www.education.gov.au/higher-education-statistics/resources/2020-section-14-award-course-completions>

importance of learning experiences which include focus on the important role played by all on building a safe, respectful and inclusive sector is also well recognised. Whilst there is much more work ahead for our sector on building awareness, removing structural barriers to greater women and indigenous representation, there are key opportunities to ensure students experience learning on the impacts of sexual harassment, bullying and racism through their study streams.

As part of the industry's commitment to diversity and inclusion, companies support and are keen to see an increase the diversity of candidates in engineering (and other professions). For example, updating traditional recruitment processes with consideration to potential barriers to Aboriginal and Torres Strait Islander participation. One CME member company has developed a program that provides TAFE students with the opportunity to live and train on-site over a three-week period, providing site tours and valuable work experience in various departments. This program completed with all participants being offered positions with the company or as contractors on site, with family members and community elders attending the graduation ceremony.

A recent report from Engineers Australia on Women in Engineering states that the low rate of female entry into engineering degrees stems from a simple fact: most girls do not even consider engineering as an option. Engineers Australia commissioned this research in late 2021 to obtain insight into what factors are most influential when it comes to causing female engineers to choose engineering, and what factors caused those who didn't choose engineering, to not choose it⁶. The report outlines that:

- Most girls do not even think of engineering as a career option. This is driven by a lack of familiarity as there is little understanding of what engineers do, or of the breadth of the engineering profession and the career opportunities it offers.
- Engineering lacks positive perceptions: it is seen as male-dominated and challenging.
- Many girls are not supported to do well in STEM subjects in primary and high school, which reduces their likelihood of pursuing the prerequisite subjects for engineering degrees. There also exists a damaging perception that one needs to be exceptional in STEM subjects, particularly math and science, to meet the demands of engineering study.

The challenge ahead for the future pipeline for the resources sector is to attract a younger and more diverse generation to work in the sector. Stakeholders, report an overall reduction in graduate applications, particularly in engineering, metallurgy and geology.

University Sector Connection to Industry

Stakeholders report that graduates who have had exposure to industry throughout their study graduate with more 'industry ready' skills and attributes. Western Australia's universities are world-class institutions and Curtin University's Western Australian School of Mines (WASM) has long been ranked second in the world for mining and mining engineering courses, eclipsed only by the Colorado School of Mines with the University of Queensland at third.⁷ WASM includes in its alumni some of WA's leading mining industry professionals.

WASM is in the heart of the Goldfields and students have the opportunity to learn not only the academic requirements for a career in mining, but also the practical skills required for jobs in mining. WASM's location offers students opportunities in part-time work with mining companies and suppliers while studying. The benefits of this cannot be overstated as it leads to meeting key contacts for later life, full-time work during university breaks, thesis projects and graduate roles. WASM graduates achieve over 90 per cent employment outcomes post-graduation.

Supporting Regional and Remote Learners into Higher Educations

⁶ Engineers Australia [Women in Engineering](#) June 2022

Initiatives to ensure access and equity for remote and regional students across the state to higher education should be further investigated. This is the approach that Pilbara Universities Centre (PUC) has adopted in partnering with other universities to deliver degrees and diplomas while providing students in regional areas access to tertiary education without having to leave their community. It does this while also providing physical spaces and resources to support online learning. There is an emerging need and opportunity to develop new partnerships, courses, and lines of inquiry through research to support emerging industry developments and skills requirements.

There are further opportunities for Western Australian public universities, to collaborate with industry and vocational education providers in Perth and regional centres across the State.

Vocational Education pathway to Higher Educations

Increasing accessibility of pathways between VET and higher education with a key connection to industry should be further investigated to sustain a fit-for-purpose and skilled professional workforce for the State. There is a need to create alternative pathways into university that are non-ATAR pathways with necessary STEMS bridging courses to aid participation at different points in a person's life – such as from a trade pathway to university or transferring from one sector to another or from one occupation to another.

For non-ATAR pathways, students need to be supported to complete undergraduate degrees. Studies have shown there is a high correlation between non-ATAR pathway entrance to university and non-completion rates of degrees.

Workforce training and development is a key focus for resources companies and there is a need to continue to upskill existing workers to gain higher education qualifications as industry moves to more technology-enabled workplaces. A requirement for streamlined ways of recognising existing skills of technically trained employers through recognition of prior learning (RPL) in a VET context needs to be developed with pathways leading from Advanced Diploma Level into higher education.

Increasing micro-credentialling opportunities for employees could also be more fully leveraged post degree qualification to obtain specialist areas of knowledge to further contribute to knowledge, skills, competencies, and lifelong learning.

Recommendations

- Addressing systemic issues will require longer-term initiatives with continuity and ongoing assessment to measure effectiveness. Examples include long-term initiatives to improve the uptake of ATAR completions, and in particular STEMS subject selection in high school and at ATAR level.
- Initiatives such as school career talks with representation from industry to influence career choices should be targeted early - from junior high school (and even earlier). They should also include representation by women in the industry to increase participation of females in non-traditional roles in the resources sector⁸.
- Coordinated and improved career visibility in critical professions connected to the resources sector would be beneficial and help ensure a sustained pipeline of skilled professionals for the requirements of the resources sector.
- More frequent, coordinated communication on the specific actions that universities and industry are taking to generate positive environmental and social impact. Industry and higher education need to communicate the role that university and the resources sector has in a future green economy.
- Collaboration between university and industry, applying research expertise to enhance operations and services. Provision of scholarships and connection between students and industry is regarded as best practice and needs to be further developed.
- There is a need to create alternative pathways into university that are non-ATAR pathways. This could be achieved with necessary STEM bridging courses to aid participation at different points in a


⁸ Engineers Australia [Women in Engineering](#) June 2022

person's life – such as from a trade pathway to university or transferring from one sector to another or from one occupation to another.

- The utilisation of VET as an alternate pathway into university with further links to industry could be further developed.
- Further leveraging micro credentialing opportunities to obtain specialist knowledge and skills.

For further information/should you have questions regarding this letter, please contact Adrienne LaBombard, Director – Policy & Advocacy [REDACTED]

Yours sincerely,



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Chief Executive Officer