MINERALS COUNCIL OF AUSTRALIA

SUBMISSION TO THE AUSTRALIAN CURRICULUM ASSESSMENT AND REPORTING AUTHORITY REVIEW OF THE AUSTRALIAN CURRICULUM F-10

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1. INTRODUCTION

Educating young Australians in STEM from an early age is fundamental to the future success of the Australian resources sector.

Encouraging primary and secondary students to learn about the mining industry and the science behind the formation of the earth, water systems and climate is an important building block for the skills pipeline feeding one of Australia's largest industries.

In addition, ensuring that students are exposed to the core foundational mathematics (across primary, secondary and senior secondary studies) for successful participation in STEM pathways must not be compromised.

Existing skills shortages including those generated or worsened by the COVID-19 pandemic means that building better understanding and connections for primary and secondary students to earth sciences is critical to the future growth of the minerals workforce.[1]

The minerals industry also needs the best and brightest students with a broad and deep understanding of the world around them to achieve more sustainable and socially valuable outcomes.

A stronger minerals industry which uses innovation and a highly skilled workforce is good for Australia, providing stronger economic growth, export income and sustaining regional communities.

Yet Australia's prosperity and the future success of the minerals sector would be put at risk with the proposed changes to the ACARA curriculum.

As the world's leading exporter of minerals and metals, Australian mining – which employs more than 243,000 people directly – is well positioned as an industry of choice for students.[2]

The opportunity created by many thousands of new high-tech jobs which will either be totally or partly reliant on STEM skills creates a critical need to support primary and secondary students transition to the resources sector through relevant VET or higher education.[3]

Australia cannot take its global leadership in mining and minerals processing for granted.

In 2019, the resources sector generated $289 billion of export revenue (59 per cent of total export revenue) and invested $34 billion in new capital expenditure.

Mining investment is a significant driver of economic prosperity in Australia as demonstrated by Reserve Bank of Australia calculations which show the mining investment boom from 2003 to 2013 delivered a 13 per cent increase in household real per capita income and a 6 per cent increase in real wages.[4]

Mining also powered Australia's economic recovery during the COVID-19 pandemic with record high export revenue for iron ore, gold and copper in 2020. Australia's resources exports in 2020 – including minerals, metals and energy commodities – generated $270 billion in export revenue for the economy and accounted for 62 per cent of total export revenue.[5]

The resources sector has a strong record in creating highly paid, highly skilled jobs – particularly in regional areas. Average earnings in resources are $141,000 a year, 58 per cent higher than the average for all industries, and the industry employs more than 8,600 apprentices and trainees and more than 6,600 Indigenous Australians, including in remote areas of the Northern Territory, Queensland and Western Australia.[6]

[1] Minerals Council of Australia, *Submission to the Joint Standing Committee Inquiry into Australia's Skilled Migration Program*, 31 March 2021, Canberra
[2] Minerals Council of Australia, *2020-21 Pre-Budget Submission*, 24 August 2020, Canberra
[3] Ibid.
[4] Ibid.
[5] Minerals Council of Australia *Mining export revenue leads Australia's economic recovery* 2020.
[6] Ibid.

Together, mining and the mining equipment, technology and services (METS) sector account for approximately 12.4 per cent of Australia's gross domestic product and support (directly and indirectly) 1.1 million jobs – around 10.8 per cent of Australia's total workforce.[7]

Supporting the continued success and growth of this significant portion of the Australian workforce requires a fit for purpose and contemporary national curriculum to support future operational, technical and professional careers.

As Australia recovers from the COVID-19 pandemic, the skills and training needs of both the industry and the future minerals workforce will require close attention, including retraining and reskilling entrants from other industries affected by COVID-19.

Skills required in mining are also complementary to those required in agriculture, advanced manufacturing, construction and defence industry.

With interest in STEM subjects falling short of the levels required to ensure Australia's future workforce is job-ready, now is the time to strengthen the ACARA earth sciences and mathematics curricula, not weaken them with poorly-considered changes.

[7] Deloitte Access Economics, *Economic Contribution of the Mining and METS sector: Australian estimates*, commissioned by the MCA, 2021.

2. AUSTRALIA'S WORKFORCE TODAY AND TOMORROW

A highly skilled workforce

Mining in Australia is a sophisticated and technologically advanced enterprise that requires a highly skilled and adaptable workforce.

Australian resources sector jobs are high-value, highly-paid, high-skilled jobs, mostly in regional Australia.

Australian mining is a technology leader with a diverse range of career opportunities.

Attracting and retaining new talent (partly to replace an ageing workforce), encouraging existing workers to gain new skills and move between roles and supporting the career development of First Nations Australians are all industry priorities.

In the past, workers had one career. In the future, they will have a mix of skills acquired from different workplaces throughout their lives.

Using the latest mining technology and developing innovative new processes and techniques delivers greater productivity and better health and safety performance.

Technology is already augmenting and shaping future roles – for example, shotfirers using drones and truck drivers operate automated vehicles – and hybrid roles will continue to emerge requiring skills and expertise from multiple fields, such as data analytics, robotics and artificial intelligence.

The influence and impact of technology across the mining value chain is altering the future skills required of the mining industry workforce, with technology enhancing or redesigning 77 per cent of mining jobs over the next five years.[8]

Australia's resources workforce covers a range of scientific fields and professional occupations. The resources sector is the largest total employer of:

- Mining engineers (3,502)
- Geologists and geophysicists (9,865)
- Industrial, mechanical and production engineers (10,685)
- Production managers (5,628)
- Metallurgists and physicists (699).[9]

Mining is also the third-biggest employer of environmental scientists, employing more than 9,326 directly and indirectly.[10]

In addition to the above professional occupations, the sector has identified chemical engineering, electrical engineering, mechanical engineering and computer science and data science as emerging occupations over the next five years.

A large proportion of the workforce is highly skilled; 68 per cent hold a Certificate III level qualification or higher, above the national average.[11] A quarter of the workforce is university educated.[12] Through the Australian Government-funded Mining Skills Organisation Pilot (MSOP) working with MCA and industry, 5000 new apprenticeships will become available over the next few years.[13] The level of education within the workforce reflects the importance, value and ongoing need for trade and professional occupations to the mining industry.

[8] EY, *Skills Map for the Future of Work*, commissioned by the MCA, 2019.
[9] Department of Jobs and Small Business, *Job Outlook;* MCA calculations, viewed 7 September 2019. NB these figures are estimates of the total number of workers directly and indirectly employed by the resources sector.
[10] Ibid.
[11] Minerals Council of Australia, *Advantage Australia* 2020.
[12] Ibid.
[13] Ibid.

Current state of play in minerals higher education and training

Minerals higher education in Australia experienced strong growth in enrolments across minerals-related disciplines from 2004 to 2012 because of the unprecedented growth within Australia's minerals industry.

Since 2012, as the industry has transitioned from the construction to production phase, enrolments have fallen sharply.

Decline in labour demand was exacerbated by recent falls in commodity prices, which in turn has negatively affected 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.

The MCA has taken action to stem this decline, investing more than $65 million since 2000 through the Minerals Tertiary Education Council across 17 Australian universities to support more than 5,500 graduates in mining engineering, minerals geoscience and extractive metallurgy. See Appendix A for more information on the MTEC initiative.

Mining engineering

Mining engineering graduates lag the economic cycle by four years (the length of the degree). The number of students commencing mining programs across Australia show a stark decrease from the high in 2015 (table 1).

Table 1: Australian mining engineering graduates

University	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
University of Western Australia	14	18	23	22	32	46	51	40	29	10	13	16
Monash University	-	-	-	-	-	-	11	10	12	8	6	10
Federation University	-	-	-	-	-	-	4	9	18	6	3	2
University of Wollongong	16	27	23	34	49	24	35	31	23	30	14	20
Curtin University	61	43	69	61	71	52	56	53	36	26	22	20
University of Queensland	45	57	50	44	46	73	65	53	40	22	14	18
University of New South Wales	50	53	50	54	52	50	78	68	86	58	32	15
University of Adelaide	-	36	34	39	47	42	33	33	26	19	7	3
TOTAL	**186**	**234**	**249**	**254**	**297**	**287**	**333**	**297**	**270**	**179**	**111**	**104**

Source: Australian Network of Engineering Educators, 23 March 2021

An analysis of government labour demand data and MCA projected enrolments into minerals higher education programs suggests the decline in labour supply (enrolments in mining-related tertiary disciplines) will outpace future labour demand in critical technical areas, creating potential skilling issues downstream.[14]

[14] Minerals Council of Australia, *Supplementary information for review of the 2016-17 Skilled Occupation List – Mining*, MCA, Canberra, 2018.

For mining engineering the moving average trend for university completions from 2017 to 2020 declined by 81 per cent.[15] In the same period, labour demand was expected to decline by only 13 per cent.[16]

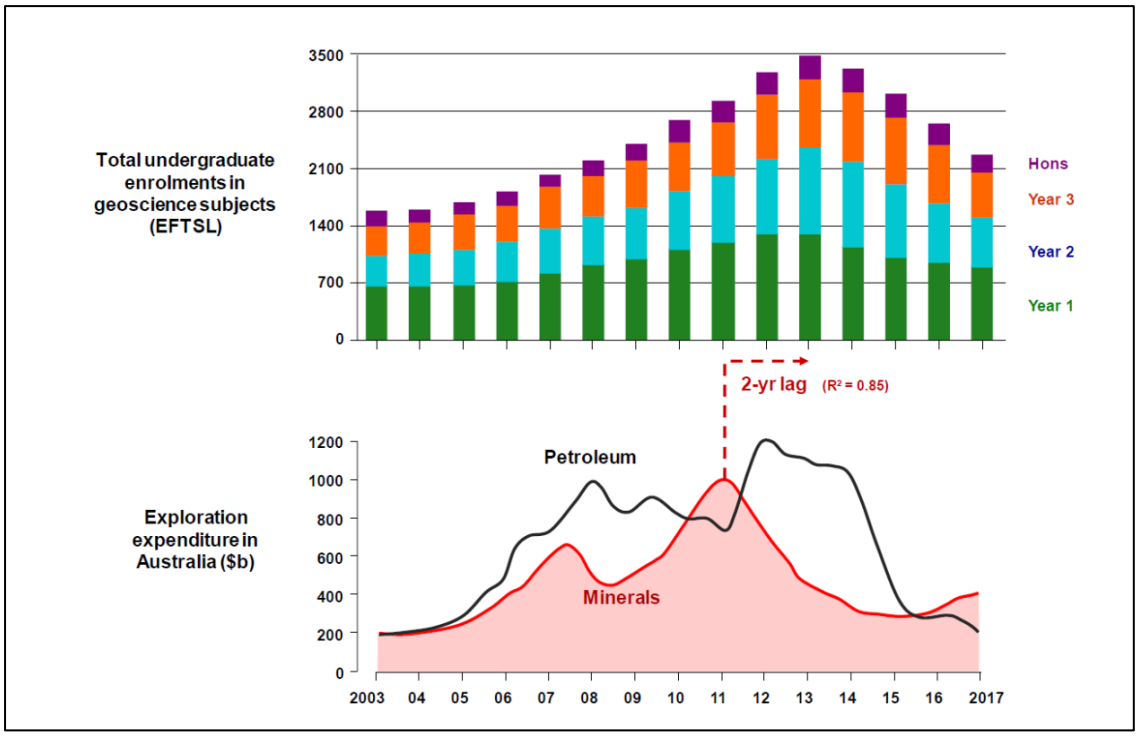
This is further evidenced through the Department of Jobs and Small Business employment data noting that the number of mining engineers grew moderately over the past five years and is expected to grow over the next five years from 11,100 in 2019 to 12,200 in 2024 to work directly and indirectly in the Australian economy (including in the professional services sector).[17] Simply, Australia will not have enough domestic mining engineers to meet anticipated growing demand.

Based on the status quo, industry requires a minimum of 200 mining engineers per annum to offset natural attrition (resignation and retirement). This does not include expansion of operations. In applying current enrolments and projected graduates, future shortfalls to accommodate natural attrition grew from 100 in 2019 to 150 in 2020 and will continue to increase in 2021 and beyond.

Geophysics and geology

Geophysics and geology enrolments are also in decline. A comparison between total undergraduate enrolments (by level) in geoscience subjects across Australian universities and expenditure on minerals and petroleum exploration in Australia 2003–2017 shows this downward trend.[18] This trend continues into 2021.[19]

Figure 1: Geoscience enrolments and exploration expenditure in Australia



Source: Australian Geoscience Council

Many geoscientists graduates go on to work in the resources industry. Some 53 per cent of the 119 geoscience honours students graduating 2016-20 now work in the mining industry, and 22 per cent of the 88 geoscience masters and PhD graduates over the same period work in the mining industry. Approximately 10 per cent of these graduates work in the energy sector.

[15] Estimated from various MEA reports analysed December 2017.
[16] Department of Employment, *Employment Projections 2020*. Provided by Skilled Occupation List (SOL) Team during 2019-20 SOL Stakeholder Consultations.
[17] Ibid.
[18] Cohen, D.R., *Australian Geoscience Tertiary Education Profile 2017*, Australian Geoscience Council, 2017.
[19] Geo Down Under, *Australia's geoscience paradox threatens its prosperity and sustainability*, viewed on 4 June 2021

These statistics demonstrate the demand in the resources sector for graduates from these backgrounds and the continued need for investment in the F-10 curriculum to support the uptake of geology or geophysics subjects in the higher education sector.

Better skills for Australians

MCA advocates for uninterrupted skills pathways regardless of the business cycle. This means the funding and provision of quality training throughout the cycle supported by industry and associated education and training institutions and a strong evidence and policy base.

The minerals industry contributes significantly to the education and training of its workforce – and by extension the Australian population more broadly – when skills attained in our industry are transferred to other jobs in the broader economy.

Industry investment in areas of skills development in high demand areas and training initiatives with Indigenous and local employment is targeted and offers a mutually beneficial return on investment with the community.

Apprenticeships and traineeships continue to be an important pathway into the minerals industry and a stable source of talent to meet current and future needs, as shown by the ongoing consistency in the number of apprentices and trainees year-on-year.

Apprentices and trainees currently make up 4.3 per cent of the minerals workforce.

With demand for skilled workers growing across Australia, the MCA has long advocated for more flexible, higher quality and responsive training and workforce development to build the minerals workforce of the future.

This workforce will be more diverse, geographically distributed and digitally connected, with skills and capabilities that are adaptable, transferable and relevant to the needs of the future economy.

Another significant initiative is the Mining Skills Organisation Pilot (MSOP) announced on 1 November 2019. The mining industry is at the forefront of industries undergoing large-scale skills shifts as a result of changing technologies and future global demands.

The MCA will coordinate the MSOP on behalf of employers and in conjunction with broader industry, working with key players in the national VET governance structures to advise on and obtain agreement to changes that improve the quality and the extent of training for the sector.

Through MSOP, the mining industry will have the flexibility to develop and test innovative forecasting methods, training offerings and options across the skills pipeline to achieve the responsive pathways and skills acquisition required in the immediate and post COVID-19 employment landscape.

The MSOP forward work plan contains four project hubs in digital transformation, apprenticeships, attraction and retention and qualifications reform – all specifically calibrated to address skills issues identified by industry.

Ensuring the sustainable supply of skilled trades and graduates with the required skills is critical to the current and future prosperity to the minerals industry. The minerals industry will continue to require a broad base of talented professionals as the nature of work changes and is concerned at the dramatic reduction of commencements into mining engineering degrees at Australian universities in recent years.

While the MCA remains committed to national collaborative programs in mining engineering, metallurgy and minerals geoscience – which continue to deliver an important pipeline of skilled professionals to the industry – a national F-10 curriculum designed to support the future needs of critical industries is essential to Australia's economic prosperity and future success.

3. IMPACTS OF PROPOSED CHANGES TO THE ACARA CURRICULUM

Structural changes to earth science F-10 education

The proposed changes to the ACARA curriculum in removing key sections of the curriculum around earth, water systems and climate into the early years, puts at risk key learnings and understandings that are critical in the middle years for understanding the earth, its systems and workings. More concerning is that students will not gain the knowledge of these areas that will inform career pathways in the resources sector particularly in those that are experiencing a skills shortage.

Areas of concern include repositioning the level at which key earth science modules are taught.

This could reduce the ability of students to comprehend and absorb content.

The transition of the rock cycle as a year 8 science to a year 6 science could also pose challenges to primary educators due to a lack of scientific specialisation and training.

In particular, designing a map which includes local geological sites of interest and the rock types that can be found there would pose a challenge to a primary teacher with limited geological experience.[20]

The water cycle – a fundamental component in the broader understanding of renewable and non-renewable resources including foundational knowledge on how the Earth's homogenous mass was formed – is removed from the national curriculum under the year 7 science program.

It is critical that students have a clear and scientific understanding about water in order to increase their knowledge and inform attitudes on water quality, availability and distribution. Access to clean water is a key attribute of liveable communities and students need to understand the scientific concepts that underpin its use and management particularly in industrial settings.

While it is positive to see in the Geography Year 7 curriculum the Water in the World topic, it seems a wasted opportunity for students to evaluate strategies to overcome water scarcity in Geography (AC9HG7K03_E4) (e.g. recycling, desalination, etc.) without the opportunity to study the complementary scientific aspects associated with water, water filtration, water scarcity and experimenting with these and mitigating strategies to make clear, comprehensive and informed decisions around strategies for the future of this world.

Environmental managers, engineers and hydrologists to name a few are just a sample of the professionals needed in our sector who have chosen this pathway based on the rigor of scientific concepts taught in school.

Returning this element of the curriculum complements knowledge on the solar system, the formation of the earth, tectonic plate movement and volcanic eruptions which all explain how water came to the surface of the earth.

Moving the carbon cycle from year 10 to year 8 is shifting another complex module of the curriculum which may pose too great a challenge to year 8 students.

The proposal also removes mention of key components of the carbon cycle including the natural processes involved in producing coal and petroleum from the curriculum.[21] Removing this because of alleged negative impacts of those resources fails to inform students about significant contextual issues including the importance of such commodities to a prosperous modern economy.

It also stifles the ability for students to picture themselves as being part of the solution. The curriculum in this form will only be around for a short time until the next review, however, students studying under this curriculum need to understand the broad range of energy products powering their lives today and into the short-term future, while also looking to possible solutions for a sustainable energy mix once they have transitioned through tertiary education and into the workforce.

The proposed changes clearly position the curriculum on biological sciences to avoid the connections between minerals and everyday life due to the perceived negative effects of combustion – without

[20] ACARA Curriculum review (AC9S6I06_E7)
[21] ACARA Curriculum review (AC9S9U03_E4) and (AC9S9U03_E6)

which many common goods would not be accessible.[22] These include warm showers, food cooked on gas stoves, vehicles and mobile phones.

The minerals industry supports initiatives to supplement the school-based curriculum through providing resources, teacher professional development and technologies. These include:

- Significant industry investment in Year 6 and 8 games through a series of video games designed to enhance student engagement in understanding of natural resources and the resources sector and stimulate interest in the curriculum from a young age. This project is aligned with the curriculum and designed to increase student participation in Earth Science including the rock cycle. The games focus on Emergency Rescue Training (ERT), the iron ore supply chain and the broader influence of mining on communities
- In 2008 the MCA supported an industry initiative to establish the Teacher Earth Science Education Programme (TESEP). TESEP offers teachers professional development courses accessible online to enhance their knowledge of the course material to develop better student learning outcomes. The development of online student resources has further enabled the progression of the Australian earth science education delivery
- The industry continues to support school visits to mines to demonstrate the contribution of the resources sector to the Australian economy, local communities, and the importance of extracted minerals to everyday life. For example, the Upper Hunter outreach programme is planning to deliver 32 tours in 2021 and provides schools with the Pathways to Resource Industry and Mining Employment (PRIME) Teacher Workbook. PRIME is a collection of accessible, ready to use classroom activities for Stage 5 students (Years 9-10). The activities used are mapped to the Science, Geography and Maths syllabus content, supporting future pathways to relevant education and resources industry careers.
- The Queensland Minerals and Energy Academy (QMEA) offers students on site experiences through trade camps connecting schools to industry for unique educational experiences. QMEA supports 80 schools across Queensland and measured 25 per cent of 2019 school leavers entering engineering and related technologies compared to 15 per cent from non-QMEA schools.

Foundational knowledge and skills in mathematics

With the increased opportunities across the mining industry and the growing skills shortages, it is imperative that students are equipped with the fundamental knowledge to engage in STEM studies across primary, secondary and senior secondary, through to tertiary education. Disrupting the opportunity for students to achieve solid foundations in mathematics and obtain the skills critical to continued STEM learning is a key limitation of the proposed mathematics curriculum.

The inconsistencies, errors and complexities highlighted in the open letter (addressed to the Chief Executive Officer and Board of ACARA) supported by senior academics, educators and experts are concerning. In particular in the context of addressing identified weaknesses in the existing curriculum and the evidence base for implementing the new approach.[23] Notably, there is a concern that the proposed approach would not deliver the appropriate level of knowledge students need to satisfy year 11 and 12 mathematics requirements (particularly where the decision is made post year 10 and optional studies have not been taken up), and/or confidently pursue post-secondary STEM pathways.

Whilst the ACARA review is limited to F-10, at a time when some states (for example New South Wales) are independently seeking to introduce compulsory senior secondary mathematics, greater consideration of the senior secondary curriculum and opportunities to streamline the patchwork arrangement across states and territories would have been welcome.[24] Particularly given it has been almost a decade since the broader senior secondary curriculum was published in 2012.[25]

[22] ACARA Curriculum review (AC9S9U03_E2)
[23] A Al Amin et al, *ACARA mathematics open letter and list of signatories*, viewed 6 July 2021; and ACARA Program of Research: 2017 – 2020, ACARA, viewed 6 July 2021.
[24] NSW Premier, *Maths to be compulsory for students*, media release, NSW Government, NSW, 24 October 2019.
[25] ACARA, *Senior secondary curriculum*, ACARA, viewed 6 July 2021.

4. CONCLUSION

The proposed changes to the ACARA national curriculum will reduce understanding of pathways for secondary students to undertake resources related courses in universities and constrict the supply of skills to the industry.

Considering the existing skills shortages in the mining industry, this proposal will damage the future of one of Australia's most significant industry sectors at the very time when future opportunities beckon to supply the globe with high-quality minerals for energy, infrastructure, growth and decarbonisation.

In order to reinforce the uptake of tertiary education pathways which support the continued growth of the resources sector and the high skill and high wage jobs it offers, the national curriculum needs to:

- Be focused on building an interest and understanding in earth science for students during their primary and secondary education
- Offer F-10 and senior secondary mathematics curriculum that is aligned, reflects the role of mathematics in everyday life and STEM careers, and signals to students the importance of mathematics to succeed in life after school.[26]

On this basis, as a minimum the:

- Status quo of the secondary school-based earth science curriculum should be maintained
- An expert review (as recommended in the open letter) of Australian mathematics curriculum should be undertaken and extended to include senior secondary curriculum with strong consideration of mandatory senior secondary mathematics at a national level.
- A review of the broader senior secondary curriculum, including introduction of compulsory mathematics as recommended above should also be completed.

[26] New South Wales Premier, *Maths to be compulsory for students*, Media Release, 24 October 2019.

Appendix A: Minerals Tertiary Education Council

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.

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 basis. Such financial investment can support, but cannot sustain, these programs. MCA funding is in excess of $65 million since 2000 for programs which have benefitted approximately 5,500 graduates. A key role of MTEC has been an intermediary body driving engagement between universities and industry and building collaboration between universities in program development and provision.

The MCA, through MTEC, has built a unique, innovative and powerful model for strategic and purposeful industry investment in minerals related tertiary education across a number of Australian universities. However, a significant recalibration of the industry's relationship with the university sector (to modernise courses, content and delivery to provide the knowledge and skills needed in the redesigned workplaces of the future) necessitated a change in how MCA funding through MTEC is directed.

During 2020, in addition to the ongoing support for programs in extractive metallurgy and minerals geoscience, the MCA piloted three new tertiary programs to create the professionals the modern mining sector needs. These include modernising the undergraduate mining engineering curriculum to better reflect the graduate attributes required by industry, improving the content for the associate degree in mining engineering to increase paraprofessional pathways, and creating an industry first mining microcredential package providing contemporary and emerging mining insight to a broader community of interest. This investment of $1 million charts a new course for mining engineering education for the modern mining sector in Australia.

A reframed network of select university departments will be dedicated to achieving true world class education by cooperating in the development and delivery of undergraduate learning in the core disciplines of mining engineering and metallurgy, and a specialist graduate program in minerals geoscience.

Mining engineering curricula

The MCA and MTEC support existing pathways and in 2020 invested in two curricula pilots to analyse, review, refresh and test curriculum to reflect contemporary skills needs.

Central Queensland University and the University of Southern Queensland conducted a curricula pilot to refresh and re-focus the Associate Degree of Engineering to reflect the modern mining sector. The associate degree provides a pathway to a professional engineering career for trade qualified paraprofessionals in engineering related industries including the resource sector. This pilot offers a refreshed opportunity to consider an education product that bridges vocational education and training and higher education and develop a new cohort of professionals from within the existing workforce.

Curtin University conducted an overhaul of the undergraduate curriculum in mining engineering, established through extensive consultation with industry and community partners.

First year engineering initiative

The MCA and University of New South Wales are undertaking a student recruitment pilot to attract current first year engineering students yet to decide their major to the mining engineering stream. The pilot will take the form of industry lectures to the entire first year engineering cohort (including from recent mining graduates in industry), a promotional email campaign and a field trip to Hunter Valley mining operations.

Micro-credential package

The MCA and MTEC support the development of new pathways that complement existing offerings and are able to facilitate access to and inspire a wider talent pool to the modern mining sector.

Curtin University and University of Queensland, in an industry first, developed a micro-credential package as an online professional certificate in foundations of modern mining, consisting of six individual short courses. This program advances training creation and delivery mechanisms in innovative ways when higher education environments can be somewhat restrictive.

The open source, free access package offers education attainment (through a graduate certificate) and allows for a pathway to further study for participants in from any discipline who wish to gain mining specific skills.

Extractive metallurgy and minerals processing

The Metallurgical Education Partnership (MEP) is a formal partnership funded by MTEC and its partner universities (the University of Queensland, Curtin University and Murdoch University) for collaborative teaching of the capstone metallurgical process and plant design course for fourth year engineering undergraduate students. Industry contribution continued in 2020 by way of a week-long industry masterclass attended by all students and supplying real industry data for the student projects. MEP produces 100 per cent of all four-year trained Australian extractive metallurgists nationally with long term graduate numbers of approximately 30 per year.

Minerals Geoscience

The National Exploration Undercover Schools (NExUS) is a prestigious minerals geoscience summer school established by MTEC for tomorrow's leading mineral explorers and hosted by the University of Adelaide as a collaboration of universities, government and industry partners. It delivers a truly world-class national program of training for 30 enthusiastic and engaged students wanting to acquire specialist minerals geoscience skills. Places are also made available to Geoscience Australia early-career staff. By the end of 2020, there will be over 150 NExUS alumni. The industry benefits from a cohort of students keen to pursue careers in the minerals industry. Students came from every state and territory, with many MCA members providing industry sessions as part of the program.

Minerals Industry National Associate Degree

The industry-supported associate degree programs in mining engineering and minerals geoscience will continue to be offered by the University of Southern Queensland and Central Queensland University with support from the new mining curricula and NExUS programs to ensure quality curriculum for these paraprofessional qualifications.