



# Resources Education Collaboration Summit



# Executive summary

Hosted by the AusIMM in conjunction with the Victorian Government, the Resources Education Collaboration Summit provided an opportunity for education, industry and government bodies in the resources sector to come together and discuss some of the most important issues facing the sector. In particular, there was a large focus on education and its potential to be leveraged and enhanced to ensure a sustainable future workforce, while utilising a collaborative approach to develop solutions.

It should be noted that this report is not a policy paper by the AusIMM. As such, recommendations proposed

currently in this report are not binding, and are for consideration by AusIMM Board and Communities of Interest during the development of future activities, initiatives and strategies in relevant areas.

Progressively throughout the Summit, key themes emerged encapsulating the issues being experienced by stakeholders within the resources sector. Six key themes that encompass the discussions, presentations and workshops at the Summit are presented below:

- 1. Improving the public perception of the sector** 
- 2. Need for more “internal” communication and collaboration** 
- 3. Building an effective external “narrative”** 
- 4. Government has a role to play in the future of the sector** 
- 5. Development of education pathways and opportunities** 
- 6. A sustainable and agile workforce for the future** 



## Executive summary continued

Based on the key themes, as well as presentations throughout the day and workshop content produced by attendees, this report presents a set of goals for AusIMM's consideration. This report recommends AusIMM work with the participants and organisations at the Summit to put these into action to support the achievement of a sustainable resources workforce for the future.

The below provides a high-level view of the four goals identified for action by industry:

**1.** Investigate the establishment of an overarching collaborative body that can take ownership of goals

**2.** Work to investigate and support and current or potential engagement strategy for forecasting future needs in the industry

**3.** Work to improve the perception of the resources sector in order to increase its sustainability and long term potential

**4.** Work to develop and expand education pathways to diversify entry and progression options



# Contents

<b>Introduction</b>	<b>3</b>
<b>Key Themes</b>	<b>5</b>
<b>Where to from here</b>	<b>7</b>
Appendix 1. Detailed summary of session 1	10
Appendix 2. Detailed summary of session 2	12
Appendix 3. Detailed summary of session 3	14
Appendix 4. Detailed summary of session 4	20



# Introduction

The Resources Education Collaboration Summit (RECS) was hosted by the Australasian Institute of Mining and Metallurgy (AusIMM), in partnership with the Victorian Government, on Thursday 3 October 2019. The Summit provided an opportunity for key resources sector leaders and representatives from industry, education and government to come together and explore the future of the resources sector workforce.

The purpose of the Summit was to bring together a diverse group of people and provide a platform for a robust and meaningful discussion on how we can collectively build a sustainable workforce for the resources sector. Education and the supply of a future workforce is an issue of paramount importance across the resources sector. With significant decreases in relevant enrolments, competition for graduates with other sectors, and challenges around the perception of the industry, many organisations are struggling to find workers to match the demand in their businesses. The resources sector is a critical pillar of the Australian economy, contributing 19% of the country's economic growth over the last decade and indirectly employing over 1 million Australians. Therefore, supporting the sector to evolve in the changing education and workforce landscape is both a valuable and necessary investment.

## Structure of the Summit

The day was structured in four segments, with each including a presentation(s) or panel discussion and workshop activity. This approach was utilised to provide participants with the opportunity to hear from experts before undertaking a collaborative problem solving exercise in small groups. The role of PwC was to structure and facilitate these workshops in a way that encouraged participants to think outside the box, be ambitious and draw on the range of expertise in the room to develop meaningful insights and solutions that can be utilised by AusIMM to form the basis of a roadmap to respond to some of these issues.

# Resources Education Collaboration Summit

BRIDGING THE GAP BETWEEN  
EDUCATION, INDUSTRY  
AND GOVERNMENT



## Objectives of this report

This report collates the discussions and conversations from the day to provide AusIMM with a clear analysis of the Summit. The report is structured in three segments:

1. Summary of key themes from the day
2. Articulation of recommended goals and next steps for consideration by AusIMM
3. Detailed summary of the four sessions in the appendices, including an overview of the presentations and main discussion points from each workshop

The desired outcomes of this report include:

1. A consolidated view of the key themes that evolved throughout the Summit, incorporating the key issues to be addressed by industry, education and government bodies,
2. A view of the potential avenues in which these issues can be addressed by AusIMM and,
3. An outline of the potential next steps for AusIMM to consider, utilising the work and insights from the Summit to further develop the ideas in this report into detailed action plans.

As emphasised at the commencement of the Summit, the purpose of the day was not to “solve the problem”, but rather start the conversation on the complex and nuanced issues facing the industry. The report provides a summary of the collective efforts achieved at the Summit in commencing this process, and recommends the essential next steps to build on this and start to take action to solve these issues.



# Key Themes

The Resources Education Collaboration Summit provided a platform for open and meaningful discussion on the sector's more prominent issues currently being faced. With approximately 80 diverse, well-informed and passionate individuals coming together, there was an extensive range of discussions to be captured on the day. However, over the course of the day, a number of key themes emerged in the presentations, discussions and workshop activities. These themes are specifically called out as they encapsulate the most prevalent discussions and represent the key pain points felt by industry, education and government. These themes are not mutually exclusive, however, separating them into the discrete topics enables a clear articulation of the issues that were raised.

## A. Improving the public perception of the sector

Throughout the day the issue of "perception" was a frequent discussion point, with participants continuing to highlight that the sector has an image problem within broader Australian society. In particular, it was noted that the sector is often described as "dirty", "dangerous", and "disruptive", with the impact of this perception being that it is hard to attract new talent and receive ongoing support in the sector. In particular, it was noted that commentary in the social environment regarding the long term environmental sustainability of the sector was increasing, resulting in difficulties attracting young workers and combating negative media attention.

These negative perceptions relate not only to the sector as a whole but to individual job roles within the sector, and as a result many different solutions to this problem were discussed. In particular, increasing awareness and marketing "good news" stories from the sector, alongside increased engagement with schools and communities, was recommended as a key strategy in shifting public perception.

## B. Need for more "internal" communication and collaboration

The purpose of the Summit was to enhance collaboration between industry, education and government, and the need for these bodies to work together became a central topic of conversation during the day. Conversations around collaboration took a number of different directions, including the need for a cohesive approach to improve forecasting for future skills needs. Participants noted that better skills forecasting would allow educators to develop appropriate pathways and courses that prepare students to engage in current and future job roles and thus provide the sector with the required skills mix. Participants also noted that a collective effort is required to address the perception issue. Challenging societal views and misconceptions in political and media commentary requires a collaborative and informed approach that should draw on the expertise of different bodies.

In addition, with such a large number of stakeholders involved, the need for “one voice” and “one overarching collaborative body” was identified as a potential solution to the current communication problem. This body would represent a group of collective voices from industry, education and government, and could take the lead on addressing the issues currently being faced.

### **C. Building an effective external “narrative”**

At many points throughout the day participants talked about the need for an external narrative showcasing the positives and benefits of the sector. Many of the issues being faced by the resources sector stem from a lack of awareness and inaccurate perceptions, therefore, clear and meaningful communication with non-industry players is critical.

In particular, this external narrative should highlight the “good news” and “success stories” in the sector, both from an individual and collective perspective. For example, reiterating the importance of the sector for the country and its contribution to economic growth, whilst also highlighting the meaningful and innovative job roles that workers in the sector engage in. The sector is rapidly changing and evolving with new ways of working, technologies and job roles. Reimagining the external narrative to focus on the innovative nature of the sector could play a key role in changing the perception of the sector.

### **D. Government has a role to play in the future of the sector**

While much of the day focused on the contribution of education and industry and their roles in building a more sustainable workforce, the role of government was emphasised in supporting real change to take place. While industry and education bodies are often directly faced with these issues on a daily basis, government has a broader responsibility to drive growth in Australia’s economy and job creation by facilitating economic transformation and boosting industry competitiveness.

Furthermore, government can help where other bodies may not be able to, including with policy changes, funding incentives, and marketing campaigns. As a result, the government will be an important player in helping to achieve sector targets and goals moving forward.

### **E. Development of education pathways and opportunities**

Throughout the day the topic of education was of utmost importance due to the impact it has on the skills of the workforce and career decisions. It was agreed that to encourage more students to enrol in mining-related disciplines, a key focus should be on the enhancement of existing education pathways and the development of new education pathways into the sector. While there are a range of existing pathways into the sector (mainly higher education), diversifying entry and progression options (including through VET, micro credentials and cross-sector opportunities) will enhance the ability to attract, retrain and upskill students, graduates and workers.

Participants noted that awareness of these education pathways and opportunities is essential and that awareness raising should start early. Indeed, engaging with primary and secondary school students and their communities about the sector and the opportunities it provides was a prominent point of discussion throughout the day. It was recognised that engaging students in practical engineering and mining concepts should start early and continue through to graduation from high school to support student enrolment numbers at the tertiary education level.

### **F. A sustainable and agile workforce for the future**

It was acknowledged throughout the day that the nature of work in the resources sector is changing. A common example referenced by participants is the impact of technologies that can be operated remotely. Indeed, with autonomous vehicles and machinery, the requirement for workers to be located onsite is changing, with the possibility that machines operating in remote Western Australia are controlled by a worker on the east coast.

In this environment of change, the agility and adaptability of the workforce is essential. Workers need to have the skills to engage in businesses and job roles that are changing and be supported to understand what their future is in the sector. Bringing workers on this journey is critical to ensure stakeholder buy-in and ongoing engagement with the sector.





# Where to from here

The presentations, discussions and workshops that took place at the Summit were structured in a way to guide participants' thinking towards the end goal of the day: to develop a list of key next steps for AusIMM's consideration. With each of the sessions focusing on a specific topic, attendees had the opportunity to reflect and contribute to each individual topic before bringing it all together for the final session on next steps. Further detail on the next steps developed by attendees is in Appendix 4.

Based on the discussions throughout the day and the analysis above on the key themes, this report has synthesised the information into four targeted 2025 goals for AusIMM's consideration. The purpose of these goals is to resolve some of the issues raised throughout the Summit, with a particular focus on goals that facilitate better industry, education and government collaboration to address the education and skills shortage faced by the sector. Each goal is structured with an overarching statement of the goal, followed by the identification of key steps that could be taken by AusIMM to action the goals.

It is noted that this report proposes the goals be led by AusIMM and that AusIMM would draw on its unique position in the resources sector with a plethora of

contacts and experts to help action the goals. Therefore, the goals are conceptualised with AusIMM playing a facilitator role, but drawing on other bodies and individuals to spearhead, lead and help achieve these goals is critical.

**GOAL 1.** AusIMM to investigate the establishment of an overarching collaborative body that can take ownership of goals

#### Key actions:

1. **Help strategise and define** the vision, purpose and overall strategy of the body, roles and responsibilities, terms of reference and associated definitions
2. **Assist in determining** membership, support structures, governance structure, communication channels and accountability measures
3. **Conduct a kick-off session**, aligning members on the purpose, vision for the body, as well as the Sustainable Resources Sector Workforce Strategy for 2025 (discussed in more detail below)

This collaborative body could be responsible for actioning the goals set out below.

*AusIMM should consider overseeing the activities of the body and provide general administrative and facilitation support where required.*



**GOAL 2.** Development of a robust internal engagement strategy for forecasting future needs

**Key actions for consideration:**

1. **Develop** vision and targets for the ideal forecasting
2. **Define** the resources sector
3. **Map** key contacts across the sector to communicate and engage with
4. **Develop** a centralised collaborative platform to shape “best practice”
5. **Map** the skills requirements aligned to the national economic and social strategic plan, as well as the needs and trends of the sector and what is required for a sustainable future workforce
6. **Consult and collaborate** with different bodies to establish a unified view on the key skills gaps and forecasting needs
7. **Assign** roles, responsibilities and frequency for gathering, collating and forecasting data
8. **Utilise** the centralised collaborative platform to store and access forecasting information as required
9. **Conduct** a trial period to determine the effectiveness of the solution and refine as required

**GOAL 3.** Improve the perception of the resources sector in order to increase its sustainability and long term potential

**Key actions for consideration:**

1. **Develop** vision and targets for perception of the sector
2. **Generate** a list of initiatives to be implemented to improve perception. Such initiatives can include:
  - a. Develop and expand national and state **programs to engage** with primary and secondary education providers, industry and outreach programs to influence young learners and increase awareness of the sector (e.g. school visits by industry professionals, mining summer camps, etc.)
  - b. Create a **national campaign**, advocating the “good news” stories and other positive work being done by the sector
  - c. Target **social media platforms** with “success stories”, such as displaying “a day in the life of mining and resources sector worker” via movies, short films and/or advertisements
  - d. Host a **national student forum** on mining, creating an open space for respectful dialogue between students and mining companies to bridge the gap
  - e. Showcase how we are advocating as a **sustainable industry**, and meeting the UN’s sustainability goals
3. **Determine** timeframes, individual roll out plans, and responsible parties
4. **Put** measures in place to determine the effectiveness of these initiatives

**GOAL 4.** Develop and expand education pathways to diversify entry and progression options

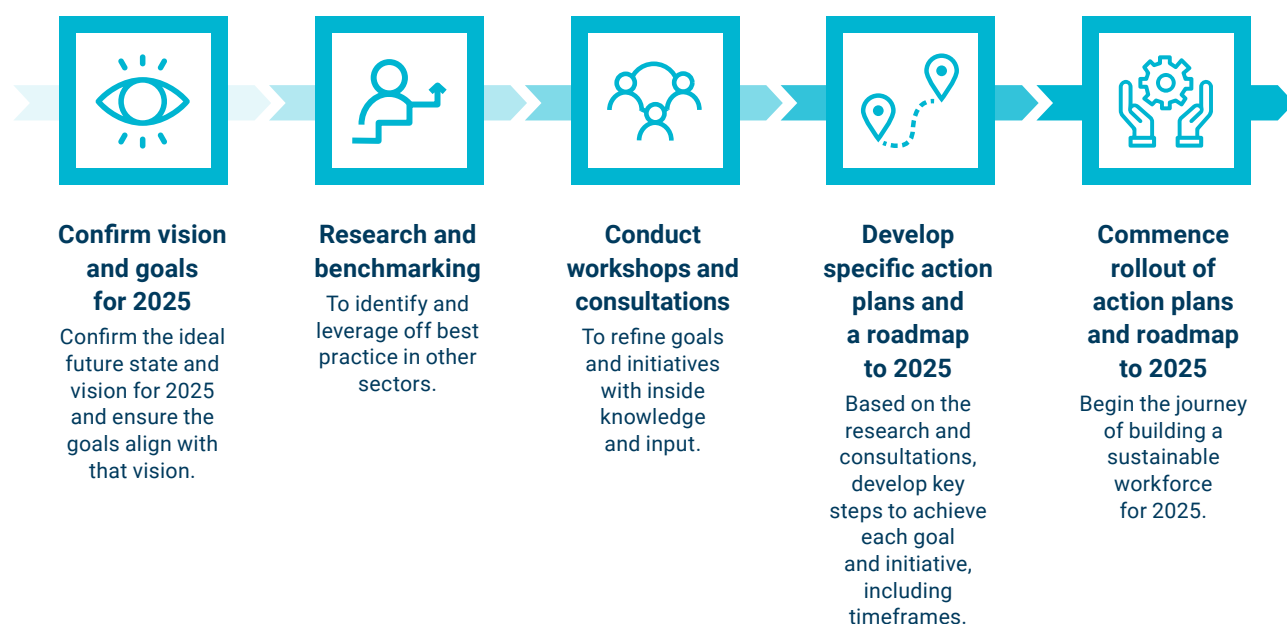
**Key actions for consideration:**

1. **Develop** vision and targets for sustainable education
2. **Generate** a list of initiatives to be implemented to expand education pathways. Such initiatives can include:
  - a. **Improve the connections** between the education sectors and **streamline pathways** between sectors using a range of delivery options (online, face-to-face, blended)
  - b. Create mining training and information **packages for schools** to inform them of the “what, who, how and where” and assisting Careers Counsellors in their role
  - c. Enable **training and upskilling opportunities** for people who are already involved in the sector or who are transferring from another sector
  - d. Establish and promote **industry internships and work integrated learning**
  - e. Developing targeted scholarships at undergraduate and postgraduate coursework level
3. **Determine** timeframes, individual roll out plans, and responsible parties
4. **Put** measures in place to determine the effectiveness of these initiatives

While these four goals have been developed based on discussions and outcomes from the Summit, there are many different pathways these goals can take. PwC recommended that these goals are further refined and enhanced with the development of a *Sustainable Resources Sector Workforce Strategy*. The benefit of a formalised strategy is that it will ensure all stakeholders are aligned to a common vision and purpose, and establishes a single source of truth when considering steps that should be taken. The strategy should include the following elements:

1. Statement of key principles
2. Current state assessment
3. Articulation of vision
4. Benchmarking comparison with other sectors facing similar issues
5. Delineation of goals
6. Action roadmap

Below is a proposed approach for the development of the *Sustainable Resources Sector Workforce Strategy*:





# Session summaries

## Appendix 1. Detailed summary of session 1

### Overview of presentations

To commence the first session of the day there was a panel discussion on the topic, “The supply of our past and the demand in our future - changes to the nature of work and the need for new disciplines and diversity”. The panel included the following individuals:

- Sarah Callil (Director, Growth and Innovation Mining, Minerals & Metals, Worley)
- Sam Retallack (Head of People and Culture, IGO)
- Fiona Vines (Head of Inclusion & Diversity and Workforce Transition, BHP)
- Facilitated by Gavin Yeates (Chair, AusIMM Education Taskforce and AusIMM Director)

The main discussion points in this segment related to trends in demand for workers and the skills these workers will require in the future resources sector. In particular, the panel discussed the shift from manual work to automated processes and the subsequent impact on job roles. Important skills in this changing environment will include analytical skills, emotional intelligence, teamwork, problem solving and flexibility.

These changes present many benefits, including the opportunity to gather talent from a larger pool, however there will also be many challenges, including supporting workers to navigate uncertainty. In particular, it will be

important to be selective in the adoption of different technologies and leverage these technologies while merging traditional and new skills/capabilities.

The panel discussion set the scene for the first workshop of the day, “How do we collectively get a better forecast of industry needs?”

### Workshop activity

The purpose of this workshop was to determine how we can collectively get a better forecast of industry needs, through the discussion of the following:

- Current state assessment
  - How industry needs are currently forecast, the limitations of current methodologies, and what each stakeholder group (education, industry, government) seeks from this analysis.
- Target future state
  - What the desired future state of industry forecasting should look like and what will be required to achieve this.

This workshop commenced with each table brainstorming how the industry currently forecasts skills needs and what the limitations are with current results, before brainstorming what the ideal future forecast looks like. Afterwards, each table was asked to determine two

main limitations of current industry forecasting and two characteristics of an ideal future industry forecast and these were displayed on one of the walls for attendees to look at and reflect on throughout the day.

The below outlines the key themes and discussion points from this workshop.

### **Current State Forecasting Limitations**

- Low exploration funds
- Short term focus that is reactive in nature, and this is compounded by a fast-changing environment
- Lack of data in the resources sector and limited sources of information to understand the cyclical nature
- No mechanism for industry and education stakeholders to interact resulting in a lack of communication and coordination
- Political
- Ad-hoc and compartmentalised forecasting activity
- Disconnect between forecast and practices

### **Target Future State Forecasting Characteristics**

#### **An ecosystem**

- Fully representative
- Incorporate views of those on the ground (e.g. miners)
- Develop and strengthen advisory relationships with professional associations
- A quantitative and data driven approach
- Developed by peak industry bodies
- Quantitative forecast of skills and demand
- Full future forecast for 30+ years
- Engage students in primary and secondary schools, as they will be the leaders in 2050
- Forecasting longer term to understand how numbers and skills could change

### **Employment / Industry ready graduates and shorter pathways**

- Technical skills will remain fundamental
- Future development of emotional intelligence skills
- Engage students in primary school
- Story told to communities (young people, parents)
- To change the image and perception of the resources sector, communities need to be well-informed and this starts with the engagement of primary school children and their parents

### **Manage the reaction to the cyclical nature of the industry**

- University placements on site
- Regional university engagement and involvement
- Increase growth to achieve this
- Industry-wide skills audit
- Led by government with peak industry bodies



## Appendix 2. Detailed summary of session 2

### Overview of presentations

The second session of the day focused on the supply of traditional disciplines in education, with two key speakers presenting on this topic. First, Professor Elizabeth Croft (Dean, Faculty of Engineering, Monash University) discussed 'The changing tertiary education landscape'. Following this, Professor Mark Hoffman (Dean of Engineering, UNSW, Sydney) discussed, 'Thinking outside the box: case studies to increase student enrolment'.

Both of these presentations focused on the decline in the number of students studying traditional disciplines. In particular, Professor Elizabeth Croft explained how Australia's proportion of engineering graduates has decreased since 2015 when compared to other resource-heavy economies whose numbers have increased during that period. This is despite there being a significant demand for engineering graduates across Australia. Professor Mark Hoffman noted that this engineering skills gap is being met through migration due to the small numbers of local talent. This change in student mix, with increasing numbers of international students, as well as the overall decline in enrolments, highlights the need to address issues relating to traditional disciplines.

Professor Mark Hoffman discussed a variety of ways these issues can be addressed, including increasing the number of scholarships from industry, combined

degrees, giving students a breadth of choice, and reaching out to high schools. Furthermore, Professor Elizabeth Croft highlighted the importance of increasing commonwealth support for engineering undergraduates across Australia. In particular, these engineering courses should prioritise employment experiences and future focused engineering, with a range of different courses and elective subjects offered as well as access to the latest technology.

These two presentations opened the discussion for the second workshop, 'What can we do collectively to increase the supply of traditional disciplines?'

### Workshop activity

Based on the presentations for session 2, the purpose of this workshop was to consider how the supply of traditional disciplines can be increased, while also assessing what other disciplines can be drawn into the resources sector, and the education formats that could be used to support this. This workshop was conducted firstly in pairs, with each pair asked to consider three questions:

- What can we do to encourage the supply of traditional disciplines?
- What are similar disciplines that we can draw on?
- How can we support similar disciplines to move into the resources sector, and what education formats would support this?

From here the discussion moved into table groups, with pairs asked to share their insights with the other participants on their tables. Finally, to facilitate a broader discussion on these topics, this workshop culminated in a survey using the “slido” online survey platform. This tool was used to provide a different mechanism of participant engagement whilst also allowing us to gather quantitative data on this topic. To this end, all participants were asked to use their mobile devices to

go to the “slido” website and enter the relevant code for the session. Participants were then given a few minutes to answer three questions based on discussions in their pairs and table groups, with the collective answers from the group appearing on the screen in a word cloud as more responses were provided. This provided the room with a visual on which responses were most common, as these would appear the largest in the word cloud. See below for the results of each question.

**Question 1: What do you think is the biggest barrier in increasing the supply of traditional disciplines? (n = 46)**









## Appendix 3. Detailed summary of session 3

### Overview of presentations

Session 3 focused on recruiting new disciplines to the mining industry and this topic was addressed by two guest speakers. Gavin Lind (General Manager, Workforce and Innovation Minerals Council of Australia) discussed, 'Case studies on the recruitment of new disciplines' and this was followed by Jane Burton (A/Executive Director, Earth Resources Policy & Programs at the Department of Jobs, Precincts and Regions), who discussed, 'Supporting the change: the role of government policy in growing the workforce pipeline'.

Gavin Lind focused on the concept that technology is changing rapidly and, as a result, the development, nurturing and sustaining of our skills will need to change. With this in mind, to maintain a competitive advantage, new skills will be needed in the sector. To break this down, Gavin Lind explained how in the future of work 42% of job roles will be enhanced by technology, 35% will be redesigned and 23% will be automated. To support this change, the key skills of the future will include change management, stakeholder engagement, creativity, data analytics, design thinking, strategic partnerships, stakeholder analysis and data and digital literacy. To adapt and prepare for the future of work, we need to consider if current courses are including the most relevant content, if there is an image problem with the mining sector that should be addressed, and if the structure of the courses themselves need to be modified.

To add to Gavin Lind's presentation, Jane Burton discussed the government's priorities and initiatives for the future of the workforce and the commitment provided to the resources sector as it relates to education. In particular, Jane Burton discussed the International Mining and Resources Conference (IMARC) that involves 7,000 people coming together, including key decision makers, mining leaders, policy makers, investors, commodity buyers, technical experts, innovators and educators. With over 260 companies showcasing the latest mining projects, machinery and innovations and more than 350 mining and resource experts covering content on the mining supply chain, it is Australia's largest mining event. The themes of the conference directly relate to discussions at the Summit, including digital transformation, global market trends and opportunities, workforce attraction, retention, diversity, inclusion, and the workforce of the future: people, technology and culture.

These two presentations provided a link into the third workshop, 'What can we do to make the mining industry more desirable for graduates?'

## Workshop activity

The purpose of this workshop was to deep-dive into five different levers that could be used to make the mining industry more desirable for graduates. These levers included:

- Perception
- Awareness
- Pathways
- Diversity and Inclusion
- Incentives

For this workshop, five stations were set up around the room and participants were asked to attend two stations over a 20 minute period to discuss how these levers are currently used and how they can be used more effectively in the future to enhance the desirability of the industry. Afterwards, participants were able to walk around the room to add content to other stations and tick ideas and comments they thought were important.

Based on discussions, the key points raised at each station are outlined in the table below.

LEVERS	How is this lever currently used?	How can this lever be used more effectively in the future?
<b>Perception</b>	<ul style="list-style-type: none"> <li>• Current public perception of the resources sector is poor, with the majority of Australian's identifying the sector as dirty, dangerous, disruptive, exploitative and predominantly foreign-owned.</li> <li>• There is a strong view the sector is not environmentally friendly, and therefore is not sustainable in the long term. As a result, young people of today have lost respect for the sector due to a strong pro-sustainability mentality.</li> <li>• The sector has created an image in the minds of Australians that it is not "family friendly" due to the amount of travel required for work, and the nature of the work itself. Income is also a key concern as most Australians question the earning potential of miners, further emphasising the image that the resources sector is an undesirable sector to work in.</li> </ul>	<ul style="list-style-type: none"> <li>• The current narrative of the sector can be adapted to a topic that attracts the younger generation. For example, making reference to sustainability, social and environmental policy (e.g. Green Energy).</li> <li>• Stories of current resources sector workers should be shared with students, while ensuring there is relatability with the stories provided to increase expressions of interest. This can include industry professionals and recent graduates presenting at Student Careers Nights and partnering with schools to establish national "Mining Summer Camps".</li> <li>• Share and actively market how "ways of working" are changing in the sector. This includes how remote working is now enabled with new technologies, and examples of best practice (such as coming up with improved methods for individual safety and environmental sustainability).</li> <li>• Increase positive media coverage to society by focusing on mining more broadly and showcasing its credibility, displaying how engineering is a positive influence and enables solutions for a better future.</li> </ul>

LEVERS	How is this lever currently used?	How can this lever be used more effectively in the future?
<p><b>Awareness</b></p>	<ul style="list-style-type: none"> <li>• There was a general consensus that awareness of the resources sector is crucial from an early age and throughout all levels of education. There are currently some programs tailored for engagement with primary schools, secondary schools and university students to increase awareness of the sector to the next generation of potential workers. This includes:               <ul style="list-style-type: none"> <li>– “Get into Resources” - a unique careers event designed to showcase the resources sector to secondary school students. Industry professionals volunteer their time to present hands-on interactive activities.</li> </ul> </li> <li>• Further to this, there are some programs that are being trialled and piloted to help increase the awareness of mining through on-the-job experience.</li> <li>• Also supporting awareness of the industry are role models for both students and teachers at primary and secondary schools, however, there is a desire and a need to increase this platform.</li> <li>• Overall there are a range of innovative and effective mechanisms that have been developed to increase awareness for the sector. However, it was agreed that coordination between education, industry and government remains the key issue, preventing the acceleration and spread of such mechanisms.</li> </ul>	<ul style="list-style-type: none"> <li>• The expansion of various programs, including mining experiential awareness programs and engagement with schools (e.g. Get into Resources) will ensure “awareness” is more effectively leveraged.</li> <li>• This can include:               <ul style="list-style-type: none"> <li>– showcasing what students’ future could look like,</li> <li>– displaying how students can contribute to society as a mine worker, and</li> <li>– targeting specific groups that may have an increased likelihood of interest in the sector.</li> </ul> </li> <li>• There is also potential to establish a national strategy to more effectively implement these initiatives and take action. Many factors need to be considered when developing this strategy, but all stakeholders should be taken into consideration and this includes:               <ul style="list-style-type: none"> <li>– primary, secondary and tertiary teachers; parents; careers counsellors; government, industry professionals in different job roles.</li> </ul> </li> <li>• In line with this national strategy is the need for one voice, or one individual/ group to take the lead. This voice could be from a Government / Lobby lead, etc. However, it will be important to consider how all bodies within the sector can be heard and shared through this one voice.</li> <li>• In today’s world it is also important to leverage social media and videos to spread resources sector awareness.</li> <li>• Community development in this space is critical to increase the understanding of key influencers of the future workforce (e.g. parents, friends and teachers). It is these individuals that impact a student’s career pathway.</li> </ul>

LEVERS	How is this lever currently used?	How can this lever be used more effectively in the future?
<p><b>Pathways</b></p>	<ul style="list-style-type: none"> <li>• Existing formal pathways are rigid and have remained mostly unchanged in the last few decades. As an example:               <ul style="list-style-type: none"> <li>– Undergraduate qualifications are particularly restrictive as they are accredited by Engineers Australia. As a result, high ATAR requirements for higher education engineering qualifications deter many candidates who would otherwise be interested. Additionally, entry requirements for higher education engineering qualifications aren't flexible enough to include candidates with Associate Degrees.</li> <li>– However, postgraduate qualifications are more flexible as entry requirements are set by training providers.</li> </ul> </li> <li>• Existing informal pathways are limited, however there are some examples of effective informal pathways, this includes:               <ul style="list-style-type: none"> <li>– The partnership between BHP, BMA, TAFE Queensland and CQ University to support the introduction of new technology in mining, and</li> <li>– Trades are being used as pathways into some mining qualifications.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Diversifying entry and progression pathway options is key to attracting, retaining and upskilling students, graduates and workers. In particular:               <ul style="list-style-type: none"> <li>– Industry has a key role to play in signalling and clarifying these progression pathways to students, graduates and workers. This includes pathways from allied industries, including civil construction, defence, automotive, etc.</li> </ul> </li> <li>• Industry and training providers must work together to determine the appropriate mix of traditional qualifications (e.g. university degrees, graduate certificates, etc.) and non-traditional qualifications (e.g. micro credentials, open online learning [OOL], etc.) Specifically:               <ul style="list-style-type: none"> <li>– Traditional qualifications are important for signalling graduates' technical and 'soft' skills. For example, Registered Professional Engineer QLD is an example of an effective, existing graduate pathway. Similarly, PhD graduates were highlighted as a great 'signal' for working autonomously with complex systems, however there is a perception among industry that PhDs lack some key commercial and social skills.</li> <li>– Non-traditional qualifications will become more important as traditional, entry-level qualifications become more generalised (i.e. graduates are required to specialise once they've completed an undergraduate qualification). For example, JORC OOL courses are ASX-recognised and an effective example of micro credentialing in the industry.</li> </ul> </li> <li>• Furthermore, asking key questions about entry and progression pathways is vital:               <ul style="list-style-type: none"> <li>– Why would someone want a qualification if they're already in the industry? (E.g. upskilling, attaining a statutory position)</li> <li>– How early should industry start trying to attract people? (E.g. Early high school – engaging students in practical engineering concepts starts early and should continue through to graduation).</li> </ul> </li> </ul>

LEVERS	How is this lever currently used?	How can this lever be used more effectively in the future?
<p><b>Pathways</b> <i>continued</i></p>		<ul style="list-style-type: none"> <li>Overall, transparent communication and knowledge sharing between industry, government and the education sector will be key to validating and promoting progression pathways.</li> </ul>
<p><b>Diversity and Inclusion</b></p>	<ul style="list-style-type: none"> <li>The current focus on diversity and inclusion is narrow. Traditionally, discussions about diversity have focused on how to get more women engaged in the sector, rather than adopting a broader understanding of what diversity and inclusion actually means. For example, diversity of gender, age, culture, and socio-economic background.</li> <li>Although targets are set with good intentions by organisations, they can sometimes be unrealistic, drive negative behaviours, and fail to consider the practicalities of meeting the target. For example, to meet a target of 50 per cent of leadership roles being filled by women, there must be an appropriately skilled and interested pipeline of women.</li> <li>Some participants noted that there are good examples of additional support provided to select groups of individuals when entering the sector. The lessons from this engagement should be mirrored.</li> <li>Engagement with Aboriginal communities and employees was seen as a D&amp;I strength of the mining industry. However, some participants questioned whether engagement could be more meaningful, to prevent a perception that it is a “tick and flick” exercise.</li> </ul>	<ul style="list-style-type: none"> <li>Reframe the D&amp;I discussion to have a broader focus on what diversity is.</li> <li>Clearly articulate why diversity and inclusion is good: what the case for change is. Emphasise that it’s about diversity of thought and backgrounds, and how this can assist with innovative problem solving and ways of working.</li> <li>Best practice case studies and champions in the D&amp;I space should be held as sector exemplars so that lessons can be learned.</li> <li>Recruitment and marketing should tailor messaging to the cohort they are engaging with in acknowledgement that the story that attracts different cohorts to the sector will differ. The recruitment process should also provide further avenues for D&amp;I to be more effectively demonstrated.</li> </ul>
<p><b>Incentives</b></p>	<ul style="list-style-type: none"> <li>From an industry perspective, there are currently no dollar incentives to bring in graduates, and minimal dollar incentives to bring in apprentices.</li> <li>Current student incentives include job offers and salary, job development, current student enrichment in some sectors, hands on, and paid experience.</li> </ul>	<ul style="list-style-type: none"> <li>Focus on providing cognitive motivations including, development opportunities for job role improvement, sharing of experiences and current knowledge, and connecting incentives to something of larger value.</li> <li>Establish collaborations and partnerships between industry and education - connect them to the student body. Emphasising the statement of “You can’t be what you can’t see!”</li> <li>Provide incentives for student experience enrichment generally.</li> </ul>

LEVERS	How is this lever currently used?	How can this lever be used more effectively in the future?
<b>Incentives</b> <i>continued</i>	<ul style="list-style-type: none"> <li>• Currently, there are no incentives offered to promote the resources sector to university graduates. Rather, university incentives are dependent on location, for example, University ranking incentives; Chancellor and Vice-Chancellor influenced by perceptions, etc.</li> <li>• Current “other” industry incentives are provided through outreach programs, funding and sponsorships.</li> </ul>	<ul style="list-style-type: none"> <li>• Improve the structuring of student practical experience in the resources sector - this is a challenge.</li> <li>• Foster the promotion of transferable skills and knowledge of an individual’s current sector, to the resources sector.</li> <li>• Increase sharing of information in industry and sharing of best practice methods and models that have been proven to be effective.</li> <li>• Increase the capacity for providing upskilling incentives (e.g. operators to engineers).</li> </ul>



## Appendix 4. Detailed summary of session 4

### Overview of presentations

To commence the fourth and final session of the day, Suzi Hewlett (Director, PwC) discussed models of industry collaboration that have the potential to be leveraged by the resources sector. Suzi highlighted the role of PwC's Skills for Australia, which supports five Industry Reference Committees to shape the Resources and Infrastructure Training Package, providing PwC with a variety of experience in education and the resources sector.

Two collaboration model examples were presented by Suzi Hewlett, one from naval shipbuilding, particularly the role of the Naval Shipbuilding College, and another from the Industry 4.0 Apprenticeship Program. The aim of the Naval Shipbuilding College is to build the sovereign workforce capability required to deliver the Australian Government's \$90bn Naval Shipbuilding Program over the next 30 years. To achieve this, the College consulted with industry to establish future workforce requirements, and connected students with providers of endorsed shipbuilding courses, while connecting industry with suitably skilled candidates. To add to this, the College expanded its pathways into naval shipbuilding to increase the talent pool to students, graduates and workers from allied industries. Secondly, the Industry 4.0 Apprenticeship Program aimed to develop a new apprenticeship model tailored to advanced manufacturing skills. This was achieved through the expansion of the traditional apprenticeship

model, providing 22 weeks of study and 26 weeks of hands-on training. Participants were awarded an Associate Degree at the completion of the program, with the opportunity to articulate it into a Bachelor's Degree. This structure meant it appealed to a broader range of potential applicants relative to traditional apprenticeships.

Overall, each sector has its own unique challenges and opportunities, however there are common themes for successful industry collaboration. These include, bringing all key stakeholders to the table for a coordinated approach, tackling long term goals, and adapting to uncertain and complex environments in a proactive manner.

Following from Suzi Hewlett's presentation the final workshop, 'What should we do next, and how?', commenced, bringing together all the discussions and activities of the day to develop a set of key next steps.

### Workshop activity

This final workshop collectively summed up the discussions and activities of the day into a set of key next steps. Each table was tasked to come up with a list of five key next steps that AusIMM and the broader group should take to resolve the issues discussed throughout the day. After the initial lists were created, each table took a deep-dive into one next step, shaping

it into a desired goal and outlining in more detail how it could be achieved. A key focus of this workshop was what these key next steps and goals would mean for collaboration between industry, education and government going forward.

Altogether, eight goals were identified and broken down into key steps. Below is a snapshot of each of these goals - created collectively by the mining industry, education and government representatives.

#	Goal and description	Summary of actions for consideration
1	Change the current funding model for tertiary education in order to align training and education to the long term vocational requirements of the nation	<ol style="list-style-type: none"> <li>1. Establish a task force to define the strategy (a collective group of key stakeholders).</li> <li>2. Map out the vocational requirements aligned to the national economic and social strategic plan.</li> <li>3. Map out clean and concise articulation of what the industry requirements will be.</li> <li>4. Merge steps 2 and 3.</li> <li>5. Engage the Department of Education and Training, and associated Universities.</li> </ol>
2	Develop a robust forecasting and assessment of future mining and resource skills <ul style="list-style-type: none"> <li>• Include long term measures for sustainability</li> </ul>	<ol style="list-style-type: none"> <li>1. Set up one body (including both state and federal stakeholders) to represent the needs of the resources sector and act as a trusted advisor (e.g. an industry reference group, such as AusIMM or MCA).</li> <li>2. Establish a collaborative platform to shape "best practice".</li> <li>3. Identify characteristics of a suitable workforce for the future and develop a roadmap for the next 5 to 10 years.</li> <li>4. Collaborate with different bodies for a unified view on the skill gaps.</li> <li>5. Determine the resource sector definition (broader than just mining).</li> <li>6. Determine if there is a "one stop shop" central repository for exchanging good practice between industry and education providers (e.g. Australian Academy of Science).</li> <li>7. Develop a roadmap and targets for sustainable education.</li> </ol>
3	Long term sector consistency and commitment <ul style="list-style-type: none"> <li>• A framework that defines a collaboration approach, and achieves 10+ years commitment between industry and education providers</li> </ul>	<ol style="list-style-type: none"> <li>1. Make minerals-related education disciplines national priority of the Resources 2030 Taskforce.</li> <li>2. Develop a collaborative framework with "one voice".</li> <li>3. Define what "good" looks like for universities.</li> <li>4. Engage with primary and secondary schools, industry and outreach programs to influence young learners.</li> </ol>



#	Goal and description	Summary of actions for consideration
4	<p>Improve the perception of our sector</p> <ul style="list-style-type: none"> <li>• What innovative changes can we make to the way in which we disseminate information about the sector?</li> </ul>	<ol style="list-style-type: none"> <li>1. Companies to consider, promote and articulate how they are addressing the UN sustainability goals (similar to what Qantas have done).</li> <li>2. Host a student forum on resources, creating an open space for respectful dialogue between students (of all opinions) and resources companies.</li> <li>3. Gold Industry Group for brown coal.</li> <li>4. Focus on delivering the following messages: <ol style="list-style-type: none"> <li>a. in the resources sector you can have a societal impact and your skills can make a positive difference to our world, and</li> <li>b. bthe resources sector grows communities, both locally and internationally (we need to make more noise about the good stories).</li> </ol> </li> </ol>
5	<p>Address the perception of the sector</p> <ul style="list-style-type: none"> <li>• Focus on upstream education (engagement) to dispel misconceptions</li> <li>• Have a “forward-looking” approach, and have a future beyond 5 years (20+ year outlook)</li> <li>• We want to be seen as a sector that is on the front of adapting to disruptive change without losing essential key skills; we are relevant and long term (30+ years, 2050 and beyond); and create solutions for a better world</li> </ul>	<ol style="list-style-type: none"> <li>1. Develop a collective sector body to lobby government and re-address and contemporise the education system, as opposed to siloed curriculums.</li> <li>2. School visits made by sector leading representatives to increase sector and school engagement in order to create a “positive” experience with the resources sector that is ongoing.</li> <li>3. Create mining and resources training and information packages for schools to inform them of the “what, who, how and where”.</li> <li>4. Establish CORE (Centre of Resourcing Excellence) in more schools.</li> </ol>
6	<p>Lift the image of the resources industry in Australia</p>	<ol style="list-style-type: none"> <li>1. Advocate as a sustainable sector, showcasing best practice work as a sector, including with rehabilitation and communities.</li> <li>2. Demonstrate a sustainable outlook to enable resources to be a long term sector, providing jobs for the future.</li> <li>3. Highlight key opportunities and the diverse range of job options.</li> <li>4. Advocate our “good news” stories, and highlight the positive work being done within the sector.</li> <li>5. Create and market a “day in the life” of resource sector workers as a movie, short film and/or advertisements.</li> <li>6. Emphasise that the general stereotypes of mining (such as large trucks, a lot of gear, dirty, etc.) is not an accurate holistic view of the sector.</li> </ol>

#	Goal and description	Summary of actions for consideration
7	<p>Overarching collaborative body to create a unified approach for industry, education and government</p> <ul style="list-style-type: none"> <li>• Inclusion of primary and secondary education</li> <li>• Resources industry attraction and retention group</li> <li>• A private, independent body that will act on all stakeholders' behalf</li> </ul>	<ol style="list-style-type: none"> <li>1. Set up an overarching collaborative body (terms of reference, definitions, etc.)</li> <li>2. Look to other sectors for ideas and success stories (e.g. technology sectors).</li> <li>3. Forecast an industry needs workforce (map who is doing what in primary, secondary and tertiary education)</li> <li>4. Increase communication across sectors</li> <li>5. Put a sustainable framework in place</li> <li>6. Enable training and upskilling opportunities for people who are already involved in the sector or for those who are transferring from another sector.</li> </ol>
8	<p>Increase industry advocacy and involvement to help and develop existing and new education options for the sector</p>	<ol style="list-style-type: none"> <li>1. Determine an engagement strategy with Government and Universities - with a common message but incorporating multiple sources.</li> <li>2. Recognition of the importance of multiple pathways, with a need to support traditional disciplines.</li> <li>3. Sector internships and work-directed learning.</li> <li>4. New investments for sector participation, short courses, etc. with management support.</li> <li>5. Targeted scholarships at undergraduate and postgraduate coursework level (e.g. certificate, diploma and masters).</li> </ol>



# Participating organisations

This report compiled, was put together based on the discussions of many participating groups on the day. These include:

AusIMM  
AusIMM Geoscience Society  
AusIMM Health and Safety Society  
AusIMM Metallurgical Society  
AusIMM Mining Society  
AusIMM Mining Society  
AusIMM Social and Environment Society  
Austmine  
BHP  
Cahoot Learning  
Charles Sturt University  
Core Learning Foundation  
CQUniversity  
CSIRO Mineral Resources  
Department of Jobs, Precincts and Regions  
Dept Of Industry, Innovation and Science  
Deswik  
Earth Science WA  
Federation University Australia  
FLSmidth USA Inc  
Glencore  
Iluka Resources  
Independence Group  
Industryc2i  
James Cook University

Kirkland Lake Gold  
KLG - Fosterville Gold Mine  
Metisphere  
Minerals Council of Australia  
MinEx CRC/University of South Australia  
Monash University  
National Australia Bank  
Para-professional And Technician Course Recognition Working Party  
PwC  
RMIT University  
St Barbara  
Swann Global  
Swinburne University  
The Australian National University  
The University of Adelaide  
The University Of Queensland  
University Of Adelaide  
University Of Melbourne  
University Of Queensland  
University Of South Australia  
University Of Tasmania  
University Of Western Australia  
University Of Wollongong  
UNSW  
WA School of Mines  
Worley  
Yokogawa