AusIMM

Submission to The Department of Industry, Science and Resources

Australia's Critical Minerals Strategy

February 2023

About Us

The Australasian Institute of Mining and Metallurgy (AusIMM) is the peak body and trusted voice for people working in the resources sector. Founded in 1893 with its first head office in Broken Hill, we operate under a Royal Charter. Today, we are a global community of members and industry professionals with influential partnerships across industry, education, and government. We shape careers, showcase leadership, create communities, and uphold industry standards.

We represent 14,000 professionals in our industry through a network of 21 branches, 6 societies, 14 student chapters, and network linkages including Women in Mining (WIMnet) and New Professional networks, delivering more than 150 community of interest events a year.

We are the custodians of industry codes, JORC and VALMIN, run the industry's leading Chartered Professional program, and provide professional certification in areas such as:

- JORC Code Reporting
- ESG and Social Responsibility
- Tailings Management
- Registration of Engineers in Queensland

Our education and professional development courses include:

Professional Certificates in:

- ESG & Social Responsibility
- JORC Code Reporting
- Metal Accounting
- Tailings Management
- Geophysics for Mining Professionals

Short courses in:

- Practical data analytics and machine learning
- Operationalising ESG
- Mine Operations Manager Course Skills
- Strategy & Governance
- Cost estimation
- Study processes for resource projects
- Enabling optimal performance

And Masterclasses in

- Advance Rock Mechanics
- Diversity and Inclusion
- Tailing Risk and Governance
- Mine Internet of things
- Uranium Mining
- Specialist Technical Masterclass supported by UNSW.

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3 February 2023

To:
Critical Minerals Facilitation Office
Department of Industry, Science and Resources
Industry House, 10 Binara Street
GPO Box 2013, Canberra ACT 2601 Australia

Re: AusIMM response to Australian Critical Minerals Strategy Discussion Paper

Thank you for the opportunity to respond to the Australian Government's review and refresh of the nation's critical minerals strategy. As the consultation paper outlines, the Government's strategy is designed to:

- add value to Australia's resources.
- grow its domestic downstream processing and manufacturing industries.
- support decarbonisation.

Complement the government priorities including:

- $15 billion National Reconstruction Fund (NRF)
- Powering Australia (including the National Electric Vehicle Strategy)
- Australia Made Battery Plan
- A Future Made in Australia Plan

And to consider:

1. the important role Australia's critical minerals can play in helping Australia and international partners achieve their emissions reduction targets.
2. the imperative to bring Australian projects online quickly to support diversified critical mineral supply chains and markets.
3. the growth of Australia's domestic manufacturing and industrial sectors, and
4. Australia's ongoing commitment to the highest environmental, social and governance (ESG) standards.

As Resources Minister, Hon. Madeleine King, explicitly states in the foreword to consultation paper:

> *"Critical minerals are also essential inputs to technologies we take for granted everyday - and that help to power our homes, offices, factories, and mobile phones. As well as being central to our future energy needs, critical minerals play an important role in other ways. Rare earth magnets are a key component of the motors used in robotics, platinum is used in medical products such as pacemakers, and magnesium and scandium are used in fighter jets. Without mining, the world cannot reach net zero by 2050.* ***In fact, the minerals required to achieve our decarbonisation goals are of such magnitude that to reach net zero, we will need more mining, not less."***

We also note the call to action by Industry Minister, Hon. Ed Husic, to almost double the nation's R&D investment to 3% of GDP (closer to the OECD average of 2.67% and Germany's 3.13%). [1]

[1] Hon Ed Husic, Speech at UTS Vice Chancellors Innovation Showcase, 3 November 2022

AusIMM Submission

Recognising that a number of kindred industry associations will make submissions on downstream processing opportunities, international collaboration, and investment support, AUSIMM's submission is focused on three areas:

1. The need for state and federal government alignment and collaboration to deliver a truly national plan.
2. Increased support for targeted skills and education programs and Research & Development (R&D) initiatives.
3. The important role of professional standards in strengthening Australia's role as a sustainable and ethical producer of critical minerals and supporting ESG, Responsible Mining and Circular Economy advances.

1) Seize the opportunity – From a federal plan to a national plan

The Federal Government is to be commended for seeking to advance Australia's critical minerals sector. While in recent years it has taken the lead in:

- providing financial support for several critical minerals initiatives,
- establishing the Critical Minerals Facilitation Office (CMFO),
- delivering the majority of government and agency funds to the CSIRO and a range of Cooperative Research Centres,

the reality is the great potential of Australia's critical minerals and downstream processing opportunities is in the hands of the country's state governments.

For this reason, we recommend the Commonwealth be the catalyst to forge a truly national critical minerals strategy, with state governments aligned as partners and significant funding contributors.

Alignment with the states is the critical missing element in the current strategy.

State governments have been, and continue to be, the beneficiaries of billions of dollars of royalties ($112 billion[2] in the past decade) and yet have reinvested a fraction of this in pre-competitive data, minerals and metals industry infrastructure, R&D and industry skills.

The states are the key to expediting land access and project approvals for exploration and development. They are the nexus between state manufacturing plans and VET skills strategies and are best placed to deliver regional support programs.

State governments have earmarked billions of dollars for state hydrogen plans. They should also reinvest billions of dollars in a coordinated federal and state critical minerals strategy to activate and underpin the vast potential of mining and minerals processing in each state.

The states should act with the same purpose and urgency for critical minerals as they have for solar power, wind farms and hydrogen hubs which are reliant on metals, minerals from our sector and pool of skills and professional expertise in our industry.

If the country is to double or triple its critical mineral investment, production, and processing in the decade ahead the Federal and State Governments must double or triple their commitment to the sector to:

- fund exploration incentives and critical minerals activation funds,
- underpin and de-risk investment and infrastructure,
- provide certainty and streamline regulatory approvals,
- increase R&D activities among the nation's university and research institutions such as the CSIRO and CRCs,
- support VET and higher education,
- fund regional 'just transition' support programs.

[2] EY for the Minerals Council of Australia, Royalty and Company Tax Payments, June 2022.

Australia could look to other jurisdictions with coordinated national plans. Canada has a Federal-Provincial-Territorial (FPT) task team on critical minerals.

Australia's Department of Industry, Science and Resources has identified 81 critical minerals projects[3] totalling almost $40 billion including lithium, cobalt, tungsten, and high-purity alumina.

An Australian taskforce of federal and state resources ministers and departments could identify 50-100 metals and minerals projects to be tracked, reviewed, and reported on as to progress. It would provide greater co-ordination through what is expected to be a complex regulatory environment in the years ahead with changes to the EPBC and several state-based EPAs.

Such projects could be given a dedicated federal and state department representatives to jointly facilitate approvals (e.g., similar to projects of state significance) and funding.

Study after study shows regional communities have the most to benefit from resource sector investment with 56% of its workforce located outside capital cities.[4]

Australia's mining and manufacturing sectors were built on the back of critical assets – smelters and refineries, railways, and ports.

They have produced lead, zinc and nickel for batteries, copper for electricity, steel for infrastructure, and aluminium for transport. They hold the key to the next generation of opportunities to recycle, reprocess more materials and advance the circular economy principles open to the industry.

These same assets are the critical assets with which to build new sovereign capabilities. The federal and state governments should develop comprehensive and cohesive plans to harness their potential. Funding the rejuvenation, renewal, or repurposing of these significant critical national assets should be a shared responsibility between federal and state governments.

In seeking to advance the nation's sovereign capabilities and manufacturing opportunities, governments should resist the temptation to focus only on downstream processing and final products, such as batteries.

Each step in the value chain, from exploration to ore and to concentrate, is just as vital and has a role to play in securing Australia's advantage in international markets and partners. Australia should continue to play to its strengths, while looking to uplift our capability and reputation in its downstream activities.

The Federal Government should maintain its support for developing pre-competitive data and extend GeoScience Australia's Exploring For The Future program to help uncover the next generation of critical assets.

Key also are the various state exploration incentive schemes and support funding through the gap ('the valley of death') between discovery and development.

The NSW Government's Critical Minerals and High-Tech Activation Fund which assists with part-funding for early studies should be expanded and is a model to be considered by all states.

Given the known shortfall between identified deposits and predicted global demand, exploration and early-stage development must be key components of the federal strategy.

[3] Department of Industry Science and Resources, Resource and Energy Major Projects 2022, Page 13-14
[4] Department of Industry, Science and Resources, Resource 2030 Taskforce Report, page 23, September 2018.

The Federal Government should also look to broaden the critical minerals list.

The CSIRO's Critical Mineral's Roadmap[5] includes aluminium, nickel and copper. The Queensland Government uses a list of New Economy Minerals[6]. The NSW Government's priority list includes high-purity alumina, copper, nickel, hafnium and helium.

There are a number of lenses through which to view critical minerals, be they:

- strategic (for defence applications)
- critical elements (for electronics and IT sector)
- vital to the energy transition such as copper, nickel, lithium, zinc, or
- where technological changes could deliver step changes in emissions profile (e.g., high-purity alumina, carbon-free aluminium smelting).

The development of all of these is in the **nation's critical interest** to drive the strategic outcomes the government has identified such as building sovereign capability, resilient supply chains, delivering regional benefits and driving a clean energy transition.

In summary, the Federal Government should be the catalyst for a more deeply integrated national plan in true partnership with the states that considers a coordinated approach to data, funding, exploration, approvals and broadening the critical minerals list.

2) Skilling the nation - Supporting education and R&D

Australia's mining workforce has increased 28% in past five years[7].

Including the mining equipment, technology, and services (METS) sector, the industry directly and indirectly employs[8] more than 1.1 million Australians (~10% of FTE employment) and its economic contribution accounts for 15% of GDP.

Mining is a high-wage occupation due to the decades of industry investment, value adding and the skills of its highly-trained workforce. More than 73% of the workforce hold a qualification[9].

The industry is undergoing strong growth and rapid change and the professional skills needed to underpin the next generation of critical minerals developments are in short supply.

As AusIMM's A Critical Moment Report[10] shows (with forecasts by PWC) by 2040 demand for geotechnical engineers and mining engineers will increase by 21%, and for metallurgists by 29%.

This is consistent with the National Skills Commission priority list which forecasts a national shortage of these professional skills and several other highly skilled professions including geologists and engineers, across many disciplines.

Over the next five years, the National Skills Commission[11] forecasts very strong employment growth of 14.2% in science, technology, engineering, and mathematics (STEM) occupations, well above the all occupations average of 9.1%, and around twice as fast as non-STEM of 7.4%.

The challenge of skilling and sourcing STEM-based workforces is shared by many sectors. Engineers Australia estimates[12] Australia will need an additional 100,000 engineers by 2030.

[5] CSIRO, Critical Energy Minerals Roadmap.
[6] Queensland department of Resources, Critical Minerals.
[7] Australian Government Labour Market Insights, 5 years to November 2022.
[8] Minerals Council of Australia, Deloitte Access Economics Mining and METS report, March 2017.
[9] National Skills Commission, Australian Jobs 2021 Report
[10] AusIMM, Critical Moment - Supply and demand of mining, metallurgical and geotechnical engineering report, 2021
[11] National Skills Commission, Employment Projections, 5 years to November 2026.
[12] Engineers Australia, Strengthening the Engineering Workforce in Australia, August 2022.

Compounding the problem is a decline in the number of young Australians choosing to study engineering and the number of Australian school students undertaking intermediate or advanced mathematics.

Australia's skills mix will need to evolve and change. Upskilling pathways and micro credentials will be key. As the National Skills Commission notes[13] nine out of 10 new jobs in the next five years will require skills developed through post-school education.

Advancing critical minerals projects, solving complex problems, driving innovation and developing unique intellectual property will be reliant on the VET and higher education sectors and nation's research institutions.

Australia has among the highest-ranked universities – these are vital areas to help support STEM graduates and drive industry collaboration and R&D.

The next generation of solutions in batteries, green steel and decarbonisation may be found in the CSIRO and Cooperative Research Centre projects. The Federal Government plays a critical role.

In 2021-22 the Federal Government provided $950 million to the CSIRO[14] with $87 million (6.8%) of its research budget focused on mineral resources, $148 million on manufacturing R&D, and $269 million (21%) invested in environment management, climate change and natural hazards related R&D.

CSIRO support for university undergraduate and postgraduate places has been declining. From 633 undergraduate students in 2017-18 to 376 students (including 197 vacation students) in 2020-21, with support for post-graduate students declining from 1438 to 1029 students[15].

Cooperative Research Centres (CRC) are also key to harnessing and focusing the industry's talents. CRCs receive their funding from several government, agency, university, and private sector sources.

Australia's minerals and energy-transition related CRCs include:

- The CRC for Optimising Ore Extractions (CRCCORE)
- Mineral Exploration (MinEx) CRC
- Heavy Industry Low Carbon Transition (HILT) CRC
- Transformations in Mining Economics (TiME) CRC
- Future Battery Industries (FBI) CRC
- Future Fuels CRC
- CRC for Reliable Affordable Clean Energy (Race for 2030)

The majority of CRC funding is drawn from federal sources. The Federal Government should consider:

- closer collaboration and matching support funding from state governments, and
- increased commitment and funding to enable more VET, graduate, and PhD programs.

Increasing the intake of geoscience, metallurgy, mining, materials science, and STEM graduates at the CSRIO and CRCs would send a strong signal to the next generation of students of stimulating and purpose-filled careers in the decades ahead in science, mining, critical minerals processing and Australia's value-added manufacturing sectors.

The Federal Government's recent commitment[16] to fund an extra 20,000 university places in 2023 and 2024 for regional and remote students, and those from low socio-economic

[13] National Skills Commission, Employment Projections, 5 years to November 2026.
[14] CSIRO, 2021-22 Annual Report, page 49.
[15] CSIRO 2021-22 Annual Report, page 77.
[16] Department of Education, 20,000 additional Commonwealth supported places.

backgrounds, or students with a disability, or First Nations heritage is welcome. However, of the 20,000 additional places, 1,738 are in engineering.

The Federal Government can play a key role in industry skill development across the education and training spectrum and should look to continue to promote and support STEM in schools, university placements, and regional access.

Australia's critical minerals strategy should be deeply embedded in supporting the nation's R&D and commercialisation agenda and broadening Australia's higher education pathways and skills base.

3) Professional Standards supporting sustainable development

In the past decade global societal and investor expectations regarding safe and inclusive workplaces and sustainable and transparent mining industry practices have increased significantly.

Australian mining seeks to be a safe and inclusive workplace environment for all people, however the recent reports - including the WA Government's Enough is Enough report and Rio Tinto's Everyday Respect report - demonstrate that bullying and harassment occur at unacceptable rates.

The introduction of a positive duty on employers to stop sexual harassment in their workplaces, via the Anti-Discrimination and Human Rights Legislation Amendment (Respect at Work) Bill 2022, is a welcome move.

Building a truly safe, inclusive, and diverse culture in the mining industry is crucial to attracting and retaining the best and brightest minds that will be required to support the industry now and into the future and remains and integral to addressing the industry's skills gap.

Across the mining sector, training to change behaviours and build more inclusive workplaces is on the rise with a range of programs including the Minerals Council of Australia's Industry Code on Eliminating Sexual Harassment and toolkit and AUSEMEA's Building Safe and Respectful Workplaces[17] training scheme.

To help drive meaningful change AusIMM is focused on several initiatives to raise awareness, deliver professional skills and drive industry engagement through activities such as:

- **Diversity & Inclusion masterclasses (Foundations & Advanced) -** the masterclasses are designed to help those who work in the industry learn more about Diversity & Inclusion challenges and opportunities. The Advanced Masterclass provides individuals with the opportunity to gain skills, knowledge, and tools to drive change to help their working environment be more inclusive and embrace diversity and belonging.
- **Annual Diversity & Inclusion survey** - the survey helps gain the perspectives and experience of those working within the industry, focusing on bullying, harassment, flexibility, and other key diversity and inclusion (D&I) topics. The survey data provides valuable insights and informs our D&I strategy and initiatives.
- **International Women's Day series** - events held in five capital cities around Australia not only celebrate women but also include opportunities for immersive workshops focused on psychological safety and bystander training.
- **Mentoring programs** - AusIMM's mentoring program runs for nine months and drives valuable learning and experiences for mentees and mentors and include a focus on helping to build an inclusive leadership style.

- **Engagement with broader industry** - AusIMM continues to work with state-based Women in Mining networks, the MCA, AMEC, and other industry bodies to share learnings / challenges, align with initiatives and help drive meaningful change to address the ongoing issues of harassment and bullying.

AusIMM is committed to fostering the social responsibility of its membership. Our Royal Charter references community considerations and our Code of Ethics states *'The purpose of the Institute is to advance the sciences applying to the minerals industry for the benefit of the community'*.

Our 14,000 members seek to uphold and advance industry standards. Approximately 1,300 members are **Chartered Professionals (CPs)** and recognised as industry experts meeting additional competency and experience requirements in their field of expertise.
The Chartered Professional program covers seven technical disciplines including:

- Environment,
- Geology,
- Management,
- Mining,
- Geotechnical,
- Metallurgy, and
- Social performance.

AusIMM members who have accountability in areas of practice such as environment and social performance must demonstrate this through professional qualification, experience, a working knowledge of jurisdictional requirements, workplace systems and procedures, and an understanding of the relevant global principles standards and frameworks.

AusIMM's social responsibility framework makes it clear that all of our.members must be aware of and consider environmental, social and governance (ESG) factors in their professional work.

Around the world a range of sustainability frameworks, codes, and standards can be housed under the sustainability and ESG umbrella, for example the:

- International Council on Mining and Metals (ICMM) 10 Principles
- Minerals Council of Australia (MCA) Enduring Value Principles
- Toward Sustainable Mining Framework
- Australian Government Leading Practice Handbooks for sustainable mining
- International Finance Corporation (IFC) Sustainability Framework and Performance Standards on Environmental and Social Sustainability
- The Equator Principles
- United Nations Guiding Principles on Business and Human Rights
- Voluntary Principles of Security and Human Rights (VPSHR)
- United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP)
- OECD Due Diligence Guide for Responsible Business Conduct
- Global Industry Standard on Tailing Management
- Global Reporting Initiative (GRI)
- International Sustainability Standards Board (ISSB) and SASB standards

Sustainability frameworks, codes and standards will continue to evolve.

The Federal Government has recently given its support to the Sustainable Critical Minerals Alliance joining Canada, the United Kingdom, France, Germany and the United States. The Alliance seeks to advance sustainability and the highest environmental, social and governance standards for the mining and processing of critical minerals.

Maintaining rigor in assessment, compliance and transparency in disclosure while addressing rapidly increasing demand will be important to demonstrate value and maintain local and societal support for the sector.

The Minerals Council of Australia has recently committed its members to implementing the Towards Sustainable Mining (TSM) Framework.

TSM includes a range of protocols from Climate Change, Safety & Health, to Indigenous and Community Relationships, to name just a few. TSM's public reporting requirements will bring an extra dimension of industry transparency to Australia supported by associated verification process and a Community of Interest (COI) Advisory Panel.

Frameworks, codes, standards, policies, principles are important guides.
The key to delivering on their intent, aspirations and goals is the professional skills of the people who apply them. This is relevant not only to those in the mining sector, but to regulators and government representatives too.

Efforts to improve public transparency and accountability of mineral production, environmental protection and trade would be greatly supported by increasing the awareness, knowledge and skills of government agencies and administrations responsible for such policy input and regulatory oversight.

AusIMM's ESG and Social Responsibility courses are used by people around the world, are global in scope and equip professionals with an understanding of existing and emerging ESG and social performance practice and tools.

AusIMM also plays a vital industry role as a co-custodian of The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code**).**

The JORC Code is used by Australian exploration and mining companies in their public reporting to the Australian Securities Exchange (ASX). The critical mineral deposits identified by GeoScience Australia are reported to JORC standards.

The JORC Code is undergoing a significant review with key stakeholders, including ASX and ASIC, with the aim of aligning public reporting of exploration results, mineral resources and ore reserves with the rapidly evolving societal and investor expectations around ESG related issues and risks.

An update to the JORC Code will see it continue to be a robust and practical reporting standard that is fit for purpose and strengthens the ESG credentials of Australia's mining sector.

Minerals and metals are at the heart of a circular economy.

As the International Council on Mining and Metals (ICMM) notes[18] circularity is not new to the industry which has been integrating circular principles for many years.

Responsible supply chain accreditation and initiatives are key to providing customers, consumers and regulators with signals as to ethically sourced and responsibly produced products.

The mining sector has a range of responsible sourcing initiatives including the Responsible Minerals Institute, the Aluminium Stewardship Initiative and Copper Mark to name a few.

Companies are also voluntarily launching responsible sourcing and supply chain initiatives, for example Rio Tinto in 2021 launched START, a sustainability label for aluminium using blockchain to support product traceability.

[18] ICMM, Circular Economy

The Australian Government has also funded a blockchain pilot with Everledger to contribute greater clarity and confidence in marketplace transparency.

Increased data and transparency are enabling customers, investors, and governments to measure the ESG credentials of metals and minerals producers and their products.

Australian companies already face multiple reporting requirements with regard to ESG, sustainability, responsible supply chain, emissions and workforce data to federal and state regulators, stock exchanges, securities regulators, investors, customers and consumers.

The world is awash in metrics.

Given the multiplicity of sustainability and ESG frameworks, leading international industry groups are working hard to bring greater alignment (also called equivalency) between such frameworks, codes and standards.

Australian governments (Federal and state) should consider carefully, and where possible, avoid legislating or mandating particular ESG reporting requirements while work on aligning global standards evolve.

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