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Submission – Critical Minerals Strategy discussion paper

The Clean Energy Council (CEC) and the Australian Hydrogen Council (AHC) welcome the opportunity to make a submission in response to Critical Minerals Strategy discussion paper.

The CEC is the peak body for the clean energy industry in Australia. We represent and work with more than 1,000 businesses operating in Australia across renewable energy, energy storage, and renewable hydrogen.

AHC is the peak body for the Australian hydrogen industry. AHC connects the hydrogen industry and its stakeholders in building a secure, clean and resilient energy future that sustainably produces and uses hydrogen within the energy mix. AHC's members are from a range of sectors, including energy, transport, consulting, banking and technology.

The timely decarbonisation of the energy sector depends on a major expansion of the critical minerals sector. Embedding environmental, social and governance (ESG) concerns and social license at the core of this expansion presents a major opportunity to improve outcomes for all stakeholders, including First Peoples, local communities and businesses, industry, and workers. This requires additional funding options for capital-intensive, pre-revenue critical minerals projects willing to demonstrate the viability of innovative approaches that increase financial returns and improve environmental outcomes, while enhancing the profitability and global reputation of the Australian mining sector. Implementing achievable local componentry targets, as well as a clear demand pipeline can greatly boost local manufacturing.

Creating economic opportunity

1. How can Australia capitalise on its existing advantages to create economic opportunity for all Australians – particularly regional communities and First Nations Peoples?

Industry must engage with First Peoples communities early in any planning process and establish them as genuine partners in decision-making. Negotiations must be entered in good faith, ensuring communities are empowered to give free, prior and informed consent on all relevant matters, including siting, implementation, decommissioning and rehabilitation. Projects need to prioritise the establishment of long-term relationships of benefit-sharing with local communities as a key success criterion. Achieving social license from the outset of a project addresses the risk of lengthy development timelines due to community backlash and increases return on investment. Cultural

awareness and safety training is also essential to ensure that a project's workspace is a safe and welcoming place for local communities.

An honest communications strategy is needed on the employment opportunities in critical minerals. Where there is prior and informed consent for a project and it is co-located with local Indigenous communities, preferential employment opportunities should be provided. In these instances, additional support should be also provided. This could include training on how the critical minerals and clean energy industries function and what effective partnership might look like with clean energy industry projects to maximise the opportunities to self-determine outcomes. It should also include assistance in navigating administrative and employment tasks such as acquiring identification, opening a bank account, understanding a paycheck, assistance with transportation etc. Government support could be provided to assist industry in engaging on-site mentors and support assistants for indigenous employees.

2. What could be done to facilitate project development and ensure benefits flow to regional communities?

Prioritising local employment rather than fly-in, fly-out workers ensures income benefits stay within the community, creating additional induced jobs through economic activity. Local employment outcomes could be achieved through the provision of education and training pathways for locals. Where the local labour supply is insufficient to meet labour demands, targeted permanent skilled migration can meet labour shortages, while providing benefits to local communities. Whenever a project results in localised population growth, investment in social infrastructure such as accommodation is essential to ensure the stability of local house prices. Investment in additional social infrastructure needed to support a growing population, such as health and education services, can deliver additional benefits to local communities.

3. What might be done to ensure maximum reasonable opportunity for local employment and local business participation in projects?

Projects should set preferential procurement targets for local contractors and Aboriginal businesses. This can be achieved through planned involvement and consultation with local businesses from the outset. Sufficient lead time allows small and medium-enterprises (SMEs) contractors the opportunity to upscale to meet the demands of large-scale mining projects.

The Government could facilitate and establish a targeted tender platform for regional projects, increasing the visibility of bids and tender processes for local SMEs. Participants could be required to unbundle large or multifaceted tenders, increasing the accessibility to SMEs. This could be accompanied by training offerings for SMEs on how to successfully bid for tenders, as well as

CAPEX subsidies to assist SMEs in purchasing the equipment needed to bid for a broader range of tenders.

4. What role can Government play to help ensure the sector maximises gender equality?

Women are significantly underrepresented in the mining industry, accounting for only 19% of jobs in the 2021 Census, and only 13% of C-suite roles globally. Industry and government have roles to play in enhancing gender equity and ensuring that workplaces are safe and inclusive. Industry could work to increase the representation of women in leadership roles, as well as the development of talent pipelines targeting the retention and promotion of women in more junior roles. Governments could implement targets for tender recipients tied to strategies and outcomes promoting gender diversity in organisations. This could include the implementation of safe workplaces, including on-site gender-appropriate amenities and suitable channels for women to safely escalate issues regarding gender-based discrimination.

Developing new sovereign capabilities and industries

5. What are the specific opportunities Australia should seek to realise while developing downstream processing and manufacturing capabilities?

One opportunity for Australia to capitalise on is the extraction and processing of platinum-group elements, including iridium, rhodium and ruthenium. Currently, Australia does not produce these minerals, despite having known reserves and the potential for globally significant future production.¹ These minerals have a critical application in the production of polymer electrolyte membrane (PEM) electrolyzers. While the technology currently experiences higher capital costs than alternatives such as alkaline electrolyzers (AE), PEM electrolyzers operate with greater flexibility, which is better suited to a variable renewable energy supply. PEM electrolyzers are expected to become the dominant technology used to produce green hydrogen over the next decade. The AHC have projected the global hydrogen export market could reach 660MT in 2050. Producing this quantity of hydrogen would require roughly 6.6TW of electrolyser capacity; there is currently 1.4GW of installed capacity globally. This presents a substantial market opportunity.

Regarding minerals processing generally, most Australian ores are currently exported for processing overseas. The emissions embodied in these ores exceed 1 billion tonnes for CO₂-e per annum. This represents many times Australia's current emissions. Onshoring the processing of minerals using green hydrogen as a reductive agent, and cheap renewable energy for heat.

¹ Sandiford, M. (2022). The Net-Zero Opportunity for Australian Minerals. In R. Garnaut (ed.), *The Superpower Transformation* (pp.149-169). La Trobe University Press.

Australia has some of the cheapest renewable energy resources in the world. Australia has a significant opportunity to substantially reduce the scope 3 emissions of the mining sector by onshoring minerals processing, while developing a domestic industry in green minerals.

The United States *Inflation Reduction Act* (IRA) also presents a key opportunity for Australian critical minerals. The IRA offers generous tax credits for companies that use minerals extracted, processed or recycled from countries with which the US has a free trade agreement. Electric vehicle (EV) manufacturers can receive a tax credit up to US\$3,750 per vehicle. When compared with an internal combustion engine vehicle, battery EVs contain five times as many critical minerals. China currently holds 78% of manufacturing capacity for EV batteries, and refines 68% of the world's nickel, 40% of copper, 59% of lithium, and 73% of its cobalt. Chinese products are not eligible for a tax credit under the IRA. With the battery value chain forecast to increase tenfold to 2030, Australia is in a strong position to capture a greater share of the downstream mineral processing market.

Building reliable, competitive, and diverse supply chains

12. Is there more the Australian Government can do to facilitate business-to-business engagement and drive supply chains diversification?

To drive supply chain diversification, the Government could implement achievable componentry targets for locally manufactured content. This would create domestic demand for products manufactured onshore in relevant supply chain niches. It would also enable local providers to engage with international companies who have established relationships with preferred suppliers in offshore jurisdictions.

Key to the success of this approach, is that any target be readily achievable based on projected demand and existing local capacity. Targets could increase over time, and a clear pipeline of future projects would afford local businesses confidence in future demand growth while affording time needed to expand capacity. A clear demand pipeline also manages project costs and reduces unnecessary competition for limited manufacturing capacity. Achieving targets could be incentivised by financial subsidies directly reducing the cost of local products, or indirectly in the form of taxation relief.

13. How can Government and business work together to ensure private sector insights on the context and complexity of current supply chains and markets can inform policy design?

The Government should establish a standing advisory panel on critical minerals markets, including the clean energy supply chain and opportunities for critical minerals projects to support renewable technologies. The panel could commission research to identify key informational barriers and data gaps affecting markets for specific minerals, particularly small-scale critical minerals markets

dominated by a limited number of producers. Once identified, the panel would be responsible for uplifting this information through regular reporting, assisting industry and Governments to inform effective policy and correct market failures. This could include supply chain mapping by region, as well as the identification of niches within the industry best suited for onshoring and expansion. This process could also inform the identification of suitable locations and opportunities to implement industry clusters through the co-location of interdependent businesses across the supply chain, including development, extraction, processing, transportation, and manufacturing. Industry clusters de-risk investment decisions by accelerating the developing of localised markets and reduce capital, operation and transportation expenses through shared infrastructure assets. This approach has been a key enabler for the emerging hydrogen industry.

Central to the success of such an advisory panel is ensuring that the individuals on the panel genuinely represent the state of industry knowledge and capabilities.

Supporting clean energy technologies

14. What are the opportunities for critical minerals projects to maximise their ability to support clean energy supply chains and technologies?

As previously discussed, a standing advisory panel could assist critical minerals projects by identifying opportunities for integration with clean energy supply chains and technologies. Increased access to information, as well as co-location of interdependent businesses across the supply chain in industry clusters would support greater integration, lowering costs and increasing the competitiveness of domestically processed and manufactured products.

15. How could the Australian Government help industry address capability barriers to supporting clean energy supply chains for critical minerals projects?

A significant barrier to domestic investment in clean energy supply chain capability is surety of future demand. In the absence of a future project pipeline and a strategy to increase local componentry requirements over time, local manufacturers are unwilling to increase local capacity. This barrier is best overcome through the implementation of a Federal Transition Authority to provide national leadership and shape an Australian decarbonisation strategy. Certainty of demand would also provide investors with confidence of return, lowering the cost of capital within the sector. A nationally coordinated approach would also assist in aggregating demand and creating economies of scale, further reducing capital costs.

There are also major training capacity shortfalls in Australian universities.² Geophysics, metallurgy and mining engineering departments have experienced weak domestic enrolments and have had funding slashed in the face of declining international enrolments throughout the COVID pandemic. Downsizing has occurred in geoscience departments at The University of Melbourne, Macquarie University, Newcastle University, and the Australian National University. Finally, the Australian Research Council allocates an order of magnitude more funding to cosmology than geophysics. Lack of training capacity risks labour shortfalls, increasing project costs.

In the absence of domestic capacity, permanent skilled migration may be required to meet project demands. The Federal Government has a role to play in increasing geoscience funding at universities, while enabling skilled migration visa sponsorships for the mining industry to address capacity gaps in short- to medium-terms. Visas issued by the industry rather than an employer would encourage movement within the sector, leading to better employee outcomes.

Supporting sustainable critical minerals development

17. What more can Australia do to ensure we are the international best practise jurisdiction for ESG?

As previously noted, there is a need for government financial support for new models of work that embed ESG and social license in industry practices. Critical minerals currently have no public funding support mechanisms, which inhibits the development of critical minerals projects with embedded ESG objectives in capital-intensive, pre-revenue phases of development. Addressing this through additional funding opportunities would unlock private investment and support new businesses willing to test the viability of innovative, sustainable modes of operation. Prioritising ESG and social license has the potential to increase profitability by minimising project delays and ensuring that projects, governments and the communities in which they operate agree on project parameters. This includes the need for a whole-of-lifecycle approach to planning, including for the eventual decommissioning and rehabilitation of the land on which a mine is sited. As indicated above, this planning should occur with the meaningful involvement of any affected First Peoples in decision-making to ensure extraction occurs with free, prior, and informed consent. Best practice rehabilitation involves independent costing, with periodic re-evaluation to ensure funding demands are known throughout the lifecycle of a project and are responsive to the most recent science. Rehabilitation funding should be set aside throughout the life of a project to ensure it remains available in the event of unplanned closure or organisational failure.

² Sandiford, M. (2022). The Net-Zero Opportunity for Australian Minerals. In R. Garnaut (ed.), *The Superpower Transformation* (pp.149-169). La Trobe University Press.

As mentioned previously, preferential procurement for local contractors and Aboriginal businesses affords greater flexibility and quality control, and can lead to more ethical supply chains. This minimises the modern slavery risks endemic in complex, opaque projects, which are experienced throughout many global mining supply chains. The Clean Energy Council's recent report [Addressing Modern Slavery in the Clean Energy Sector](#) identified the extraction of raw materials and downstream manufacture of components as key points of exposure for the industry. This occurs across renewable generation technologies including solar, wind and battery storage. Onshoring processing and manufacturing would play an important role in eliminating modern slavery from these sectors in the clean energy transition. This could be enhanced with initiatives promoting supply chain transparency and celebrating best practice.

21. What are the opportunities for Australia in increasing recycling and circular economy practices in the critical minerals sector?

As is touched on in the Discussion Paper, over the next decade and beyond, there is going to be a significant influx in waste flowing from renewable energy infrastructure reaching end-of-life. Product stewardship of renewable energy infrastructure and products is imperative for the nation's transition to net zero emissions and for Australia's critical minerals resources and industries for a number of reasons.

A key reason is that it is vital for the development of circular economy within Australia. Developing a fully functional product stewardship scheme in Australia will ensure the retainment of the critical minerals found in renewable energy infrastructure. Leakage of critical minerals occurs through sending solar PV systems, wind turbines and other renewable energy infrastructure deemed "waste" to other nations to dispose of them. This "waste" material can then be harvested for its critical minerals and reused or repurposed, ultimately entering another nation's economy. This represents a significant opportunity lost by Australia which should and can rely on critical minerals that already exist within the economy.

Reliance on raw materials to produce renewable energy infrastructure and other commodities is not sustainable. As such, the product stewardship of renewable energy infrastructure is a vital element of developing a circular economy in Australia and retaining these critical minerals domestically. Not only is product stewardship essential to the economic benefit of Australia, but it also prevents these materials from entering landfill. Renewable energy infrastructure, such as solar PV panels, wind turbines, electronic material such as inverters and batteries, etc., entering landfill in and of itself should be avoided, but it also has the potential to become hazardous waste that can leach in the soil and groundwater leading to numerous health and environmental concerns.

As such, the product stewardship of renewable energy infrastructure needs to be realised within the shores of Australia to best place Australia in this next leg of the transition to net zero.

Currently, the Department of Climate Change, Energy, the Environment and Water (DCCEEW) is consulting with the CEC and other key stakeholders to develop a regulatory product stewardship scheme for solar PV systems and household electrical and electronic products. The potential overlap of this scheme with other federal schemes to manage the product stewardship of renewable energy infrastructure. As such, the CEC encourages state and federal governments to consolidate a nation-wide management of product stewardship of such products. We also encourage research funding to Australian universities exploring the options for re-use of critical minerals.

We thank the Government for taking on the development of this new strategy, and hope its work catalyses an important conversation about the important role Australian critical minerals will play in the emerging green global economy, as well as the opportunities for workforce development and empowerment of local Indigenous populations.

Yours sincerely,



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