Australia's Critical Minerals Strategy

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Submission to the "Australia's Critical Minerals Strategy" Discussion Paper[*]

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Introduction

We thank the Department of Industry, Science and Resources (DISR) for the opportunity to contribute to the development of a national critical minerals strategy. We agree with the DISR that Australia has a narrow window of opportunity to capitalize on the very high demand and prices of critical minerals in order to become the world leader in clean energy production. While the *Discussion Paper* touches on several issues relevant to developing a critical minerals sector in Australia, our submission focuses on achieving a level of investment and output in the sector, consistent with global decarbonization and global net zero by 2050. Specifically, we proffer a tax reform proposal in the form of a Decarbonization Corporate Bond that, we believe, would mitigate, or eliminate, most of the factors inhibiting investment in critical minerals.

As outlined in the *Discussion Paper*, putting in place incentives to attract investment, and increase production, of critical minerals can potentially deliver on several key goals:

- Promote sustainability and support clean energy technologies.
- Create economic opportunities for all Australians, particularly for regional communities and First Nations Peoples.
- Creating value chains and employment.
- Develop new midstream and downstream capabilities.
- Ensure security of supply and stable market conditions.

Growing global commitment to developing clean energy technologies requires an unprecedented amount of critical minerals to be produced, in order to facilitate the transition to clean energy by 2050. According to the World Bank, "*More than 3 billion tonnes of minerals and metals will be needed to achieve global decarbonization targets*." Table 1 shows the relative importance of key critical minerals in developing clean energy technologies.

Table 1: Relative importance of critical minerals in clean energy technologies

CET/ Mineral	EVs and batteries	Electric network	Solar	Wind	Hydro	Bio-energy	Geo-thermal
Bauxite	●	●	●	◍	◍	◍	○
Cobalt	●	○	○	○	○	○	○
Copper	●	●	●	●	◍	●	○
Lithium	●	○	○	○	○	○	○
Nickel	●	○	○	◍	○	○	●
Zinc	○	○	○	●	◍	◍	○

Source: International Energy Agency (2022). Notes: CET is clean energy technology. Shading indicates the relative importance of minerals for a particular clean energy technology (black=high; grey = moderate; white = low).

Table 2 illustrates that Australia has some of the world's largest proven reserves of most of these critical minerals and that is already among the largest producers of critical minerals needed for developing several clean energy technologies.

Table 2: Australia's critical minerals

Critical mineral	Geological potential	Reserve ranking	Production ranking
Lithium	High	2nd in the world	World's largest producer
Rare earths	High	6th in the world	4th largest producer
Cobalt	High	2nd in the world	3rd largest producer
Graphite	Moderate	8th in the world	-
Manganese	High	4th in the world	3rd largest producer
Bauxite (alumina oxide)	Moderate	2nd in the world	World's largest producer
Silica	High	-	-
Nickel	High	5th in the world	-
Vanadium	High	2nd in the world	-

Source: Department of Industry, Science and Resources (2022).

An historical opportunity exists to realize sustainable economic growth in Australia

Australia's reserves of critical minerals represent an unprecedented opportunity to generate sustainable economic growth, while making a significant difference in realizing net zero emissions by 2050. Our estimates suggest that Australia has the potential to increase the value of critical minerals production to more than $US460 billion ($A670 billion) by 2050. Australia has the potential to realize its full potential to add value to its proven reserves by investing in clean energy supply chains that make it a global leader not only in critical mineral production, but in developing clean energy technologies. As just one example, Australia is the world's largest producer of lithium and bauxite and the third-largest producer of cobalt (see Table 2). These are three of the critical minerals of high importance to developing batteries and electric vehicles (see Table 1). Accenture (2021) suggests that if Australia could take advantage of its dominant position in the production of these critical minerals to develop a battery industry, it would create more than 34,700 jobs by 2030. Creating value chains on the back of critical minerals represents an excellent opportunity to develop our mining sector and support development in regional Australia, increasing opportunities for regional and First Nations communities through employment.

In 2020, the International Energy Association (IEA) estimated that "*The scale and speed of the global energy transition means we can't approach financing critical minerals projects and related infrastructure the way it's previously been done - different approaches are needed*".

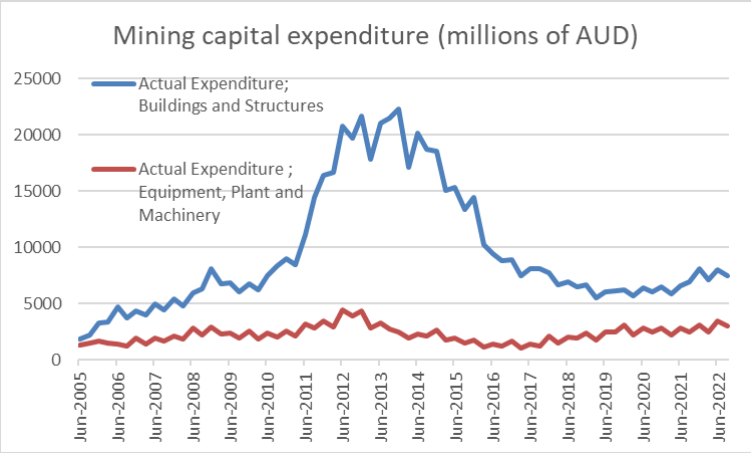
Three years later, the central problem facing the sector is that there is insufficient investment in critical minerals in Australia and globally to facilitate the transition to clean energy by 2050.

Why is investment in critical minerals in Australia lacking?

Figure 1 shows investment in Australia's mining sector for buildings and structures (blue line) and equipment, plant and machinery (red line). The large increase in investment between 2011 and 2016 reflects the mining boom, driven primarily by gas exploration averaging around A$67.5 billion per year. In the years that followed, the level of investment moderated significantly and

was A$30.6 billion in 2022. We estimate that for Australia to have a production level consistent with global decarbonization targets by 2050, it will need an additional USD340 (A$478) billion in investment over the next decade in *just* critical minerals. There is a considerable lag between investment and production. According to the International Energy Agency, it can take as much as 12 years between exploration and production for some critical minerals.

Figure 1: Capital expenditure in the mining sector 2005Q1-2022Q3



Source: Australian Bureau of Statistics (September 2022), Private New Capital Expenditure and Expected Expenditure, Australia, ABS Website, accessed 27 January 2023.

We identify the following key reasons for slowing investment in critical minerals:

1. High taxes: Corporate taxes in Australia are one of the highest in the OECD (30% compared to the OECD average of 23%). Royalties also constitute an important deterrent for mining investment. Constable (2022) estimates that the effective tax rate (including corporate taxes and royalties) for the mining sector was around 51% in 2021. In a very comprehensive study, Otto et al (2006) show that high taxes (including royalties) reduce mining investment. Since that study was published in 2006, the real effective tax rate for the mining sector in Australia has increased from 36% to 51%. Investment in mining exploration is risky by nature as mineral prices are volatile and require between 8-12 years from exploration to extraction, according to the IEA.

2. Tight global financial credit conditions: Global inflation was 8.8 per cent in 2022, which is its highest level since 1980. As a consequence, central banks have significantly tightened monetary policy, reducing credit availability and investment (see, for example, the World Economic Outlook, October 2022 (IMF)). Global monetary tightening is expected to continue, resulting in a higher cost of capital for all sectors, including critical minerals.

3. Global decarbonization uncertainty: Achieving decarbonization requires collaboration and coordination policies worldwide, which has proved difficult in a complex geopolitical environment. According to the IEA world energy outlook 2022, *"The world has not been investing enough in energy in recent years, a fact that left the energy system much more vulnerable to the sort of shocks seen in 2022. A smooth and secure energy transition will require a major uptick in clean energy investment flows. Getting on track for the [Net Zero Emissions] NZE Scenario will require a tripling in spending on clean energy and infrastructure to 2030*"

4. Government uncertainty: Although the Commonwealth and state governments have publicly stated that they are committed to global decarbonization targets, it is not clear how this will be done and if present and future governments will support the critical mineral sectors in the future. Uncertainty about commitment is compounded by rising energy prices and the electoral risk that this poses. This creates uncertainty for investors in a sector that requires long-term investment.

5. Competition: The need for urgency in developing the Australian critical mineral sector is reflected in the fact that the United States, the United Kingdom, Canada, and the European Union, among others, have recently provided incentives for critical mineral exploration and production. For example, Canada introduced a 15% mining exploration tax credit for corporate income tax in 2019. Investment by these countries in critical minerals can potentially undermine Australia's first mover advantage, despite its large reserves of critical minerals.

How can Australia increase investment in critical minerals?

In Smyth and Vespignani (2022), we propose introducing a Decarbonization Tax Discount (DTD) for critical minerals exploration and production. This discount should be consistent with a level of investment/production target to be established via consensus between the government and industry, and then working back to ascertain the optimal percentage for the DTD consistent with the pre-set target. Below we show the form that a DTD can take to stimulate investment.

Proposition: Decarbonization Corporate Bond for the Critical Mineral Sector:

A possible way to attract an unprecedented amount of investment in Australia is to develop a "Decarbonization Corporate Bond for the Critical Mineral Sector", consisting of a program in which the interest rate paid by the bond issuer can be fully discounted from future royalties and/or income taxes. This schedule has the following potential upsides for addressing the constraints on investment in the critical minerals sector:

- It would accelerate the decarbonization process via critical minerals production; hence, reducing the cost of clean energy.

It would also address the reasons for insufficient investment in critical minerals we identify above:

- It would reduce high taxes on investment in critical minerals (reason 1).
- It would reduce the cost of capital in a tight credit environment to zero (reason 2).
- It would mitigate global decarbonization uncertainty (reason 3) and government uncertainty (reason 4) as the government commits to long-term support for the infant industry.
- It would increase the competitiveness of critical minerals in Australia (reason 5).

More details of this proposal can be provided upon request and further investigation

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