

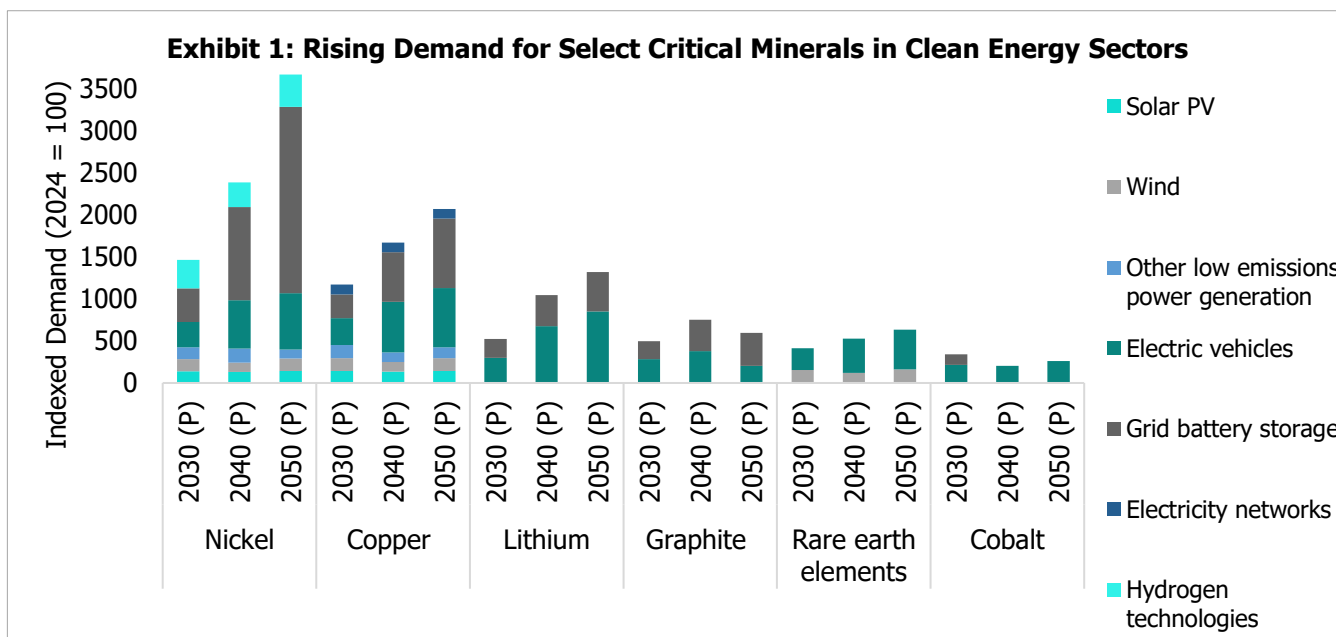
Investments in Refining: Key to Harnessing Australia's Critical Minerals Edge

October 03, 2025 | Sovereign

As the world moves toward a low-carbon future, the growth of clean energy technologies is changing global demand for minerals and the way countries view their resource strengths. Lithium, nickel, copper, cobalt, graphite and rare earth elements stand out as key energy transition minerals, central to electric vehicles, battery storage, renewable energy systems and electricity networks. These minerals, part of a broader group known as critical minerals, are already included in Australia's exports, contributing to the long-established share of iron ore and coal in the country's export mix. With large reserves, Australia is well-positioned to play a key role in the future supply chain of these minerals. However, capturing this potential fully will depend on adding value to the resource wealth through refining and processing, which would support more diverse and higher-value exports. Achieving this will require substantial investment, and Australia's strong institutions and policies could enhance its ability to attract capital.

Energy Transition Minerals in Focus

Traditionally, energy supply depended on fuels like coal and oil, which required relatively few additional minerals beyond the fuel itself. Recently, the transition towards cleaner energy is changing this balance. This has led to the growing relevance of critical minerals. Critical minerals are a group of mineral resources that are essential inputs for modern technologies and are vital for economic development and national security. However, these minerals face potential supply risks- due to limited production sources or geopolitical concentration. Building electric vehicles, battery storage, wind power, and modern electricity networks needs far more diverse mineral inputs, each with unique properties that make these technologies work. As countries build electric vehicle fleets, upgrade electricity networks, and invest in renewable energy, demand for minerals such as lithium, nickel, copper, cobalt, graphite, and rare earth elements is expected to rise sharply.



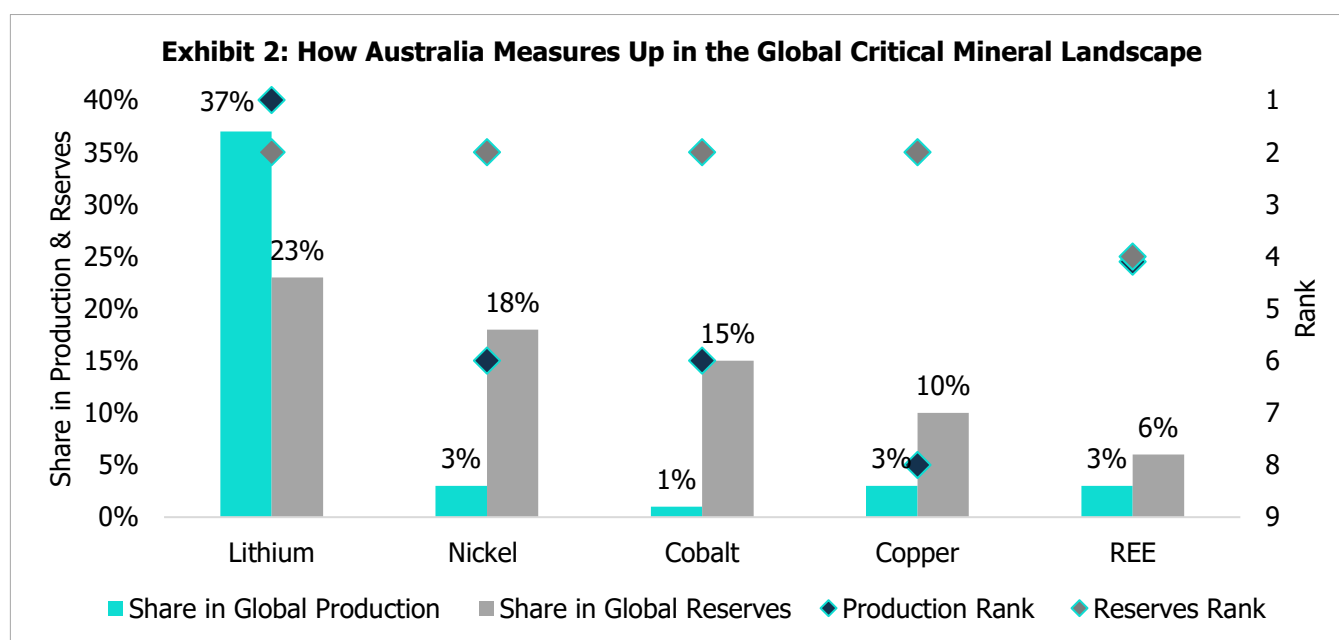
Source: International Energy Agency (Global Critical Minerals Outlook 2025)

The International Energy Agency (IEA) projects that the mineral demand from clean energy use alone will grow from about 12 million tonnes in 2024 to over 27 million tonnes by 2050 under its stated policies scenario. The most rapid growth is expected between 2024 and 2030, particularly for lithium and graphite, with projected compound annual growth rates (CAGRs) of 19.3% and 18.2% respectively. This reflects both the scale and pace of the ongoing energy transition. As demand patterns evolve and the global race for critical minerals intensifies, the spotlight is turning to supply security. With production concentrated in only a few countries, the push to diversify sources has gained urgency. This is where Australia is expected to stand out, with its rich and extensive mineral base.

Australia in the Critical Minerals Landscape

Australia holds substantial reserves of key energy transition minerals, positioning it as a central player in the future supply chains for clean energy technologies. It is the world's largest producer of lithium and a significant supplier, accounting for 37% of global lithium production, and holds 23% known reserves. It also ranks second globally in reserves of nickel, cobalt, lithium, and copper. In rare earth elements, Australia ranks as the fourth largest globally in both production and reserves.

However, despite holding a high share of reserves, its share of current production for some of these minerals remains modest (Exhibit 2), with 3% of global output for both copper and nickel, and just 1% for cobalt. This gap between production and reserves for most minerals (except Lithium) suggests untapped reserves that could support a broader role in future supply chains.



Source: U.S. Geological Survey (USGS) Mineral Commodity Summaries

Building Refining Capacity to Capture More Value is Key

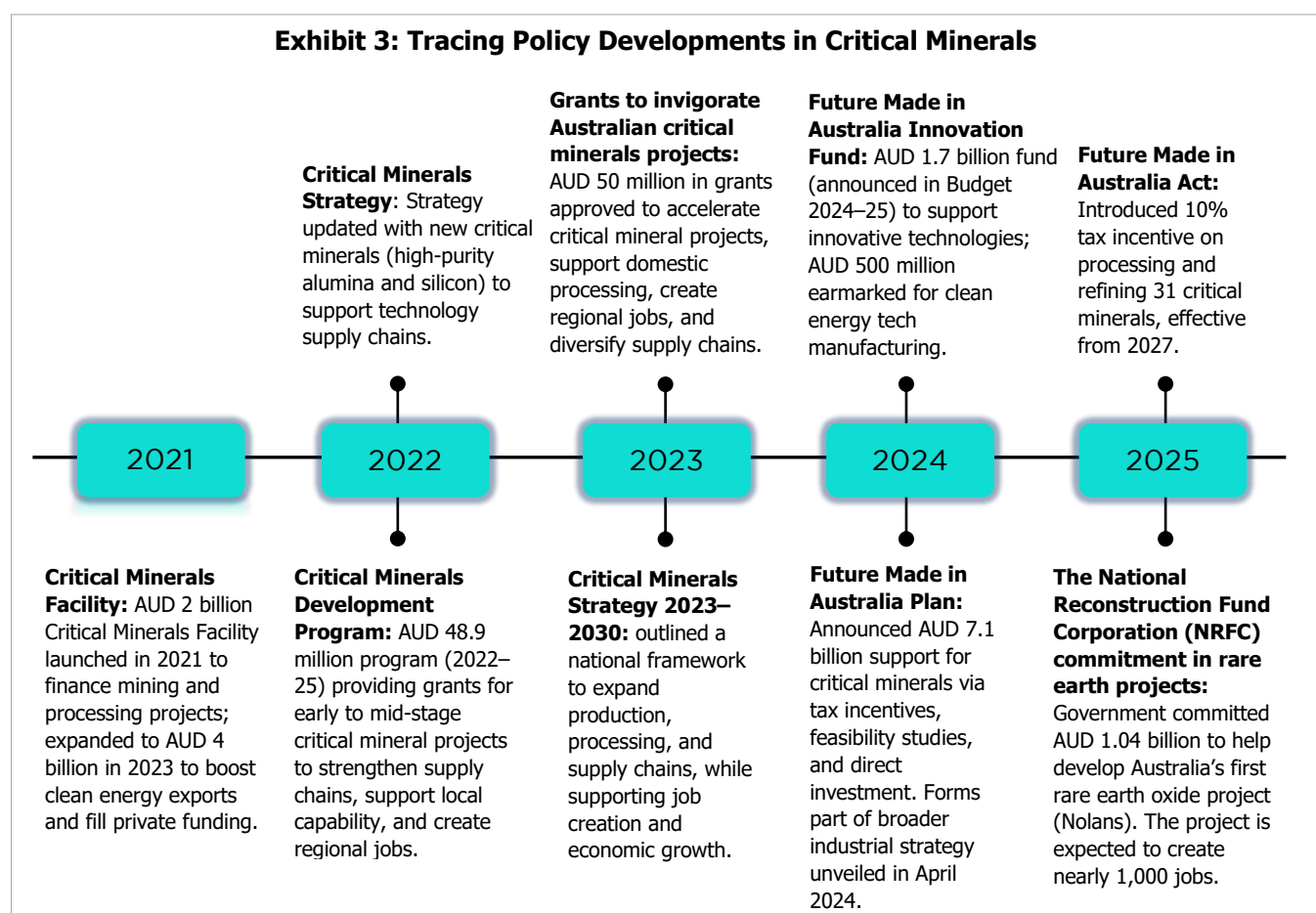
While Australia's critical mineral reserves and extraction capabilities are strong, the next stage in the value chain —i.e., refining— remains limited. According to the International Energy Agency (2025), the market value of Australia's production of key energy minerals in 2024 stood at approximately USD 15 billion from mining, while refining stood at only USD 4 billion. In comparison, China's refining value alone stood at around USD 106 billion, underscoring Australia's limited role in higher-value processing. Even with announced projects, refining value is

expected to increase to just USD 5 billion by 2040, while mining could grow to USD 23 billion. This gap restricts how much value the country captures from its mineral wealth, especially as refining transforms mined minerals into higher-value products used in batteries and clean energy systems.

Steps have been taken to strengthen Australia's refining base. The first rare earth refinery opened in 2024, with further projects underway at Eneabba and in the Northern Territory, supported by significant government funding. Lithium refining is also expanding, with three major facilities expected to boost output nearly fivefold by 2030. These developments show progress in moving up the value chain. Nonetheless, on the global scale, the refining sector remains highly concentrated, with China maintaining a dominant position across key minerals. As countries globally seek to diversify their supply chains, rising demand for critical minerals presents an opportunity for Australia, though capturing it will depend on its ability to scale refining capacity and expand its role in global supply chains.

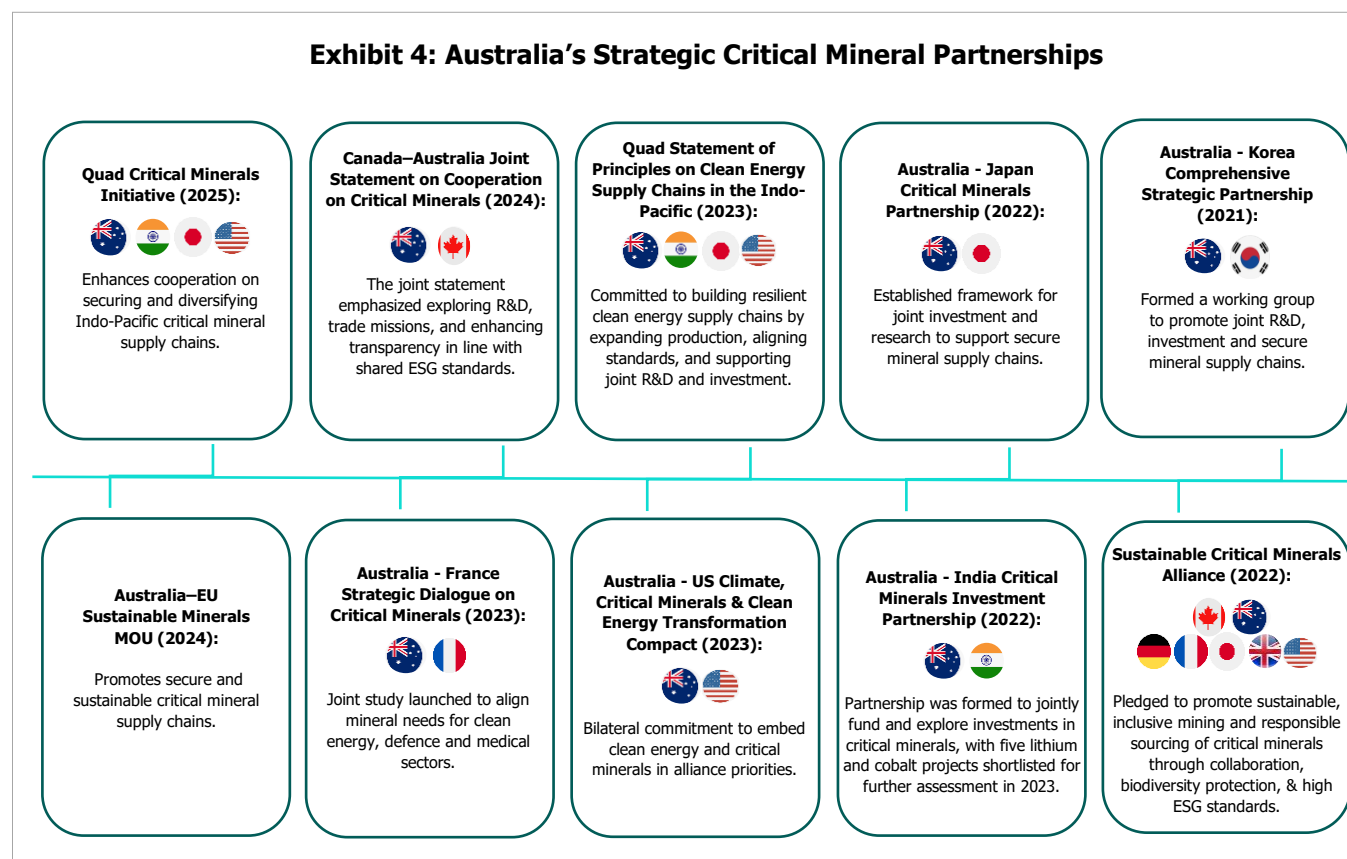
Policy Developments and Strategic Engagements

Australia has taken steps to advance along the critical minerals value chain is supported by targeted policies and strategic international partnerships. These measures aim to attract investment, secure export markets, and support domestic processing. The timeline chart shown below (Exhibit 3) captures major policies introduced since 2021. These include large-scale financing programs, tax incentives, and long-term strategic frameworks designed to support supply chain development and resilience.



Source: International Energy Agency (IEA)

In parallel, Australia has expanded its network of strategic international collaborations and investment-focused partnerships, signalling a positive trajectory in the sector. The timeline of international engagements (Exhibit 4) illustrates this evolution. It includes memorandums of understanding, joint studies, and structured dialogues on supply chain resilience, reflecting alignment between domestic policy and global demand for secure and sustainable critical minerals.



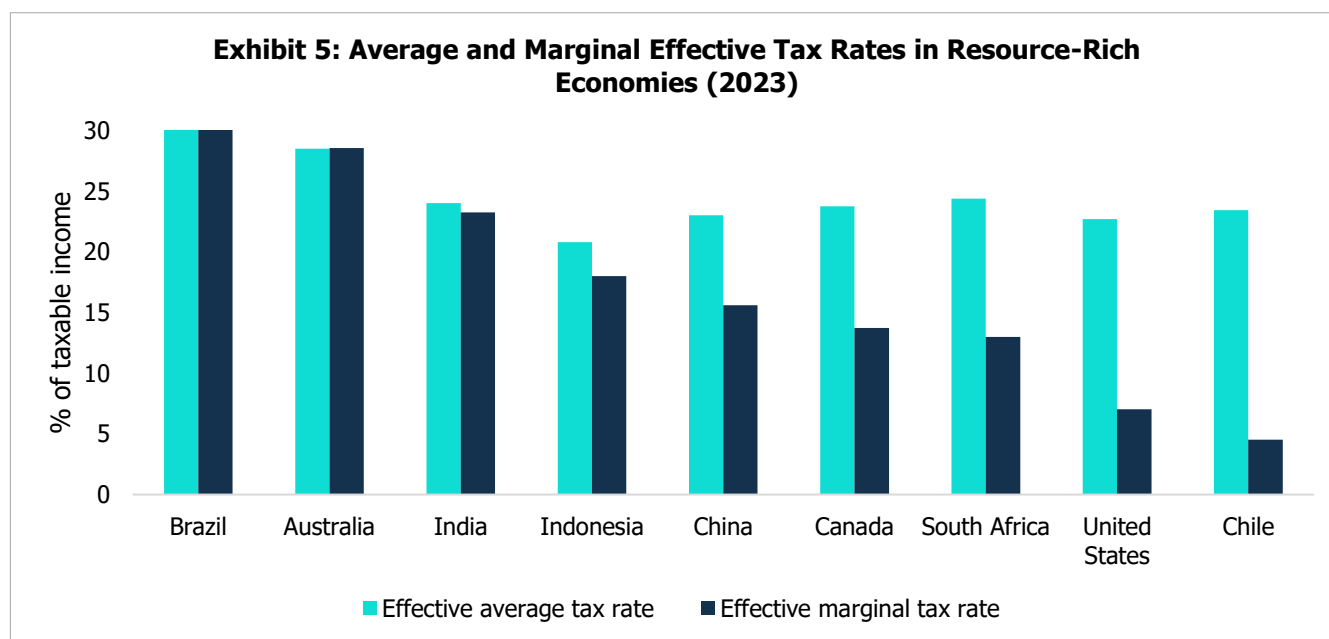
Source: International Energy Agency (IEA)

Challenges in Scaling Australia's Critical Minerals Sector

While the government has taken steps to strengthen international engagement and investment, the central priority remains expanding Australia's refining and processing capacity, which is essential to fully realize the economic potential of its critical minerals. Achieving this requires substantial investment. Australia's substantial resource endowments, combined with reliable governance and policy stability, could support the attraction of such investment, as these factors provide predictability for long-term projects. Securing such investment, however, is subject to a range of challenges.

Mining projects in Australia face higher construction, energy, and operational costs compared to those in many other resource-rich countries. Competing jurisdictions in South America, Africa, Southeast Asia, India, and the Middle East often offer higher-grade deposits and lower costs. For example, the Minerals Council of Australia's 2023 report notes that building a lithium hydroxide processing plant in Australia can cost 25–50% more than in South America and up to twice as much as in China. These cost pressures could affect the feasibility of investing in large-scale refining and value-added processing.

Beyond costs, tax competitiveness is a key factor for investment decisions. Having stable and globally competitive tax rates is critical for encouraging companies to invest, particularly in sectors with large upfront capital and long development timelines, such as mining. In 2023, Australia's effective average tax rate (EATR) was 28.5%, ranking 10th out of 91 countries, while its effective marginal tax rate (EMTR) stood at 28.6%, placing 13th globally. These comparatively high rates reduce Australia's competitiveness among resource-rich economies (Exhibit 5) and could influence investment in refining and processing projects.

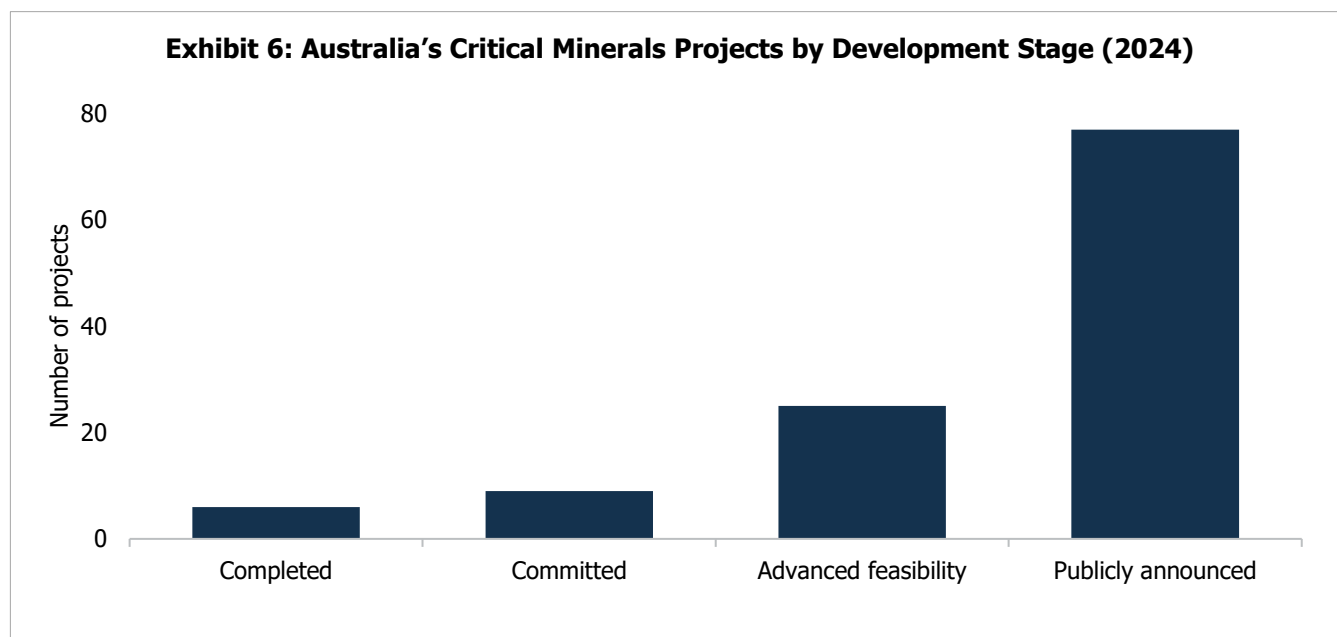


Source: OECD, Corporate Tax Statistics 2024

Note: The Effective Average Tax Rate (EATR) measures the average tax burden on a project earning above-zero economic profits. It reflects the proportion of a project's pre-tax return that is absorbed by taxes. Effective Marginal Tax Rate (EMTR) indicates the proportion of each additional dollar of profit from a marginal investment project that is paid in taxes. It captures the impact of taxation on the cost of capital for a project that just breaks even economically.

Regulatory complexity poses another challenge to scaling Australia's critical minerals sector. While Australian mining is recognised for its innovation and technological expertise, investment decisions are increasingly influenced by project delays and uncertainty from duplicative or overly complex regulatory processes. The Minerals Council of Australia's 2023 report highlights that, on average, developing a mine from exploration to first production takes around 16 years globally. High regulatory and compliance costs, including complex approval processes, can undermine project feasibility or delay proposed investments.

Further, Australia's critical minerals sector currently comprises 117 major projects; however, two-thirds remain in the early stages (publicly announced), with only 21% having advanced to feasibility studies and 8% having been committed (Exhibit 6). Only six projects reached completion over the past 12 months, worth ~AUD 3.8 billion, including lithium mines and rare earth processing facilities. This distribution highlights a central challenge: scaling Australia's refining and processing capacity to move further up the value chain and compete with global leaders, such as China, thereby ensuring the country captures a larger share of the economic benefits from its mineral resources.



Source: DISR, Resources and Energy Major Projects 2024 Report

Conclusion

Australia's critical minerals sector holds significant strategic potential, supported by abundant reserves, stable governance, and a robust institutional framework. Fully realizing this potential requires moving beyond extraction to expand refining and processing capacity, which depends on substantial investment.

While policy initiatives and international partnerships demonstrate a clear commitment to developing the sector, cost pressures, tax competitiveness and regulatory complexity present tangible challenges. Addressing these hurdles will be essential for Australia to strengthen its position in global critical minerals value chains, increase the share of higher-value exports, and fully capture the economic benefits of its mineral wealth. If realized, this could broaden Australia's export base, create additional local employment through downstream activities, and reinforce the country's role in future critical mineral supply chains.

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