

MACKAY AND THE GREATER WHITSUNDAY

Establishing a Critical Minerals
Processing and Services Hub



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EXECUTIVE SUMMARY

Australia and its allies have committed to accelerate the development of skills, infrastructure and capability to harness and exploit Australia's natural endowment in critical minerals.¹

In response to the opportunities presented by these new commitments, this roadmap sets out practical steps required to position Mackay and the Greater Whitsunday region as a leading global Critical Minerals Processing and Services Hub.

The roadmap builds on the region's strengths in mining equipment, technology and services (METS) and its long history in resources extraction and processing. The roadmap leverages new regional initiatives such as the Flexi-Lab and Future Industries Hub, the Isaac Resources Excellence Precinct and the proposed Australian Centre for Critical Minerals Intelligence project.

As the home of the Bowen Basin's vast coal reserves and the southern hemisphere's highest density of METS firms, GW3 analysis has calculated that the region generates \$49.7 billion in mining and METS output (62% of gross regional product (GRP)) and employs 18,884 workers (19% of the local workforce).²

The roadmap outlines steps to apply existing regional METS capabilities which have been built around the coal industry to critical minerals processing and services to help lead Australia's efforts to develop the critical minerals sector, provide greater economic resilience, leverage existing METS skills and capabilities, and drive regional and national productivity.

Regional Strengths

These include:

- Infrastructure: Flexi-Lab (the Resource Centre of Excellence (RCOE), Future Industries Hub in Mackay) pilot projects producing cobalt, nickel, vanadium, and rare earth elements from waste; and the Isaac Resources Excellence Precinct (IREP, Moranbah) which will drive research and development.
- Prospective Australian Centre for Critical Minerals Intelligence (ACCMI): building on RCOE's existing research partnership with University of Queensland Sustainable Minerals Institute (SMI), Central Queensland University, James Cook University and others to anchor research and development at Flexi-Lab.
- METS ecosystem: Paget precinct's world-leading fabrication/services exports to the North West Minerals Province (gold, copper, lead, zinc); the Greater Whitsunday METS Revenue Diversification Strategy targets \$500M revenue in critical minerals/circular economy.
- Logistics: Four ports (Port of Mackay, Abbott Point, Hay Point, Dalrymple Bay) ensure flexible exports; Bruce Highway/air links/rail network connect to global markets.
- Policy Alignment: Builds out the Queensland Critical Mineral Zones (secondary processing), US–Australia Framework (October 2025, \$8.5B pipeline), and the Productivity Commission's five pillars agenda (dynamic economy via hubs, skilled workforce via IREP, net zero via tailings).

Productivity gains

Importantly, the roadmap aligns with the Federal Government's productivity agenda by focusing on actions that improve efficiency, attract investment and create skilled jobs. These include:

- Faster approvals and streamlined regulation to reduce delays and lower costs for critical minerals projects.
- Energy and emissions efficiency measures that support cost-effective decarbonisation and long-term competitiveness.

¹ Most recently, in January 2026 the Australian Government announced further detail around the Critical Minerals Strategic Reserve, including particularising prioritised minerals as well as allocated funding from the Critical Minerals Facility. The Australian Government announced further commitment to collaboration with international partners to diversify critical minerals supply chains, including with the United States, Japan, Republic of Korea, Europe, Canada and the UK.

² <https://greaterwhitsundayalliance.com.au/industry/mining/>

- Workforce development initiatives to build adaptable skills through partnerships, training programmes and recognition of prior learning.
- Investment facilitation and innovation to encourage private sector participation and strengthen Australia's sovereign capability.
- Climate resilience planning to ensure infrastructure and communities are prepared for future risks.

By embedding these priorities as set out by the Productivity Commission, the roadmap contributes to national goals for productivity, sustainability and economic resilience.

Economic Dividend

Establishing Mackay and the Greater Whitsunday region as a Critical Minerals Processing and Services Hub will support regional economic growth and diversification. Alignment with productivity ambitions will underpin infrastructure prioritisation (e.g., rail spurs, grid upgrades). Retaining the skilled METS and mining workforce in the region will help diversify the economy, create new skilled roles, boost incomes and foster population stability in the region.

The Roadmap Summary

The roadmap identifies 18 action items across four themes with a 12-month delivery timetable.

- **Expand partnerships:** Formalise ACCMI MOU and advocate to the Export Finance Agency; convene North Queensland corridor with Townsville; host national hubs conference; form critical minerals working group with regional industry groups such as the Resource Industry Network.
- **Influence local actions:** Implement METS diversification gaps (skills, partnerships; streamline zoning for pilots; private public partnerships (PPPs) for METS promotion.)
- **Facilitate investment:** Prospectus for Queensland/Australian agencies; virtual tours/marketing videos; success stories from Flexi-Lab graduates.
- **Build profile:** Market the roadmap, the region and the specific institutions and facilities nationally and internationally.

Policy Alignment

The roadmap has been designed to align with key federal and state policy agendas, in particular the state and federal critical minerals strategies and priorities as well as the federal productivity growth agenda.

1. Introduction

This report presents a comprehensive, actionable policy roadmap for establishing Mackay and the Greater Whitsunday region as a Critical Minerals Processing and Services Hub. The analysis draws on recent Greater Whitsunday Alliance (GW3) strategic, technical, and diagnostic analysis and responds directly to contemporary policy statements, including global supply chain security, Australia's evolving critical minerals strategy, and ambitions for collaboration with international partners to boost Australia's supply of critical minerals.

The impetus for this policy roadmap arises from awareness of local capability, national need and international opportunity. Mackay and the Greater Whitsunday region have a world-class capability in providing mining equipment, technology and services (METS) capabilities, extending well beyond coal mining. Over decades, this has fostered a deep, technically sophisticated workforce and a mature ecosystem of METS businesses that deliver advanced, export-ready solutions. Together, these capabilities form a highly transferable skill base that supports a wide range of diversification opportunities. Recent and forecast shifts in global demand for METS are accelerating as global energy systems decarbonise. Accordingly, this policy roadmap aims to leverage these strengths to establish Mackay and the Greater Whitsundays as a leading global Critical Minerals Processing and Services Hub.

1.1. The Greater Whitsunday region

The Greater Whitsunday region of North Queensland comprises the three local government areas of Mackay, Isaac and Whitsunday. The region has a total land area of approximately 90,000 km², and an estimated resident population of 192,302 persons.³ The region is well connected to major trading centres via the Bruce Highway running from Mackay to Townsville, and hosts four major airports with weekly flights to Brisbane, Sydney and Melbourne.

Mining is the key industry, as the region includes the roughly 6,000 km² Bowen Basin, containing the largest coal reserves in Australia, and most of Queensland's operational coal mines. The mining and METS industry sector makes the greatest contribution to economic output in the Greater Whitsundays region, which GW3 estimates at \$49.7 billion, accounting for 62.29% of total output.⁴ The mining and METS industry sector is also the largest employer with 18,884 jobs which represents 19.35% of total employment within the region.⁵ Health care and social assistance and tourism, particularly related to the islands of the Whitsundays and the Great Barrier Reef, are also important industries.

Mackay is a significant mining services support centre and home to the highest density of METS businesses in the southern hemisphere, including significant mining and engineering expertise. A key context is that a significant number of Queensland's operating mines are approaching the end of their productive life in the coming decades, with 2040 and 2070 being the peak closure period in the Bowen Basin. GW3 and other key stakeholders have a strong interest in ensuring the ongoing sustainability of industry in the region beyond mine closures and to continue promoting its established, highly capable and world-class METS capabilities.

2. Strategic and policy context

2.1. Critical minerals

Critical minerals are essential inputs in global technology development, defence capabilities, and renewable energy infrastructure. They have emerged as central to contemporary geopolitical and economic security globally. With China dominating both extraction and processing of many critical minerals (see the figure below), Australia is leading efforts to address the geopolitical risks this creates and to diversify supply chains to establish global supply chain security.

³ Estimated resident population as at 30 June 2024, sourced from Queensland Regional Profiles, December 2025, GW3 region.
<https://statistics.qgso.qld.gov.au/profiles/qrp/resident/pdf/68WNC6ZBQTDK5T4CP6V82PK16VOYHK3FTHSVU9WNGFYZZRRUP3BEWGH4KMTQ2RJA5F02105LT8ZHCVVWYZCDOKTX2EPLBN7QKEZ0TRZAWJEDSC93KY6RMKHCK5MEP7W6/qld-regional-profiles-resident#view=fit&pagemode=bookmarks>

⁴ <https://greaterwhitsundayalliance.com.au/industry/mining/>

⁵ <https://greaterwhitsundayalliance.com.au/industry/mining/>

Figure 1. Global supply chains for Critical Minerals⁶

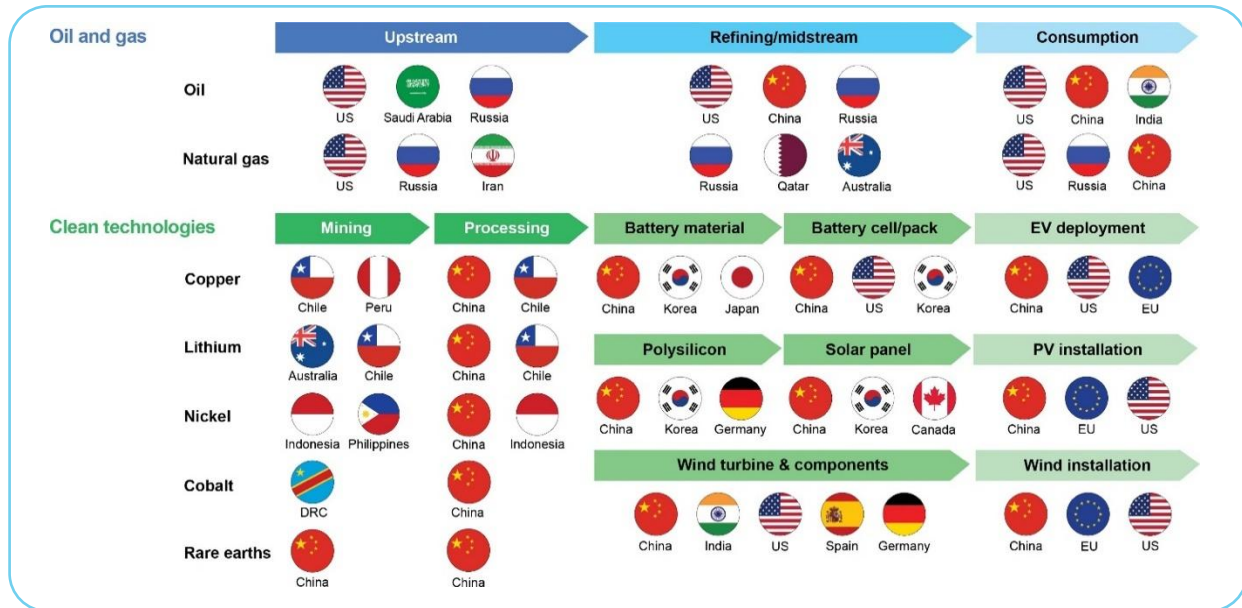
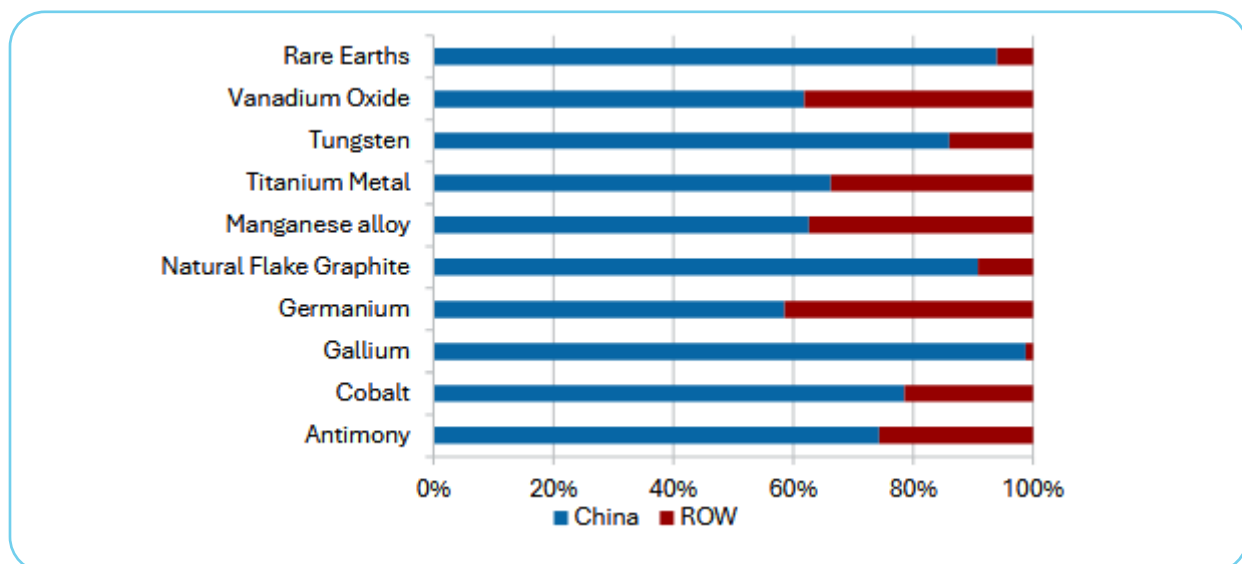


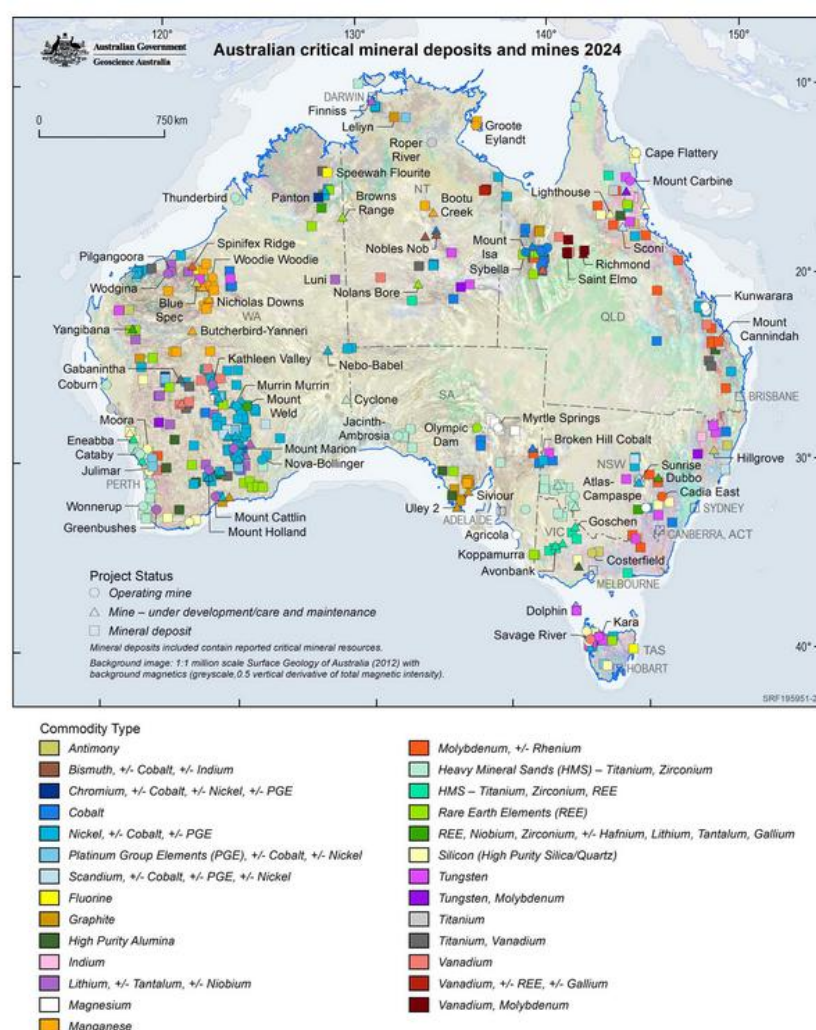
Figure 2. Critical Minerals Production, China and Rest of World



Australia has substantial deposits of critical minerals, particularly lithium, cobalt and rare earths, and has a strategically important role to play in the diversification of global supply chains. Australia's critical mineral mines and deposits by types of minerals are mapped below.

⁶ Peterson Institute for International Economics, cited in <https://oia.pmc.gov.au/sites/default/files/posts/2025/01/Impact%20Analysis%20Critical%20Minerals%20Production%20Tax%20Incentive.pdf>

Figure 3. Australia's critical minerals (GeoScience Australia 2024)⁷



Australian critical mineral deposits and mines in 2024

Queensland holds substantial deposits of many critical minerals; at least ten of Australia's critical minerals are found in Queensland, including rare earth elements.⁸

2.2. Australian Critical Minerals Strategy

The Australian Government's Critical Minerals Strategy 2023–2030, released in June 2023,⁹ articulates a national framework for positioning Australia as a globally significant producer of raw and processed critical minerals, supporting diverse, resilient, and sustainable supply chains. The Strategy's four core objectives are to:

- create diverse, resilient and sustainable supply chains through strong and secure international partnerships;

⁷ <https://www.ga.gov.au/scientific-topics/minerals/critical-minerals>

⁸ See <https://www.statedevelopment.qld.gov.au/news-and-events/what-are-critical-minerals-and-why-are-we-mining-them-in-queensland>

⁹ <https://www.industry.gov.au/publications/critical-minerals-strategy-2023-2030>

- build sovereign capability in critical minerals processing;
- use Australia's critical minerals to support its transition to renewable energy leadership; and
- extract more value from resources onshore, creating jobs and economic opportunities for regional and First Nations communities.

2.3. Australian Critical Minerals List

The Strategy established a \$4 billion Critical Minerals Facility and a national Critical Minerals List, which identifies minerals essential to modern technologies, economies, or national security that are vulnerable to supply chain disruption. The list currently comprises 31 minerals. Subsequently, Australia has identified a complementary Strategic Minerals List, which identifies six minerals that are essential for the energy transition (aluminium, copper, nickel, phosphorus, tin, and zinc) but are not currently considered to have sufficiently vulnerable supply chains to be listed as critical minerals.¹⁰

2.4. Queensland Critical Minerals Strategy

The Queensland Government released its state-level Queensland Critical Minerals Strategy in June 2023, committing to maximising investment and building value chains for critical minerals. The Queensland Strategy adopts a place-based approach, committing to the establishment of Critical Minerals Zones, with efforts tailored to enable collaboration, common-user infrastructure, contribute to regional development, and to foster mineral discovery, extraction, and processing capabilities.

2.5. Processing capacity

Although Australia has abundant critical minerals resources, it does not process critical minerals processing capacity domestically at scale. A report by the Commonwealth Department of Treasury and the Department of Industry, Science and Resources (2024) identifies barriers to investment in the critical minerals supply chain preventing the development of processing, namely supply chain concentration and consolidation, and the cost gap. Private firms are failing to appropriately price in the required level of economic resilience and security in critical sectors and supply chains, which indicates a justification for government intervention to encourage new entrants by de-risking investments and “crowding-in” private sector funding.¹¹

Suggested interventions include tailored public financing arrangements to assist projects to manage price risks over longer periods, and fostering connections between Australian companies and international partners. The report cites the US case as evidence of the potential benefits of government intervention: the US administration reported that since the introduction of the US Inflation Reduction Act of 2022, which was complemented by the Bipartisan Infrastructure Law, and CHIPS and Science Act, the private sector had announced more than \$110 billion in new clean energy manufacturing investments and more than 170,000 clean energy jobs created.

¹⁰ <https://www.industry.gov.au/news/updates-australias-critical-minerals-list>

¹¹

<https://oia.pmc.gov.au/sites/default/files/posts/2025/01/Impact%20Analysis%20Critical%20Minerals%20Production%20Tax%20Incentive.pdf>

2.5.1. Queensland Critical Minerals Zones

The Queensland Government committed to establishing Critical Minerals Zones (CMZs) as a key policy lever under its Queensland Critical Minerals Strategy. This offers a significant opportunity for the Greater Whitsunday region to position itself as a secondary prospectivity and processing zone.

Text Box 1: CMZs in Queensland

CMZs in Queensland

The government has begun implementing CMZs in Queensland, allocating \$75 million to establish two pilot zones:

- Julia Creek/Richmond Zone: Focused on establishing a vanadium industry.
- Mount Isa/Cloncurry Zone: Focused on secondary processing and recovering critical minerals from tailings (waste).

Baseline Studies: In the Julia Creek/Richmond zone, the government has funded "baseline studies" for social impact, water availability, and environmental matters. This effectively removes cost and risk for private investors because the government has already done the heavy lifting on the regulatory data they need.

Resource Teams: They have established Critical Minerals Queensland (CMQ), a dedicated office in Townsville, to manage these zones and coordinate approvals.

Rent Reduction: The strategy includes rent deferrals for exploration permits within these zones to lower holding costs for miners.

Mount Isa / Cloncurry Critical Minerals Zone -

Critical Minerals Training Hub: The government is funding a \$3.2 million dedicated training facility in Mount Isa. This provides a "ready-made" workforce pipeline for investors.

Industrial Land Supply: Economic Development Queensland is directly funding the development of new industrial estates (e.g., Kalkadoon Industrial Estate) to ensure "shovel-ready" land is available for support industries.

Rent Deferrals: Exploration permits for new-economy minerals within the zone are eligible for rent reduction (lowered to zero for 5 years in some cases) to encourage exploration in deeper or more complex geology.

2.6. US-Australia Critical Minerals Framework

Most recently, on 20 October 2025, the United States and Australia signed a landmark US–Australia Critical Minerals Framework, establishing a common policy framework for mining and processing of critical minerals and rare earths. This Framework represents a substantial deepening of bilateral strategic cooperation on supply chain resilience.

Text Box 2: US-Australia Critical Minerals Framework

US-Australia Critical Minerals Framework

The US–Australia Critical Minerals Framework is a bilateral agreement signed on 20 October 2025, between the United States and Australia to enhance cooperation in mining, processing, and supply chain security for critical minerals and rare earths essential to defence, clean energy, and advanced technologies. It aims to reduce reliance on adversarial suppliers, particularly China, by accelerating domestic and joint projects through policy tools, financing, and regulatory streamlining.

Background and Objectives

The framework builds on existing alliances and responds to global supply vulnerabilities, including China's export restrictions on rare earths and magnets. Key objectives include achieving resilient supply chains for raw and processed materials, leveraging economic policies such as stockpiling and investment to foster diversified markets, and supporting industrial bases in both nations. It emphasises non-market protections, such as price floors, to counter unfair trade practices while promoting standards-based free trade among compliant partners.

Key Provisions

- **Financing and Investment:** Both countries commit to mobilising at least \$1 billion each within six months for projects in mining, separation, processing, and recycling, potentially unlocking an \$8.5 billion pipeline of initiatives.
- **Regulatory Streamlining:** Measures to accelerate permitting timelines for critical mineral operations, consistent with domestic laws, including a joint ministerial on mining investments within 180 days.
- **Supply Security Mechanisms:** Establishment of a US–Australia Critical Minerals Supply Security Response Group, led by the US Secretary of Energy and Australian Minister for Resources, to identify priorities, vulnerabilities, and rapid response plans.
- **Additional Commitments:** Cooperation on geological mapping, asset sale reviews for national security, scrap recycling technologies, and engagement with third parties to broaden supply diversification.

Strategic and Economic Impact

A joint US–Australia Critical Minerals Supply Security Response Group, led by the US Secretary of Energy and the Australian Minister for Resources, has been established to identify priority minerals, monitor vulnerabilities, and coordinate emergency responses. The agreement strengthens the US–Australia alliance by capitalising on Australia's vast mineral resources and the US's industrial demand, positioning both as key players in the clean energy transition and defence capabilities. It is non-binding but provides a policy roadmap expected to boost investment in Australian projects and enhance bilateral economic ties amid geopolitical tensions. Industry groups, such as the Minerals Council of Australia, hail it as a catalyst for prosperity and supply chain resilience. The Minerals Council of Australia estimates that the agreement could unlock a USD\$8.5 billion pipeline of Australian critical mineral projects over the next several years, supported by joint investment and faster regulatory approvals.

3. The role of regional hubs for critical minerals

There is a strong economic rationale for the establishment of “hubs” to reap efficiency gains and economic benefits from agglomeration (see the box below). In the context of critical minerals, such hubs may combine exploration, processing, and pilot and commercial-scale facilities, supported by research institutions.

Regional hubs are central to the Australian Critical Minerals Strategy 2023–2030, which explicitly prioritises “unlocking investment in enabling infrastructure” to create clusters of heavy industry. By consolidating processing capacity in hubs, Australia can attract greater investment and move beyond a “dig and ship” model to downstream processing.

The establishment of regional hubs also aligns with the “place-based approach” to the development of the Queensland Critical Minerals Strategy, which commits to fostering CMZs. The Strategy articulates that such zones will tailor government actions—such as planning approvals, rent deferrals, or common-user infrastructure—to the specific geography and mineral endowment of a region.

Furthermore, hubs facilitate the transition of regional economies from simple extraction to complex manufacturing and industrial services. This aligns with the “Future Made in Australia” agenda, ensuring that regional communities capture a greater share of the value chain rather than serving solely as transit points for raw exports. This aggregation is essential for supply chain security, as it creates a domestic ecosystem capable of producing precursor materials, thereby reducing reliance on dominant foreign processing monopolies.

The economics of hubs

The economic theory of agglomeration suggests that firms derive significant efficiency gains from spatial proximity. In the context of critical minerals—where projects often face high capital intensity and technical complexity—hubs function as mechanisms to reduce unit costs and accelerate development through the following channels:

- **Input Sharing (Infrastructure Efficiency):** Individual critical minerals projects often lack the scale to justify standalone investment in major utilities, logistics, or reagents processing. A hub model allows for shared user infrastructure, which distributes fixed capital costs across multiple users. This reduces the "hurdle rate" for investment and improves the allocative efficiency of public and private capital.
- **Labour Market Pooling:** specialised skills required for mineral processing (e.g., chemical engineers, metallurgists) are scarce. Hubs create a deep, localised pool of specialised labour, reducing search costs for firms and improving job matching for workers.
- **Knowledge Spillovers:** Co-location fosters the diffusion of tacit knowledge and technical innovation. In a nascent industry such as critical minerals processing, the proximity of METS firms to operators accelerates problem-solving and technical refinement.
- **Regulatory Streamlining:** Hubs often benefit from "pre-approved" environmental or planning zones (e.g., State Development Areas). This reduces the time-cost of money for investors by shortening approval timelines and providing regulatory certainty.
- **Reduced "First-Mover" Disadvantage:** The first firm to build in a greenfield area often faces prohibitive costs (building roads, power). A hub model shifts some of these "enabling" costs to the state or shares them, de-risking the investment decision for private capital.
- **Social License and ESG:** Clustering industrial activity allows for centralised management of environmental impacts (e.g., shared waste management or water treatment facilities), which can streamline regulatory approvals and enhance social license to operate compared to dispersed industrial footprints.

There are many established regional hubs for various sectoral economic activities in Australia, including hubs for critical minerals in most states/territories. An overview of current initiatives is provided in Appendix 2. This includes the Future Industries Hub, which includes the Flexi-Lab, funded by the Queensland Government and Mackay Regional Council, which was officially opened in early 2026. It targets pilot-scale processing of diverse minerals (cobalt, nickel, zinc, vanadium, molybdenum, silica, alumina, rare earth elements) and mine waste reprocessing—offering the ability to test commercial viability before full-scale production. The Flexi-Lab is complemented by the Townsville Queensland Resources Common User Facility (QRCUF), which focuses on vanadium processing and scaling to lithium-ion battery materials, supporting downstream manufacturing and defence applications.

Figure 4. The Resources Centre of Excellence Initiatives

RCOE Future Industries Hub and Flexi-Lab

In January 2024, the Queensland Government announced the establishment of the Resources Centre of Excellence (RCOE) Flexi-Lab in Mackay. Flexi-Lab is a common-user pilot processing plant that enables industry to test and prove the commercial viability of processing critical minerals including cobalt, nickel, zinc, vanadium, molybdenum, silica, alumina and rare earth elements. The common-user element means it

does not just have one single permanent tenant but rotates different users through for specific test campaigns. The facility operates at lab- and pilot-scale, providing dedicated space for testing, innovation, research and development, and training in processing minerals. Design work was led by researchers from the University of Queensland's SMI, with the vision for the facility originating in mid-2018 through collaboration with RCOE management. Local METS company DGH Engineering has been contracted for fabrication and assembly of the pilot plant equipment, demonstrating the region's existing technical capability.

Strategic alignment with regional METS strengths

The Flexi-Lab initiative directly builds upon the Greater Whitsunday region's world-leading METS sector, which has developed over decades through proximity to major mining operations in the Bowen Basin. The Paget industrial estate in Mackay hosts the largest mining services industrial precinct in the southern hemisphere, providing an extensive ecosystem of specialised technical businesses and skilled workforce.¹² Flexi-Lab enables these existing capabilities in equipment design, fabrication, metallurgical testing and process optimisation to be redirected toward emerging critical minerals opportunities, supporting industrial diversification while retaining core technical competencies. The facility forms part of the Future Industries Hub, which sits adjacent to the RCOE campus, creating an integrated site for processing, testing and commercialisation of critical minerals alongside mine tailings reprocessing projects.

Role in value chain development

As a common-user facility, Flexi-Lab addresses a critical gap in the minerals value chain by providing accessible infrastructure for companies to test processing technologies before committing to full-scale commercial operations. This de-risking function is particularly important for critical minerals, where processing technologies may be less established than for traditional bulk commodities, and where proving commercial viability at pilot scale can attract further investment. The facility supports the Queensland Government's objective of developing a complete pit-to-product value chain within the state, enabling mineral processing and value addition to occur locally rather than shipping raw materials for processing elsewhere. Flexi-Lab complements the QRCUF being established in Townsville, creating processing capabilities across multiple regional centres.

Implications for Greater Whitsunday positioning

The Flexi-Lab facility provides tangible infrastructure that reinforces Mackay's credentials as a Critical Minerals Processing and Services Hub. The Flexi-Lab was commissioned in early 2026. For the Greater Whitsunday region, Flexi-Lab represents both physical infrastructure and institutional capability that can attract critical minerals projects, support mine waste reprocessing initiatives, and facilitate training programs for the emerging sector workforce. The region has a strong capacity to leverage mining, METS and agriculture expertise to support the burgeoning critical minerals industry in the Bowen Basin. This positions Mackay not merely as a mining service centre, but as a key location where processing innovation, commercialisation and technical problem-solving for critical minerals can occur at scale.

Status

Construction of the Future Industries Hub, in which the Flexi-Lab is located, was completed by a local contractor in September 2025. The facility's design and operational model were developed in direct partnership with the University of Queensland's SMI and Core Resources Pty Ltd, a specialised metallurgical processing firm. This ensures the lab has immediate academic and technical users driving its initial research agenda. The Future Industries Hub has been operational since late 2025. The Flexi-Lab pilot plant itself (the technical equipment inside the hub) was commissioned and became operational in early 2026. It is open for booking and "capability prospectus" inquiries from junior miners and METS companies. It offers serviced offices and industrial tenancy space alongside the lab, creating a "soft landing" pad for incoming companies to set up their local headquarters while testing occurs. The lab is specifically designed for—and is actively courting—companies involved in:

- Vanadium processing (aligning with Queensland's push for battery minerals).

¹² https://greaterwhitsundayalliance.com.au/wp-content/uploads/2024/10/GW3MetsDiversificationStrategy_DigitalFinal04.09.24.pdf

- Cobalt, nickel, and zinc recovery.
- Tailings reprocessing: companies seeking to reprocess mine waste from the Bowen Basin, positioning it as a circular economy hub.

In addition, the Greater Whitsunday region is host to the IREP, a major industrial and educational hub currently under development in Moranbah, Queensland. It is designed to serve as a centre for innovation, training, and future-focused industries within the Bowen Basin, helping the region transition beyond traditional coal mining. The focus of the IREP is to develop new technologies, including low-carbon processes and mine site rehabilitation. The precinct includes land for future commercial partners and industrial activities that align with the region's economic diversification goals. The project has received significant backing, including up to \$40 million from the Queensland Government's Resources Community Infrastructure Fund (RCIF), which is its largest single investment to date. The IREP is a collaborative effort involving the Isaac Regional Council, the RCOE, and state/federal government bodies.

The IREP will include:

- Research and development facilities for critical minerals, mine rehabilitation, and renewable energy technologies.
- A dual-sector learning centre, delivering university-style education and reskilling programs.
- A mining heritage centre, celebrating industry history while shaping the future.
- Multi-functional collaboration spaces, connecting industry, community, and research.

4. Opportunity Analysis

Given the strategic context of global supply chain insecurity and critical minerals strategies, there is an opportunity for the Greater Whitsunday region to promote and establish itself as a global Critical Minerals Processing and Services Hub. This opportunity arises from the national and international need for supply chain security and sovereignty, and also from local needs.

4.1. Market, employment, and regional development implications

Owing to its proximity to the Bowen Basin – one of the world's largest metallurgical coal reserves – the Greater Whitsunday region has developed a strong METS sector. This geographic advantage created sustained demand for specialised equipment, technical expertise and service providers, embedding METS as a cornerstone of the regional economy. The Greater Whitsunday mining and METS sector is Australia's premier cluster, with over 700 businesses generating \$49.7 billion in annual output (62% of regional GRP) and employing 18,884 people (19% of the workforce). The sector is world-leading in fabrication, slurry management, mineral separation, water treatment, rehab/remediation—transferable from Bowen Basin coal to critical minerals (tailings REEs/vanadium), NWMP metals (copper/gold), and decarbonisation. It services 40+ mines and facilitates exports globally.

However, as fossil fuel industries contract and global energy systems decarbonise, the region must identify new sources to support local communities and prevent skills and population drain. Diversification to a critical minerals hub offers significant market, employment and regional development benefits, while leveraging the region's established world-class METS sector – an

ecosystem of businesses and expertise that can adapt and apply its capabilities to emerging industries.

Modelling suggests that if Australia moves downstream into processing and manufacturing, the critical minerals sector could generate up to 330,000 new jobs and \$171 billion in gross domestic product (GDP) by 2040.¹³ A more conservative analysis by the Australian Treasury suggests that even partially domesticating processing (50%) would triple the sector's skilled workforce to over 90,000 by 2040.¹⁴ Both models confirm that the vast majority of employment growth is contingent on establishing downstream processing hubs rather than raw extraction. Although these statistics reflect national data rather than being specific to the Mackay and Greater Whitsunday region, they are indicative of the economic value created by a downstream processing industry for critical minerals. In particular, establishing Mackay and the Greater Whitsunday region as a processing and service hub for critical minerals could have a profound multiplier effect on regional development through the following effects:

- **Supply chain "thickening":** A processing and service hub creates steady, predictable demand for local service providers—from engineering and fabrication to catering and lab services. This enables local SMEs to invest in capability and scale, creating a more complex and resilient local economy.
- **Economic diversification:** A critical minerals processing and service hub diversifies the industrial base. This acts as a hedge against commodity price volatility and carbon transition risks, providing long-term economic stability.
- **Revenue retention:** By moving from "dig and ship" to downstream processing, regions capture a larger share of the value chain. This increases the GRP and ensures that wealth generated from mineral endowment is retained locally rather than exported as raw ore.
- **Skills retention and creation:** Downstream processing jobs are typically higher-skilled and higher-paid than general extraction or services roles. Critical minerals processing is technology-intensive, requiring laboratory technicians, chemical engineers, and metallurgists. This would also retain the existing skilled mining and METS workforce in the region.
- **Investment attraction:** From an investor perspective, a government-backed processing and service hub signals long-term stability and commitment.
- **Leveraging existing infrastructure:** diversification to critical minerals could leverage existing coal industry infrastructure, including utilising mine tailings for the extraction of critical minerals.
- **Sustainable employment:** Establishing the region as a critical minerals processing and service hub would create sustainable long-term employment.

The Grattan Institute estimates that if Australia maintains its market share as demand grows, the critical minerals market in 2050 will be worth double the current thermal coal market.¹⁵ Metallurgical coal exports are significantly more valuable than thermal coal and they are an input to green steel production, which remains below scale. However, fostering critical minerals processing is not an either/or with metallurgical coal for the Mackay region, but an addition. In Australia, coal export earnings have historically been much higher than critical minerals, but this is changing. According to the Department of Industry, Science and Resources, combined critical minerals exports (lithium,

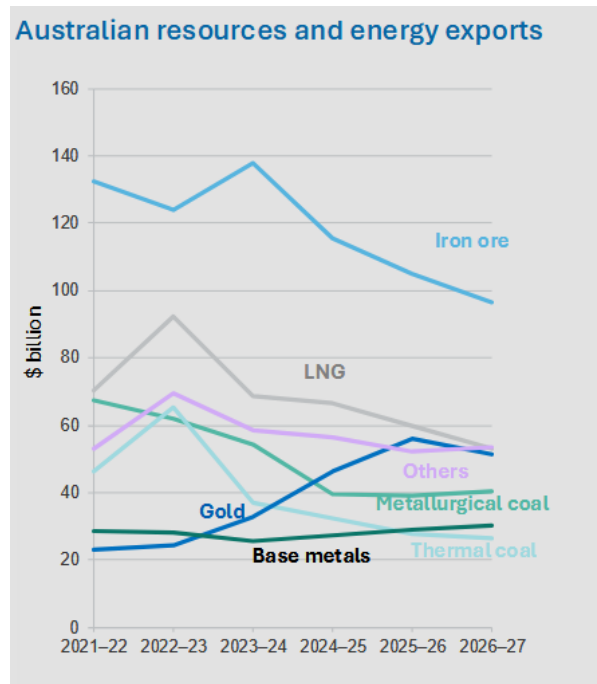
¹³ Based on the scenario combining downstream processing, faster project approvals, and deeper international integration. PwC Aussie Mine 2024. By comparison, if Australia stays in "dig and ship" (mining only), the GDP uplift is only \$71.2 billion—essentially half the value

¹⁴ oia.pmc.gov.au/sites/default/files/posts/2025/01/Impact Analysis Critical Minerals Production Tax Incentive.pdf

¹⁵ <https://grattan.edu.au/wp-content/uploads/2023/02/Critical-minerals-delivering-Australias-opportunity.pdf>

nickel, copper, etc.) will match the value of thermal coal by 2028.¹⁶ Although metallurgical earnings will not fall as fast as thermal coal, it is expected that revenue from metallurgical coal exports will decline long term, whereas demand for critical minerals such as lithium is surging.

Figure 5. Australian Resources and Energy Exports: Future Decline of Coal Exports¹⁷



5. Why Mackay and the Greater Whitsunday Region?

One of the key issues for Mackay and the Greater Whitsundays will be establishing why the region should be the focus for a Critical Minerals Processing and Services Hub, including noting that Townsville will host the QRCUF, a state-owned mineral processing plant.

The key advantages of the Greater Whitsunday region which enhance operational efficiency as a Critical Minerals Processing and Services Hub lie in:

- Geographic Advantage:** Proximity to Bowen Basin. Mackay and Greater Whitsunday is the logistics and service hub for 40+ operating mines across the Bowen and Galilee Basins. While the Bowen Basin primarily hosts coal operations, recent studies¹⁸ identify significant potential for critical minerals—particularly vanadium and rare earth elements (REEs)—in coal tailings and overburden, supported by initiatives like the Bowen Basin Circularity Consortium projects.¹⁹ Processing closer to these waste sources reduces haulage distances for reprocessing feedstocks, which represent a significant operating expense, giving Mackay an advantage over Townsville for Bowen Basin secondary critical minerals recovery and METS servicing.

¹⁶ <https://www.industry.gov.au/publications/resources-and-energy-quarterly-march-2025>

¹⁷ <https://www.industry.gov.au/sites/default/files/2025-06/resources-and-energy-quarterly-june-2025.pdf>

¹⁸ <https://www.rcoe.com.au/pit-to-port>; <https://www.business.qld.gov.au/industries/mining-energy-water/resources/geoscience-information/exploration-incentives/collaborative-development-program>

¹⁹ <https://www.bowenbasincircular.com.au/>

- **Partnerships:** Mackay recently established the Critical Minerals Flexi-Lab, which contributes to minerals processing, testing, commercialisation, and the RCOE, which provides a complementary R&D space; the facility serves as a training ground for students, apprentices, and researchers, ensuring the workforce is skilled in new-economy mineral processing techniques.
- **Connectivity (energy and transport):** Mackay and the Greater Whitsunday region has access to four major ports (Port of Mackay, Abbot Point, Hay Point and Dalrymple Bay), which provides flexibility to route products to different markets, and reduces risk of port congestion, as well as offering competitive shipping cost options. In terms of energy, power grid connections already exist, and rail spurs to major mines are already established.
- **METS capability / expertise:** Mackay and Greater Whitsunday is an economically significant METS cluster, home to skilled personnel with highly technical expertise in mining services, equipment and plant operation maintenance, equipment fabrication, logistics, engineering, process innovation and so on. There is a skilled workforce and supplier ecosystem. The Greater Whitsunday METS Sector Revenue Diversification Strategy confirms that the region possesses the highest density of METS businesses in the southern hemisphere, providing an unparalleled industrial base for critical minerals processing and services innovation. Greater Whitsunday METS businesses have been servicing operations in the North West Minerals Province for decades, including major projects extracting gold, copper, lead and zinc.
- **Tailings and mine waste reprocessing:** Bowen Basin operations have decades of accumulated tailings with recoverable minerals. The region's coal tailings and overburden contain significant unrecovered concentrations of vanadium, cobalt, REEs, and alumina. Mackay's METS firms are uniquely positioned to service the "secondary prospectivity" market (extracting value from waste) not just primary extraction. This creates a ready-made ecosystem for junior miners to test flowsheets at the Flexi-Lab without the capital burden of building bespoke pilot plants. The Greater Whitsundays METS sector already possesses transferable skills in slurry management, mineral separation, and water treatment—competencies directly applicable to tailings reprocessing and projects are underway through the Pit to Port initiative by the RCOE,²⁰ and the Bowen Basin Circularity Consortium projects targeting critical minerals recovery from coal waste.²¹
- **Prospective Australian Centre for Critical Mineral Intelligence (ACCMI):** Building on existing RCOE partnerships already currently in place with University of Queensland SMI, CQUniversity (CQU), and James Cook University (JCU) and the Queensland resource sector to establish ACCMI. The proposed centre will be located in Mackay and anchored around the Critical Minerals Flexi-Lab processing plant. It will combine complementary expertise across science, engineering, regional development, and workforce capability to deliver a coordinated, nationally significant platform. It will extend the Flexi-Lab model into a scalable, national framework that leverages Queensland's unique concentration of expertise and infrastructure.

There would be significant productivity advantages from positioning Mackay and the Greater Whitsunday region as a Critical Minerals Processing and Services Hub. The Productivity Commission outlines five pillars to promote productivity growth nationally.²² The region's advantages—proximity to Bowen/Galilee Basins for efficient tailings reprocessing, the world-class METS ecosystem (700+ firms), Flexi-Lab/IREP infrastructure, and multi-port connectivity—directly generate productivity gains through agglomeration, skills transfer, and cost reductions, aligning with three of the Productivity Commission's five pillars of productivity growth agenda.²³

The Flexi-Lab will act to reduce capital expenditures for junior miners, thus contributing to the dynamic economy pillar, transferable METS skills enhance workforce efficiency (skilled workforce),

²⁰ <https://www.rcoe.com.au/pit-to-port>

²¹ <https://www.bowenbasincircular.com.au/>

²² <https://www.pc.gov.au/inquiries-and-research/five-productivity-inquiries/growth-mindset/>

²³ https://assets.pc.gov.au/2025-12/meeting-productivity-challenge.pdf?VersionId=DhDrbhRRPBZaBrEn_p8M6iN2V9mF1gOh

and waste valorisation supports net zero energy (cheaper energy pillar). These enhancements position the region to capture downstream value, hedging coal decline while contributing to the growth of national productivity. ACCMI would further these advantages in promoting innovation and skills spillovers. Below are the three pillars of the Australian Government's productivity growth agenda which are most supported by the roadmap's ambition to develop Mackay and the Greater Whitsundays region as a Critical Minerals Processing and Services Hub.

Figure 6. Contributions to the pillars of productivity growth

Productivity pillar	Regional advantages	Productivity gains
Dynamic and resilient economy	METS businesses, Flexi-Lab, IREP, geographical proximity to Bowen and Galilee Basins	METS clustering (700+ firms) enables shared Flexi-Lab/IREP infrastructure, cutting first-mover costs via common-user facilities. Agglomeration and infrastructure sharing lowers capital costs, boosts investment, spurs innovation, also facilitated by proposed ACCMI. Reducing ore/waste haulage (e.g., Bowen Basin tailings) also enhances efficiency. Government support to "crowd in" private sector investment and de-risk critical minerals.
Skilled and adaptable workforce	METS skills and capabilities developed for coal mining transferable to critical minerals context IREP reskilling and training	Retention of skilled METS workforce, skills transfer. Skills spillovers from ACCMI, IREP.
Cleaner energy/Net-zero transition	Critical minerals in tailings and mine waste, geographical proximity to Bowen and Galilee Basins	Tailings reprocessing boosts resource efficiency and ultimately supports cheaper, cleaner energy in net-zero transition

GW3 has already commenced identifying gaps that need to be addressed to enter coal-adjacent areas, including critical minerals in its 2024 report, METS Sector – A Revenue Diversification Strategy. The Strategy notes gaps in skills transferability, stakeholder partnerships, market awareness/insights, and regulatory/policy barriers hindering METS firms from entering seven priority sectors (critical minerals, circular economy, post-mining land use, biomanufacturing, etc.).

The benefits of establishing Mackay and the Greater Whitsunday region as a Critical Minerals Processing and Services Hub accrue to the region and the national economy. Alignment with productivity ambitions would justify infrastructure prioritisation (e.g., rail spurs, grid upgrades) and retaining the skilled METS and mining workforce in the region would hedge against GRP risks, help diversify the economy, create new skilled roles, boost incomes and foster population stability in the region.

6. The Roadmap: Targeted Actions by GW3 and other key stakeholders

This section outlines a strategic roadmap – practical actions – for the Greater Whitsunday region to capture this global opportunity and to operationalise the region’s comparative advantages in critical minerals processing. The roadmap prioritises actions where the Greater Whitsunday region can deliver high value with low risk and cost. Consistent with best practice for local economic development, the roadmap presents actions relating to local government operations (actions subject to the direct control of GW3 and other key stakeholders) as well as areas where the other agencies can influence and facilitate external investment (through partnerships and advocacy).

Text Box 4: Key counterparts and agencies

Key counterparts and agencies

Key counterparts and agencies for GW3's critical minerals hub include

Local and Regional Partners

- Resources Centre of Excellence (RCOE): Leads Flexi-Lab in Mackay for critical minerals processing pilots (e.g., cobalt, vanadium from tailings); partners with GW3 on METS diversification and ACCMI proposal.
- Isaac Resources Excellence Precinct (IREP): Moranbah-based hub
- Future Industries Hub (Mackay): Hosts Flexi-Lab; supports commercialization of tailings reprocessing and METS for critical minerals.

Universities

- University of Queensland (UQ), especially the Sustainable Minerals Institute (SMI),
- Central Queensland University (CQU),
- James Cook University (JCU);
- Collaborating on ACCMI and tailings recovery.

Industry groups

- Resource Industry Network (RIN): Regional industry group for forums and working groups on critical minerals opportunities.

State Government Agencies

- Critical Minerals Queensland (CMQ: manages CMZs (e.g., Julia Creek-Richmond for vanadium, Mount Isa-Cloncurry for tailings); provides baseline studies, investor connections.
- Economic Development Queensland (EDQ): Funds industrial land (e.g., for processing); supports shovel-ready sites in CMZs.
- Trade and Investment Queensland (TIQ): Assists international branding, trade missions for GW3 hub.
- Queensland Resources Common User Facility (QRCUF): Townsville facility for vanadium/cobalt/rare earths testing; complements Flexi-Lab (opening late 2026).

National Bodies

- Department of Industry, Science and Resources: Oversees Critical Minerals Strategy 2023-2030, \$4B Facility; aligns with GW3's sovereign processing goals.
- Geoscience Australia and CSIRO: Support RD Hub for processing tech; national mapping.

The world is moving extremely quickly in this sphere. It is recommended that the roadmap have a 12-month timeframe for delivery, with a review at the end of 2026 of progress, positioning and accomplishment.

6.1. Expand partnerships

1. Advance the Australian Centre for Critical Minerals Intelligence (ACCMI): Build upon the existing high-level partnership between RCOE, UQ SMI, CQUniversity, JCU, and Queensland resources sector to establish ACCMI in Mackay, anchored at the Flexi-Lab within the Future Industries Hub.
2. Advocate for federal funding (e.g., via the Critical Minerals Facility) to position ACCMI as a national intelligence platform for processing R&D, market intelligence, and supply chain coordination—leveraging regional METS to deliver sovereign capability and export-ready solutions.
3. Act as a national and global convenor, creating structured collaborations between METS firms, miners, Australian and global research institutions, and state and federal agencies around critical minerals, and to connect to the Townsville hub, as well as the various critical minerals hubs and zones that have been earmarked around the country.
4. Convene a national conference of the various critical minerals processors, companies, supply chain actors, hubs and zones focused on delivering strengthened national critical minerals processing.
5. Work with regional industry groups such as the Resource Industry Network, and other relevant regional economic development groups, to create a standing critical minerals processing working group for the region. Establish and coordinate regular forums or roundtables where junior miners, METS companies, researchers and financiers discuss project opportunities using Flexi-Lab, the Future Industries Hub and IREP.
6. Prepare a joint Greater Whitsunday region critical minerals advocacy brief (signed by all three mayors) requesting recognition of the region as a Critical Minerals Processing and Services Hub, complementary to existing zones and hubs.
7. Collaborate with other related regional development bodies and neighbouring councils to present the Mackay and the Greater Whitsunday region as part of a broader North Queensland critical minerals corridor, complementary to Townsville's hub.

6.2. Influence local actions

8. Review local planning schemes, laws and policies, industrial zoning and infrastructure charges to identify and address barriers to establishing critical minerals processing, pilot plants and related services in suitable precincts. Investigate options for more flexible or streamlined development assessment pathways for low-impact critical minerals pilot and demonstration facilities in designated industrial areas.
9. Develop capabilities for and seek public-private partnerships with industry to promote critical minerals METS processing and services.
10. Identify Council powers to adjust planning and regulatory settings to make it easier to establish processing and service activities, while actively marketing the region.

6.3. Facilitate investment

11. Develop a concise investment prospectus for the Queensland Government and federal agencies highlighting the Greater Whitsunday region's METS base, Flexi-Lab, Future Industries Hub and IREP, and the role they can play in the state and national value chain, including the benefits for Australia of having these processing capabilities (including sovereign capabilities and regional development).
12. Map relevant Queensland and Australian critical minerals programs and funds and submit coordinated applications or expressions of interest on behalf of regional consortia.

13. Build international awareness, especially in the United States and North Asia, of the Mackay and the Greater Whitsunday region METS capability. This includes joining trade missions and international conferences.
14. Seek support from Critical Minerals Queensland, Trade and Investment Queensland and Austrade to brand internationally the Greater Whitsunday region Critical Minerals Processing and Services Hub.

6.4. Build profile

15. Develop “Virtual tours” of Flexi-Lab, METS and IREP to promote the Greater Whitsunday region nationally and globally, and approach Austrade, Trade and Investment Queensland and other promotion agencies to use and promote these materials to national and international investors.
16. Develop a feature-length video production of the Greater Whitsunday’s capabilities and positioning in relation to the global critical minerals processing agenda.
17. Prepare targeted marketing materials and online content that reframe the Greater Whitsunday’s METS cluster as a critical minerals services, processing and tailings reprocessing hub, and share these through industry conferences, delegations and digital channels.
18. Success story campaigns: actively track and publicise the success stories of companies that “graduate” from the Flexi-Lab, e.g., case studies of a junior miner moving from pilot test to commercial production within the region, to attract future investors.

7. Conclusion

The Critical Minerals Processing and Services Hub Roadmap presents a transformative vision for both the region and Australia’s minerals future. By leveraging local strengths, aligning with policy imperatives, and pursuing staged, collaborative implementation, the roadmap outlines a clear pathway for sustainable, diversified regional growth. With effective coordination, stakeholder leadership, and strategic investment, the Mackay and the Greater Whitsunday region can secure its place as a leading national and global hub for critical minerals processing and innovation.

APPENDICES

Appendix 1: Related Analysis and Frameworks

There are a number of previously completed strategies and analyses that relate to proposed GW3 Critical Minerals Processing and Services Hub. This project has built on this past work. These strategies and analyses have helped underpin the proposed actions to design the roadmap for the GW3 Critical Minerals Processing and Services Hub. They are summarised below.

Greater Whitsunday (GW3) METS Diversification Strategy

The report²⁴ presents a strategic roadmap for the Greater Whitsunday region to future-proof its economy by diversifying its established METS sector. It identifies that critical minerals is a high-priority sector that aligns empirically with the region's industrial strengths, transferable skills, and mature supply chain infrastructure. The report was developed by the Greater Whitsunday Alliance (GW3) in partnership with the RCOE and Queensland Government.

Strategic Alignment: Critical Minerals: Critical Minerals is highlighted as a primary diversification pathway for the region because of the ability to leverage the region's existing technical expertise while reducing reliance on traditional thermal coal markets.

Sector Adjacency: The extraction and processing requirements of critical minerals (e.g., vanadium, cobalt, rare earths) share significant operational and technical parallels with the region's established metallurgical coal industry.

Future-Proofing: By pivoting towards critical minerals, the region can position itself to capitalise on global decarbonisation trends, ensuring the longevity of the local industrial base.

Regional Strengths and Capabilities

The strategy emphasises that the GW3 region does not need to build a new industrial base from scratch but rather can "flex" its existing assets towards new value streams.

Transferable Skills and Workforce: The report identifies the region's highly skilled workforce as a critical asset for the transition to Critical Minerals:

Technical Adaptability: The "Powering a Workforce" pillar of the strategy focuses on identifying and activating cross-industry skilling pathways. It notes that technical skills currently used in mining equipment maintenance, automation, and heavy industry are directly transferable to the critical minerals sector.

Workforce Mobility: Research underpinning the strategy suggests a "natural but unstructured workforce flow" already exists between mining and allied sectors, which the strategy aims to formalise through targeted upskilling and "future-fit" academy initiatives.

Infrastructure and Supply Chain Expertise:

The report underscores the maturity of the region's supply chain as a competitive advantage:

Mature Ecosystem: The region is home to over 700 METS businesses that currently provide specialised goods and services to the mining industry. This ecosystem offers a "turnkey" supply chain

²⁴ https://greaterwhitsundayalliance.com.au/wp-content/uploads/2024/10/GW3MetsDiversificationStrategy_DigitalFinal04.09.24.pdf

solution for critical minerals projects, reducing the logistical friction often associated with greenfield mining developments.

Advanced Capabilities: The local METS sector possesses world-leading capabilities in rehabilitation, remediation, and equipment refurbishment. The report frames these capabilities as essential for the circular economy aspects of modern critical minerals mining, allowing local firms to offer high-value services beyond simple extraction.

Strategic Action Pillars

To operationalise this diversification, the report outlines four key strategic actions:

Powering a Workforce: Supporting skills development and transferability to ensure labour availability for new sectors like Critical Minerals.

Forging Relationships: Facilitating partnerships between traditional METS companies and emerging critical minerals stakeholders.

Exploring Opportunities: Providing market intelligence to raise awareness of specific entry points in the critical minerals value chain.

Championing Change: Advocating for regulatory and policy frameworks that support industrial diversification.

Full Value Realisation of Metallurgical Coal Tailings Value Proposition

The report presents a business case for the "Bowen Basin Circularity Project," a collaboration between Coreo, the RCOE, and the Queensland Government. It argues that metallurgical coal tailings—historically treated as waste—are actually misclassified resources containing significant economic value. By shifting from a linear "extract-and-dump" model to a circular economy approach, the region can recover up to \$3.4 billion annually in value while addressing environmental liabilities.

The Scale of the Opportunity

The Bowen Basin produces approximately 137 million tonnes of saleable metallurgical coal annually, generating between 11.7 and 23.5 million tonnes of tailings per year.

Composition: Unlike thermal coal waste, these tailings contain consistent profiles of valuable materials across the basin, including high-grade residual carbon, aluminosilicates (clays), quartz, and trace critical minerals.

Potential Value Streams: The report's financial model based on conservative recovery yields estimates a total potential annual revenue between \$1.7 billion and \$3.4 billion. The value is derived from three primary categories:

Recovered Coal (Primary Value): The most immediate opportunity is recovering fine coal particles that were missed by older processing methods. Test work on legacy dams indicates yields of 35%–85%, potentially unlocking nearly 10 million tonnes of saleable coal worth ~\$1.7 billion annually.

Industrial Materials: Significant value exists in non-coal by-products, including aluminosilicates (for cement replacement), quartz dust (for construction), and sulphuric acid.

Critical Minerals: While present in lower concentrations, the tailings contain REEs, titanium, and vanadium, which are essential for modern technologies. The report suggests these may become viable as "co-products" rather than standalone targets.

Operational Pathway: The "Flexi-Lab"

To bridge the gap between theory and commercial reality, the report highlights the role of the RCOE Flexi-Lab in Mackay.

Pilot Facility: This pilot-scale processing plant allows operators to validate recovery rates using actual site samples. It features advanced flotation technologies (like Jameson cells) specifically designed to recover fine particles that traditional plants miss.

Roadmap: The document outlines a staged implementation plan, starting with site assessment and pilot testing, followed by specialised laboratory analysis for specific co-products (e.g., testing clays for brick manufacturing), before proceeding to a full business case.

Strategic Benefits

Economic: Creates new revenue streams from existing assets without new mining footprints.

Environmental: Reduces the volume of tailings stored in dams, mitigating long-term liability and environmental risk.

Regional: Leverages existing METS capabilities (engineering, processing) to build a new "circular" industrial sector in the Bowen Basin.

Future Industries Hub Prospectus

The Future Industries Hub is the second major stage of the RCOE located in Mackay, Queensland. It serves as a dedicated commercial and research precinct designed to accelerate the region's transition into new economic sectors, particularly critical minerals, bio-futures, and advanced manufacturing.

The Hub includes two primary elements:

Commercial & Industrial Precinct

Incubator Space: The Hub offers serviced offices and industrial tenancies for startups, researchers, and METS companies. This physical proximity to the pilot plant fosters collaboration between technical experts and commercial operators.

Sector Focus: Beyond mining, the Hub is designed to support the bio-futures sector (e.g., sugar by-products) and agriculture, leveraging the region's other dominant industries to create cross-sector innovation.

Strategic Role

The Future Industries Hub acts as the "commercialisation engine" for the region's diversification strategy. While the IREP (in Moranbah) focuses on on-site operational training and heavy industry needs near the mines, the Future Industries Hub (in Mackay) focuses on:

R&D and Testing: Proving that new processes (like extracting cobalt from waste) are economically viable.

Market Entry: Lowering the barrier to entry for new businesses by providing shared infrastructure.

Workforce Skilling: Training local technicians in new processing technologies before they are deployed at full scale.

The Flexi-Lab Pilot Plant

This is the centrepiece of the Future Industries Hub—a "common-user" facility that allows companies to test and validate industrial processes without the high capital cost of building their own plants.

Critical Minerals Processing: It is equipped to test the commercial viability of processing minerals like vanadium, cobalt, and REEs, which are found in the region's mine tailings.

Tailings Reprocessing: The facility supports the "circular economy" strategy by enabling operators to test methods for recovering valuable materials from waste, directly supporting the Full Value Realisation of Metallurgical Coal Tailings project discussed previously.

The Critical Minerals Flexi-Lab processing plant

The Critical Minerals Flexi-Lab is a new, state-of-the-art pilot processing facility located at the RCOE in Mackay, Queensland. It was officially opened in early 2026 at the newly completed Future Industries Hub, demonstrating the region's momentum with critical minerals.

The lab is a pilot-scale processing plant designed to bridge the "Valley of Death" between small-scale lab tests and full commercial production. Designed to bridge the gap between laboratory research and commercial production, it operates as a "common-user facility," meaning multiple companies can access it to test their mineral processing techniques without having to build their own pilot plants. It allows companies to test the processing of critical minerals specifically vanadium, cobalt, nickel, and REEs.

Key Features and Capabilities

Purpose: Its primary function is to help companies prove the commercial viability of their processing methods. It moves projects from the "test tube" phase to a scalable industrial phase.

Plug-and-Play Design: The lab is designed to be flexible (hence "Flexi-Lab"), allowing different modular equipment to be swapped in and out depending on the specific mineral being tested. This avoids the rigid, single-purpose nature of traditional processing plants.

Target Minerals: It is specifically equipped to handle critical minerals such as cobalt, nickel, zinc, vanadium, molybdenum, silica, alumina, and REEs.

Research & Training: Beyond just commercial testing, the facility serves as a training ground for students, apprentices, and researchers, ensuring the workforce is skilled in new-economy mineral processing techniques.

Strategic Context

Location: It is housed within the "Future Industries Hub" (Stage 2 of the RCOE), strategically located in the Bowen Basin to leverage existing mining infrastructure.

Funding: The project is supported by approximately \$5.7 million in funding from the Queensland Government as part of the Queensland Resources Industry Development Plan.

It complements the larger Queensland Resources Common User Facility (QRCUF) in Townsville, acting as a smaller, more agile testing ground that feeds into larger-scale industrial projects.

In essence, the Flexi-Lab acts as an "incubator" for the physical chemistry of mining, allowing companies to de-risk their projects before committing hundreds of millions of dollars to full-scale refineries.

Reimagine Rehab Prospectus

Reimagine Rehab is a strategic initiative led by the Post-Mining Land Use Working Group, a collaboration between the RCOE, Greater Whitsunday Alliance (GW3), and Isaac Regional Council, .

Vision and Purpose

The initiative reframes mine rehabilitation not as a compliance burden or an "end-of-life" obligation, but as a multi-billion dollar economic opportunity. It envisions post-mining land as a springboard for new industries, with a forecasted value of \$8 billion by 2030.

The core philosophy is to "leverage the region's mining areas to catalyse growth," moving beyond simply returning land to its original state (often grazing) and instead developing high-value commercial assets.

The Reimagine Rehab prospectus identifies three primary pathways for transforming mine sites:

- **Minerals Reprocessing:** Unlocking value from mine waste and tailings (as detailed in the "Full Value Realisation" report), turning liabilities into assets like critical minerals or saleable coal.
- **Agriculture and Aquaculture:** Utilising the vast land and water resources available on mine leases for large-scale food and fibre production, or intensive aquaculture projects in mine voids.
- **Mine Water Reuse:** Converting the significant volumes of "mine-affected water"—traditionally seen as a disposal problem—into a valuable resource for industrial or agricultural use.

Catalyst Project: The IREP is identified as a key site for piloting these concepts, providing a physical space to test new rehabilitation and reprocessing technologies before wide-scale adoption.

IREP

The Isaac Resources Excellence Precinct (IREP) is a major industrial and educational hub currently under development in Moranbah, Queensland. It is designed to serve as a centre for innovation, training, and future-focused industries within the Bowen Basin, helping the region transition beyond traditional coal mining.

Key Features and Purpose

Location: The precinct is strategically located at the corner of Moranbah Access Road and Railway Station Road, placing it at the physical heart of the Bowen Basin's mining activities.

Focus Areas: The IREP is built to drive "positive change" across both resources and renewable energy sectors. It focuses on:

Innovation & Research: Developing new technologies, including low-carbon processes and mine site rehabilitation.

Workforce Training: Reskilling the local workforce for "future-fit" roles in automation, digital technologies, and clean energy.

Commercial & Industrial Use: The precinct includes land for future commercial partners and industrial activities that align with the region's economic diversification goals.

Funding and Stakeholders

Investment: The project has received significant backing, including up to \$40 million from the Queensland Government's RCIF, which is its largest single investment to date.

Partnerships: It is a collaborative effort involving the Isaac Regional Council, the RCOE, and state/federal government bodies.

The IREP will include:

- Research and development facilities for critical minerals, mine rehabilitation, and renewable energy technologies.
- A dual-sector learning centre, delivering university-style education and reskilling programs.
- A mining heritage centre, celebrating industry history while shaping the future.
- Multi-functional collaboration spaces, connecting industry, community, and research.

The report comments that “This hub will create jobs, develop skills, and open pathways for workers and families to stay” in the region.

Prospective Australian Centre for Critical Mineral Intelligence (ACCMI)

There is a high-level partnership arrangement between the RCOE, UQ SMI, CQUniversity (CQU), JCU and the Queensland resource sector to establish ACCMI. ACCMI will be located in Mackay and be anchored around the Critical Minerals Flexi-Lab processing plant and will combine complementary expertise across science, engineering, regional development, and workforce capability to deliver a coordinated, nationally significant platform. It will extend the Flexi-Lab model into a scalable, national framework that leverages Queensland’s unique concentration of expertise and infrastructure.

Appendix 2: Australia-based critical minerals hubs and service centres

This appendix presents a review of existing initiatives related to existing or proposed critical minerals hubs and service centres, including both processing and industrial hubs and R&D hubs in Australia.

A. Established processing and industrial precincts

These are specific government-designated industrial zones, hubs and centres with shared infrastructure for downstream processing or which otherwise lay claim to being a critical minerals hub of some description.

Queensland

Queensland Resources Common User Facility

This is Northern Australia's first "eco-industrial" precinct, positioning Townsville as a leading minerals processing hub. Supplied by the North West Minerals Province (Mount Isa/Cloncurry region), which is one of the world's richest mineral provinces, with resources including copper, vanadium, rare earths, cobalt, and phosphate. the Queensland Resources Common User Facility (QRCUF) built to support the development, extraction, and production of critical minerals from the region. This facility is designed to help projects trial production processes, produce samples, and attract investment. Initial focus is to be on vanadium, then expanding to cobalt and rare earths.

- Location: approximately 40km south of Townsville.
- Focus: Battery materials refining (nickel-cobalt), vanadium, green hydrogen, and advanced manufacturing.
- Key Tenants/Projects: Queensland Pacific Metals (TECH Project - nickel/cobalt), High Purity Quartz Ltd.

Isaac Resources Excellence Precinct

The Isaac Resources Excellence Precinct (IREP) is a major industrial and educational hub currently under development in Moranbah, Queensland. It is designed to serve as a centre for innovation, training, and future-focused industries within the Bowen Basin, helping the region transition beyond traditional coal mining.

- Location: Moranbah, in the Bowen Basin.
- Focus Areas: The IREP is built to drive "positive change" across both resources and renewable energy sectors. It focuses on:

- **Innovation & Research:** Developing new technologies, including low-carbon processes and mine site rehabilitation.
- **Workforce Training:** Reskilling the local workforce for "future-fit" roles in automation, digital technologies, and clean energy.
- **Commercial & Industrial Use:** The precinct includes land for future commercial partners and industrial activities that align with the region's economic diversification goals.
- **Investment:** The project has received significant backing, including up to \$40 million from the Queensland Government's RCIF, which is its largest single investment to date.
- **Partnerships:** It is a collaborative effort involving the Isaac Regional Council, the RCOE, and state/federal government bodies.

New South Wales

Central West NSW Critical Minerals Hub

Australia's first officially declared critical minerals hub.²⁵

- **Location:** Centred on the Dubbo region and the Parkes Special Activation Precinct.²⁶
- **Focus:** Rare earths, zirconium, niobium, hafnium, and cobalt.
- **Key Tenants/Projects:** Australian Strategic Materials (Dubbo Project), various cobalt/nickel exploration projects in the region.

Northern Territory

Middle Arm Sustainable Development Precinct (NT)

A federally supported precinct (via the "Future Made in Australia" policy) designed to pair critical minerals processing with clean energy.

- **Location:** Darwin Harbour.
- **Focus:** Low-emission critical minerals processing, rare earths, and green hydrogen.
- **Key Tenants/Projects:** Tivan (Vanadium/Titanium/Iron), Arafura Rare Earths (Nolans Project downstream processing options), Castile Resources.

Western Australia

²⁵ <https://www.investregional.nsw.gov.au/opportunities/our-globally-competitive-industries/critical-minerals>

²⁶ <https://www.nsw.gov.au/regional-and-primary-industries/regional-business-and-economy-nsw/special-activation-precincts/parkes-activation-precinct>

Kwinana Strategic Industrial Area / Battery and critical minerals hub

A battery and critical minerals hub with advanced operating refineries.²⁷

- Location: ~30km south of Perth.
- Focus: Lithium hydroxide, nickel sulphate, scandium, and battery active materials.
- Key Tenants/Projects: Tianqi Lithium Energy Australia (Lithium Hydroxide Refinery), BHP Nickel West (Nickel Refinery), Cobalt Blue refinery, Alcoa.

Kemerton Strategic Industrial Area

Home to Australia's largest lithium hydroxide processing plant

- Location: 17km north of Bunbury.
- Focus: Lithium hydroxide processing.
- Key Tenants/Projects: Albemarle Lithium Hydroxide Plant.

Mungari Strategic Industrial Area (Goldfields region)

The designated industrial zone for the Goldfields region

- Location: 26km west of Kalgoorlie-Boulder.
- Focus: Rare earths and precious metals processing.
- Key Tenants/Projects: Lynas Rare Earths Processing Facility (the only major commercial rare earth separation plant outside China) is located in the broader Kalgoorlie industrial area.

South Australia

Upper Spencer Gulf / Port Pirie - "Green iron" and copper processing hub

A consortium of companies (Magnetite Mines, Aurizon Holdings, Flinders Port Holdings, and GHD) have formed Green Iron SA with plans to transform Port Pirie into a green iron and copper processing hub. Supported by the State Prosperity Project and Northern Water Supply.

Location: Whyalla, Port Augusta, Port Pirie triangle.

Focus: Copper, magnetite (green iron), and hydrogen.

²⁷

B. Critical minerals R&D hubs

Australian Critical Minerals R&D Hub

This is designed as a national research hub.²⁸ The aim is to fund research that reduces the bar to entry for Australian projects involving extraction and processing of critical minerals, including by building international supply chains. This is because processing has been recognised as a major bottleneck for many Australian projects. The R&D Hub is hosted by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and brings together expertise from leading federal science agencies: the Australian Nuclear Science and Technology Organisation and Geoscience Australia.

The R&D Hub will work with industry to address technical challenges and drive collaborative research across the critical minerals value chain needed to support clean energy and Australia's net zero policy agenda.

The top priorities of the R&D Hub are to:

- scale-up and commercialise critical minerals research and development – including priority research projects on supply chains of strategic significance
- help coordinate, guide and prioritise critical minerals research and development efforts across Australia
- connect critical minerals projects to the technical and research expertise they need
- support strategic international critical minerals collaboration and science diplomacy.

Future Battery Industries Cooperative Research Centre (FBICRC)

- National R&D hub for the battery supply chain.
- Specific Mineral Focus: Battery Minerals (Lithium, Nickel, Cobalt, Manganese, Graphite, Vanadium).
- Key Activity: It manages a portfolio of research projects ranging from the extraction of battery minerals to the manufacture of precursor chemicals and battery cells. It has a significant presence in Western Australia (at the Kwinana Industrial Area) and collaborates with industry players like BHP and Tianqi Lithium.

Isaac Resources Excellence Precinct

Noted above, combines R&D and industry.

Australian Centre for Critical Mineral Intelligence (ACCMI), Mackay - Prospective

- A high-level partnership arrangement has been established between the RCOE, The UQ SMI, CQU, JCU and the Queensland resource sector to establish ACCMI.

²⁸ <https://www.industry.gov.au/news/our-commitment-developing-australias-critical-minerals-sector#new-critical-minerals-rd-hub>; see also <https://www.industry.gov.au/news/our-commitment-developing-australias-critical-minerals-sector>

- This centre will be located in Mackay and be anchored around the Critical Minerals Flexi-Lab processing plant and will combine complementary expertise across science, engineering, regional development, and workforce capability to deliver a coordinated, nationally significant platform. It will extend the Flexi-Lab model into a scalable, national framework that leverages Queensland's unique concentration of expertise and infrastructure.

ARC Centre of Excellence for Enabling Eco-Efficient Beneficiation of Minerals (COE Minerals)

- Hosted primarily by the University of Newcastle and UQ, this centre focuses on the "beneficiation" stage - separating valuable minerals from waste rock - which is a major bottleneck for complex critical mineral deposits.
- Focus: Developing "green" separation technologies to recover minerals like rare earths and tungsten with less water and energy.

Rio Tinto Centre for Future Materials (ANU)

- Located at the Australian National University, this centre was established to solve grand challenges in mineral supply, starting specifically with copper

MinEx CRC

- Exploration (All Critical Minerals): focuses on finding deposits. It develops novel drilling technologies (like coiled tubing drilling) to discover concealed deposits of copper, nickel, and other critical metals

POSCO Critical Minerals R&D Lab

- Lithium & Steel inputs
- A private-sector R&D hub established in Western Australia by South Korean giant POSCO to improve processing technologies for its lithium and clean steel supply chains

Resources Technology and Critical Minerals Trailblazer

- Program led by Curtin University in partnership with The University of Queensland and JCU to encourage the translation and commercialisation of university research, strengthening capability and driving real-world impact within the resources technology and critical minerals sector. The initiative is supported by the Australian Government Department of Education's Trailblazer Universities Program.



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