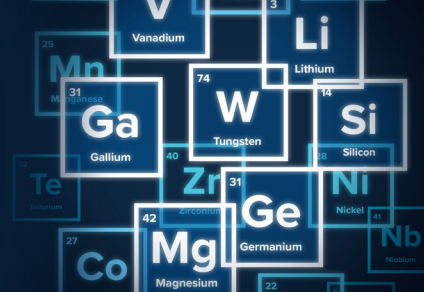


Current Research Projects Overview



Science, Research and Innovation

Accelerate the development of Australia's critical mineral resource endowment. Support energy, defence and technology industries. Build diverse, secure and sustainable supply chains with international partners.

VISION

MISSION

STRATEGY

Delivering Technical Breakthroughs

Build capabilities and downstream industries onshore. Help de-risk commercial projects and attract international investment and partnerships. Provide trusted information and advice to Government and leadership to Australia's R&D community.

The Australian Critical Minerals R&D Hub is hosted by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and was established in October 2022. Under this initiative, Australia's leading science agencies, Australia's Nuclear Science and Technology Organisation (ANSTO), Geoscience Australia, and CSIRO, are working collaboratively to develop urgent technical solutions needed to achieve the vision of the Critical Minerals Strategy 2023-2030 and Future Made in Australia plan.

LEADING SCIENCE AGENCIES

Commonwealth Scientific and Industrial Research Organisation (CSIRO)

Geoscience Australia

Australian Nuclear Science and Technology Organisation (ANSTO)



Capability

Scaling-up and commercialising critical minerals research and development.

Connection

Connecting the critical minerals R&D ecosystem, linking industry to R&D solutions, informing policy.

Collaboration

Supporting strategic international critical minerals collaboration.

KEY STRATEGIC PILLARS

Working with the Critical Minerals Office at the Department of Industry, Science and Resources (DISR), the Hub projects were developed in response to Australia's policy objectives and strategic priorities.

Value-adding/creating new industries: Develop sovereign processing technologies and create Intellectual Property needed to develop Australia's critical minerals resource endowment and industrial base, de-risk projects and attract potential foreign investment/partners.

Fill priority R&D gaps that would not be solved by the market in the immediate future, which are critical to Australia's national interests and the energy transition.

Develop R&D needed to secure the most concentrated international supply chains for materials essential to modern technologies that are most vulnerable to disruption.

Develop innovative ESG solutions that meet expectations of trading partners.

Increase the knowledge base needed to support data-driven decision-making on mining and processing of critical minerals ore bodies in Australia.

OBJECTIVES

PROJECTS

Research projects are collaborative, with all three agencies contributing their expertise and scientific infrastructure to deliver technical breakthroughs.

The Hub is also building strategic international R&D partnerships that will accelerate the development of technical solutions and promote Australian innovation with international investors. Current projects are:

- Mineral Criticality Assessment
- High Purity Silica/Quartz (HPS/HPQ)
- High Purity Alumina (HPA)
- Accelerating the Development of Australia's Rare Earth Resources
- Extracting Mineral By-Products
- Producing High Tech Metals and Materials



PROJECT

Accelerating the Development of Australia's Rare Earth Resources

GOAL

Unlock Australia's potential to develop cost competitive and sustainable new sources of heavy rare earths from lower grade deposits and diversify supply chains of the technologies dependent on Rare Earth Elements (REE).

HUB OBJECTIVES



CHALLENGE/ OPPORTUNITY

- REE are essential components of permanent magnets, catalysts, and metal alloys to name just a few advanced uses. REE demand is growing rapidly due to being required for clean energy technologies.
- Global supply chains are highly concentrated, particularly for magnets, and subject to export controls and production restrictions. Australia is well positioned to meet growing demand and help diversify supply chains.
- REE are typically extracted from hard rock and mineral sand deposits using high energy and very corrosive processes. Most of these deposits are dominated by the light rare earths rather than the more valuable heavy rare earths.
- In contrast, REE hosted in lower grade clay deposits are typically enriched in heavy REE, and can be extracted using more cost effective and environmentally sustainable techniques. Australia has untapped potential in these types of ore deposits.
- The three agencies are bringing the strengths of value chain scientific cooperation to this challenge to unlock Australia's potential to become a significant alternative supplier of heavy rare earths.



PROJECT STATUS

- Geoscience Australia has completed a comprehensive national review and assessment of priority lower grade REE deposit types, and is now developing mineral systems models and potential maps for these deposits.
- CSIRO has provided detailed characterisation and analysis of samples to support Geoscience Australia's assessment.
- ANSTO has benchmarked 'conventional' processing techniques and made significant progress in developing a novel advanced separation flowsheet.
- A significant milestone will be the construction of a purpose-built pilot plant for processing low grade ores from Australian deposits. The facility is being constructed at ANSTO in Lucas Heights and should be available to industry in 2026.
- All outputs will be available to industry in 2026, and will help de-risk commercial opportunities for developing these deposits.



SUPPLY CHAIN

EXPLORATION | DISCOVERY

EXTRACTION

MID-STREAM PROCESSING

MANUFACTURING