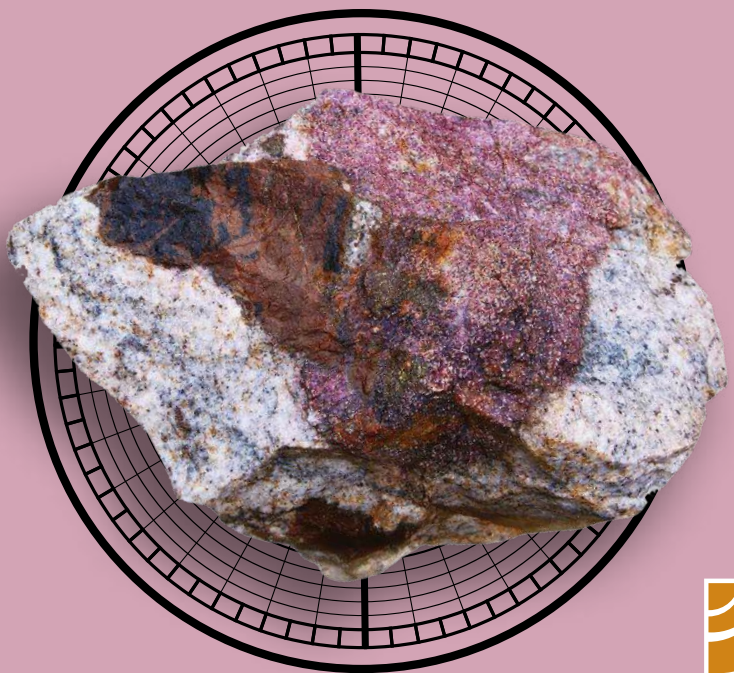
Minerals Council of Australia's

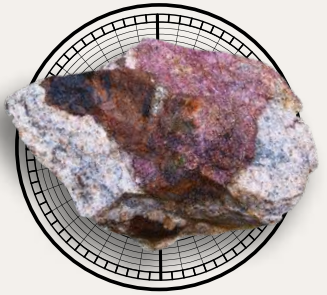
GOOD GUIDE to

Critical minerals



YOUR ESSENTIAL GUIDE TO CRITICAL MINERALS

Minerals Council of Australia



Acknowledgement of Country

The MCA acknowledges the Traditional Owners of the land and waters on which our industry operates. We pay our respects to Elders past, present and emerging, and recognise the enduring connection Aboriginal and Torres Strait Islander peoples have to Country across Australia.

Minerals Council of Australia
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Resourcing Tomorrow
Australian Mining
minerals.org.au

Foreword

Australia has a unique responsibility to lead world efforts to build new and secure supply chains for critical minerals and rare earths. As the oldest continent on Earth, Australia has enviable geology and the world's richest deposits of critical minerals. And Australia has a mining sector that has built our solid reputation as a stable and reliable supplier of resources and energy to the world.

We have the skilled workers, world-leading labour and environmental standards, and well-established supply chains for traditional resources and energy. We are working with our international partners to ensure Australia's critical minerals support the global energy transition, high technology manufacturing and crucial defence and national security applications.

The Albanese Government is committed to building the critical minerals sector in Australia. We are providing direct support through the $1.2 billion Critical Minerals Strategic Reserve, the $4 billion Critical Minerals Facility and $17 billion worth of production tax credits. And we have made a multi-billion dollar long-term investment in geoscience to help drive exploration and discoveries. No government has done more to advance the resources sector of Australia.

The Hon Madeleine King MP
Minister for Resources
Minister for Northern Australia
Member for Brand

Minerals Council of Australia's GOOD GUIDE to Critical minerals

"We are working with our international partners to ensure Australia's critical minerals support the global energy transition, high technology manufacturing and crucial defence and national security applications."

The Hon Madeleine King MP
Minister for Resources
Minister for Northern Australia
Member for Brand

Resourcing tomorrow

The pivotal next chapter in Australia's resources story

Australia stands at a critical crossroads. Our nation's enviable catalogue of minerals essential to global emissions reduction, defence capabilities and advanced technologies is our natural advantage. Strengthening partnerships with countries such as the US, Japan, South Korea and the EU confirms Australia's role as a trusted partner in global supply chains.

The industry is working with government to fully realise its minerals potential through initiatives to lift productivity, expand domestic processing capability and create a more competitive and predictable regulatory environment. Investor confidence will be strengthened through fair, well coordinated project approval processes, while expanding geological data will bring new discoveries to life.

The MCA's *Good Guide to Critical Minerals* is your pocket compass as our nation embarks on this next wave of resource potential. It contains everything you need to know about the critical and strategic minerals you'll be hearing a lot about over the next few years. We're excited about what this next chapter holds for Australia, and the chance to turn our nation's natural advantage into long-term opportunity for all Australians.

Tania Constable
Chief Executive Officer
Minerals Council of Australia

Minerals Council of Australia's GOOD GUIDE to
Critical minerals

Minerals Council of Australia's GOOD GUIDE to Critical minerals

"Australia's rich geology, strong mining and processing capabilities, and reputation for reliability and transparency make us a trusted global supplier. We are well-positioned to meet the needs of long-standing strategic partners in Asia, the US and the EU."

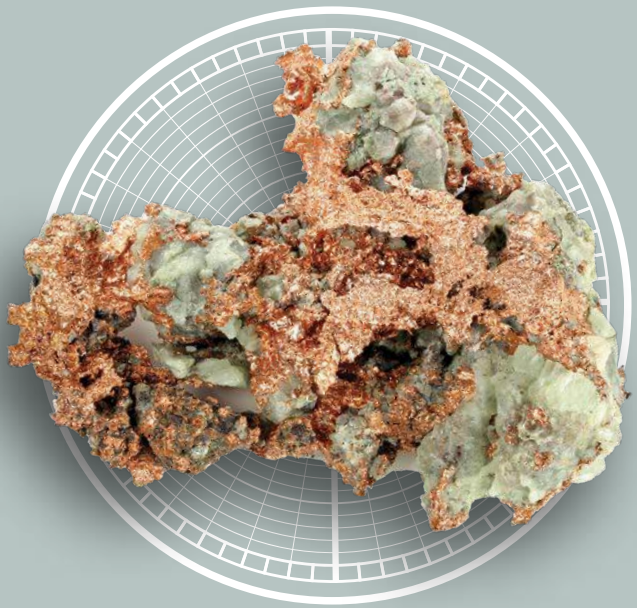
Tania Constable
Chief Executive Officer
Minerals Council of Australia

Contents

Welcome

Mineral Profiles

Minerals Council of Australia's GOOD GUIDE to Critical minerals



GOOD GUIDE to Critical minerals

Minerals Council of Australia's

How to use the GOOD GUIDE

Shaded sections in the visual diagram below explain a different part of each page. Each mineral profile includes its critical status, key applications, basic chemistry, geographical deposits, trade insights and leading global producers.

MINERAL STATUS

Either ***critical*** or ***strategic***, as it appears on the Australian Government's official lists.

GLOBAL LISTS

Other key international ***critical*** lists the mineral appears on (list abbreviations over page).

APPLICATIONS

Key applications across energy, technology, defence and industrial sectors.

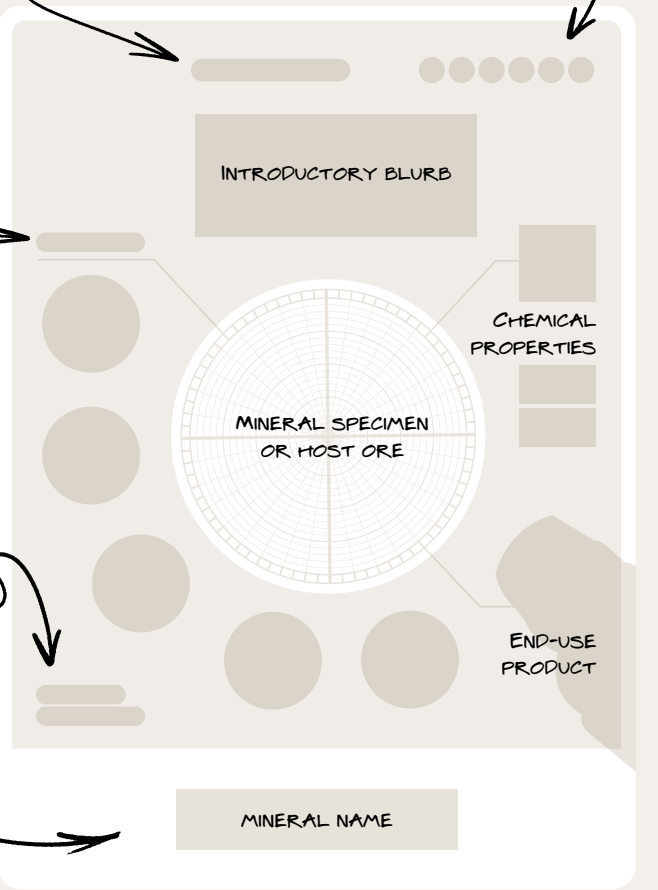
CORE SECTOR

Page colour identifies the core sector dependent on secure mineral supply.

(Colour key over page).

MINERAL NAME

Mineral profiles appear alphabetically throughout (*Cornerstone Commodities* excepted – refer Contents).



GLOBAL LISTS

International critical minerals lists referenced in the Good Guide were chosen based on Australia's trade ties, manufacturing capacity and global demand trends.

US **U.S. List of Critical Minerals 2025**
U.S. Department of the Interior, 7 Nov 2025. Viewed via usgs.gov

JA **Japan List of Critical Minerals 2024**
Ministry of Economy, Trade and Industry, 2024. Viewed via jogmec.go.jp

SK **South Korea Critical Minerals List 2023**
Ministry of Trade, Industry and Energy, 2023. Viewed via iea.org

EU **EU List of Critical Raw Materials 2023**
European Commission, 16 Mar 2023. Viewed via ec.europa.eu

UK **UK List of Critical Minerals 2024**
British Geological Survey, 28 Nov 2024. Viewed via bgs.ac.uk

CA **Canada List of Critical Minerals 2024**
Natural Resources Canada, 10 Jun 2024. Viewed via canada.ca

IN **India List of Critical Minerals 2023**
Ministry of Mines (India), 24 Jul 2023. Viewed via mines.gov.in

CORE SECTOR

Page colour denotes the core sector most dependent on secure supply of a mineral. Most minerals, metals and compounds, however, have broad cross-sector applications.

Batteries & Energy Storage

Renewable Energy

Defence & Aerospace

Advanced Manufacturing

Cornerstone Commodities

Australian Government

Australia's Critical Minerals and Strategic Materials Lists

The Australian Government assigns ***critical*** or ***strategic*** status to certain minerals essential for the energy transition, defence capabilities and advanced technologies. These lists are periodically updated by the government in response to supply chain vulnerabilities and global strategic, technological and economic changes.

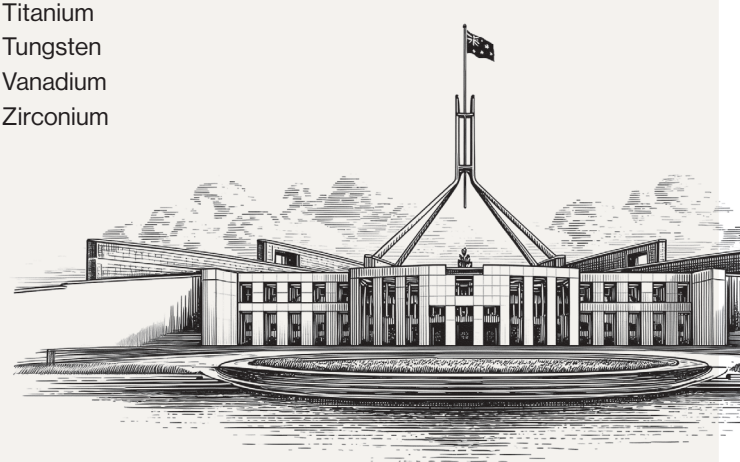
Critical minerals

Antimony
Arsenic
Beryllium
Bismuth
Chromium
Cobalt
Fluorine
Gallium
Germanium
Graphite
Hafnium
High-purity alumina
Indium
Lithium
Magnesium
Manganese
Molybdenum
Nickel
Niobium
Platinum (PGE)^
Rare earths (REE)*
Rhenium
Scandium
Selenium
Silicon
Tantalum
Tellurium
Titanium
Tungsten
Vanadium
Zirconium

Strategic materials

Aluminium
Copper
Phosphorus
Tin
Zinc

^ * See over page for expanded list of minerals within these groups.



Accurate as of March 2026

More information: Updates to these lists are reported through the Australian Government's Critical Minerals Office (Department of Industry, Science and Resources).

*

Rare earth elements
(REE)

Rare earth elements comprise the 15 lanthanides plus yttrium and sometimes, scandium. Though abundant, REE are difficult to extract and process, making supply complex and strategically important.

Lanthanum	Promethium	Thulium
Cerium	Europium	Ytterbium
Praseodymium	Gadolinium	Lutetium
Neodymium	Dysprosium	Yttrium
Terbium	Holmium	Scandium
Samarium	Erbium	

^

Platinum group elements
(PGE)

Platinum group elements are rare, corrosion-resistant metals prized for their high industrial value. They are crucial for catalysts, clean technologies, electronics and emerging hydrogen industries.

Platinum	Rhodium	Osmium
Palladium	Ruthenium	Iridium

Worth noting

Some of the listed critical minerals are primarily recovered as by-products of the mineral processing of major commodities (such as zinc, copper, lead, nickel and aluminium).

Arsenic	Hafnium	Selenium
Bismuth	High-purity alumina	Tellurium
Gallium	Indium	
Germanium	Rhenium	

Critical minerals

A quick refresher

What makes a mineral critical?

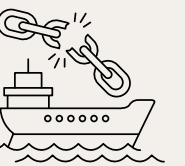
A mineral becomes 'critical' when it is essential for industry but vulnerable to supply disruption. Its value comes from powering energy, technology, defence and healthcare systems. Governments assess criticality based on import dependence, market concentration, processing bottlenecks and potential interruptions that could affect the economy or national security.

Why do they matter now?

Critical minerals are powering the clean energy transition, from electric vehicles to renewable energy storage. They also underpin defence, space exploration, digital infrastructure and advanced manufacturing. Surging global demand, supply chain shocks and geopolitical tensions have made secure access a strategic priority, highlighting how these minerals are essential to modern life.

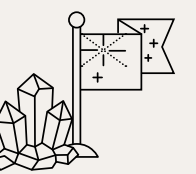
Supply chain vulnerabilities

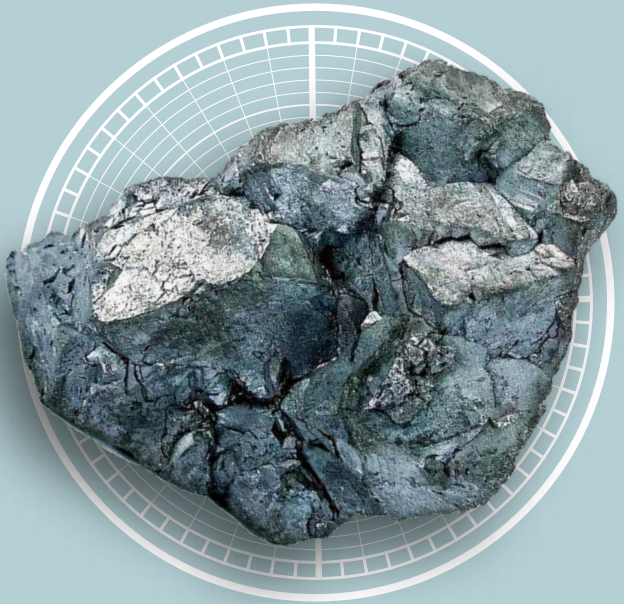
Critical minerals flow from exploration and mining through processing, refining and manufacturing. Supply is fragile due to concentrated processing and limited refining capacity, infrastructure limits and regulatory pressures. Bottlenecks in processing or downstream stages often create global vulnerabilities, making diversified, secure supply chains vital for industry, innovation and national security.



Australia's strategic advantage

Australia hosts rich critical mineral resources and growing processing potential. Industry and government are working together to back exploration, downstream investment and international partnerships. Policy frameworks, incentives and research initiatives are essential to attract investment, develop domestic capability and position Australia as a secure, strategic global supplier.





GOOD GUIDE to Critical minerals

Minerals Council of Australia's

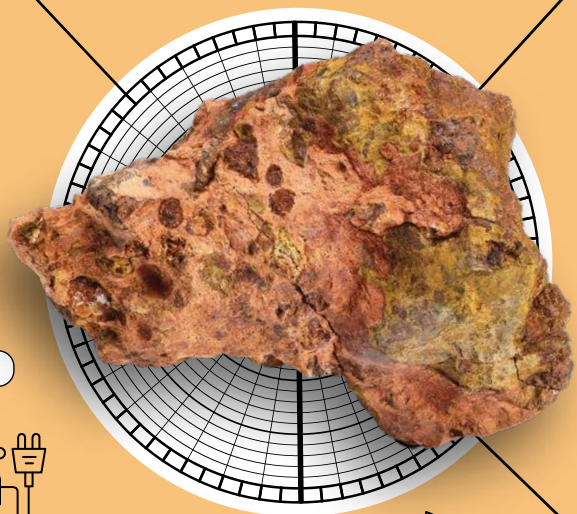
STATUS **STRATEGIC**

US SK EU UK CA

Aluminium is a lightweight, silvery metal essential to everything from electricity transmission lines to public transport to home construction. Its critical role in renewable energy technologies make it a strategically important mineral.

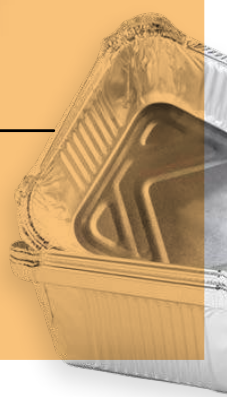
Applications

- Solar panels
- Wind turbines
- Electric vehicles
- Food packaging
- Construction



13
Al

Med
Heat tolerance
High
Conductivity
Med
Reactivity



Renewable
Energy

Aluminium

Resourcing tomorrow

Aluminium

Aluminium comes from bauxite. Bauxite is refined into alumina and then smelted into aluminium. Australia is the world's 7th largest producer of aluminium.

Bauxite resources and production, Australia

Geoscience Australia, *Australia's Identified Mineral Resources 2025*

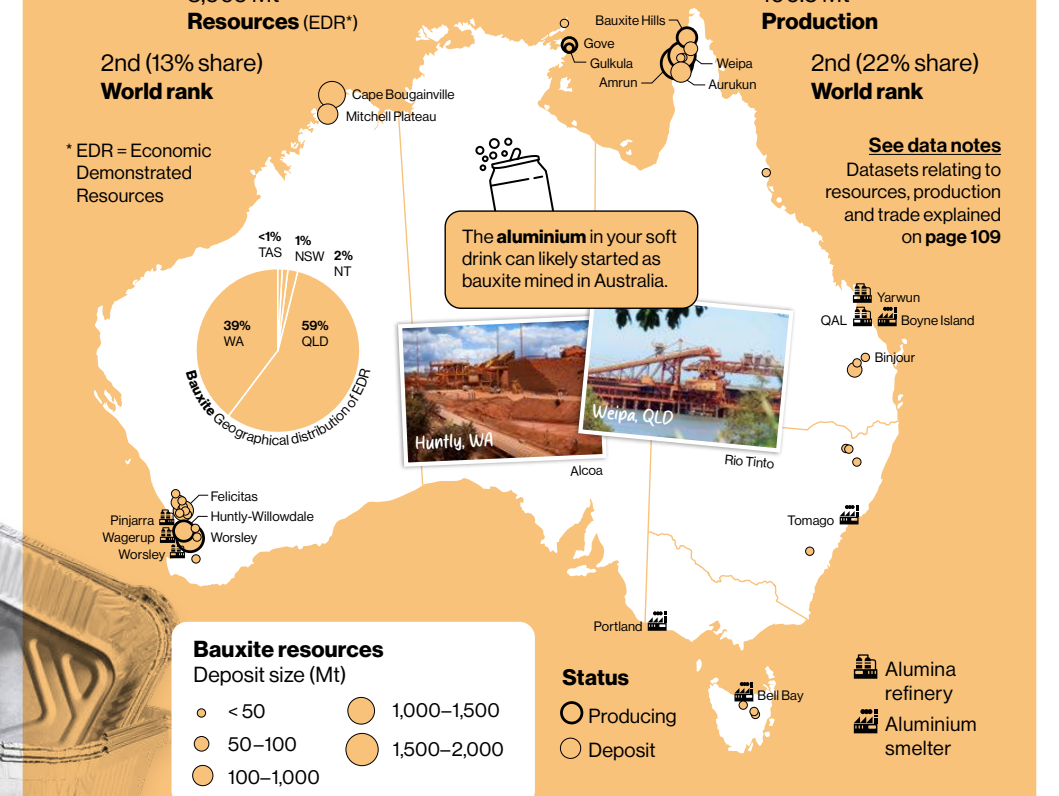
3,969 Mt
Resources (EDR*)

2nd (13% share)
World rank

100.5 Mt
Production

2nd (22% share)
World rank

* EDR = Economic Demonstrated Resources



See data notes
Datasets relating to resources, production and trade explained on **page 109**

Bauxite resources
Deposit size (Mt)

- < 50
- 50–100
- 100–1,000
- 1,000–1,500
- 1,500–2,000

Status

- Producing
- Deposit

- Alumina refinery
- Aluminium smelter

Top global producers: USGS *(aluminium smelter production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

Production (2025[e])	1. China	2. India	3. Russia	4. Canada
	45,000 kt	4,200 kt	3,900 kt	3,300 kt

STATUS **CRITICAL**

US JA SK EU UK CA IN

Antimony is a silvery-white metalloid valued for alloys and flame resistance. Its strategic role in defence and energy technologies, coupled with limited global supply and few substitutes, make it a critical mineral.

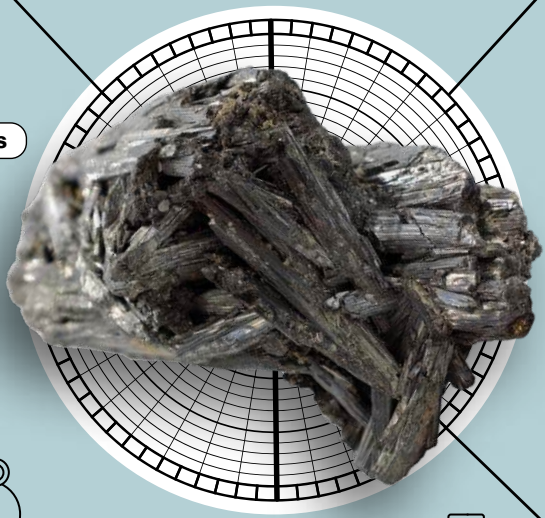
Applications

51
Sb

High
Heat tolerance

Low
Conductivity

Med
Reactivity



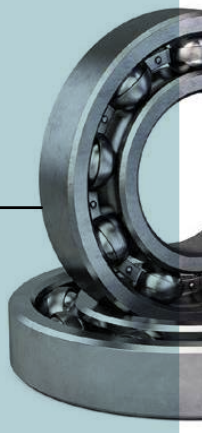
Armoured vehicles

Fire retardant

Night vision goggles

PV cell glass

Batteries



Defence & Aerospace

Antimony

Resourcing tomorrow

Antimony

Antimony commonly occurs in stibnite within hydrothermal, gold-bearing quartz veins, with strong prospectivity across Victoria, New South Wales and Western Australia.

Antimony resources and production, Australia

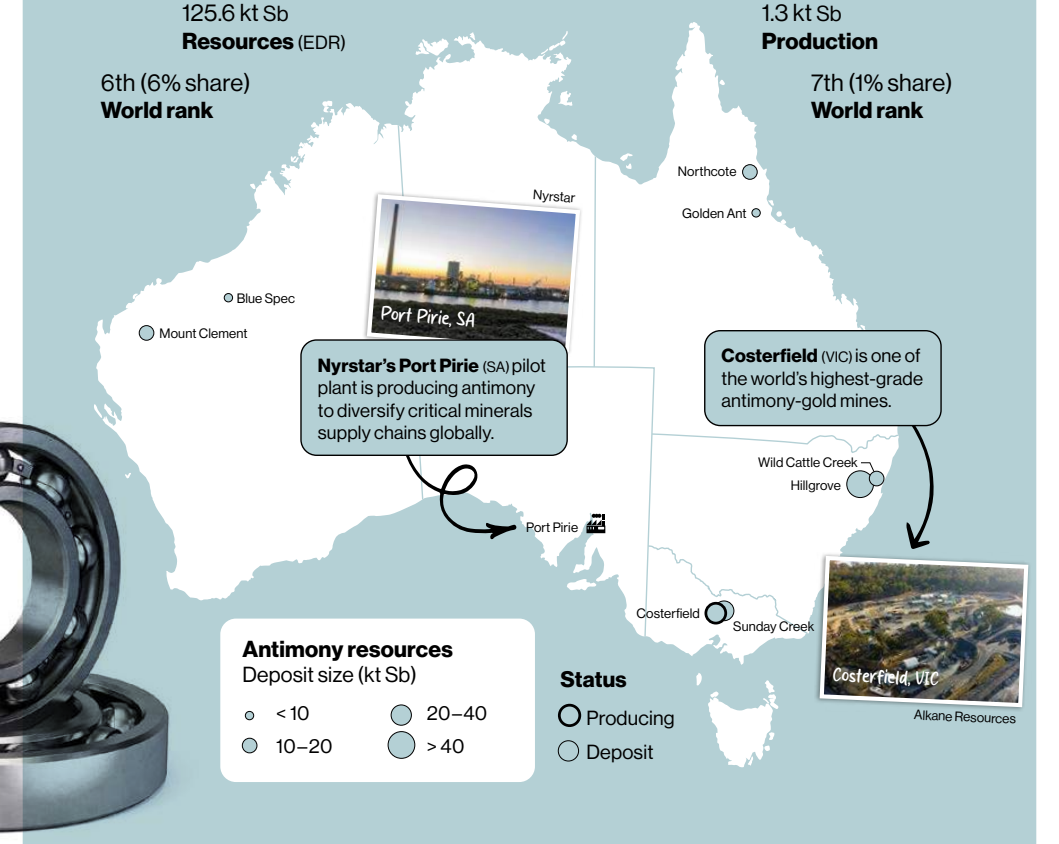
Geoscience Australia, *Australia's Identified Mineral Resources 2025*

125.6 kt Sb
Resources (EDR)

6th (6% share)
World rank

1.3 kt Sb
Production

7th (1% share)
World rank



Nyrstar's Port Pirie (SA) pilot plant is producing antimony to diversify critical minerals supply chains globally.

Costerfield (VIC) is one of the world's highest-grade antimony-gold mines.

Antimony resources
Deposit size (kt Sb)

- < 10
- 10–20
- 20–40
- > 40

Status

- Producing
- Deposit

Top global producers: USGS *(mine production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

	1. China	2. Russia	3. Tajikistan	4. Bolivia
Production (2025[e])	40 kt	32 kt	22 kt	5 kt
Reserves	*830 kt*	*350 kt*	*60 kt*	*310 kt*

Note: USGS global production and reserves data may differ from Geoscience Australia's domestic data. See data notes page 109.

STATUS **CRITICAL**

US EU

Arsenic is a brittle metalloid essential in high-performance microelectronics, optoelectronics and specialised alloys. Arsenic's rarity and irreplaceable role in advanced manufacturing make it a critically important mineral.

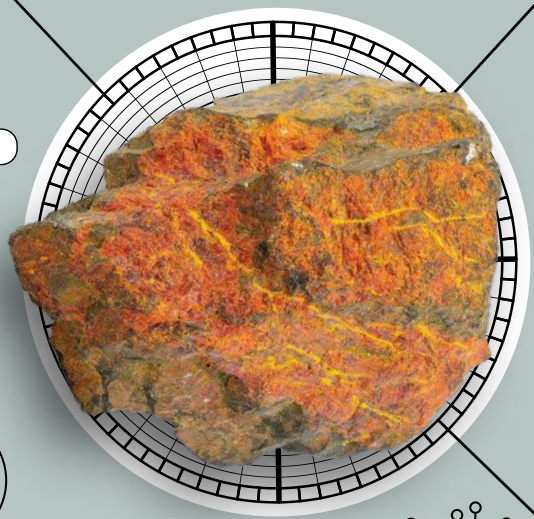
Applications

33
As

Low
Heat tolerance

Low
Conductivity

High
Reactivity



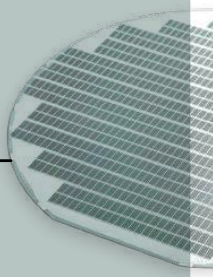
Semiconductors

Lead alloys

Radar systems

Manufacturing

5G network



Advanced
Manufacturing

Arsenic

Resourcing tomorrow

Arsenic

High-purity arsenic compounds can be produced and used in Australia for specialised industrial uses. Arsenic mining, however, ended in the 1950s due to toxicity.

Australia's resource

Arsenic occurs in minerals such as arsenopyrite. In Australia it is mainly recovered as a regulated by-product of gold and copper processing.

Global supply chain

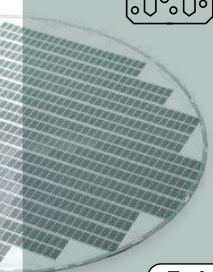
Global arsenic production is concentrated in Peru, China and Morocco, with major trade to the EU, US and China for chemicals, lasers and semiconductors.

The opportunity

Australia can leverage its base metal and gold deposits and world-class safety record to strengthen domestic capability and global supply chain security.

Arsenic: Downstream opportunity map

How Australia can capture value in the global arsenic supply chain.



Raw mineral processing

Extract arsenic from gold, copper and other sulfide ores to produce high-purity arsenic trioxide and related compounds for industrial use.

Alloy production

Produce arsenic-containing alloys such as lead-arsenic (PbAs) and gallium arsenide (GaAs)for semiconductors, lead batteries and corrosion-resistant materials.

Specialty compounds

Manufacture semiconductors, pesticides (where permitted), specialty coatings and chemical compounds for industrial and technological applications.

End-of-life recovery

Recover arsenic from industrial scrap, electronic components and alloy residues to reduce waste, protect the environment and supplement supply.

Future capabilities

Develop certified industrial chemicals, safer compounds and novel semiconductor applications to support advanced manufacturing.

STATUS **CRITICAL**

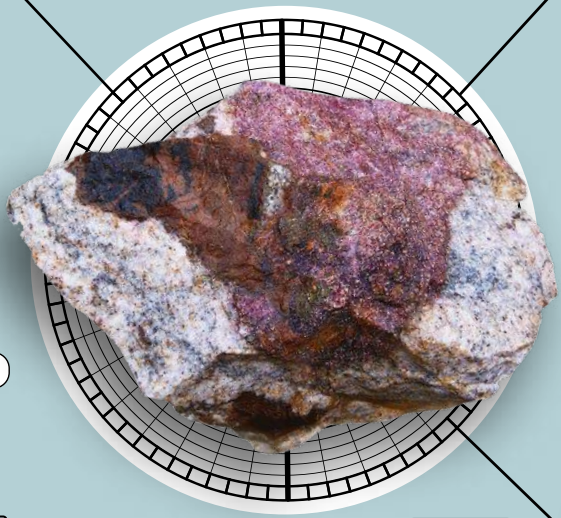
US JA EU IN CA

Beryllium is a strong, lightweight metal used in high speed aircraft components, aerospace structures and precision instruments. Limited production makes it a strategically critical mineral for defence and advanced technology applications.

Applications

- Fighter jets
- Nuclear energy
- Space telescope
- Electronics
- X-rays

Defence & Aerospace



4 **Be**

High **Heat tolerance**

High **Conductivity**

Low **Reactivity**

Beryllium

Resourcing tomorrow

Beryllium

Beryllium occurs mainly in beryl and bertrandite, formed in pegmatites during magmatism. Across Australia, there are known deposits and increasing exploration interest.

Australia's resource

Exploration programs for beryllium are on the rise across Australia with new discoveries, as well as former beryllium mines, in NSW, SA and WA.

Global supply chain

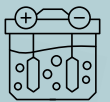
Beryllium production has largely been concentrated in the United States (Spor Mountain, Utah) although output is growing in China, Brazil and Mozambique.

The opportunity

Australia can develop its pegmatite beryllium resources, attract refining and alloy investment and create high-value exports for the beryllium market.

Beryllium: Downstream opportunity map

How Australia can capture value in the global beryllium supply chain.



Refine beryllium-bearing minerals into BeO, $BeCl_2$, or BeF_2 to provide purified feedstock for alloys and high-tech products.

Raw mineral processing

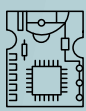
Alloy production

Produce beryllium-copper and other specialty alloys to supply high-performance aerospace, defence and other precision applications.

Specialty components

Fabricate BeO ceramics and thermal/electronic components for semiconductors, satellites, and advanced clean-energy technologies.

End-of-life recovery



Recover beryllium from scrap, retired components, and electronics to create secondary supply and reduce environmental impact.

Develop new processing methods, test materials, and certify products to enhance performance and safety.

Future capabilities

STATUS **CRITICAL**

US JA SK EU UK CA IN

Bismuth is a brittle, low-toxicity metal used in semiconductors, solders and precision alloys. Its unique thermal and electrical properties, limited supply and specialised applications make it a critically important mineral.

Applications

- Fire sprinklers
- Radiation shield
- Shape memory alloys
- Wound dressing
- Cosmetics

83
Bi

Low
Heat tolerance

Low
Conductivity

Low
Reactivity

Advanced
Manufacturing

Bismuth

Resourcing tomorrow

Bismuth

Bismuth occurs mainly in minerals such as bismuthinite, formed in hydrothermal systems and is commonly associated with gold, copper and lead deposits.

Australia's resource

Exploration activity is assessing bismuth resource potential in NSW, SA and WA, and projects in the NT are investigating bismuth production pathways.

Global supply chain

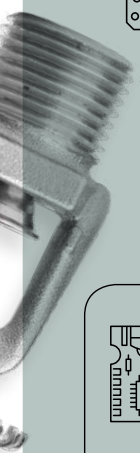
Global bismuth supply is concentrated in China, with minor production from Laos, South Korea and Japan, creating potential supply risks for industry.

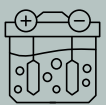
The opportunity

Australia can boost mining recovery of bismuth as a by-product in existing polymetallic deposits and explore feasibility of downstream processing.

Bismuth: Downstream opportunity map

How Australia can capture value in the global bismuth supply chain.





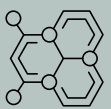
Refine bismuth from mined by-products to produce high-purity metal ready for alloys, chemicals and specialty applications.

Raw mineral processing

Alloy production

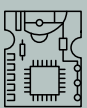
Manufacture low-melting and fusible alloys, plus bismuth-tin solders, to supply fire safety devices, precision casting and electronics markets.

Specialty compounds



Produce bismuth compounds for pharmaceuticals, cosmetics, pigments and lead-free alternatives to support high-value electronics and clean technology industries.

End-of-life recovery



Recover bismuth from solders, electronics and lead-replacement products to reduce waste and provide a sustainable secondary supply.

Develop new alloys, chemical applications and certified products to improve performance and expand niche Australian manufacturing opportunities.

Future capabilities

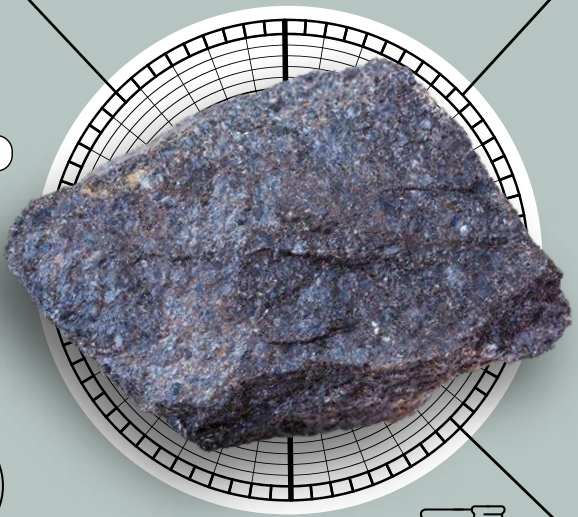
STATUS **CRITICAL**

US JA SK CA

Chromium is a hard, lustrous metal essential for stainless steel, superalloys and corrosion-resistant coatings. Its unique strength, heat resistance and limited high-grade sources make it a critical mineral for industrial applications.

Applications

- **Stainless steel**
- **Refractories**
- **Jet engines**
- **Pigments & dyes**
- **Catalysts**

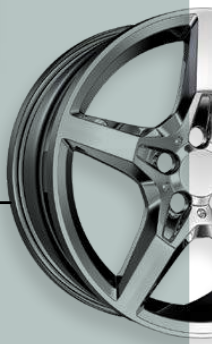


24
Cr

Very high
Heat tolerance

Med
Conductivity

Med
Reactivity



Advanced Manufacturing

Chromium

Resourcing tomorrow

Chromium

Chromium occurs mainly in chromite, concentrated in magmatic systems. Australia hosts significant resources, particularly in WA's Pilbara and Yilgarn regions.

Australia's resource

Australia has significant potential for the discovery of new chromium deposits. New economic resources (748 kt) of chromium were recorded in 2024.*

Global supply chain

Chromium production is dominated by South Africa, with lesser volumes from Turkey, Kazakhstan and India, underpinning global stainless steel demand.

The opportunity

Australia can develop its chromite deposits, support ferrochrome and alloy production, and contribute high-value exports for industrial markets.

Chromium: Downstream opportunity map

How Australia can capture value in the global chromium supply chain.

Raw mineral processing

Refine chromite ore into ferrochrome and chromium chemical compounds to supply stainless steel production and industrial alloys.

Alloy production

Produce high-carbon and low-carbon ferrochrome alloys for stainless steel, superalloys and wear-resistant materials.

Specialty components

Manufacture chromium-based coatings, plating and refractory materials for corrosion protection, aerospace and high-temperature industrial applications.

End-of-life recovery

Recover chromium from stainless steel scrap and industrial waste to reduce raw material demand and support circular supply chains.

Future capabilities

Develop new and advanced alloy formulations, corrosion-resistant coatings and certified refractory products to expand high-value applications.

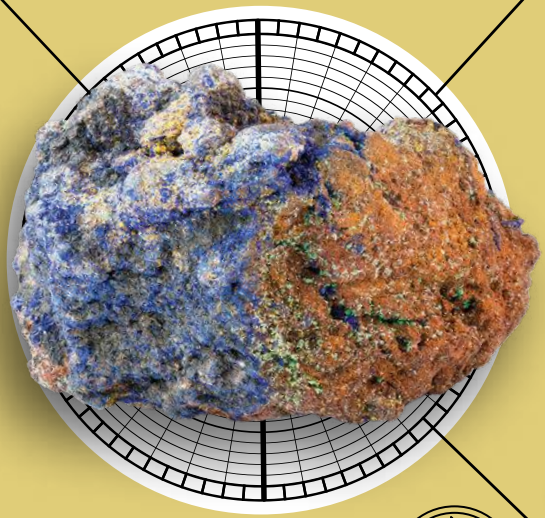
* Geoscience Australia, *Australia's Identified Mineral Resources 2025*, Canberra 2026

STATUS **CRITICAL**

US JA SK EU UK CA IN

Cobalt is a hard, lustrous metal prized for its heat resistance and magnetic properties. Essential in rechargeable batteries and clean energy systems, its concentrated supply and growing demand make it a globally critical mineral.

Applications



EV batteries

Gas turbines

Grid-scale storage

Wind turbines

Jet engines

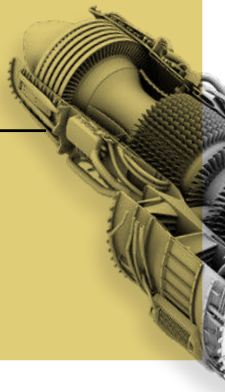
Batteries & Energy Storage

27
Co

High
Heat tolerance

Med
Conductivity

Med
Reactivity



Cobalt

Resourcing tomorrow

Cobalt

Cobalt occurs mainly in nickel and copper deposits. Australia has the world's 2nd largest economic resources, but production falls below potential.

Cobalt resources and production, Australia

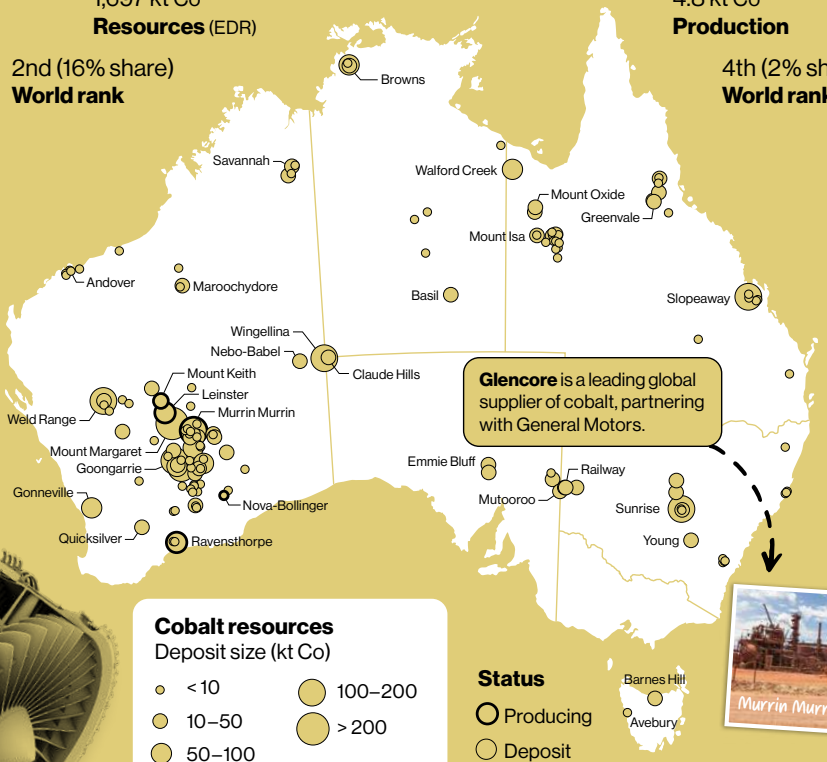
Geoscience Australia, *Australia's Identified Mineral Resources 2025*

1,697 kt Co
Resources (EDR)

2nd (16% share)
World rank

4.8 kt Co
Production

4th (2% share)
World rank

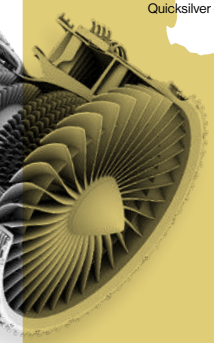


Cobalt resources
Deposit size (kt Co)

- < 10
- 10–50
- 50–100
- 100–200
- > 200

Status

- Producing
- Deposit



Glencore

Top global producers: USGS *(mine production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

	1. Congo	2. Indonesia	3. Russia	4. Madagascar
Production (2025[e])	230 kt	44 kt	7.7 kt	3.9 kt
Reserves	*6,000 kt*	*760 kt*	*800 kt*	*100 kt*

Note: USGS global production and reserves data may differ from Geoscience Australia's domestic data. See data notes page 109.

STATUS **STRATEGIC**

US JA SK EU CA IN

Copper is a highly conductive, reddish-brown metal essential for clean energy technologies. Its critical role in global decarbonisation, combined with a shortage of new copper mines, make it a strategically important mineral.

Applications

- Data centres
- Electric vehicles
- Critical infrastructure
- Artificial intelligence
- Housing

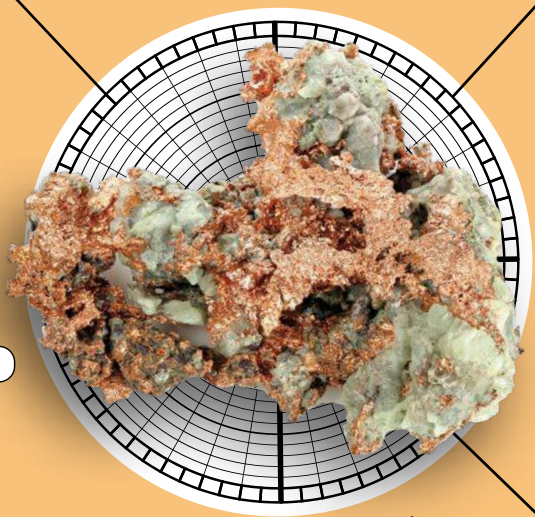
Renewable Energy

29
Cu

High **Heat tolerance**

Very high **Conductivity**

Low **Reactivity**



Copper

Resourcing tomorrow

Copper

Copper occurs in chalcopyrite from magmatic-hydrothermal systems, often with gold and molybdenum. South Australia holds around 66 per cent of Australia's copper.

Copper resources and production, Australia

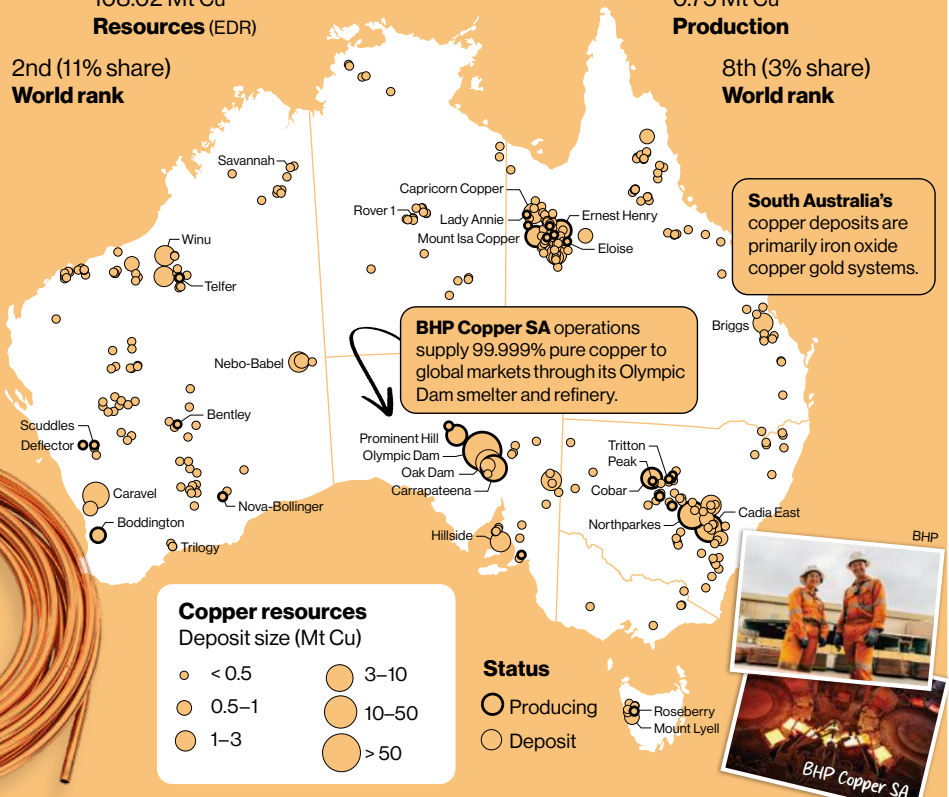
Geoscience Australia, *Australia's Identified Mineral Resources 2025*

108.02 Mt Cu
Resources (EDR)

2nd (11% share)
World rank

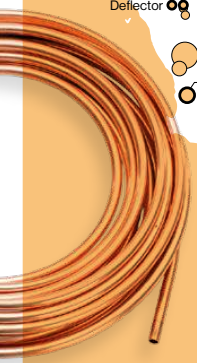
0.75 Mt Cu
Production

8th (3% share)
World rank



South Australia's copper deposits are primarily iron oxide copper gold systems.

BHP Copper SA operations supply 99.999% pure copper to global markets through its Olympic Dam smelter and refinery.



Top global producers: USGS *(mine production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

	1. Chile	2. Congo	3. Peru	4. China
Production (2025[e])	5.3 Mt	3.2 Mt	2.7 Mt	1.8 Mt
Reserves	*180 Mt*	*80 Mt*	*85 Mt*	*41 Mt*

Note: USGS global production and reserves data may differ from Geoscience Australia's domestic data. See data notes page 109.

STATUS **CRITICAL**

US JA EU CA

Fluorine is a highly reactive, pale yellow gas used in aluminium production, high-performance polymers and specialised electronics. Its unique properties, limited supply and essential role in advanced manufacturing make it a critical mineral.

Applications

Refrigerants

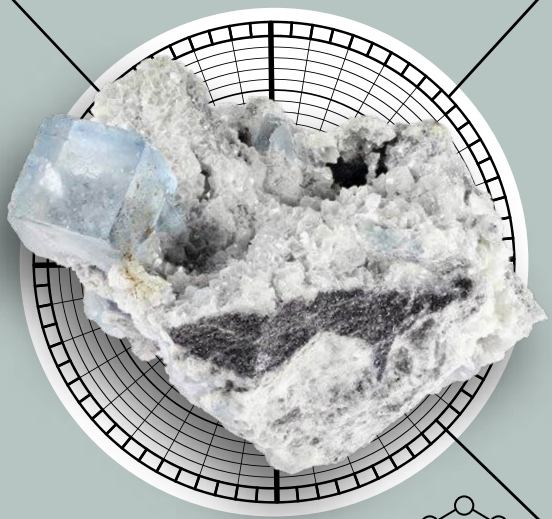
Metallurgy

Semiconductors

Pharmaceuticals

Fluorochemicals

Advanced Manufacturing



9
F

Low **Heat tolerance**

Low **Conductivity**

Very high **Reactivity**

Fluorine

Resourcing tomorrow

Fluorine

Fluorine mainly occurs as fluorite in hydrothermal systems, often linked to lead, phosphate, zinc and REE mineralisation. Australia has no current production or processing.

Fluorine resources and production, Australia

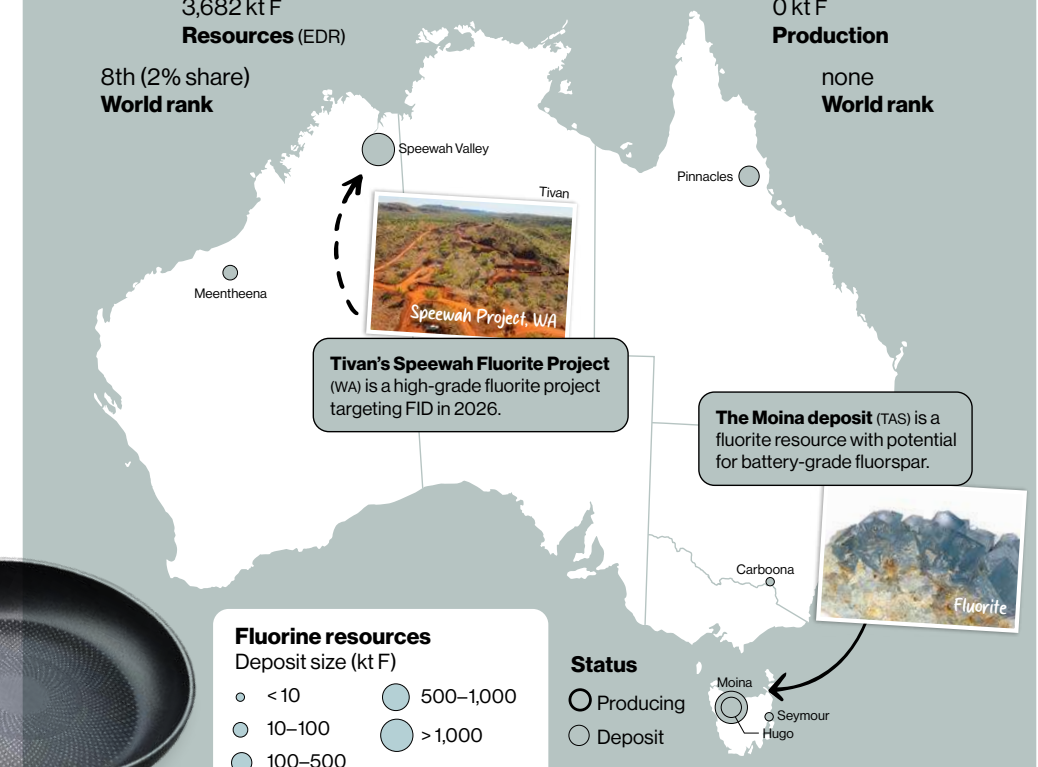
Geoscience Australia, *Australia's Identified Mineral Resources 2025*

3,682 kt F
Resources (EDR)

8th (2% share)
World rank

0 kt F
Production

none
World rank



Tivan's Speewah Fluorite Project (WA) is a high-grade fluorite project targeting FID in 2026.

The Moina deposit (TAS) is a fluorite resource with potential for battery-grade fluorspar.

Top global producers: USGS *(fluorspar mine production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

	1. China	2. Mexico	3. Mongolia	4. South Africa
Production (2025[e])	6,000 kt	1,500 kt	1,500 kt	410 kt
Reserves	*110,000 kt*	*68,000 kt*	*34,000 kt*	*41,000 kt*

Note: USGS global production and reserves data may differ from Geoscience Australia's domestic data. See data notes page 109.

STATUS **CRITICAL**

US JA SK EU UK CA IN

Gallium is a soft, silvery metal essential for semiconductors, radar systems and high-performance electronics. Its critical role in advanced and emerging technologies, combined with limited production, make it a critical mineral.

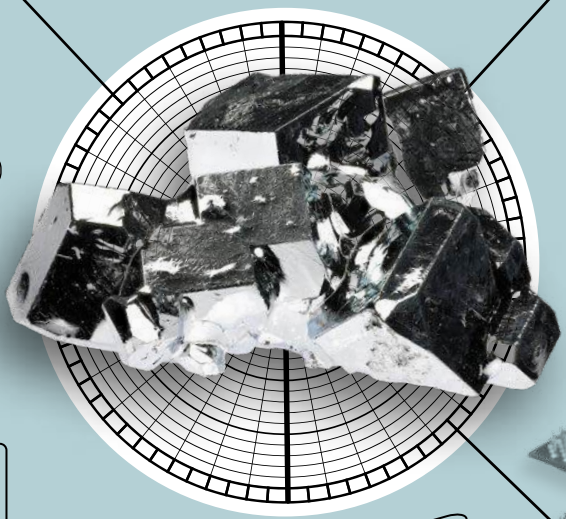
Applications

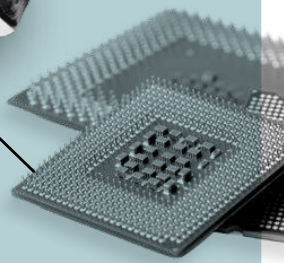
31
Ga

Low
Heat tolerance

Med
Conductivity

Med
Reactivity





Space station

Solar panels

Semiconductors

Radiotherapy

LEDs

Defence & Aerospace

Gallium

Resourcing tomorrow

Gallium

Gallium is recovered as a by-product during bauxite and zinc ore processing. Australia has significant gallium potential, particularly in northern and Western Australia.

Australia's resource

Australia's bauxite deposits host gallium in trace amounts. Emerging processing capacity is backed by strategic partnerships with the US, Japan and others.

Global supply chain

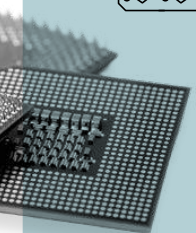
China produces around 98% of the world's gallium, creating concentrated supply chains for industries supplying critical electronics and semiconductors.

The opportunity

Australia can leverage its bauxite to develop gallium processing and refining and semiconductor-grade production to supply high-value markets.

Gallium: Downstream opportunity map

How Australia can capture value in the global gallium supply chain.



Raw mineral processing

Extract gallium as a by-product from bauxite or zinc processing to produce gallium metal for electronics and optoelectronics, such as imaging, lasers and LiDAR.

Alloy production

Manufacture gallium-based alloys, such as gallium-indium-tin, for specialty electronics, thermal interfaces and other low melting point applications.

Specialty compounds

Produce high-purity gallium arsenide (GaAs) and gallium nitride (GaN) for advanced semiconductors, LEDs, high-frequency electronics and solar cells.

End-of-life recovery

Recover gallium from LEDs, photovoltaic cell modules and electronic scrap to create secondary supply and reduce reliance on imported sources.

Future capabilities

Develop new semiconductor materials, high-efficiency LEDs and certified Ga-based devices to support advanced manufacturing capabilities.

STATUS **CRITICAL**

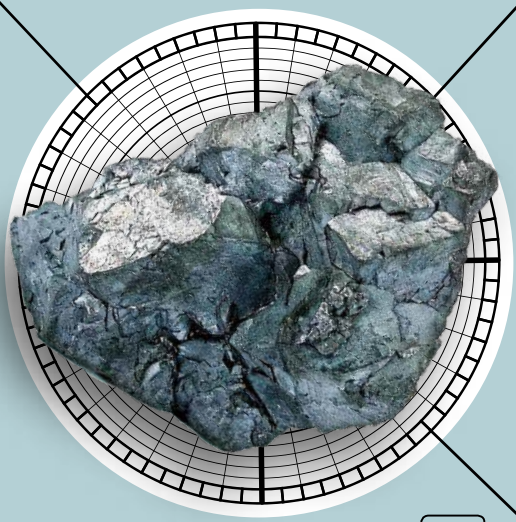
US JA SK EU UK CA IN

Germanium is a hard, grey metalloid used in advanced electronics. Its limited production, essential role in high precision technologies, limited global suppliers and few viable alternatives make it a mineral of critical importance.

Applications

32
Ge

Low
Heat tolerance
Med
Conductivity
Low
Reactivity



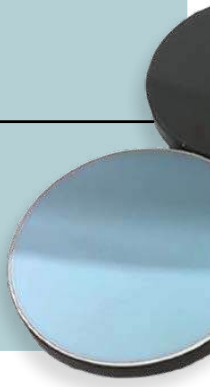
Radar systems

Fibre optics

Thermal cameras

Satellite solar cells

Data centres



Defence & Aerospace

Germanium

Resourcing tomorrow

Germanium

Germanium occurs as a trace element in zinc-lead deposits and some bauxites and coals, and is mainly recovered as a by-product during base metal processing.

Australia's resource

Australia has significant potential for germanium resources. The focus is on economically viable extraction from existing operations, such as zinc.

Global supply chain

China dominates global germanium processing and refining, with limited alternative sources. This exposes high tech industries to supply risks.

The opportunity

Australia can recover germanium from zinc and lead mining and build niche refining capacity to supply optics, semiconductor and defence markets.

Germanium: Downstream opportunity map

How Australia can capture value in the global germanium supply chain.

Raw mineral processing

Refine germanium from zinc and lead ores or coal by-products to produce high-purity germanium metal and compounds for electronics and optics.

Alloy production

Produce germanium-containing alloys for infrared optics, fiber optics and semiconductor substrates used in electronics and space applications.

Specialty components

Manufacture germanium wafers, optical lenses, infrared sensors and fiber optic components for telecommunications, aerospace and solar applications.

End-of-life recovery

Recover germanium from fiber optic scrap, solar panels and infrared devices to provide secondary supply and reduce reliance on imported material.

Future capabilities

Develop advanced germanium-based semiconductors, infrared materials and certified optical components to enable high-tech manufacturing capabilities.

STATUS **CRITICAL**

US JA SK EU UK CA IN

Graphite is a soft, lustrous form of carbon essential for lithium-ion battery anodes. Its high conductivity, limited natural deposits and growing demand for battery and storage technologies make it a globally critical mineral.

Applications

Battery anode

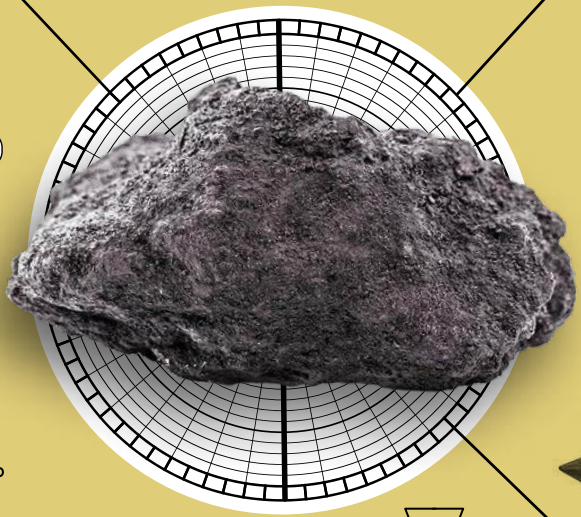
Brake linings

Nuclear energy

Lubricants

Crucibles

Batteries & Energy Storage

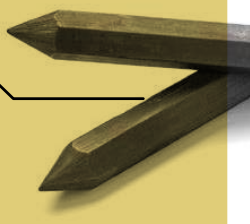


6
C

Very High **Heat tolerance**

High **Conductivity**

Low **Reactivity**



Graphite

Resourcing tomorrow

Graphite

Graphite forms from carbon-rich sediments, most commonly through metamorphism. Australia hosts substantial graphite resources, with emerging exploration activity.

Graphite resources and production, Australia

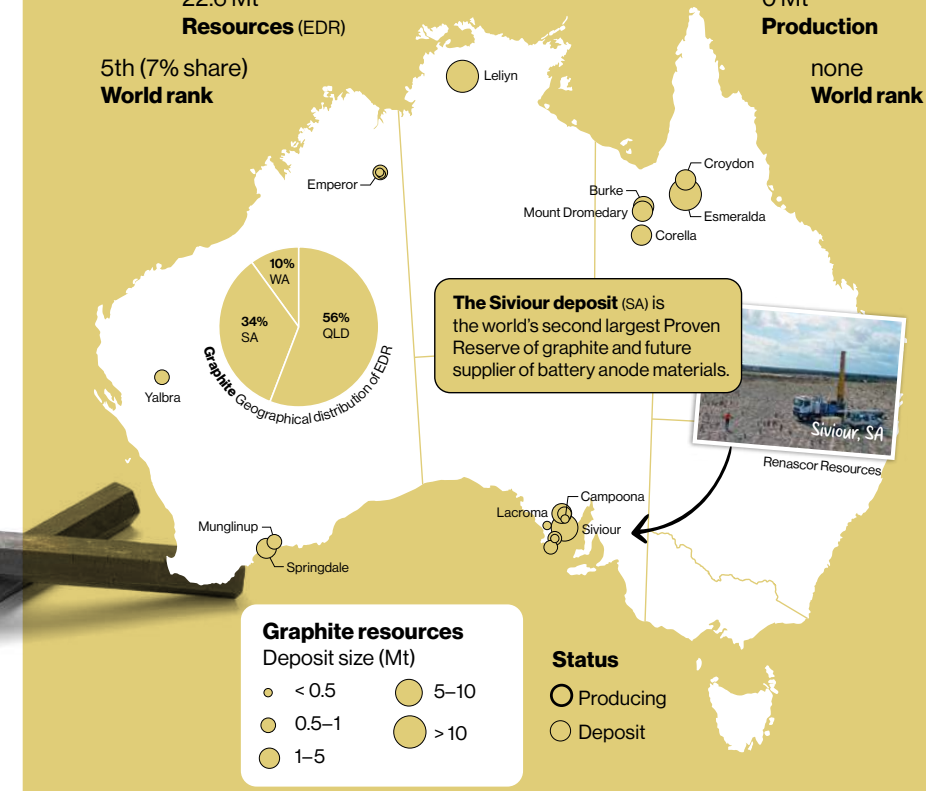
Geoscience Australia, *Australia's Identified Mineral Resources 2025*

22.6 Mt
Resources (EDR)

5th (7% share)
World rank

0 Mt
Production

none
World rank



Top global producers: USGS *(mine production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

	1. China	2. Madagascar	3. Brazil	4. Mozambique
Production (2025[e])	1,400 kt	80 kt	65 kt	60 kt
Reserves	*100 Mt*	*27 Mt*	*74 Mt*	*25 Mt*

Note: USGS global production and reserves data may differ from Geoscience Australia's domestic data. See data notes page 109.

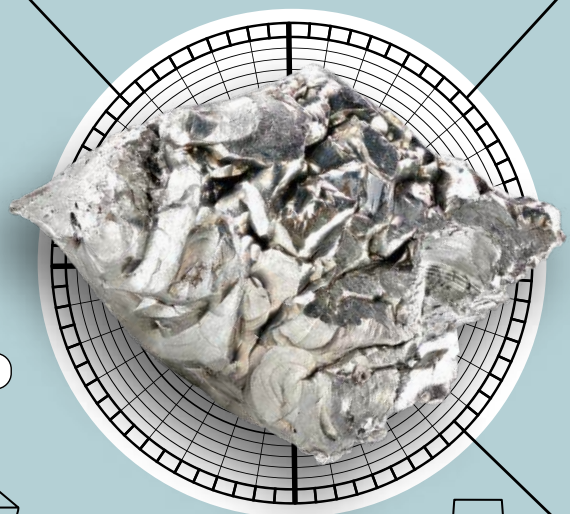
STATUS **CRITICAL**

US JA EU UK IN

Hafnium is a dense, corrosion-resistant metal used in advanced defence and energy technologies thanks to its extreme heat resistance and ability to absorb neutrons. Limited availability makes it a critically important mineral.

Applications

- Jet engines
- Heat shielding
- Nuclear submarines
- Defence & Aerospace
- Chemical processing
- Electronics

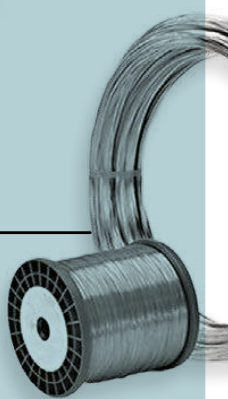


72
Hf

High
Heat tolerance

Med
Conductivity

Low
Reactivity



Hafnium

Resourcing tomorrow

Hafnium

Hafnium occurs in zirconium minerals and is often concentrated in mineral sands. Australia's key project is New South Wales' Dubbo polymetallic resource.

Australia's resource

Australia hosts hafnium in zirconium-bearing deposits across Australia, with potential for economically viable extraction from existing zircon operations.

Global supply chain

Production of pure hafnium metal is concentrated in just four countries – France, the United States, China and Russia, making global supply chains fragile.

The opportunity

Australia can recover hafnium from its zirconium deposits and develop high-temperature alloy production with an eye to supplying global markets.

Hafnium: Downstream opportunity map

How Australia can capture value in the global hafnium supply chain.

Raw mineral processing

Separate hafnium from zirconium in zirconium ores to produce high-purity hafnium metal and specialty compounds for advanced high-tech applications.

Alloy production

Produce hafnium-containing superalloys (i.e. nickel- and niobium-based) for aerospace, nuclear reactors and high-temperature components.

Specialty components

Manufacture hafnium carbide, hafnium oxide and control rods for nuclear reactors, plasma cutting, heat-resistant coatings and high-temperature jet engine components.

End-of-life recovery

Recover hafnium from aerospace components, spent control rods and industrial scrap to provide secondary supply and reduce raw material dependency.

Future capabilities

Develop advanced hafnium alloys, ceramic coatings, and certified nuclear-grade materials to bolster Australia's high-tech manufacturing capabilities.

STATUS **CRITICAL**

High-purity alumina (HPA) is a refined, white crystalline aluminium oxide compound composed of aluminium and oxygen. Its exceptional purity, thermal stability and chemical inertness make it critical for next-generation electronics.

Applications

LED lighting

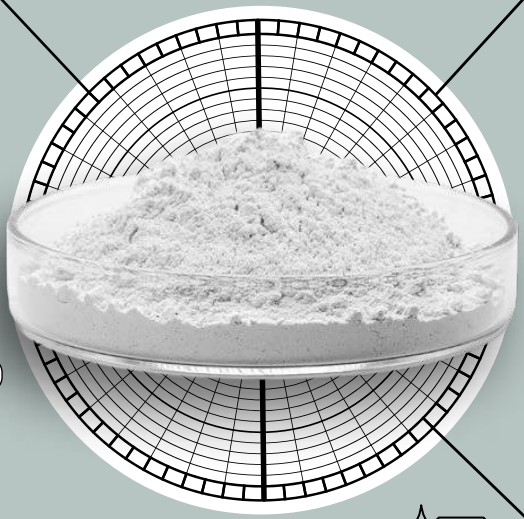
Semiconductors

Lithium-ion batteries

Biomedical implants

Advanced ceramics

Advanced Manufacturing



Al_2O_3

≥ 99.99%

Very high
Heat tolerance

Low
Conductivity

Low
Reactivity

High-purity alumina

Resourcing tomorrow

High-purity alumina

High-purity alumina (HPA) is commonly produced from high-purity aluminium metal. Other feedstocks could include kaolin clay, aluminium hydroxide and bauxites.

Australia's resource

Australia can leverage its aluminium industry to produce HPA. The CSIRO is developing energy and cost-efficient technologies to support HPA production.

Alpha HPA (QLD) is delivering Australia's first large-scale high-purity alumina production facility in Gladstone.

High-purity alumina: Downstream opportunity map

How Australia can capture value in the global HPA supply chain.

Build on existing industry

Leverage its world-leading bauxite and alumina sectors to enter the HPA market by shifting from smelting to low-carbon processing of waste streams and raw materials.

HPA production

Convert alumina precursors (alumina hydrate or aluminium metal) into high-purity powder via multi-stage leaching, purification, crystallisation and calcination.

Specialty components

Use Australian HPA to produce sapphire wafers, battery coatings and advanced technical ceramics – components requiring ultra-high thermal and chemical stability.

End-of-life recovery

Recycle and recover HPA from industrial waste, solid waste and by-product streams to provide a high-value, circular alternative to producing virgin HPA.

Future capabilities

Develop energy and cost-efficient technologies to support HPA production in Australia and explore advanced ceramic manufacturing capacity.

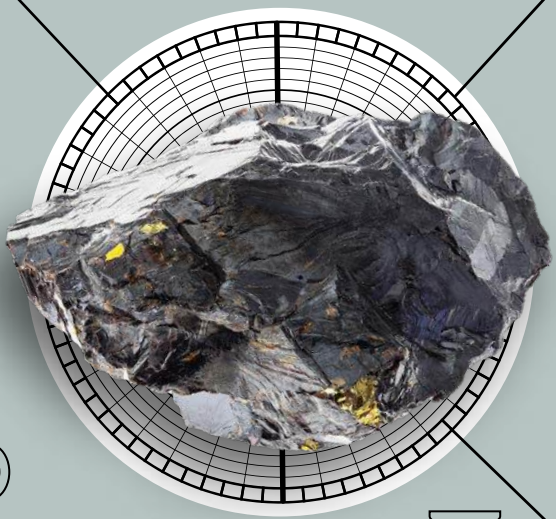
STATUS **CRITICAL**

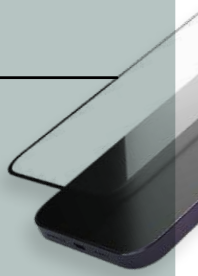
US JA SK UK CA IN

Indium is a soft, silvery metal valued for its ability to form transparent, conductive compounds. Its exceptional conductivity, malleability and vital role in next generation technologies make it a critically important manufacturing mineral.

Applications

- **Touchscreens**
- **Solar panels**
- **Optical sensors**
- **Semiconductors**
- **Fire sprinklers**





49
In

Low
Heat tolerance

High
Conductivity

Low
Reactivity

Advanced
Manufacturing

Indium

Resourcing tomorrow

Indium

Indium occurs as a trace element in zinc and lead deposits, formed in hydrothermal systems. Australia's zinc resources provide strong potential for indium recovery.

Australia's resource

Australia is a net importer of indium, mostly from China, but companies are actively exploring high-grade silver-indium deposits, as well as indium from mine waste.

Global supply chain

China leads global indium production, with smaller outputs from South Korea and Japan, creating supply chain risks for electronics and solar manufacturers.

The opportunity

Australia can recover indium as a zinc and lead by-product and explore alloy production to support high-value electronics manufacturing globally.

Indium: Downstream opportunity map

How Australia can capture value in the global indium supply chain.

Raw mineral processing

Recover indium as a by-product from zinc and lead ores to produce high-purity indium metal and compounds for electronics and coatings.

Alloy production

Produce indium-tin alloys for soldering, flexible electronics, transparent conductive films and low melting point industrial applications.

Specialty components

Manufacture indium tin oxide (ITO) for touchscreens and solar panels, indium phosphide (InP) for optical fiber light sources and low-melting-point alloys for high performance electronics.

End-of-life recovery

Recover indium from LCDs, electronic scrap and photovoltaic modules through hydrometallurgical processes to create secondary supply.

Future capabilities

Research new recovery technologies to leverage existing deposits, and develop new ITO films and advanced alloys to support next gen electronics and clean tech.

STATUS **CRITICAL**

US JA SK EU UK CA IN

Lithium is a soft, silvery metal essential for the rechargeable batteries that power everything from consumer electronics to large-scale energy storage. Lithium's pivotal role in the clean energy transition makes it a mineral of critical importance.

Applications

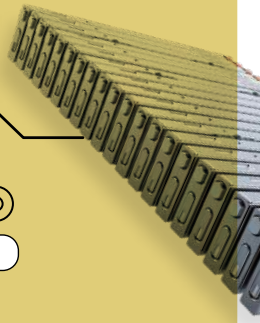
EV batteries

Home batteries

Industrial drying

Medical implants

Lubricants



3
Li

Low
Heat tolerance

High
Conductivity

Very High
Reactivity

Batteries &
Energy Storage

Lithium

Resourcing tomorrow

Lithium

Lithium is produced mainly from hard-rock spodumene pegmatites and globally from brines. Australia is the world's leading lithium producer, driven by hard rock mining.

Lithium resources and production, Australia

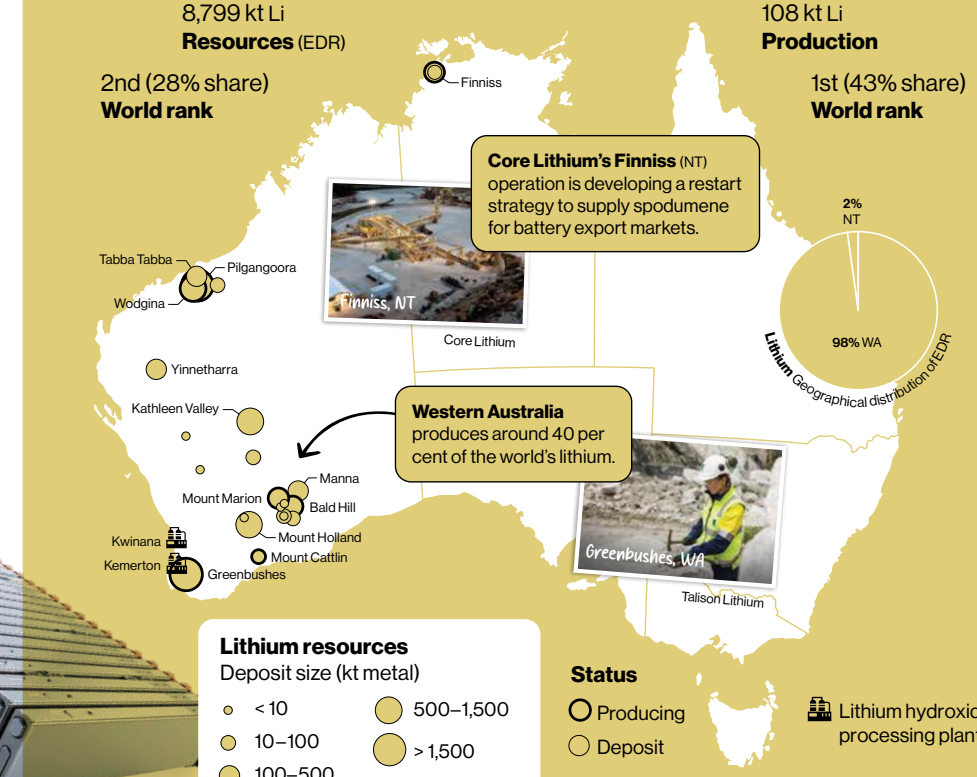
Geoscience Australia, *Australia's Identified Mineral Resources 2025*

8,799 kt Li
Resources (EDR)

2nd (28% share)
World rank

108 kt Li
Production

1st (43% share)
World rank



Core Lithium's Finniss (NT) operation is developing a restart strategy to supply spodumene for battery export markets.

Western Australia produces around 40 per cent of the world's lithium.

Lithium resources
Deposit size (kt metal)

- < 10
- 10–100
- 100–500
- 500–1,500
- > 1,500

Status

- Producing
- Deposit

Lithium hydroxide processing plant

Top global producers: USGS *(mine production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

	1. Australia	2. China	3. Chile	4. Zimbabwe
Production (2025[e])	92 kt	62 kt	56 kt	28 kt
Reserves	*8,400 kt*	*4,600 kt*	*9,200 kt*	*500 kt*

Note: USGS global production and reserves data may differ from Geoscience Australia's domestic data. See data notes page 109.

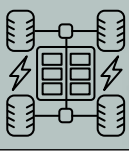
STATUS **CRITICAL**

US JA SK EU UK CA

Magnesium is a lightweight, silvery metal used in aerospace alloys and electronics casings. Its combination of strength, low density and essential role in advanced manufacturing make it a critically important mineral.

Applications

Fuselage

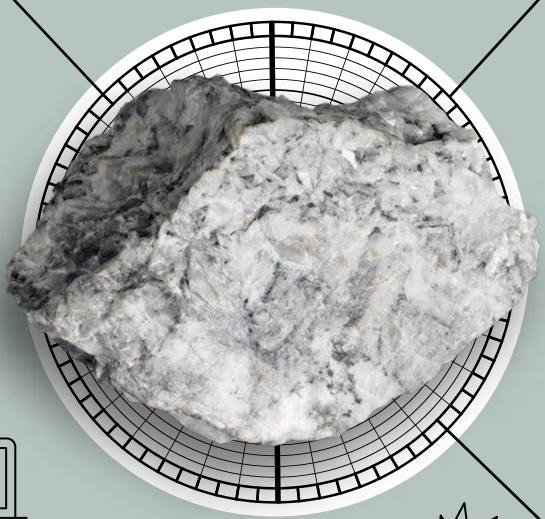


EV chassis

Laptop bodies

Crucibles

Flares

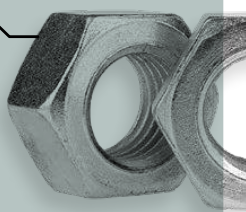


12
Mg

Med
Heat tolerance

Med
Conductivity

High
Reactivity



Advanced
Manufacturing

Magnesium

Resourcing tomorrow

Magnesium

Magnesium occurs in magnesite formed through sedimentary processes. Australia hosts widespread magnesite resources and strong magnesium potential.

Magnesite resources and production, Australia

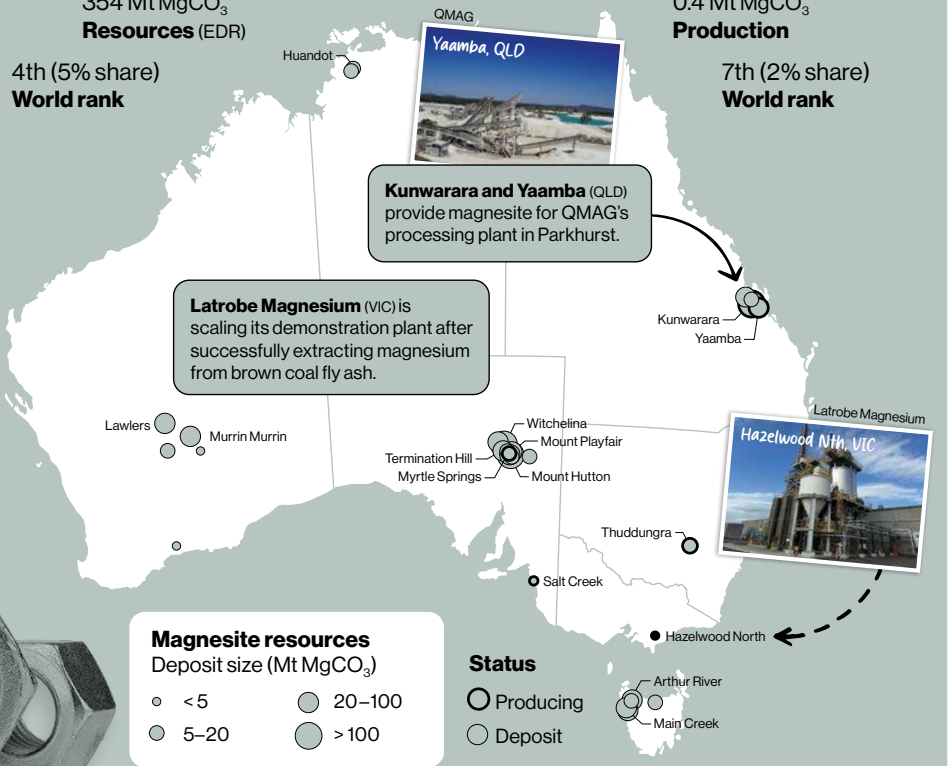
Geoscience Australia, *Australia's Identified Mineral Resources 2025*

354 Mt $MgCO_3$
Resources (EDR)

4th (5% share)
World rank

0.4 Mt $MgCO_3$
Production

7th (2% share)
World rank



Top global producers: USGS *(mine production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

	1. China	2. Brazil	3. Russia	4. Turkey
Production (2025[e])	12.7 Mt	1.8 Mt	1.7 Mt	1.6 Mt
Reserves	*700 Mt*	*200 Mt*	*2,300 Mt*	*110 Mt*

Note: USGS global production and reserves data may differ from Geoscience Australia's domestic data. See data notes page 109.

STATUS **CRITICAL**

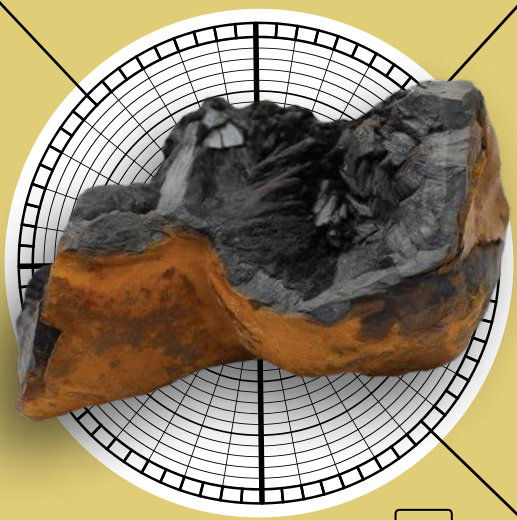
US JA SK EU UK CA

Manganese is a hard, brittle metal essential for strengthening alloys and in the manufacture of lithium-ion battery cathodes. Concentrated global supply and growing demand underscores its status as a critical mineral.

Applications

- **EV batteries**
- **Steelmaking**
- **Permanent magnets**
- **Fertiliser**
- **Colourant**

Batteries & Energy Storage

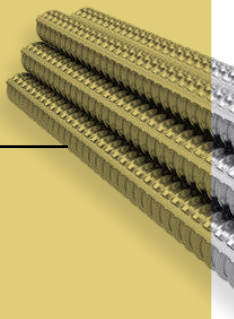


25
Mn

High **Heat tolerance**

Low **Conductivity**

High **Reactivity**



Manganese

Resourcing tomorrow

Manganese

Manganese occurs mainly in sedimentary deposits. Australia hosts world-class manganese resources, including at Groote Eylandt in the Northern Territory.

Manganese resources and production, Australia

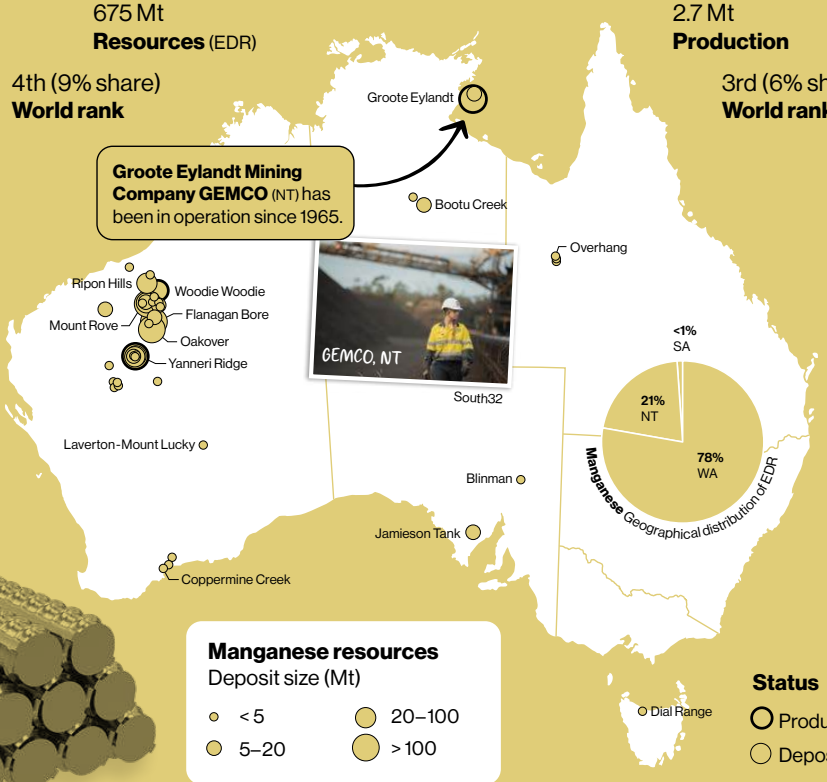
Geoscience Australia, *Australia's Identified Mineral Resources 2025*

675 Mt
Resources (EDR)

4th (9% share)
World rank

2.7 Mt
Production

3rd (6% share)
World rank



Top global producers: USGS *(mine production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

	1. South Africa	2. Gabon	3. Ghana	4. Australia
Production (2025[e])	7.6 Mt	5.0 Mt	2.0 Mt	1.6 Mt
Reserves	*550 Mt*	*61 Mt*	*13 Mt*	*580 Mt*

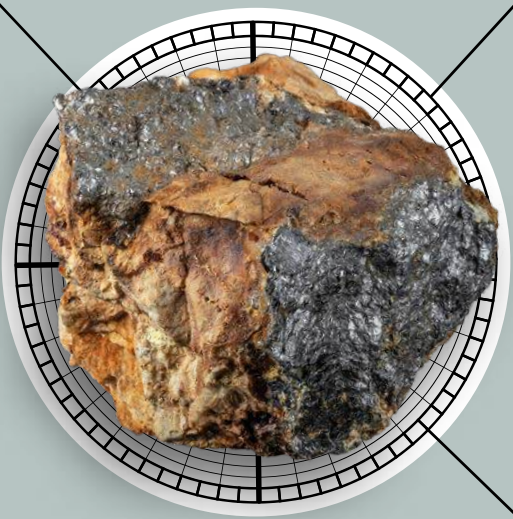
Note: USGS global production and reserves data may differ from Geoscience Australia's domestic data. See data notes page 109.

STATUS **CRITICAL**

JA SK CA IN

Molybdenum is a silvery-grey metal used in high-strength steel alloys, electronics and industrial catalysts. Its unique heat and corrosion resistance make it a critically important mineral in advanced manufacturing.

Applications



Jet engines

Tanker trucks

Steel & superalloys

Petrol refining

Plastics

Advanced Manufacturing

42
Mo

Very high
Heat tolerance

Med
Conductivity

Low
Reactivity

Molybdenum

Resourcing tomorrow

Molybdenum

Molybdenum occurs mainly in large mineral systems associated with copper. Australia hosts significant molybdenum resources with increasing exploration activity.

Molybdenum resources and production, Australia

Geoscience Australia, *Australia's Identified Mineral Resources 2025*

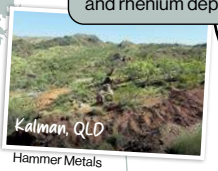
894 kt Mo
Resources (EDR)

6th (6% share)
World rank

1.9 kt Mo
Production

minor
World rank

Hammer's Kalman project (QLD) is one of Australia's largest and highest-grade molybdenum and rhenium deposits.



Spinifex Ridge
Hammer Metals
Molyhil
Vecco
Saint Elmo
Kalman
Mount Dore
Toolebuc
Richmond
Julia Creek
Anthony
Whitewash
Anduramba
Mount Mulgine
Caravel

Newmont's Cadia (NSW) operation is Australia's only currently producing molybdenum mine.

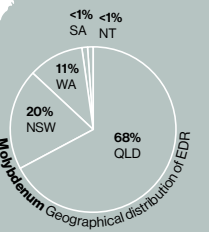
Newmont
Cadia East
Unicorn

Molybdenum resources
Deposit size (kt Mo)

- < 10
- 10–50
- 50–100
- 100–300
- > 300

Status

- Producing
- Deposit



Top global producers: USGS *(mine production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

	1. China	2. Chile	3. United States	4. Peru
Production (2025[e])	97 kt	42 kt	40 kt	39 kt
Reserves	*7,800 kt*	*2,600 kt*	*3,500 kt*	*1,000 kt*

Note: USGS global production and reserves data may differ from Geoscience Australia's domestic data. See data notes page 109.

STATUS **CRITICAL**

US JA SK EU UK CA IN

(Rare earth elements)

Neodymium is a rare earth metal crucial for powerful magnets in EVs and advanced electronics. Its role in clean energy technologies, coupled with concentrated global supply, make it a critical mineral for the energy transition.

Applications

60
Nd

Med
Heat tolerance

Low
Conductivity

High
Reactivity

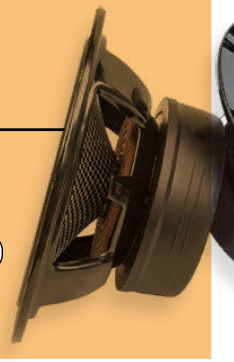
Permanent magnets

Speakers

Medical lasers

Hard disc drives

Optical glass



Renewable Energy

Neodymium

Resourcing tomorrow

Neodymium

Neodymium occurs in rare earth deposits, often within bastnäsite and monazite. Australia is developing a secure, end-to-end rare earth supply chain.

REE resources and production, Australia

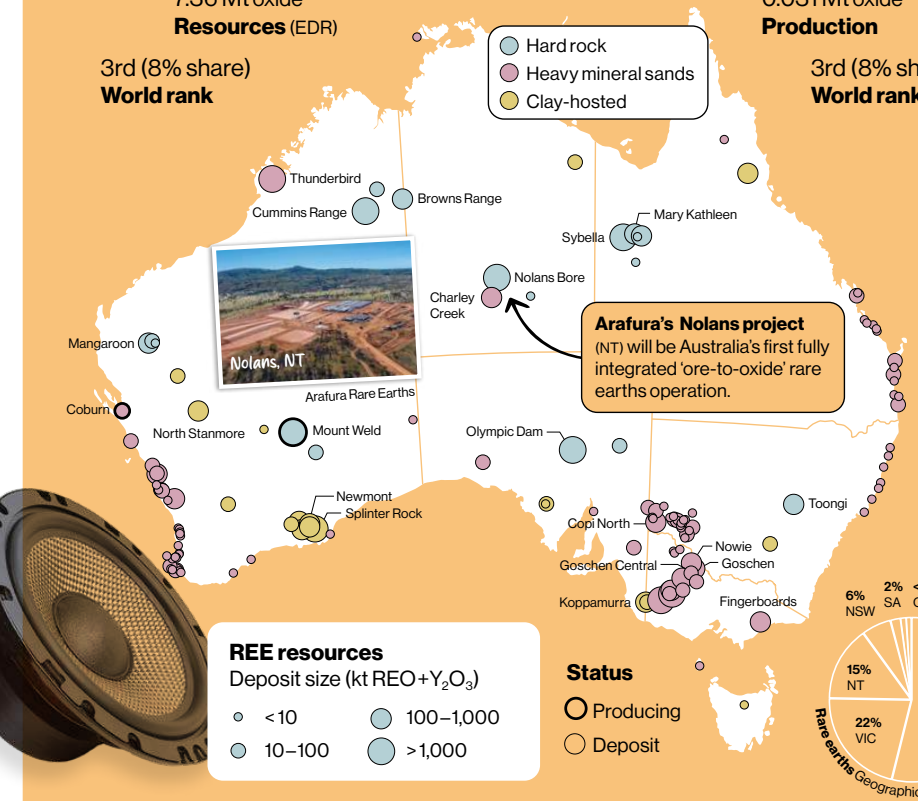
Geoscience Australia, *Australia's Identified Mineral Resources 2025*

7.36 Mt oxide
Resources (EDR)

3rd (8% share)
World rank

0.031 Mt oxide
Production

3rd (8% share)
World rank



Top global producers: USGS *(REE production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

	1. China	2. United States	3. Australia	4. Burma
Production (2025[e])	0.270 Mt	0.051 Mt	0.029 Mt	0.022 Mt
Reserves	*44 Mt*	*1.9 Mt*	*6.3 Mt*	*n.a.*

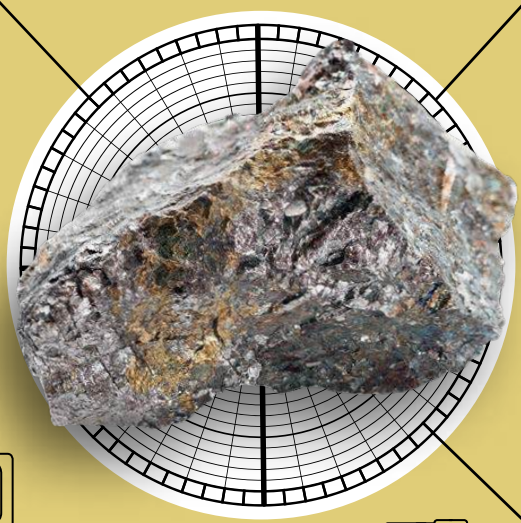
Note: USGS global production and reserves data may differ from Geoscience Australia's domestic data. See data notes page 109.

STATUS **CRITICAL**

US JA SK EU UK CA IN

Nickel is a hard, silvery metal valued for corrosion-resistant alloys and high performance batteries. Its essential role in clean energy technologies, along with concentrated supply and rising demand, make it a critical mineral.

Applications



EV batteries

Superalloys

Stainless steel

Electronics

Catalysts

Batteries & Energy Storage

28 **Ni**

High **Heat tolerance**

Med **Conductivity**

Med **Reactivity**

Nickel

Resourcing tomorrow

Nickel

Nickel occurs in minerals formed through magmatic processes and later weathering. Australia hosts some of the world's largest nickel resources in Western Australia.

Nickel resources and production, Australia

Geoscience Australia, *Australia's Identified Mineral Resources 2025*

24.7 Mt Ni
Resources (EDR)

2nd (19% share)
World rank

0.10 Mt Ni
Production

7th (3% share)
World rank

Western Australia holds around 90 per cent of nickel resources in Australia.

Australia's largest producer is **Glencore** through its Murrin Murrin (WA) operation.

IGO Limited

Glencore

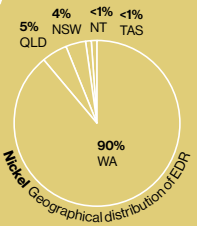
Savannah
Greenvale
Andover
Mount Sholl
Slopeaway
Nebo-Babel
Wingellina
Honeymoon Well
Mount Keith
Weld Range
Leinster
Yakabindie
Murrin Murrin
Mount Margaret
Northern Operations
Goongarrie
Nova-Bollinger
Gonneville
Cassini
Spotted Quoll
Ravensthorpe
Railway
Sunrise
Young
Avebury

Nickel resources
Deposit size (Mt Ni)

- < 0.5
- 0.5–1.0
- 1.0–2.0
- 2.0–2.5
- > 2.5

Status

- Producing
- Deposit



Top global producers: USGS *(mine production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

	1. Indonesia	2. Philippines	3. Russia	4. New Caledonia
Production (2025[e])	2.6 Mt	0.27 Mt	0.20 Mt	0.14 Mt
Reserves	*62 Mt*	*4.8 Mt*	*8.3 Mt*	*7.1 Mt*

Note: USGS global production and reserves data may differ from Geoscience Australia's domestic data. See data notes page 109.

STATUS **CRITICAL**

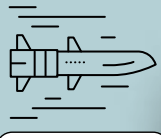
US JA SK EU UK CA IN

Niobium is a strong, ductile metal used in high-strength steel alloys, aerospace components and superconducting magnets. Its rarity and essential role in advanced engineering and national security make it a critical mineral.

Applications

41
Nb

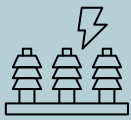
Jet engines



Hypersonic missiles

Particle accelerators

MRI machines



Transmission

Defence & Aerospace

High
Heat tolerance

Med
Conductivity

Low
Reactivity

Niobium

Resourcing tomorrow

Niobium

Niobium occurs mainly in minerals such as pyrochlore. High-grade discoveries have unearthed niobium potential across Western Australia and New South Wales.

Niobium resources and production, Australia

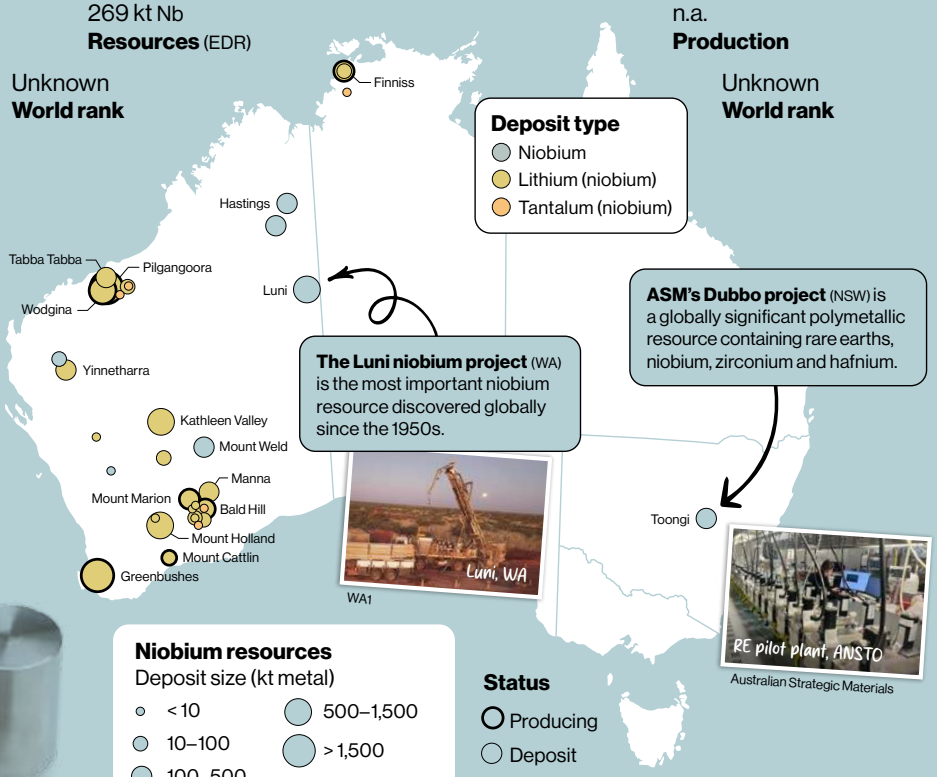
Geoscience Australia, *Australia's Identified Mineral Resources 2025*

269 kt Nb
Resources (EDR)

Unknown
World rank

n.a.
Production

Unknown
World rank



Top global producers: USGS *(mine production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

	1. Brazil	2. Canada	3. Congo	4. Russia
Production (2025[e])	104 kt	6.0 kt	1.0 kt	0.3 kt
Reserves	*14,000 kt*	*640 kt*	*n.a.*	*3 kt*

Note: USGS global production and reserves data may differ from Geoscience Australia's domestic data. See data notes page 109.

STATUS **STRATEGIC**

US JA EU UK CA IN

Phosphorus is a non-metallic element used in battery cathodes as well as fertilisers and food production. Growing demand and limited high quality resources make it a strategically important mineral for both energy and food systems.

Applications

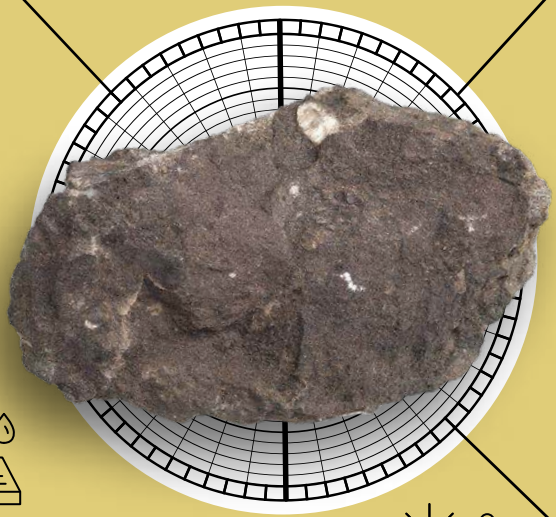
- Battery anode
- Agriculture
- Water treatment
- Steelmaking
- Pyrotechnics

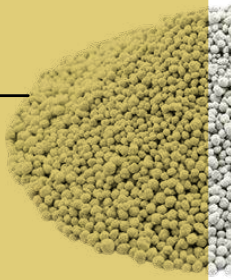
15
P

Low
Heat tolerance

Low
Conductivity

Very high
Reactivity





Batteries &
Energy Storage

Phosphorus

Resourcing tomorrow

Phosphorus

Phosphorus is sourced from phosphate rock deposits, and as a by-product from rare earth processing. Australia hosts world-class deposits in the Northern Territory.

Phosphate resources and production, Australia

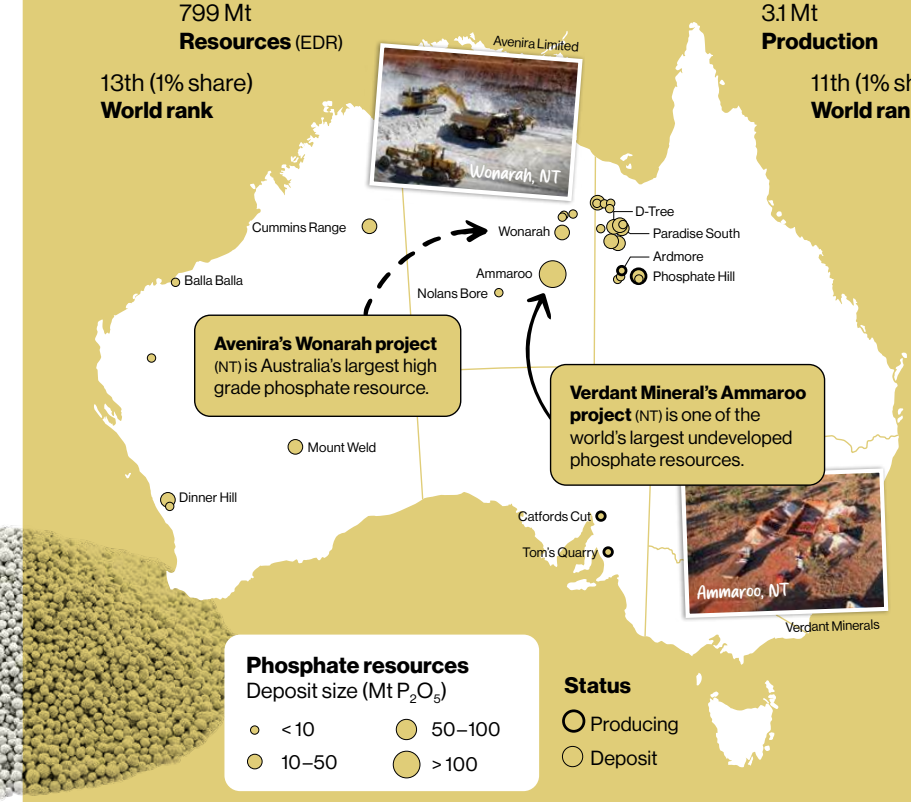
Geoscience Australia, *Australia's Identified Mineral Resources 2025*

799 Mt
Resources (EDR)

13th (1% share)
World rank

3.1 Mt
Production

11th (1% share)
World rank



Top global producers: USGS *(mine production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

	1. China	2. Morocco	3. United States	4. Russia
Production (2025[e])	110 Mt	36 Mt	20 Mt	14 Mt
Reserves	*3,400 Mt*	*50,000 Mt*	*1,000 Mt*	*2,400 Mt*

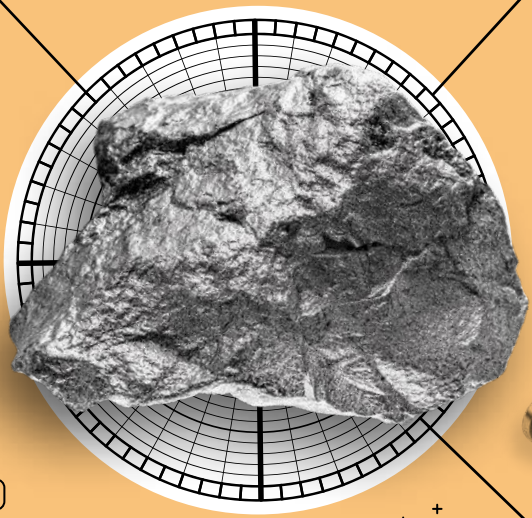
Note: USGS global production and reserves data may differ from Geoscience Australia's domestic data. See data notes page 109.

STATUS **CRITICAL**

US JA SK EU UK CA IN

Platinum Group Elements – platinum, palladium, rhodium, ruthenium, iridium and osmium – are rare, dense and corrosion-resistant. Prized for their exceptional conductive properties, their scarcity and industrial importance make them strategically critical minerals.

Applications



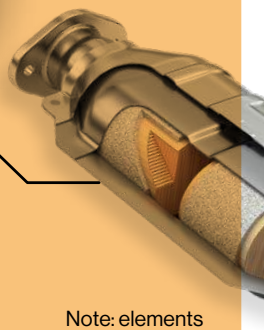
- Electronics
- Jewellery
- Catalytic converters
- Chemical catalyst
- Bullion
- Renewable Energy

78
Pt

Very high
Heat tolerance

High
Conductivity

Low
Reactivity



Note: elements classified as PGE can differ by country.

Platinum

Resourcing tomorrow

Platinum

Platinum group elements (PGE) commonly occur alongside nickel and copper in magmatic ore deposits, as well as some iron-bearing minerals.

PGE resources and production, Australia

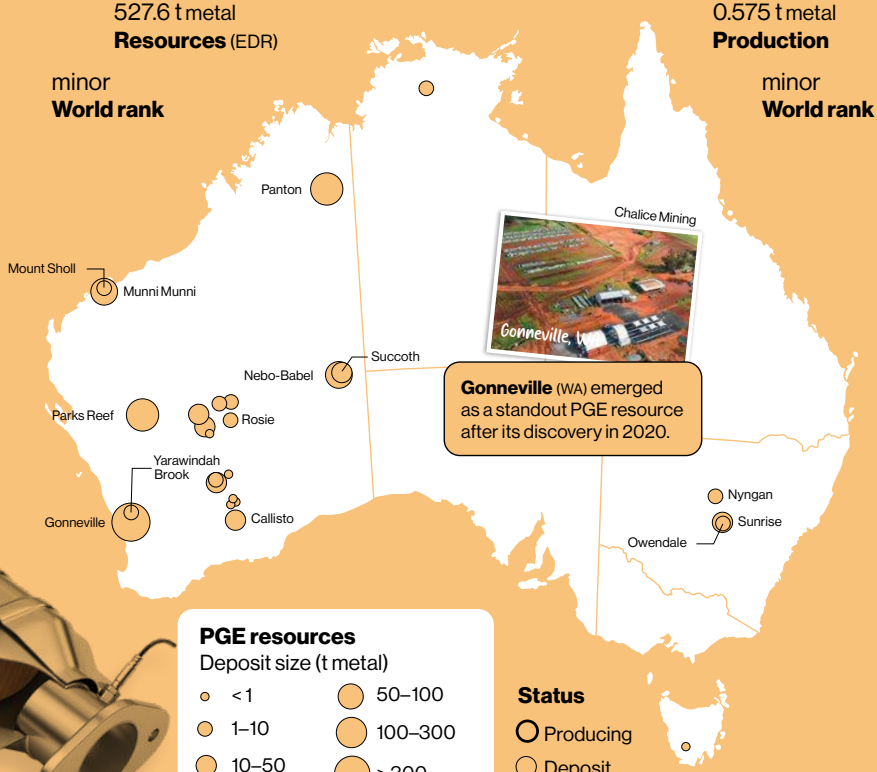
Geoscience Australia, *Australia's Identified Mineral Resources 2025*

527.6 t metal
Resources (EDR)

minor
World rank

0.575 t metal
Production

minor
World rank



Gonneville (WA) emerged as a standout PGE resource after its discovery in 2020.

Top global producers: USGS *(platinum mine production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

	1. South Africa	2. Russia	3. Zimbabwe	4. Canada
Production (2025[e])	120 t	20 t	18 t	5 t
PGM reserves	*63,000 t*	*11,000 t*	*1,300 t*	*310 t*

Note: USGS global production and reserves data may differ from Geoscience Australia's domestic data. See data notes page 109.

STATUS **CRITICAL**

US JA SK EU UK CA IN

(Rare earth elements)

Praseodymium is a rare earth metal used in high strength magnets, aircraft engines and specialised optics, as well as EVs. Limited availability and its key role in advanced energy technologies make it a critical mineral.

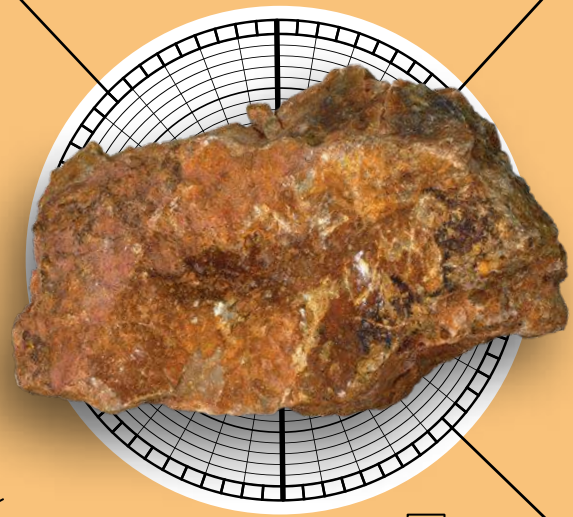
Applications

59
Pr

Med
Heat tolerance

Low
Conductivity

High
Reactivity



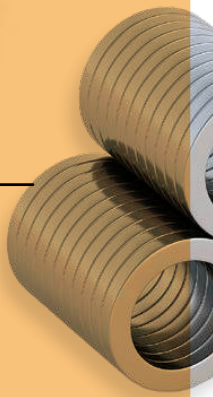
Permanent magnets

Superalloys

Industrial lasers

Safety glasses

Ceramics



Renewable Energy

Praseodymium

Resourcing tomorrow

Praseodymium

Praseodymium and neodymium occur together in minerals such as monazite. Australian rare earth projects commonly produce these elements together.

REE resources and production, Australia

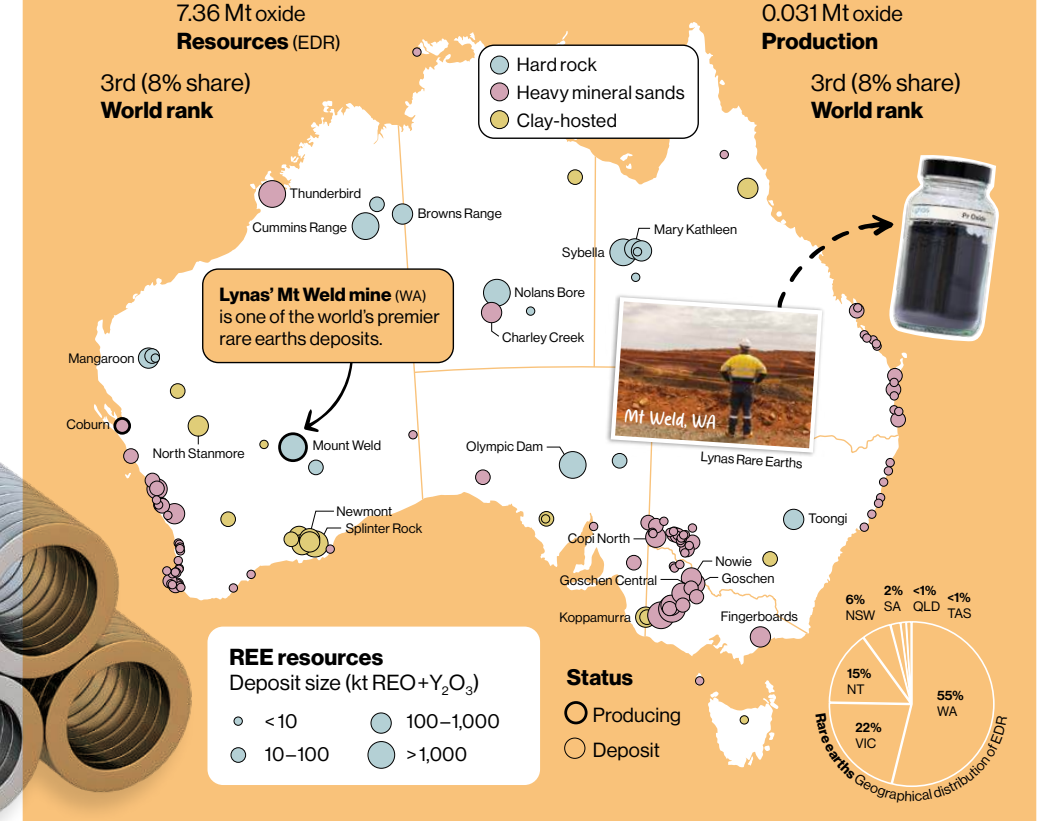
Geoscience Australia, *Australia's Identified Mineral Resources 2025*

7.36 Mt oxide
Resources (EDR)

3rd (8% share)
World rank

0.031 Mt oxide
Production

3rd (8% share)
World rank



Top global producers: USGS *(REE production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

	1. China	2. United States	3. Australia	4. Burma
Production (2025[e])	0.270 Mt	0.051 Mt	0.029 Mt	0.022 Mt
Reserves	*44 Mt*	*1.9 Mt*	*6.3 Mt*	*n.a.*

Note: USGS global production and reserves data may differ from Geoscience Australia's domestic data. See data notes page 109.

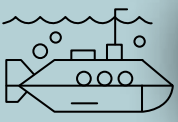
STATUS **CRITICAL**

US JA SK EU UK CA IN

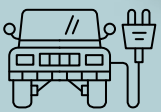
Rare earth elements are a group of 17 metallic elements essential for powerful magnets and advanced electronics. Their concentrated supply, unique properties and irreplaceable applications make them strategically critical minerals.

Applications

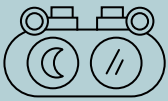
Fighter jets



Submarines



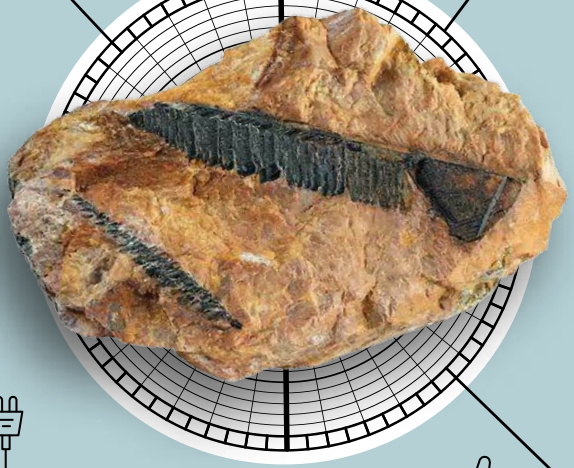
Electric vehicles



Night vision goggles

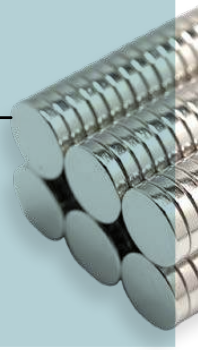
Drones

Defence & Aerospace



Rare earths

Cerium
Dysprosium
Erbium
Europium
Gadolinium
Holmium
Lanthanum
Lutetium
Neodymium
Praseodymium
Promethium
Samarium
Terbium
Thulium
Ytterbium
Scandium*
Yttrium*



Rare earth elements

Resourcing tomorrow

Rare earth elements

Rare earth elements (REE) are commonly grouped into light and heavy rare earths. Heavy REE are generally rarer, as they occur in fewer types of mineral deposits.

REE resources and production, Australia

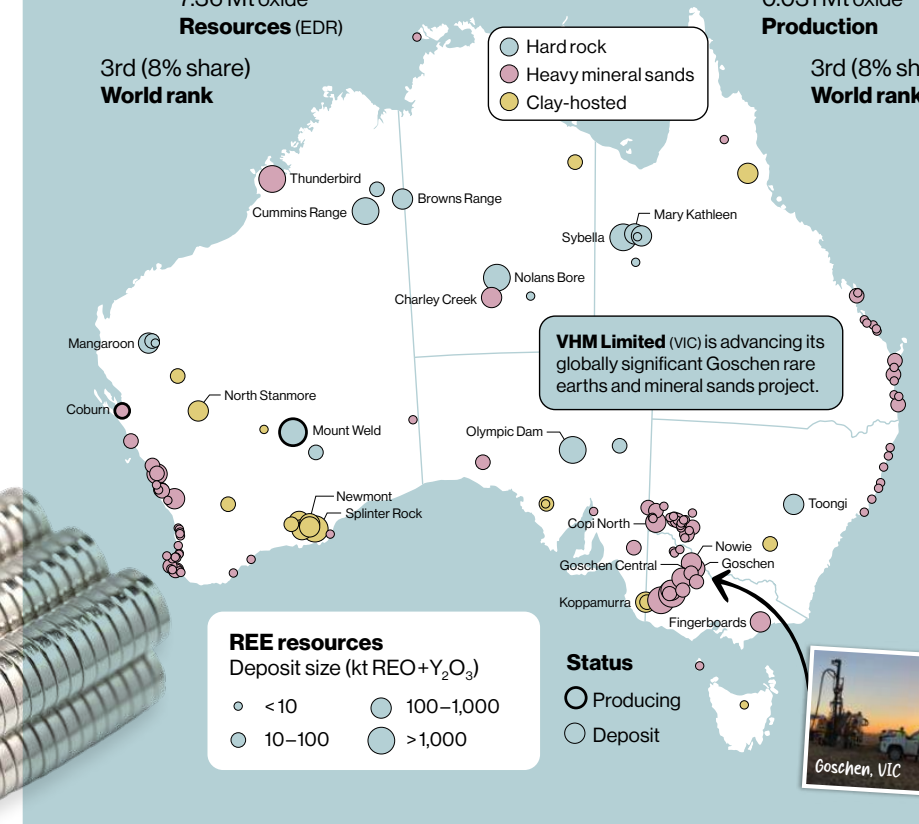
Geoscience Australia, *Australia's Identified Mineral Resources 2025*

7.36 Mt oxide
Resources (EDR)

3rd (8% share)
World rank

0.031 Mt oxide
Production

3rd (8% share)
World rank



VHM Limited

Top global producers: USGS *(REE production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

	1. China	2. United States	3. Australia	4. Burma
Production (2025[e])	0.270 Mt	0.051 Mt	0.029 Mt	0.022 Mt
Reserves	*44 Mt*	*1.9 Mt*	*6.3 Mt*	*n.a.*

Note: USGS global production and reserves data may differ from Geoscience Australia's domestic data. See data notes page 109.

STATUS **CRITICAL**

US JA EU IN

Rhenium is a dense, silvery metal highly valued for its high-temperature superalloys essential for aerospace and defence applications. Its extreme scarcity and unique heat-resistant properties make it a critical mineral.

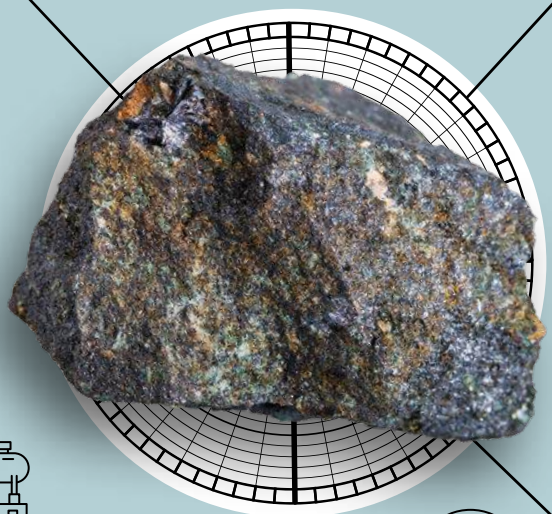
Applications

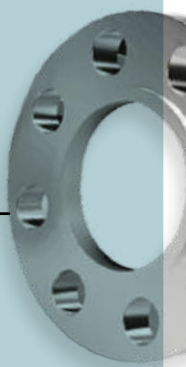
75
Re

Very high
Heat tolerance

High
Conductivity

Low
Reactivity





Thrusters

Heat shield

Petrol refining

Electronics

Radiotherapy

Defence & Aerospace

Rhenium

Resourcing tomorrow

Rhenium

Rhenium occurs in minerals such as molybdenite, formed in magmatic and hydrothermal systems. Emerging rhenium potential exists within copper-molybdenum deposits.

Australia's resource

Australia hosts rhenium primarily within molybdenum deposits in QLD, with ongoing exploration and feasibility studies assessing future production potential.

Global supply chain

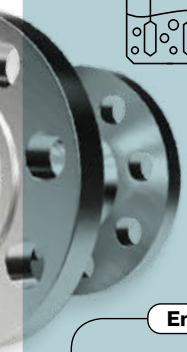
Global rhenium production is currently concentrated in Chile, the US, Poland and China, creating supply risks for aerospace, superalloy and industrial markets.

The opportunity

Australia can capture rhenium as a by-product and develop refining and superalloy production to supply high-value industrial and defence markets.

Rhenium: Downstream opportunity map

How Australia can capture value in the global rhenium supply chain.



Recover rhenium from copper and molybdenum concentrates to produce high-purity rhenium metal and salts for industrial and aerospace use.

Raw mineral processing

Alloy production

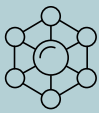
Produce rhenium-containing superalloys for advanced jet engines, gas turbines and high-temperature industrial and aerospace components.

Specialty components

Manufacture rhenium filaments, catalysts and protective coatings for chemical processing, advanced electronics, aerospace and high-performance industrial applications.

End-of-life recovery

Recover rhenium from spent superalloys, catalysts and industrial scrap to reduce raw material dependence and provide secondary supply.



Develop advanced rhenium alloys, high-efficiency catalysts and industrial components to enhance performance, durability and manufacturing capability.

Future capabilities

STATUS **CRITICAL**

US JA SK EU UK CA IN

(Rare earth elements)

Scandium is a lightweight, silvery metal used in defence and aerospace alloys and fuel cells. Its limited availability, ability to enhance material strength and critical role in advanced technologies make it a critically important mineral.

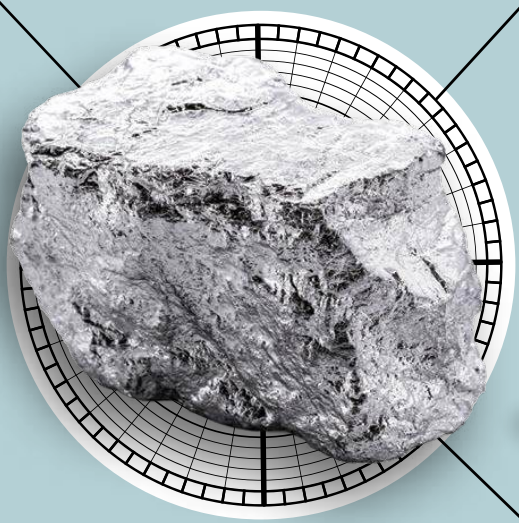
Applications

21
Sc

High
Heat tolerance

Med
Conductivity

Med
Reactivity



Airframes

Naval vessels

Armoured vehicles

Solid oxide fuel cells

Semiconductors

Defence & Aerospace

Scandium

Resourcing tomorrow

Scandium

Scandium occurs as a trace metal in lateritic nickel-cobalt deposits and in some rare earth deposits. Australia has world-class scandium resources.

Scandium resources and production, Australia

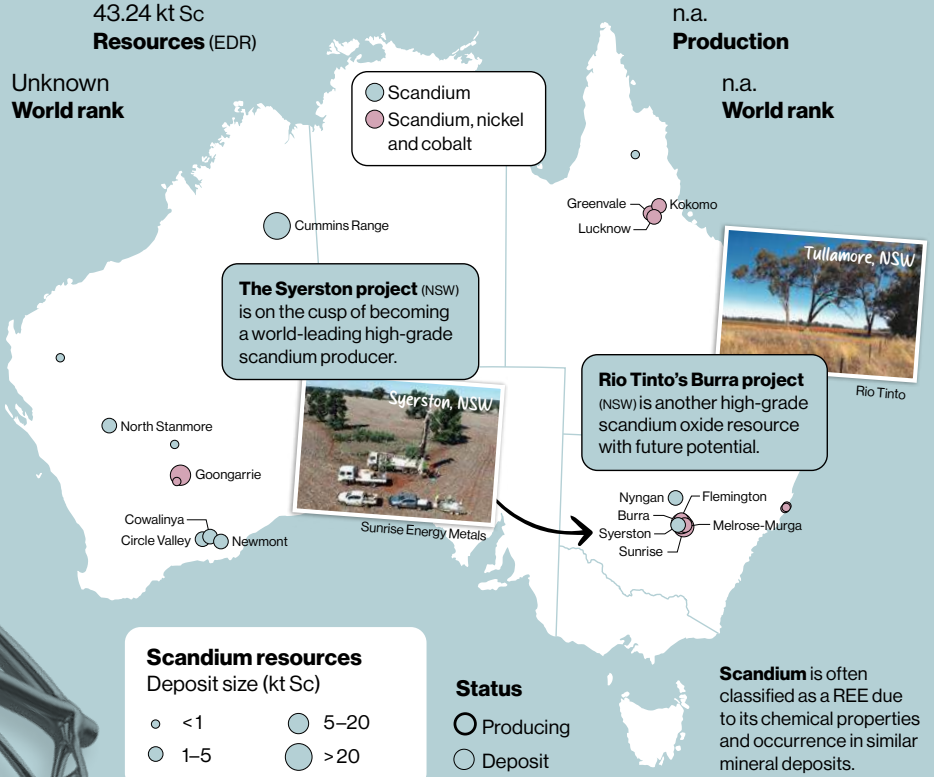
Geoscience Australia, *Australia's Identified Mineral Resources 2025*

43.24 kt Sc
Resources (EDR)

Unknown
World rank

n.a.
Production

n.a.
World rank



Scandium resources
Deposit size (kt Sc)

- <1
- 1–5
- 5–20
- >20

Status

- Producing
- Deposit

Scandium is often classified as a REE due to its chemical properties and occurrence in similar mineral deposits.

Scandium production

Globally, scandium was produced exclusively as a by-product in 2025, mainly from nickel and titanium.

Global supply chain

Total global production of scandium was about 80 tons in 2025. China was the leading producer.

The opportunity

Australia has identified specific scandium projects which could support future tungsten production.

STATUS **CRITICAL**

JA SK IN

Selenium is a brittle, grey metalloid used in thin-film solar cells and other photovoltaic technologies, as well as advanced electronics. Its essential role in clean energy technologies position it as a mineral of critical importance.

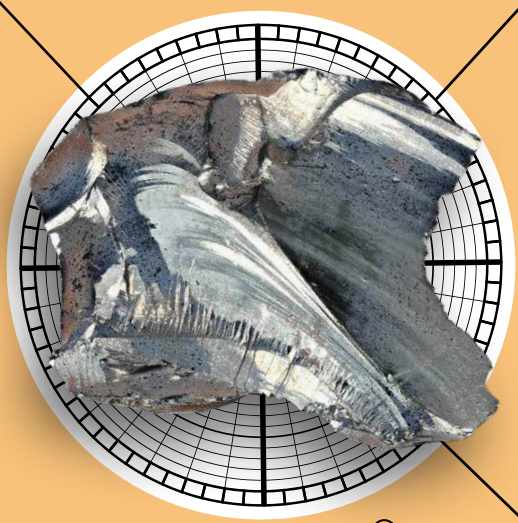
Applications

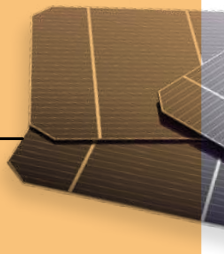
34
Se

Low
Heat tolerance

Med
Conductivity

Med
Reactivity





- **Solar cells**
- **Light meters**
- **Glass production**
- **Photocopiers**
- **Nutrition**

Renewable Energy

Selenium

Resourcing tomorrow

Selenium

Selenium occurs as a trace element in copper and lead-zinc deposits, formed in hydrothermal systems. Australia hosts modest but strategically important resources.

Australia's resource

Selenium is usually a by-product of copper, nickel and zinc production and processing. Selenium recovery pilots flag potential emerging projects.

Global supply chain

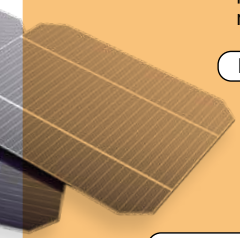
China is the world's leading refined selenium producer, with Japan, Russia and Belgium also significant, making supply sensitive to production shifts.

The opportunity

Australia can recover selenium as a by-product from existing operations, develop refining and supply specialty materials to high-value industrial markets.

Selenium: Downstream opportunity map

How Australia can capture value in the global selenium supply chain.



Raw mineral processing

Recover selenium as a by-product of copper and lead-zinc refining and processing to produce high-purity selenium metal and compounds.

Alloy production

Produce selenium-containing alloys (i.e. copper, tellurium, bismuth) for deoxidising steels, improving machinability and enhancing corrosion resistance.

Specialty components

Manufacture selenium-based glass additives, photovoltaic materials, pigments and electronics components for advanced industrial, energy and emerging technology applications.

End-of-life recovery

Boost recovery of selenium from electronic waste, solar panels and industrial scrap to provide secondary supply and reduce reliance on imports.

Future capabilities

Build R&D capabilities for selenium compounds for next gen batteries and photovoltaics, and specialty chemical and pharmaceutical manufacturing.

STATUS **CRITICAL**

US JA SK EU UK CA IN

Silicon is a metalloid with unique electrical properties critical for solar panels and advanced electronic devices. Its essential role in microelectronics and clean energy technologies make it a critically important mineral.

Applications

Semiconductors

Solar panels

Glass & ceramics

Industrial steel

Sealants

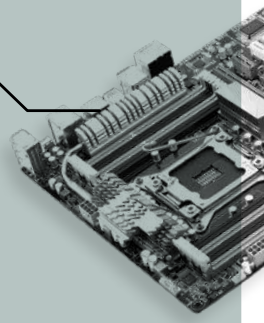
Advanced Manufacturing

14
Si

High
Heat tolerance

Low
Conductivity

Med
Reactivity



Silicon

Resourcing tomorrow

Silicon

Silicon occurs mainly as quartz and silicate minerals. Australia hosts abundant high-quality silica resources.

Australia's resource

Australia has large economic resources of high-purity and metallurgical silicas. Simcoa (WA) is currently the only silicon metal manufacturer operating in Australia.

Global supply chain

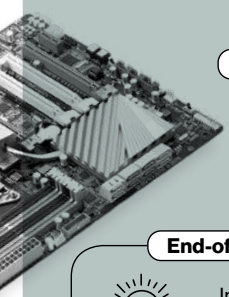
China dominates global silicon materials production – about 80% of output – underpinning steel, alloy, solar and electronics supply and concentrating risk.

The opportunity

Australia can grow its polysilicon and downstream capabilities with a view to developing ingots and wafers for high-tech applications like semiconductors.

Silicon: Downstream opportunity map

How Australia can capture value in the global silicon supply chain.



Raw mineral processing

Refine quartz or metallurgical-grade silicon to produce high-purity silicon metal for advanced electronics, solar panels and chemical industries.

Alloy production

Produce silicon-aluminium and silicon-iron alloys for lightweight automotive components, aerospace parts and steel strengthening.

Specialty components

Manufacture semiconductor-grade silicon wafers, solar cells, silicones and advanced electronic components for clean energy and other high tech and emerging applications.

End-of-life recovery

Increase silicon recovery from solar panels, electronics and metallurgical scrap to provide secondary supply and reduce raw material dependence.

Future capabilities

Develop new silicon materials, high-efficiency solar cells and semiconductor components to support advanced manufacturing and renewable technologies.

STATUS **CRITICAL**

US JA SK EU UK CA IN

Tantalum is a hard, corrosion-resistant transition metal used in high-performance electronics, capacitors and aerospace components. Its exceptional conductivity and stability at high temperatures make it a critically important mineral.

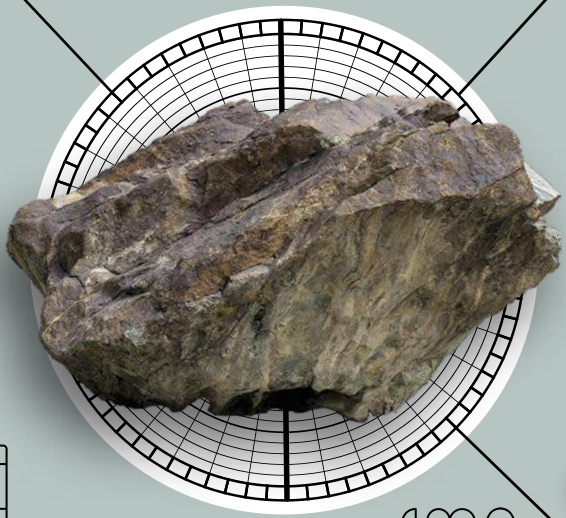
Applications

73
Ta

Very high
Heat tolerance

Med
Conductivity

Low
Reactivity



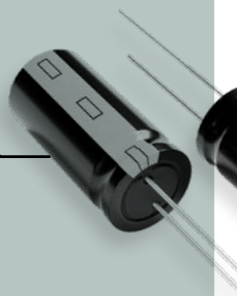
Jet engines

Capacitors

Optical glass

Dental implants

Surgical tools



Advanced Manufacturing

Tantalum

Resourcing tomorrow

Tantalum

Tantalum occurs in minerals such as tantalite, formed in magmatic systems. Australia has significant resources, with production a by-product of lithium mining.

Tantalum resources and production, Australia

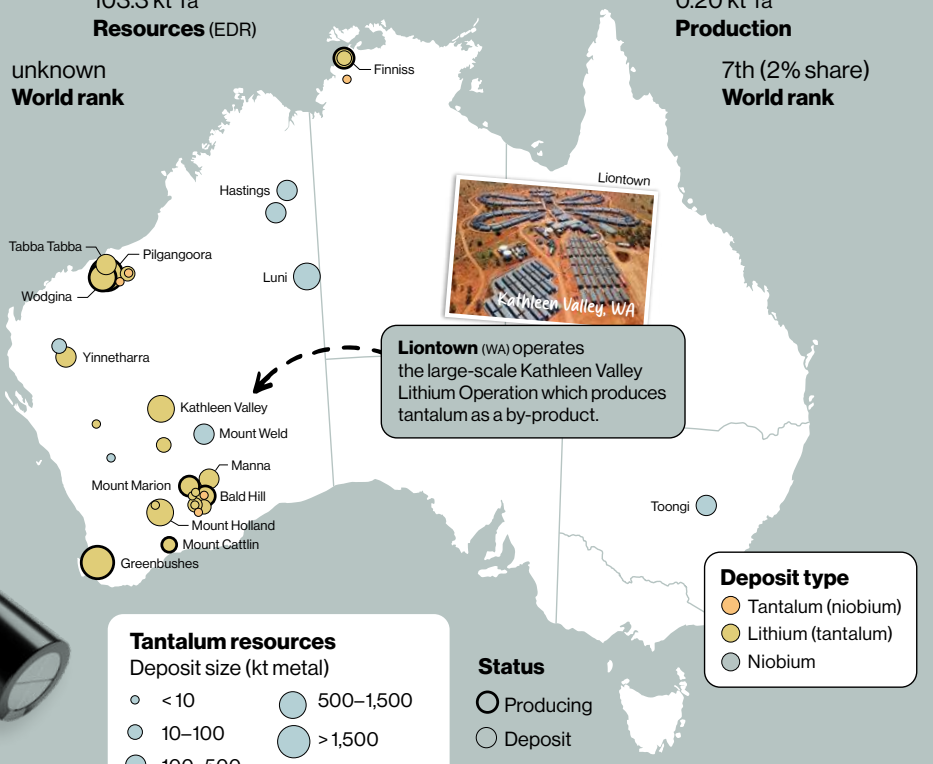
Geoscience Australia, *Australia's Identified Mineral Resources 2025*

103.3 kt Ta
Resources (EDR)

unknown
World rank

0.20 kt Ta
Production

7th (2% share)
World rank



Top global producers: USGS *(mine production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

	1. Congo	2. Rwanda	3. Nigeria	4. Brazil
Production (2025[e])	1.3 kt	0.40 kt	0.39 kt	0.19 kt
Reserves	*n.a.*	*n.a.*	*n.a.*	*40 kt*

Note: USGS global production and reserves data may differ from Geoscience Australia's domestic data. See data notes page 109.

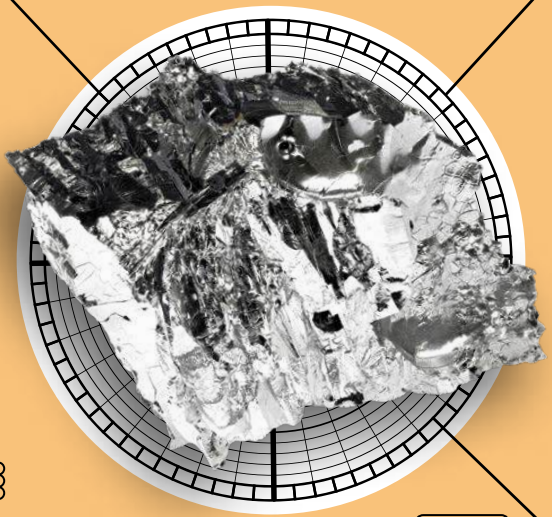
STATUS **CRITICAL**

US JA UK CA IN

Tellurium is a rare, silvery metalloid used in thin-film photovoltaics and thermoelectric devices, as well as alloys and electronics. Its limited availability and key role in clean energy solutions make it a mineral of critical importance.

Applications

- Thin-film solar
- Memory chips
- Quantum materials
- Infrared cameras
- Thermoelectrics



52
Te

Low
Heat tolerance

Low
Conductivity

Med
Reactivity

Renewable
Energy

Tellurium

Resourcing tomorrow

Tellurium

Tellurium occurs as a trace element in copper-gold deposits, formed in hydrothermal systems. Australia has strong tellurium potential linked to its copper sector.

Australia's resource

Tellurium is known to occur in copper, gold and uranium deposits, such as Olympic Dam, SA. Australia's vast copper-gold provinces suggest strong potential.

Global supply chain

China accounts for roughly three-quarters of world refined tellurium output, concentrating supply risk for photovoltaics, thermoelectrics and alloys.

The opportunity

Australia can address its limited tellurium recovery and processing capabilities with the mid-term objective of supplying materials for high-tech applications.

Tellurium: Downstream opportunity map

How Australia can capture value in the global tellurium supply chain.

Raw mineral processing

Recover tellurium as a by-product of copper refining to produce high-purity tellurium metal and compounds for electronics and solar applications.

Alloy production

Produce tellurium-containing alloys to improve machinability of copper, stainless steel and lead-free solders for aerospace and industrial applications.

Specialty components

Manufacture cadmium telluride (CdTe) solar cells, thermoelectric materials and specialty electronic components to supply high-efficiency photovoltaic and advanced energy technologies.

End-of-life recovery

Recover tellurium from solar panels, electronic scrap and industrial alloys to provide secondary supply and reduce reliance on imports.

Future capabilities

Develop advanced CdTe photovoltaics, thermoelectric devices and electronic components to support renewable energy and high-tech manufacturing.

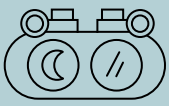
STATUS **CRITICAL**

US JA SK EU UK CA IN

(Rare earth elements)

Terbium is a silvery rare earth metal known for its strong magneto-optical properties and role in green phosphors, specialist defence applications and permanent magnets. Its limited supply and few substitutes make it a critical mineral.

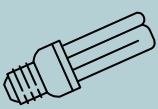
Applications



Night vision

Naval sonar

High temperature magnets



Fluorescent lamps

Data storage

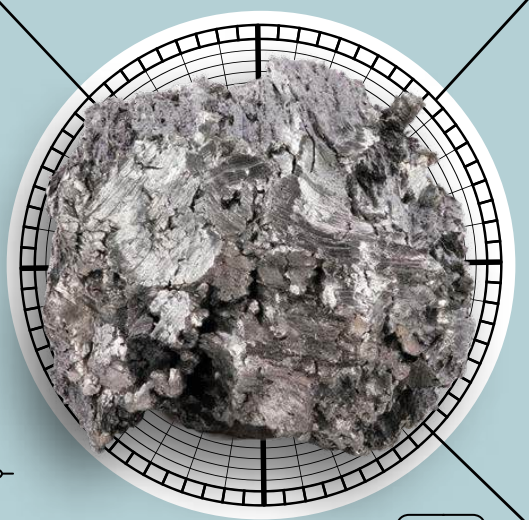
Defence & Aerospace

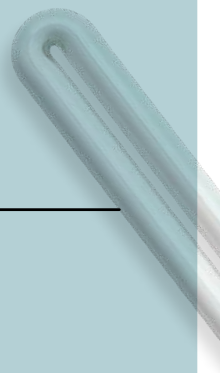
65
Tb

High
Heat tolerance

Med
Conductivity

Med
Reactivity





Terbium

Resourcing tomorrow

Terbium

Terbium is a heavy rare earth element. It occurs in REE minerals such as monazite and xenotime. Australia has significant terbium prospectivity.

REE resources and production, Australia

Geoscience Australia, *Australia's Identified Mineral Resources 2025*

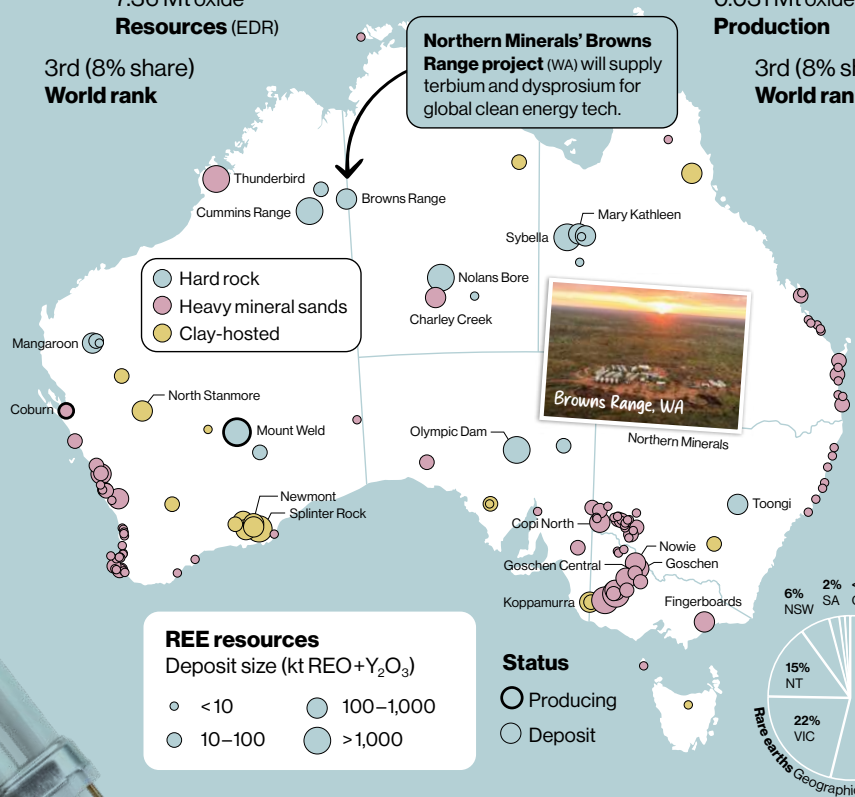
7.36 Mt oxide
Resources (EDR)

3rd (8% share)
World rank

0.031 Mt oxide
Production

3rd (8% share)
World rank

Northern Minerals' Browns Range project (WA) will supply terbium and dysprosium for global clean energy tech.



Top global producers: USGS *(REE production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

	1. China	2. United States	3. Australia	4. Burma
Production (2025[e])	0.270 Mt	0.051 Mt	0.029 Mt	0.022 Mt
Reserves	*44 Mt*	*1.9 Mt*	*6.3 Mt*	*n.a.*

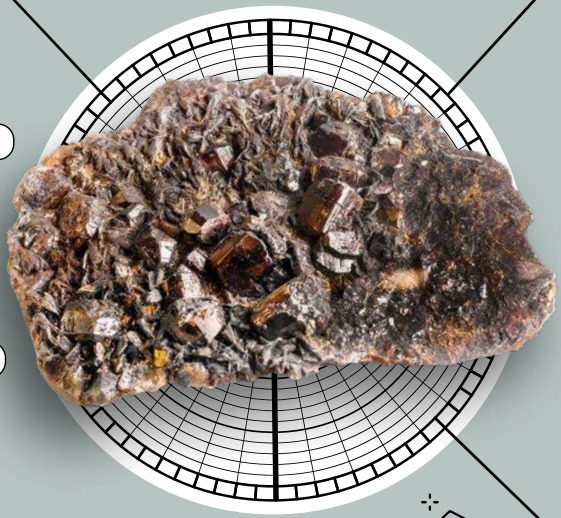
Note: USGS global production and reserves data may differ from Geoscience Australia's domestic data. See data notes page 109.

STATUS **STRATEGIC**

US SK UK CA IN

Tin is a soft, silvery metal used in soldering, electronics and advanced manufacturing. Its excellent corrosion resistance, conductivity and role in enabling reliable electronic components make it a strategically important mineral.

Applications



Lead-free solder

Alloys & plating

Renewable energy

Superconducting magnets

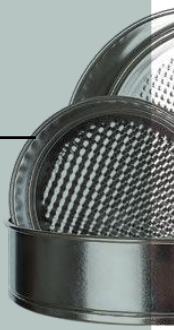
Glass production

50
Sn

Low
Heat tolerance

Med
Conductivity

Low
Reactivity



Advanced
Manufacturing

Tin

Resourcing tomorrow

Tin

Tin occurs mainly in the mineral cassiterite, formed in association with granitic systems. Australia hosts significant tin provinces, particularly in Tasmania and Queensland.

Tin resources and production, Australia

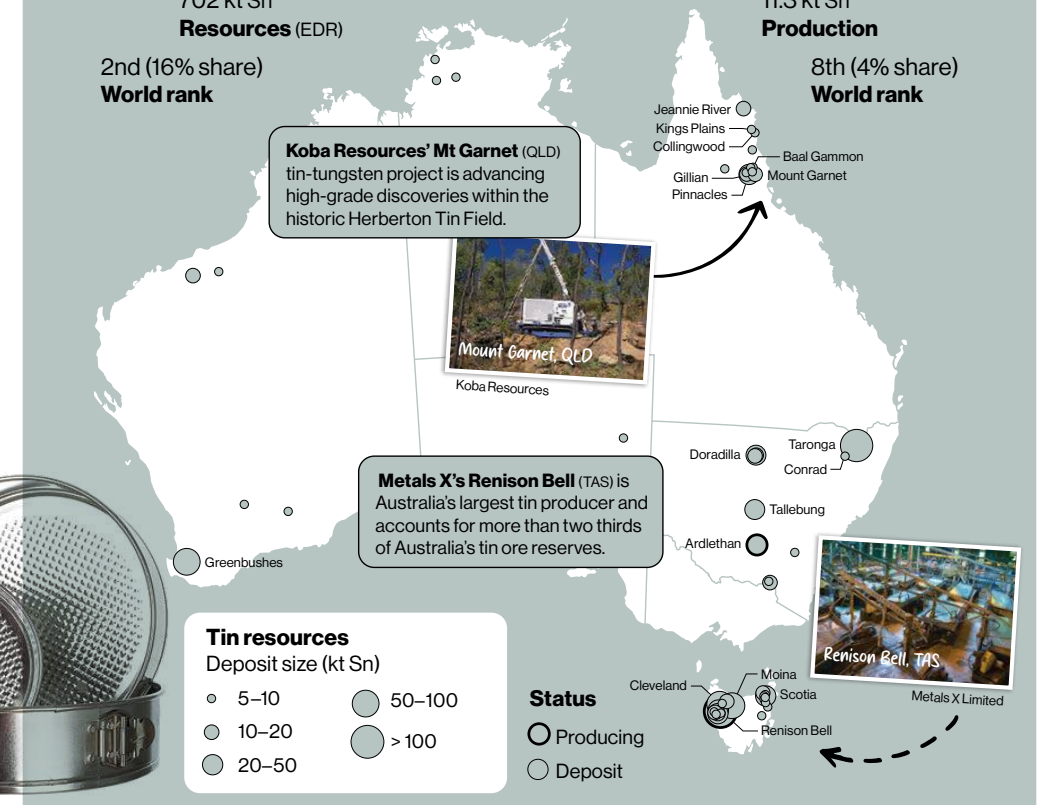
Geoscience Australia, *Australia's Identified Mineral Resources 2025*

702 kt Sn
Resources (EDR)

2nd (16% share)
World rank

11.3 kt Sn
Production

8th (4% share)
World rank



Top global producers: USGS *(mine production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

	1. China	2. Indonesia	3. Peru	4. Brazil
Production (2025[e])	71 kt	61 kt	33 kt	28 kt
Reserves	*1,200 kt*	*1,400 kt*	*150 kt*	*700 kt*

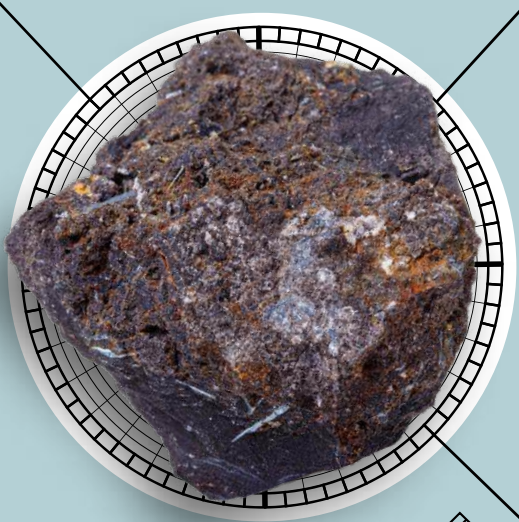
Note: USGS global production and reserves data may differ from Geoscience Australia's domestic data. See data notes page 109.

STATUS **CRITICAL**

US JA SK EU UK CA IN

Titanium is a strong, corrosion-resistant metal valued for its high strength-to-weight ratio and its essential role in defence and advanced engineering. Limited high-quality sources of titanium make it a critically important mineral.

Applications



- Fighter jets
- Spacecraft
- Medical implants
- Ceramics & glass
- White paint
- Defence & Aerospace

22
Ti

High
Heat tolerance

Low
Conductivity

Med
Reactivity

Titanium

Resourcing tomorrow

Titanium

Titanium occurs mainly in minerals such as ilmenite and rutile in heavy mineral sands. Australia is a major global producer and hosts large titanium resources.

Heavy mineral sands resources and production, Australia

Geoscience Australia, *Australia's Identified Mineral Resources 2025*

Ilmenite

308.3 Mt | 0.51 Mt
Resources | Production

4th (4% share)
World rank
Production

Rutile

42.2 Mt | 0.22 Mt
Resources | Production

1st (44% share)
World rank
Production

Kimberley Mineral Sands

Thunderbird (WA) is one of the largest high-grade mineral sands discoveries in decades.

Victoria hosts world-class titanium resources, and more than half of Australia's rutile.

Deposit type
- Ilmenite & rutile
- Ilmenite
- Rutile

Urquhart
Sill 80
Thunderbird
Goondicum
Coburn
Barton West
Eucla Basin
Perth Basin
Mindarra Springs
Cooljarloo
Bidaminna
Ambergate
Witchcliffe
McLaren West
Copi North
Avonbank
Donald Mineral Sands
Fingerboards

Heavy mineral sands
Deposit size (Mt)
- < 1
- 1–5
- 5–10
- 10–50
- > 50

Status
- Producing
- Deposit

Gippsland Critical Minerals

Top global producers *(Mine production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

Ilmenite

China	3.2 Mt
Mozambique	1.9 Mt
South Africa	1.3 Mt
Australia	0.8 Mt

Rutile

Australia	0.20 Mt
Sierra Leone	0.11 Mt
South Africa	0.10 Mt
Kenya	0.01 Mt

STATUS **CRITICAL**

US JA SK EU UK CA IN

Tungsten is a dense, hard metal used in defence and aerospace industries and high temperature industrial applications. Its exceptional durability, essential role in defence and advanced manufacturing and limited supply make it a critical mineral.

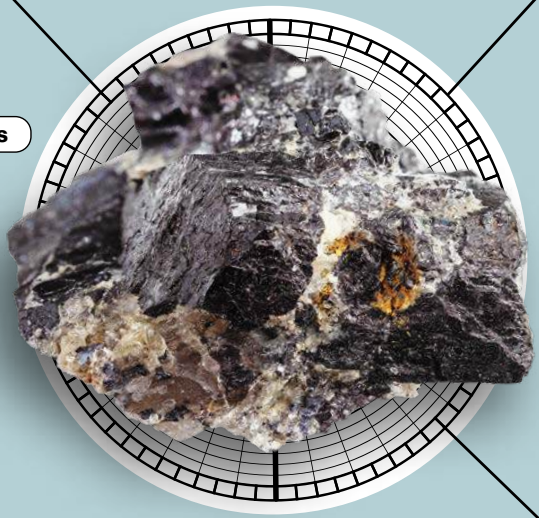
Applications

74
W

Very High
Heat tolerance

Med
Conductivity

Low
Reactivity



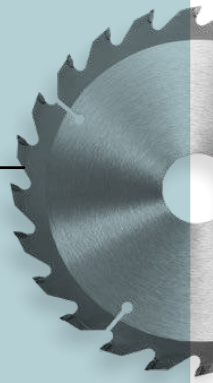
Armoured vehicles

Spacecraft

Fusion energy

Semiconductors

Cutting tools



Defence & Aerospace

Tungsten

Resourcing tomorrow

Tungsten

Tungsten occurs mainly as scheelite and wolframite hosted in granitic and quartz-vein systems. Australia hosts significant tungsten resources.

Tungsten resources and production, Australia

Geoscience Australia, *Australia's Identified Mineral Resources 2025*

568 kt W
Resources (EDR)

2nd (12% share)
World rank

>1 kt W
Production

7th (1% share)
World rank

EQ Resources

Watershed
Mount Carbine
Wolfram Camp

Cookes Creek
O'Callaghans
Molyhil

EQ Resources' Mt Carbine (QLD) is scaling production to meet global clean energy, defence, aerospace and advanced manufacturing demand.

A surge of new **tungsten projects** is leading a revival in domestic tungsten production in Australia.

Mount Mulgine

Tungsten Mining

Glen Eden
Attunga

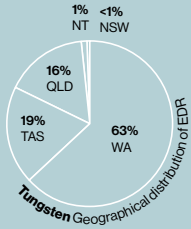
Tungsten resources
Deposit size (kt W)

- < 10
- 10–50
- 50–100
- >100

Status

- Producing
- Deposit

Dolphin
Kara Mine
Moina
Mount Lindsay



Top global producers: USGS *(mine production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

	1. China	2. Vietnam	3. Kazakhstan	4. Russia
Production (2025[e])	67 kt	3.0 kt	2.4 kt	2.0 kt
Reserves	*2,500 kt*	*170 kt*	*n.a.*	*400 kt*

Note: USGS global production and reserves data may differ from Geoscience Australia's domestic data. See data notes page 109.

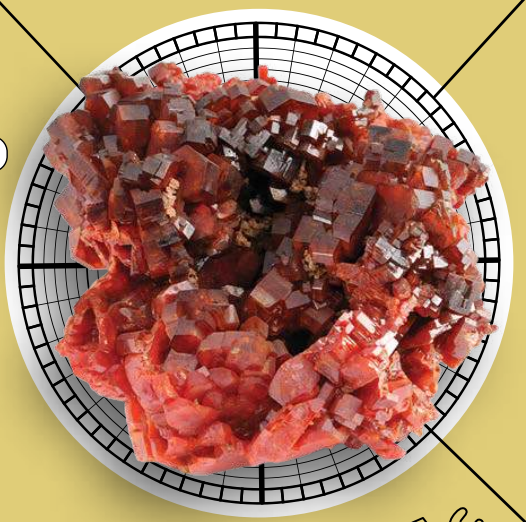
STATUS **CRITICAL**

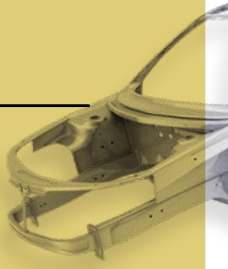
US JA SK EU UK CA IN

Vanadium is a hard, silvery metal prized for strengthening steel and vanadium-flow batteries for large-scale energy storage. Its critical role, coupled with concentrated supply, make it a mineral of critical importance.

Applications

- Grid-scale storage
- Advanced alloys
- Nuclear engineering
- Automotive steel
- Tool steel





23
V

High
Heat tolerance

Med
Conductivity

Med
Reactivity

Batteries & Energy Storage

Vanadium

Resourcing tomorrow

Vanadium

Vanadium occurs as a trace element in many minerals and rock types, most commonly in magnetite. Significant resources also occur in oil shale deposits in Queensland.

Vanadium resources and production, Australia

Geoscience Australia, *Australia's Identified Mineral Resources 2025*

10,173 kt V
Resources (EDR)

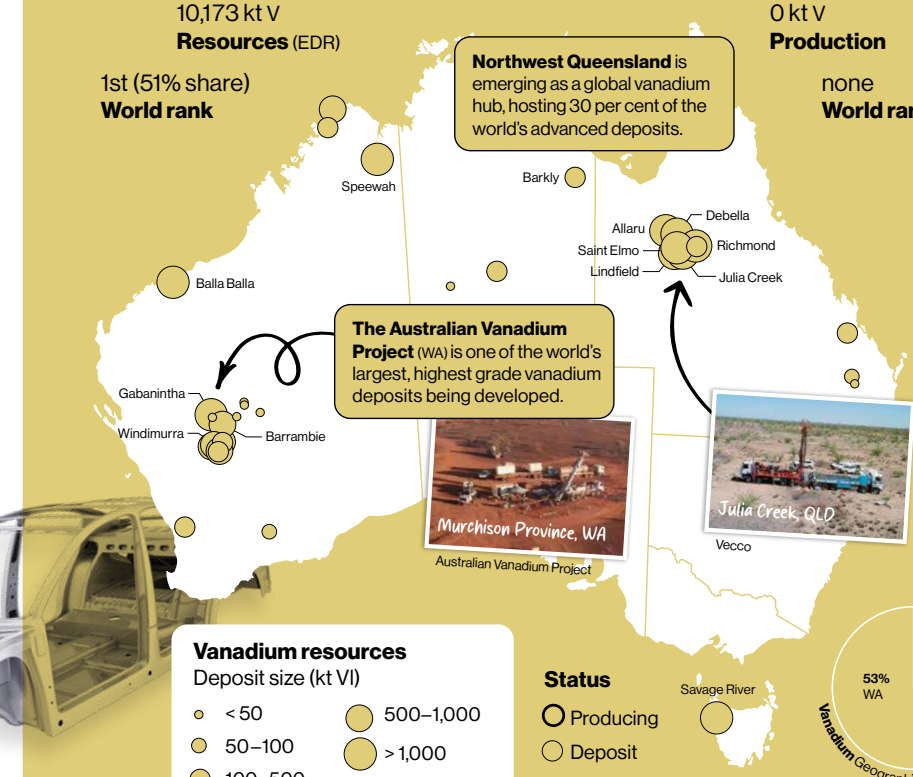
1st (51% share)
World rank

0 kt V
Production

none
World rank

Northwest Queensland is emerging as a global vanadium hub, hosting 30 per cent of the world's advanced deposits.

The Australian Vanadium Project (WA) is one of the world's largest, highest grade vanadium deposits being developed.

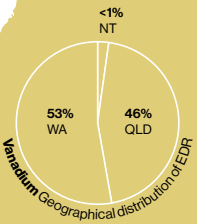


Vanadium resources
Deposit size (kt Vl)

- < 50
- 50–100
- 100–500
- 500–1,000
- > 1,000

Status

- Producing
- Deposit



Top global producers: USGS *(mine production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

	1. China	2. Russia	3. Brazil	4. South Africa
Production (2025[e])	82 kt	21 kt	5.3 kt	5 kt
Reserves	*5,800 kt*	*5,000 kt*	*94 kt*	*520 kt*

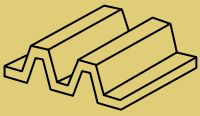
Note: USGS global production and resources data may differ from Geoscience Australia's domestic data. See data notes page 109.

STATUS **STRATEGIC**

US SK UK CA

Zinc is a bluish-white metal vital for batteries and energy storage, as well as corrosion-resistant coatings, galvanised steel and alloys. Its geographically concentrated production makes it a mineral of strategic importance.

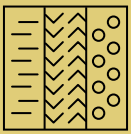
Applications



Galvanising

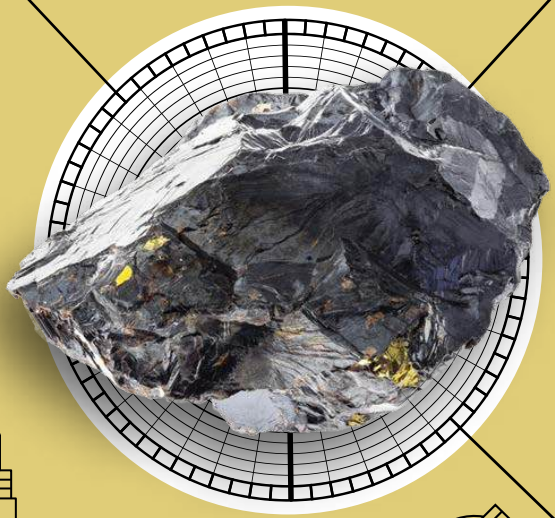
Batteries

Grid-scale storage



Die casting

Paint

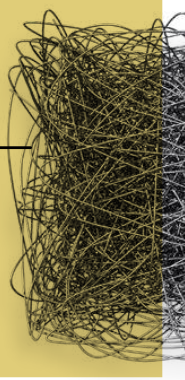


30
Zn

High
Heat tolerance

Med
Conductivity

Med
Reactivity



Batteries & Energy Storage

Zinc

Resourcing tomorrow

Zinc

Zinc is commonly found in sphalerite, formed in hydrothermal systems, and associated with lead and silver. Australia is a major zinc producer with globally significant resources.

Zinc resources and production, Australia

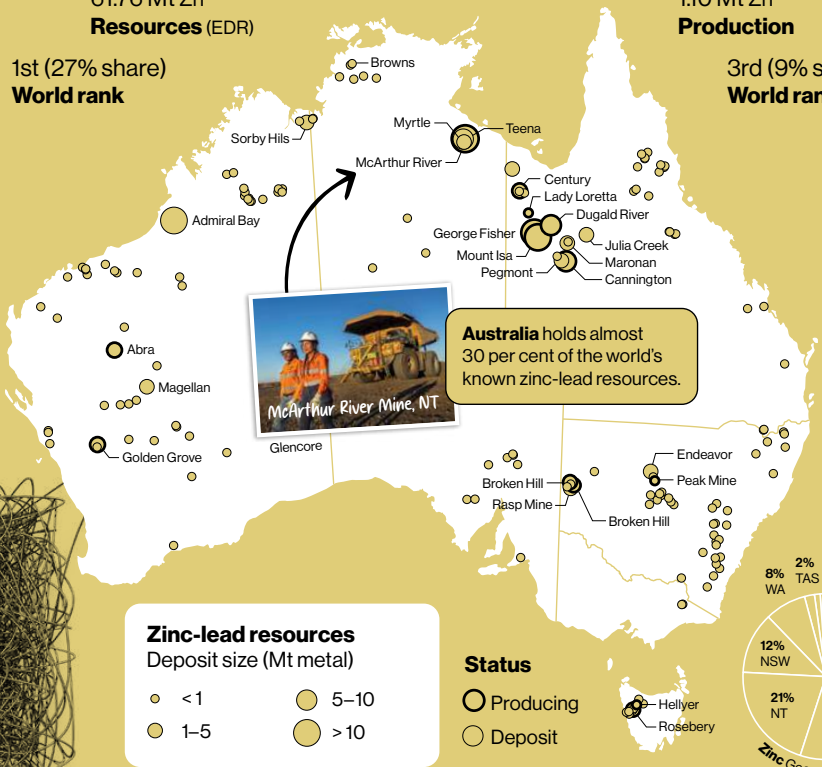
Geoscience Australia, *Australia's Identified Mineral Resources 2025*

61.76 Mt Zn
Resources (EDR)

1st (27% share)
World rank

1.10 Mt Zn
Production

3rd (9% share)
World rank



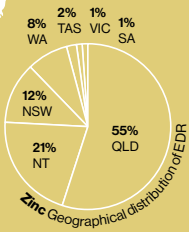
Australia holds almost 30 per cent of the world's known zinc-lead resources.

Zinc-lead resources
Deposit size (Mt metal)

- <1
- 1–5
- 5–10
- >10

Status

- Producing
- Deposit



Top global producers: USGS *(mine production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

	1. China	2. Peru	3. Australia	4. India
Production (2025[e])	4.1 Mt	1.5 Mt	1.1 Mt	0.9 Mt
Reserves	*60 Mt*	*18 Mt*	*64 Mt*	*10 Mt*

Note: USGS global production and reserves data may differ from Geoscience Australia's domestic data. See data notes page 109.

STATUS **CRITICAL**

US JA SK IN

Zirconium is a corrosion-resistant silvery metal used in nuclear reactors and advanced ceramics. Its heat-resistant properties, essential role in defence and energy technologies and limited availability make it a critical mineral.

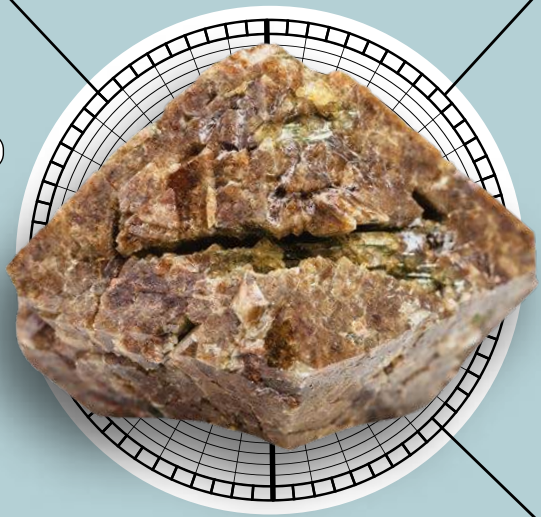
Applications

40
Zr

High
Heat tolerance

Low
Conductivity

Low
Reactivity



Nuclear energy

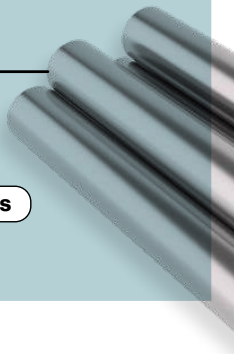
Rocket fuel

Hypersonic aircraft

Chemical processing

Solid oxide fuel cells

Defence
& Aerospace



Zirconium

Resourcing tomorrow

Zirconium

Zirconium occurs as zircon, concentrated by mechanical sorting in heavy mineral sands. Australia supplies over half of the world's zircon demand.

Heavy mineral sands resources and production, Australia

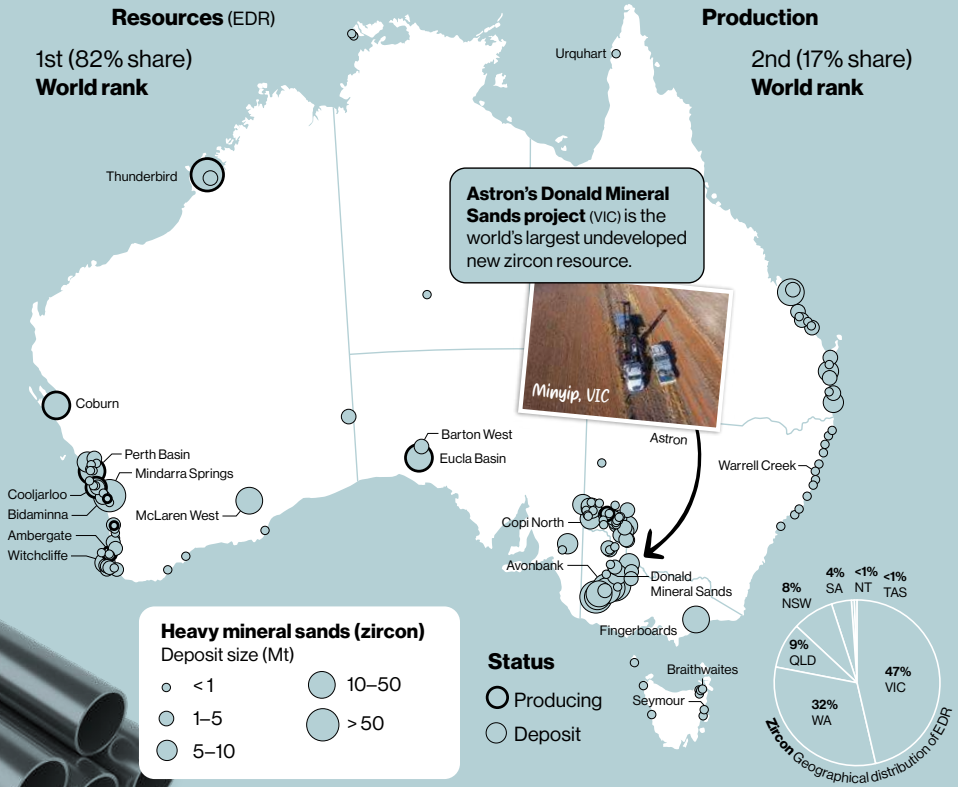
Geoscience Australia, *Australia's Identified Mineral Resources 2025*

89.7 Mt
Resources (EDR)

1st (82% share)
World rank

0.35 Mt
Production

2nd (17% share)
World rank



Top global producers: USGS *(mine production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

	1. Australia	2. Sth Africa	3. Mozambique	=4. US/China
Production (2025[e])	0.40 Mt	0.27 Mt	0.16 Mt	0.10 Mt
Reserves	*55 Mt*	*5.9 Mt*	*1.5 Mt*	*0.50 Mt*

Note: USGS global production and reserves data may differ from Geoscience Australia's domestic data. See data notes page 109.

CORNERSTONE COMMODITY

US EU

Metallurgical coal

Black coal is a carbon-rich sedimentary rock used for baseload electricity generation and steelmaking. Its long history and ongoing role in supporting reliable energy supply in Australia make it a cornerstone mineral for the economy.

Applications

Electricity

Cement

Steel making

Carbon fibre

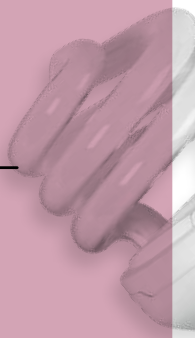
Filtration

6
C

High
Heat tolerance

Low
Conductivity

Med
Reactivity



Cornerstone Commodities

Black coal

Resourcing tomorrow

Black coal

Black coal forms in sedimentary basins from the burial and transformation of plant material. Australia hosts major producing basins in Queensland and New South Wales.

Black coal resources and production, Australia

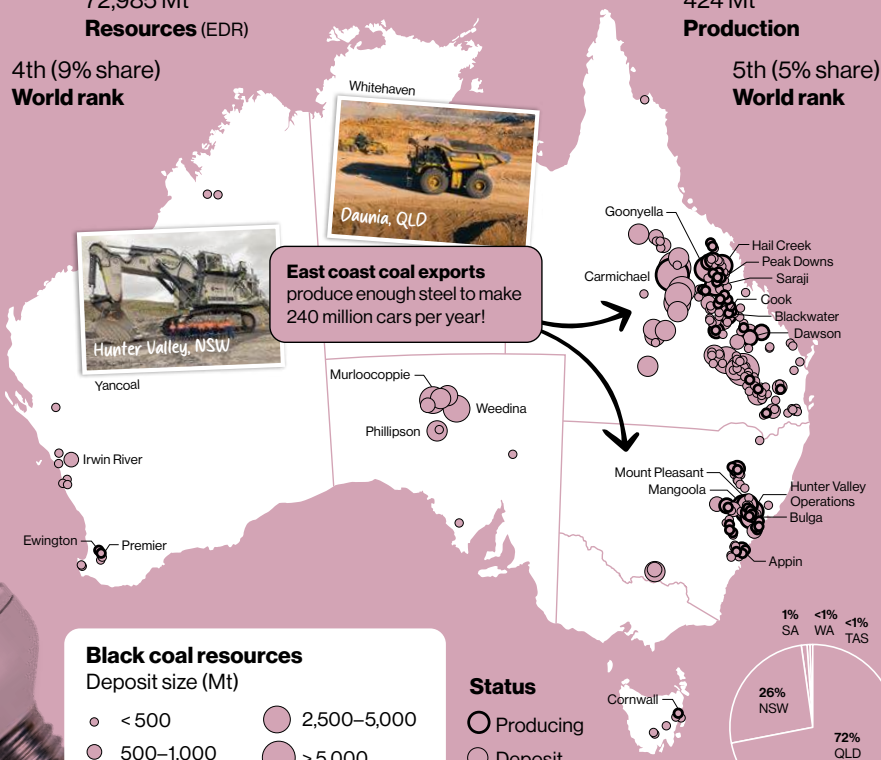
Geoscience Australia, *Australia's Identified Mineral Resources 2025*

72,985 Mt
Resources (EDR)

4th (9% share)
World rank

424 Mt
Production

5th (5% share)
World rank

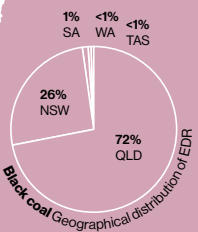


Black coal resources
Deposit size (Mt)

- < 500
- 500–1,000
- 1,000–2,500
- 2,500–5,000
- > 5,000

Status

- Producing
- Deposit



Australian coal exports

Department of Industry, Science and Resources, *Resources and energy quarterly: Dec 2025*

$54.2 b
Metallurgical coal
Value of metallurgical coal exports in 2023-24.

$37.2 b
Thermal coal
Value of thermal coal exports in 2023-24.

CORNERSTONE COMMODITY

Gold is a dense, yellow metal with a rich history shaping the early character of Australia. Treasured as jewellery and a traditional safe haven for investors, gold is finding new applications in medicine and electronics.

Applications

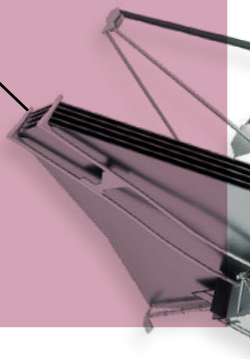
- Jewellery
- Electronics
- Investment
- Advanced health
- Aerospace

79
Au

Med
Heat tolerance

High
Conductivity

Low
Reactivity



Cornerstone Commodities

Gold

Resourcing tomorrow

Gold

Gold occurs in quartz veins and related minerals, formed in hydrothermal systems and in secondary alluvial deposits. Australia hosts the world's largest gold resources.

Gold resources and production, Australia

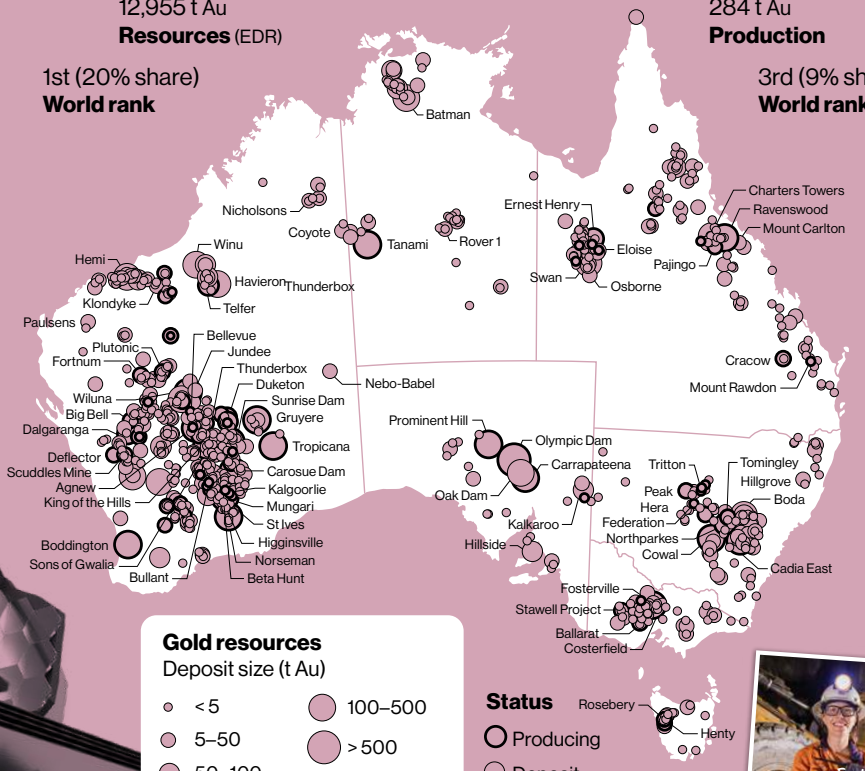
Geoscience Australia, *Australia's Identified Mineral Resources 2025*

12,955 t Au
Resources (EDR)

1st (20% share)
World rank

284 t Au
Production

3rd (9% share)
World rank



Gold resources
Deposit size (t Au)

- < 5
- 5–50
- 50–100
- 100–500
- > 500

Status

- Producing
- Deposit

Agnico Eagle

Top global producers: USGS *(mine production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

	1. China	2. Russia	3. Australia	4. Canada
Production (2025[e])	380 t	310 t	280 t	200 t
Reserves	*3,200 t*	*12,000 t*	*13,000 t*	*3,200 t*

Note: USGS global production and reserves data may differ from Geoscience Australia's domestic data. See data notes page 109.

CORNERSTONE COMMODITY

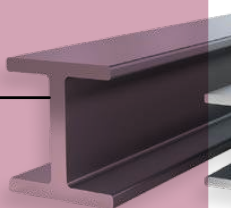
UK CA

(CA: High-purity iron)

Iron ore is a heavy, metallic rock used in steelmaking. Iron ore exports underpin the nation's economy and drive construction and manufacturing sectors, making it an essential mineral for governments, industry and global markets.

Applications

- Steel making
- Construction
- Manufacturing
- Trains & trucks
- Whitegoods



26
Fe

High
Heat tolerance

Med
Conductivity

Med
Reactivity

Cornerstone Commodities

Iron ore

Resourcing tomorrow

Iron ore

Iron ore occurs mainly as hematite and magnetite, formed in sedimentary and magmatic systems, including banded iron formations.

Iron ore resources and production, Australia

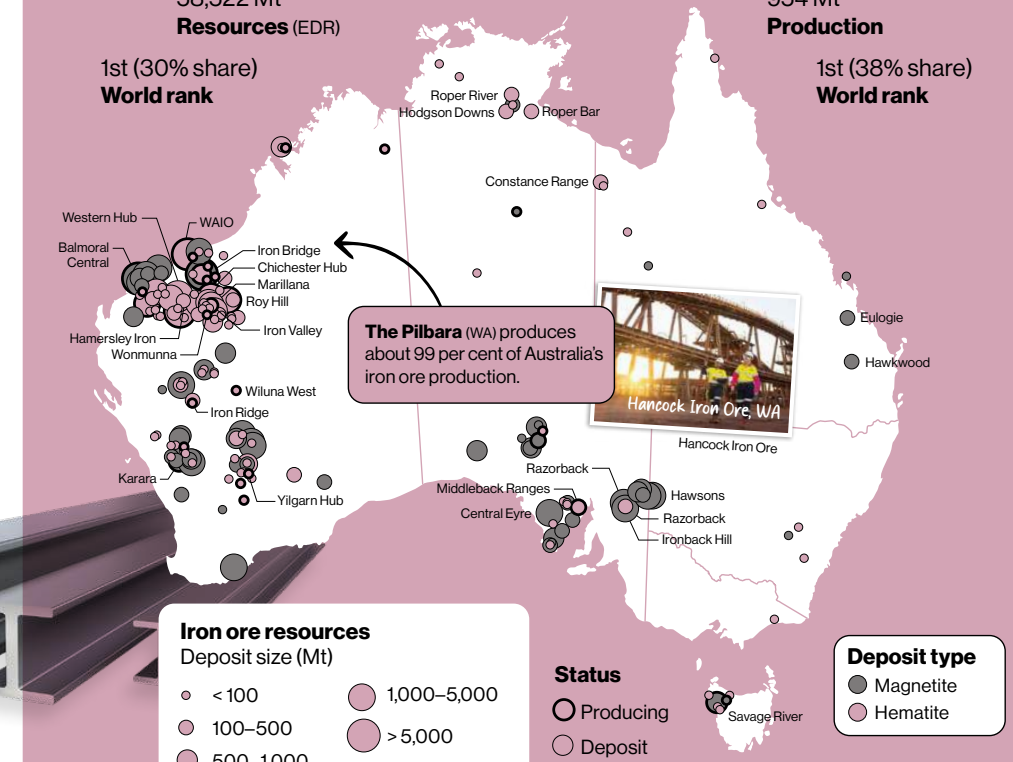
Geoscience Australia, *Australia's Identified Mineral Resources 2025*

58,522 Mt
Resources (EDR)

1st (30% share)
World rank

954 Mt
Production

1st (38% share)
World rank



Iron ore resources
Deposit size (Mt)

- < 100
- 100–500
- 500–1,000
- 1,000–5,000
- > 5,000

Status

- Producing
- Deposit

Deposit type

- Magnetite
- Hematite

Top global producers: USGS *(mine production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

	1. Australia	2. Brazil	3. India	4. China
Usable ore (2025[e])	980 Mt	420 Mt	310 Mt	290 Mt
Crude ore reserves	*(59,000 Mt)*	*(34,000 Mt)*	*(5,500 Mt)*	*(17,000 Mt)*

Note: USGS global production and reserves data may differ from Geoscience Australia's domestic data. See data notes page 109.

CORNERSTONE COMMODITY

US SK

Lead is a dense, soft metal used in batteries, radiation shielding and industrial alloys. Its malleability, corrosion resistance, and continued role in energy storage and manufacturing make it an enduringly important mineral.

Applications

- **Lead-acid batteries**
- **Ballast**
- **Radiation shield**
- **Cable sheathing**
- **Diving belts**

82
Pb

Low
Heat tolerance

Low
Conductivity

Med
Reactivity

Cornerstone Commodities

Lead

Resourcing tomorrow

Lead

Lead occurs mainly as galena, formed in hydrothermal and sedimentary systems and often with zinc and silver. Australia is a world-leading lead producer and exporter.

Lead resources and production, Australia

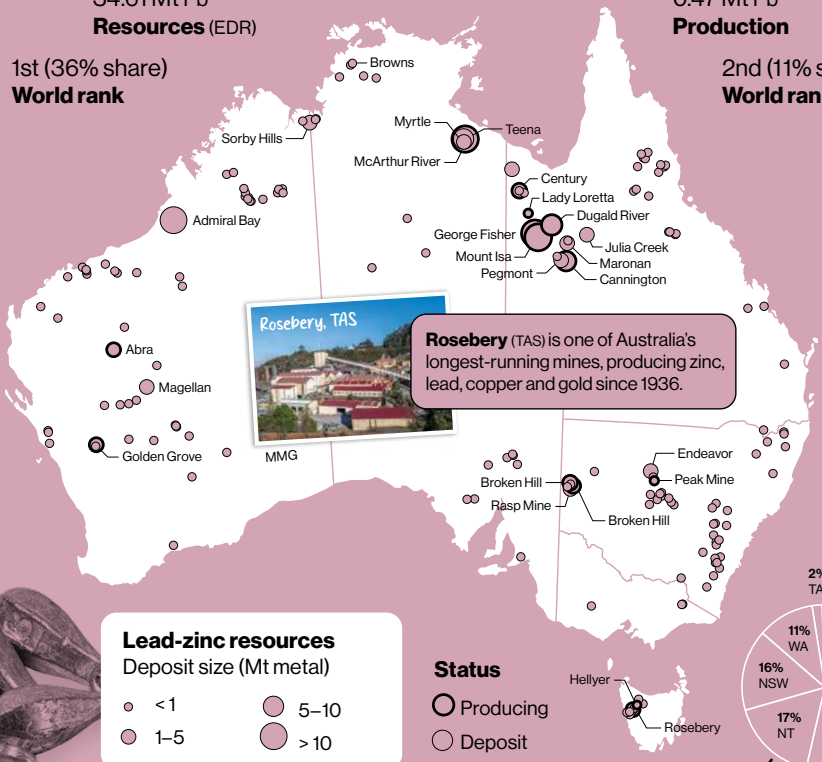
Geoscience Australia, *Australia's Identified Mineral Resources 2025*

34.61 Mt Pb
Resources (EDR)

1st (36% share)
World rank

0.47 Mt Pb
Production

2nd (11% share)
World rank



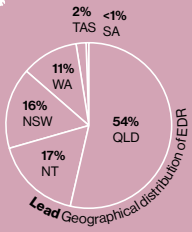
Rosebery (TAS) is one of Australia's longest-running mines, producing zinc, lead, copper and gold since 1936.

Lead-zinc resources
Deposit size (Mt metal)

- < 1
- 1–5
- 5–10
- > 10

Status

- Producing
- Deposit



Top global producers: USGS *(mine production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

	1. China	2. Australia	3. Peru	4. United States
Production (2025[e])	1.9 Mt	0.48 Mt	0.29 Mt	0.28 Mt
Reserves	*22 Mt*	*34 Mt*	*5 Mt*	*4.6 Mt*

Note: USGS global production and reserves data may differ from Geoscience Australia's domestic data. See data notes page 109.

CORNERSTONE COMMODITY

US CA IN

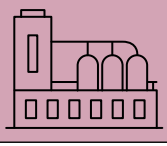
Potash refers to a group of potassium-bearing minerals essential to agriculture and food production. Its high nutrient value and vital role in sustaining crop yields make it an important mineral for the agricultural sector and the economy.

Applications

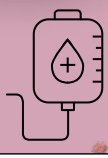
Fertilisers

Animal feed

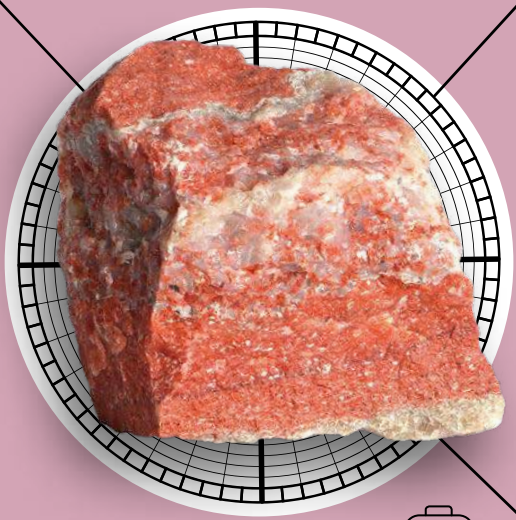
Detergents



Chemical processing



Saline drip

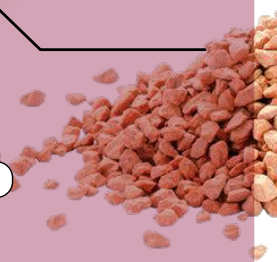


19
K

High
Heat tolerance

Low
Conductivity

Med
Reactivity



Cornerstone Commodities

Potash

Resourcing tomorrow

Potash

Potash occurs as potassium-rich salts formed through the evaporation of saline waters. High potash prospectivity exists in Western Australia and the Northern Territory.

Potash resources and production, Australia

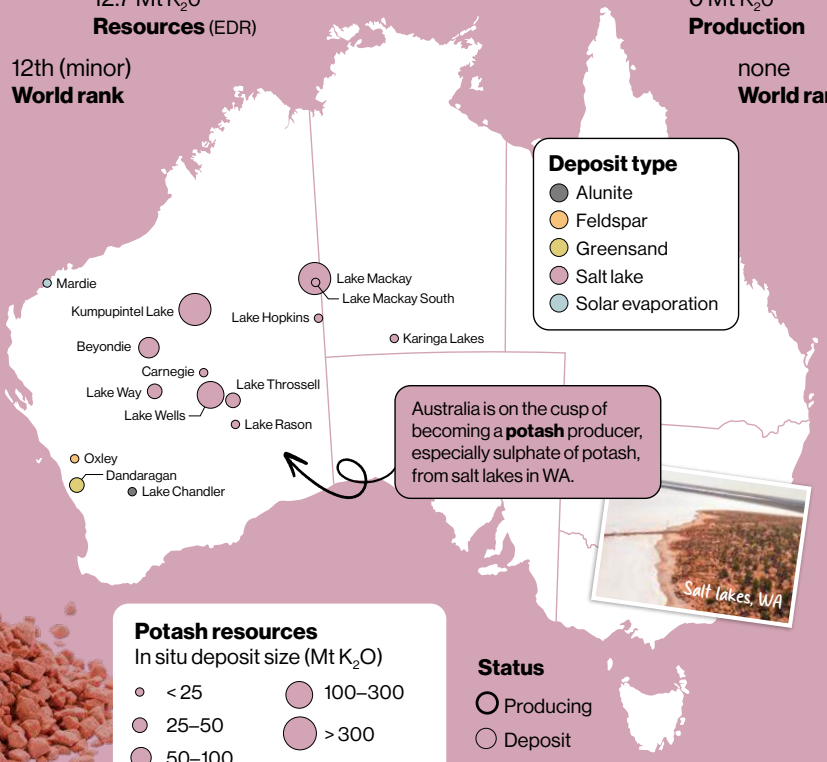
Geoscience Australia, *Australia's Identified Mineral Resources 2025*

12.7 Mt K_2O
Resources (EDR)

12th (minor)
World rank

0 Mt K_2O
Production

none
World rank



Top global producers: USGS *(mine production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

	1. Canada	2. Russia	3. China	4. Belarus
Production (2025[e])	15 Mt	10 Mt	6.3 Mt	6.0 Mt
Reserves	*1,100 Mt*	*2,000 Mt*	*200 Mt*	*750 Mt*

Note: USGS global production and reserves data may differ from Geoscience Australia's domestic data. See data notes page 109.

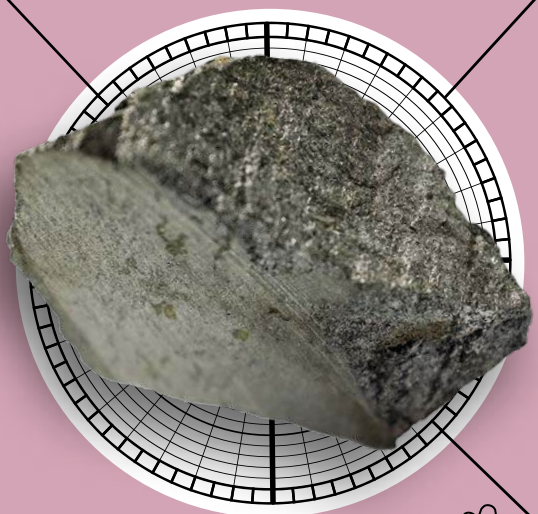
CORNERSTONE COMMODITY

US

Silver is a lustrous metal with exceptional electrical and thermal properties. Its antimicrobial attributes and reflectivity, combined with global demand across technology and manufacturing, make it an important mineral.

Applications

- Electronics
- 3D printing
- Solar panels
- Solid-state batteries
- Wound care



47
Ag

Med
Heat tolerance

Very high
Conductivity

Low
Reactivity

Cornerstone Commodities

Silver

Resourcing tomorrow

Silver

Silver occurs as native metal or within silver-bearing lead and zinc minerals such as galena, formed in hydrothermal and epithermal systems.

Silver resources and production, Australia

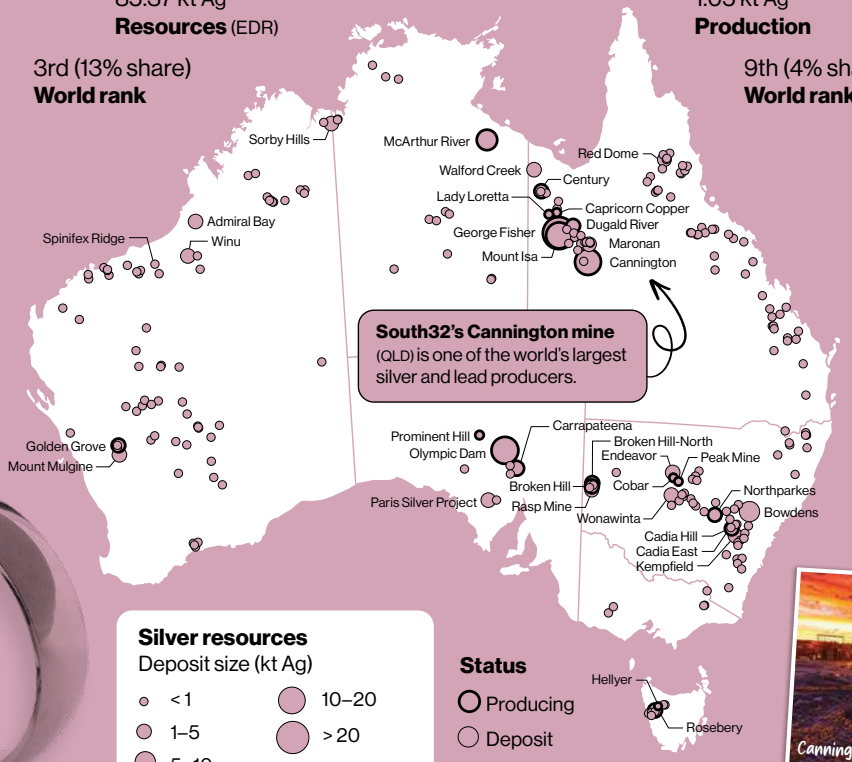
Geoscience Australia, *Australia's Identified Mineral Resources 2025*

85.37 kt Ag
Resources (EDR)

3rd (13% share)
World rank

1.05 kt Ag
Production

9th (4% share)
World rank



South32

Top global producers: USGS *(mine production)*

U.S. Geological Survey, *Mineral Commodity Summaries 2026*

	1. Mexico	2. Peru	3. China	4. Bolivia
Production (2025[e])	6.3 kt	3.6 kt	3.4 kt	1.5 kt
Reserves	*37 kt*	*110 kt*	*67 kt*	*22 kt*

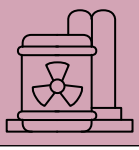
Note: USGS global production and reserves data may differ from Geoscience Australia's domestic data. See data notes page 109.

CORNERSTONE COMMODITY

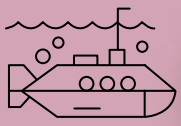
US CA

Uranium is a dense, radioactive metal mined in Australia and exported to countries committed to zero emissions nuclear energy. The same opportunity exists for Australia if a moratorium on nuclear development is lifted.

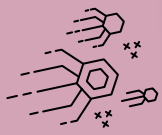
Applications



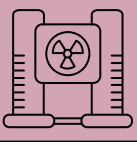
Nuclear energy



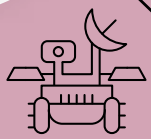
Submarines



Medical isotopes



Industrial x-rays



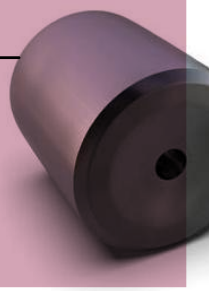
Aerospace

92
U

Very high
Heat tolerance

Med
Conductivity

Med
Reactivity



Cornerstone Commodities

Uranium

Resourcing tomorrow

Uranium

Uranium occurs in uraninite, formed in sedimentary and hydrothermal systems. South Australia's Olympic Dam is the world's largest uranium deposit.

Uranium resources and production, Australia

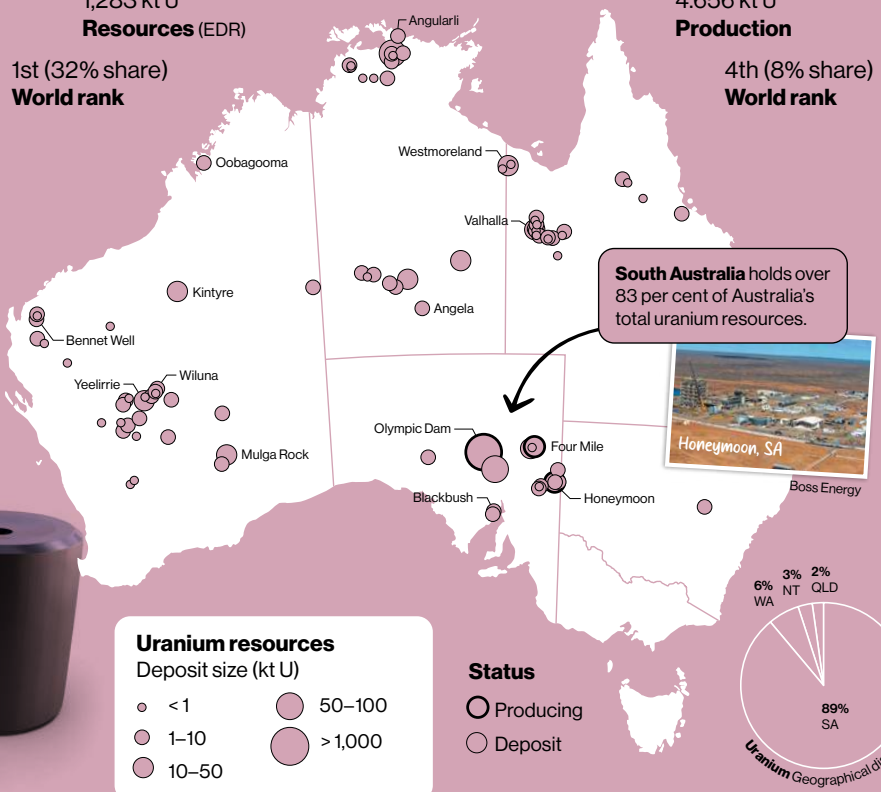
Geoscience Australia, *Australia's Identified Mineral Resources 2025*

1,283 kt U
Resources (EDR)

1st (32% share)
World rank

4.656 kt U
Production

4th (8% share)
World rank



Top global producers *(mine production)*

World Nuclear Association, *World Uranium Mining Production*, Jan 2026

	1. Kazakhstan	2. Canada	3. Namibia	4. Australia
Production (2024)	23.3 kt	14.3 kt	7.3 kt	4.6 kt
Resources	*814 kt*	*582 kt*	*498 kt*	*1,671 kt*

Glossary

The GOOD GUIDE glossary explains key geological processes, rock types and mineral deposits referenced throughout this book.

Core concepts

Ore A naturally occurring rock containing economically valuable minerals at high enough concentrations to be mined and processed profitably.

Mineral A naturally occurring inorganic solid with a defined chemical composition and crystalline structure, forming the fundamental building blocks of rocks.

Grade The concentration of a valuable element or mineral within ore, typically expressed as a percentage, parts per million, or grams per tonne.

Resource A concentration of minerals in the Earth's crust with reasonable prospects for eventual economic extraction, based on geological evidence and sampling.

Reserve The economically mineable portion of a measured or indicated resource, demonstrated by feasibility studies and accounting for technical and financial factors.

Geological processes

Hydrothermal Hot, mineral-rich water-based fluids circulate through rocks near volcanoes or intrusions, depositing metals like gold, copper and lithium in veins and altered host rock.

Magmatic Magma movement and cooling forms igneous rocks, concentrating metals like nickel, copper and rare earths within intrusions or layered systems.

Metamorphism Heat, pressure and fluids transform existing rocks, forming new minerals and textures, sometimes enriching metals like nickel, chromium, or graphite.

Tropical weathering Intense heat and rainfall break down rocks, leaching soluble elements and concentrating iron and aluminium minerals like bauxite and laterites.

Volcanism Eruption of magma, lava, and gases at Earth's surface, forming volcanic rocks, altering landscapes, and concentrating metals in deposits.

Rock systems

Granitic systems Granite-dominated continental crust formations hosting tin, tungsten, feldspar and other minerals, influencing landscapes and weathering into fertile soils.

Igneous Formed when magma or lava cools and solidifies, either underground or at the surface, producing coarse or fine-grained rocks that may host valuable minerals.

Pegmatites Extremely coarse-grained igneous rocks defined by large interlocking crystals formed late in magma crystallisation. Pegmatites are essential sources of critical minerals such as lithium, tantalum, tin and rare earths.

Sedimentary Rocks formed from compacted sediments like sand, silt or organic matter, often hosting uranium, phosphate or coal deposits.

Ultramafic Igneous rocks very low in silica, rich in magnesium and iron, forming deep in the mantle and often hosting nickel, cobalt, or chromium deposits.

Deposit types

Alluvial Heavy minerals like gold, tin, or diamonds concentrated by rivers, streams, or coastal waves into sedimentary deposits.

Epithermal Minerals deposited from hot, shallow fluids near the surface, often forming high-grade gold, silver and tellurium veins.

Lateritic Nickel concentrated by tropical weathering of ultramafic rocks, forming shallow laterite deposits suitable for mining.

Polymetallic Ores containing multiple valuable metals such as copper, zinc, lead, gold and silver, formed through hydrothermal, magmatic or sedimentary geological processes.

Skarn Skarns are formed where igneous intrusions meet carbonate rocks, producing concentrated metals such as copper, tungsten or zinc.

Volcanogenic Volcanic and hydrothermal fluids interact to deposit minerals like copper, zinc, lead and silver, and valuable mineral by-products like cobalt, gallium and germanium, on or below the seafloor.

Geoscience Australia

Geoscience Australia provides national leadership on Australia's resources by delivering comprehensive resource information and high-quality precompetitive geoscience, attracting investment and empowering industry with the data and insights needed to guide exploration and support value-adding across the resource sector. The Federal Government's Resourcing Australia's Prosperity initiative is a 35-year, $3.4 billion precompetitive geoscience initiative, led by Geoscience Australia, to accelerate the discovery and development of critical minerals and other resources to support Australia's energy transition, security and enable responsible management of all resources.

ga.gov.au

Download
Geoscience Australia, *Australia's Identified Mineral Resources 2025*, Canberra 2026.

Data notes

1. Economic Demonstrated Resources (EDR) is the category of highest geological and economic confidence in the National Classification System for Identified Mineral Resources which combines the Joint Ore Reserves Committee (JORC) Code categories of Proved and Probable Ore Reserves and most of Measured and Indicated Mineral Resources. This provides a long-term view of what is likely to be available for mining (potential supply). It does not include Inferred Resources which do not have enough geological confidence to support mine planning.
2. Australia's Identified Mineral Resources (AIMR) 2025 represents Australia's Ore Reserves and Mineral Resources as of 31 December 2024. Data shown on maps represents producing mines that have contributed to national production totals during the calendar year and total resources (EDR + Subeconomic + Inferred Resources).
3. United States Geological Survey (USGS) global production and resources data may differ from Geoscience Australia's domestic data. This is due to reporting methodologies, data collection timeframes, and definitions of 'economic' resources. USGS provides global, standardised estimates, while Geoscience Australia uses detailed, national-level data sourced primarily from published company reports, but includes some confidential and historical data.
4. For comprehensive datasets and definitions please refer to source documents at Geoscience Australia (ga.gov.au/aimr2025) and United States Geological Survey (pubs.usgs.gov/publication/mcs2026).

Resourcing tomorrow

Australian Mining

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