



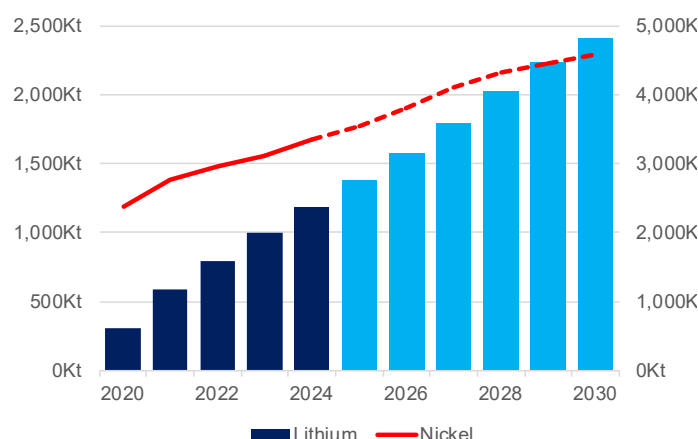
WESTERN AUSTRALIA BATTERY AND CRITICAL MINERALS PROFILE – April 2025

Battery minerals are minerals used in rechargeable batteries, such as lithium, nickel, cobalt, graphite, manganese, high purity alumina, tin, tantalum, magnesium, and vanadium. The definition of critical minerals is more subjective; jurisdictions use different definitions based on the minerals they deem to be critical to their economy and industries of strategic importance, as well as how sensitive certain minerals are to changes in global supply.

The Australian Government maintains the [Critical Minerals List and Strategic Materials List](#) for Australia. Minerals on these lists are essential to Australia's net-zero transition, advanced manufacturing, defence technologies and capabilities, and broader strategic applications. These minerals also have geological resource potential in Australia, are in demand from strategic international partners and are vulnerable to supply chain disruption.

Of the minerals included on Australia's critical and strategic minerals lists, this profile focuses on lithium, nickel, cobalt, and rare earth elements. These minerals are produced in significantly large quantities in Western Australia and are the main minerals used in manufacturing rechargeable batteries, electric vehicle and wind turbine motors, and other high-technology devices.

Demand outlook¹



Note – Forecasts start in 2024. Kt = Thousand tonnes of lithium carbonate equivalent. ¹ Consumption of nickel and demand of lithium. Demand is ahead of consumption by around 12 months due to the time taken to manufacture batteries.

Source: Office of the Chief Economist, Resources and Energy Quarterly.

- The global push to meet net-zero emissions targets is creating more demand for battery and critical minerals.
- World lithium demand rose 18% to 1.18 million tonnes in 2024. The Office of the Chief Economist forecasts world lithium demand will rise 103% to 2.41 million tonnes between 2024 and 2030.
- World nickel consumption rose 8% to 3.35 million tonnes in 2024. The Office of the Chief Economist forecasts world nickel consumption will rise 37% to 4.59 million tonnes between 2024 and 2030.
- World cobalt consumption rose 12% to 209,000 tonnes in 2023. S&P Global Market Intelligence forecasts world cobalt consumption will rise 68% to 351,000 tonnes between 2023 and 2028.
- Electric vehicles are a major driver of battery minerals demand. In 2023, global electric car sales rose 35% to 14 million. Under the International Energy Agency's Stated Policy Scenario, electric vehicle battery demand will grow four-and-a-half times by 2030, and almost seven times by 2035, compared to 2023.

Western Australia's battery and critical minerals industry

Western Australia accounts for a large proportion of the world's production of many battery and critical minerals, producing around half of the world's lithium and being among the top six producers of nickel, cobalt, and rare earths. Projects developed in recent years have moved Western Australia further up the battery and critical minerals value chain, with lithium hydroxide being produced from processing plants in Kwinana and Kemerton and a third lithium hydroxide plant under construction at Kwinana as part of the Mt Holland project.

A fall in prices has made market conditions challenging for some projects in the battery and critical minerals industry. In July 2024 Albemarle announced it would be placing one of its two operating trains at Kemerton into care and maintenance and in January 2025 Tianqi Lithium announced it was terminating construction on Phase 2 of its lithium hydroxide project at Kwinana. BHP announced the suspension of its Nickel West operations, Western Australia's largest nickel operation, from October 2024 after a surge in low-cost nickel supply globally led to a fall in the nickel price.

In response to challenging market conditions, the Western Australian Government has announced support programs, including the [Nickel Financial Assistance Program](#) and the [Lithium Industry Support Program](#).

Production and resources: 2023

Mineral ¹	Production		Resources	
	WA share of AUS (%)	WA share of world (%)	WA share of AUS (%)	WA share of world (%)
Cobalt	100	2	70	13
Copper	13	0.5	8	1
Graphite	n.a.	n.a.	17	n.a.
Lithium	97	47	99	26
Manganese	17	3	70	11
Nickel	98	4	90	21
Rare earths	100	8	50	3
Vanadium	n.a.	n.a.	62	20
Zinc	5	0.4	7	2
Zircon	35	11	34	25

Note – Western Australia's global rankings and world shares presented in the table may differ from similar content in other parts of this report due to a different data source. n.a. not applicable or available. ¹ Includes a selection of minerals for which Western Australia has a significant share of global production or resources.

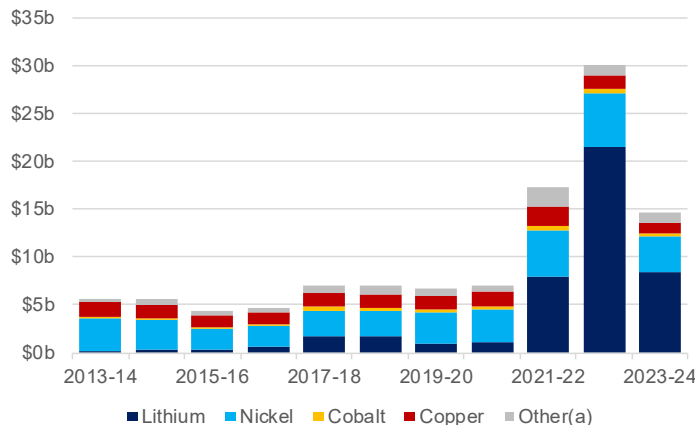
Source: WA Department of Energy, Mines, Industry Regulation and Safety, Resource Data Files; Geoscience Australia, Australia's Identified Mineral Resources; and US Geological Survey, Mineral Commodity Summaries.

Note on lithium volumes: Lithium is produced as different compounds, so lithium volumes are reported in different units. This profile uses the volumes as originally reported in the source documents. As a guide, the lithium content of lithium carbonate is around 19%, so volumes reported in lithium carbonate equivalent (or LCE) are around 5.3 times higher than volumes reported in lithium content.



Contribution to the Western Australian economy

Sales value

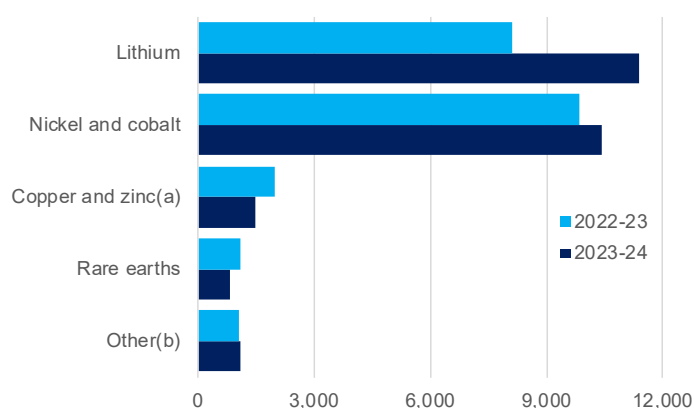


Note – The value of some minerals in the 'other' category is not included in the total for some years due to confidentiality restrictions. (a) Includes zircon, zinc, manganese, rare earths, platinum group elements, silica sands, tantalum, tin and chromite.

Source: WA Department of Energy, Mines, Industry Regulation and Safety, Resource Data Files; and WA Department of Jobs, Tourism, Science and Innovation.

- Lithium (spodumene) accounted for 57% of the value of Western Australia's battery and critical minerals sales in 2023-24, with nickel accounting for 26% and copper 7%.
- Significant falls in the price for some minerals led to the value of Western Australia's battery and critical minerals sales falling 52% to \$14.6 billion in 2023-24. The fall in 2023-24 came after a 73% increase in the value of battery and critical minerals sales in 2022-23 to \$30.1 billion.
- In 2023-24, the sales value of:
 - lithium (spodumene) fell 61% to \$8.4 billion
 - nickel fell 32% to \$3.9 billion
 - copper fell 24% to \$1.1 billion
 - cobalt fell 40% to \$222 million.

Employment¹

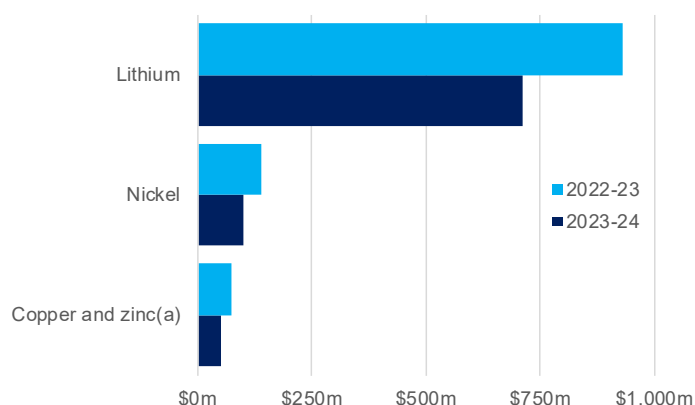


¹ Direct full-time equivalent (FTE). Includes operational and construction employment. (a) Includes lead. (b) Includes manganese, silica and silica sand, zircon, phosphate, vanadium, and magnesite.

Source: WA Department of Energy, Mines, Industry Regulation and Safety, Resource Data Files; and WA Department of Jobs, Tourism, Science and Innovation.

- Direct full-time equivalent (FTE) employment in Western Australia's battery and critical minerals industry increased 14% to 25,261 in 2023-24.
- In 2023-24, direct FTE employment in the:
 - lithium industry increased 41% to 11,386
 - nickel and cobalt industry increased 6% to 10,434
 - copper and zinc industry fell 25% to 1,499
 - rare earths industry fell 24% to 834.

Royalty revenue



(a) Includes lead.

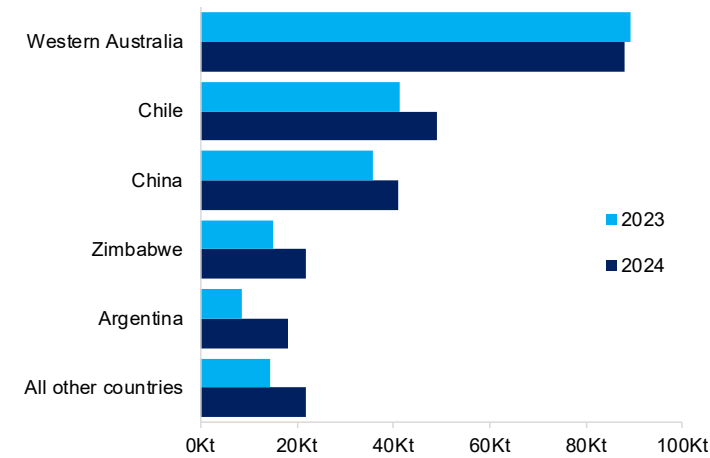
Source: WA Department of Energy, Mines, Industry Regulation and Safety, Resource Data Files.

- Western Australia has a 5% royalty rate on the value of lithium concentrate (spodumene) feedstock.
- Lithium accounted for 6% of Western Australia's royalty revenue (including North West Shelf grants) in 2023-24.
- Lithium royalties fell 24% to \$710 million in 2023-24.
- Western Australia has a 2.5% royalty rate on the value of nickel sold. The nickel industry is currently receiving support through the WA Government's Nickel Financial Assistance Program, which provides a 50% rebate on royalties paid on nickel sales each quarter between March 2024 to June 2025, if the average price of nickel in concentrate is below US\$20,000 a tonne for a given quarter.
- Nickel accounted for 1% of Western Australia's royalty revenue (including North West Shelf grants) in 2023-24.
- Nickel royalties fell 29% to \$99 million in 2023-24.



Lithium

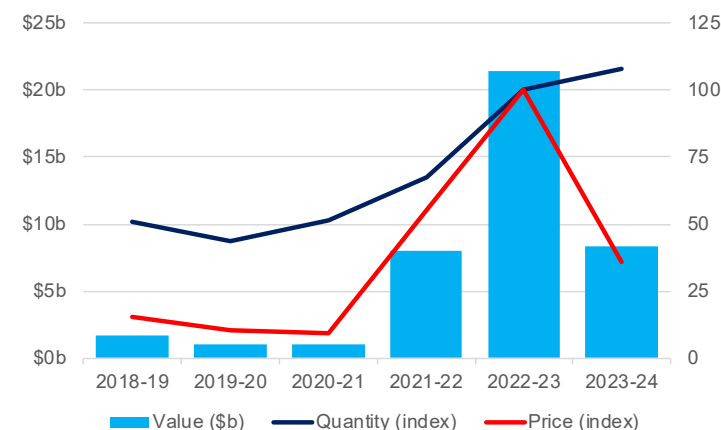
Lithium supply¹



Kt = Thousand tonnes. ¹ Lithium content from mine production.
Source: US Geological Survey, Mineral Commodity Summaries.

- Lithium is mainly used in rechargeable batteries (for mobile phones, laptops, digital cameras and electric vehicles), which accounts for 80% of global lithium consumption.
- Western Australia is the largest lithium supplier in the world.
- Other major lithium suppliers in 2024 were Chile (20%), China (17%), Zimbabwe (9%) and Argentina (8%).
- In 2024, lithium supply (as measured by the lithium content of mine production) from:
 - Western Australia fell 1% to 88,000 tonnes
 - Chile rose 18% to 49,000 tonnes
 - China rose 15% to 41,000 tonnes
 - Zimbabwe rose 48% to 22,000 tonnes
 - Argentina rose 109% to 18,000 tonnes.
- The average total cash cost of Western Australia's lithium production was US\$4,701 a lithium carbonate equivalent (LCE) in 2024, below the world average of US\$7,293 a LCE. In 2024, Western Australia's average total cash cost of lithium production was 73% lower than Chile's average total cash cost of US\$17,657 a LCE and 15% lower than China's average total cash cost of US\$5,552 a LCE.

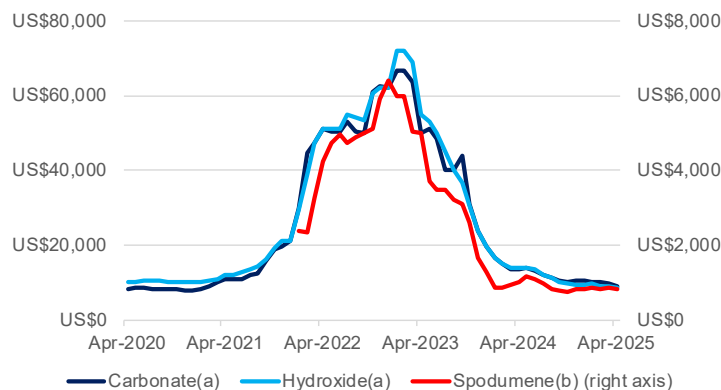
Western Australia's lithium¹ sales



¹ Spodumene concentrate. Index 2022-23 = 100.0.
Source: WA Department of Energy, Mines, Industry Regulation and Safety, Resource Data Files.

- In 2023-24, the value of Western Australia's lithium sales fell 61% to \$8.4 billion, which was the net result from the:
 - average unit price of sales falling 64%
 - quantity of sales increasing 8% to 3.6 million tonnes.
- Greenbushes is Western Australia's largest lithium mine. In 2023, the Greenbushes mine accounted for 51% of the State's lithium production, followed by Pilgangoora (17%), Wodgina (12%), Mt Marion (11%) and Mt Cattlin (6%).
- Spodumene concentrate production capacity in Western Australia will be increased by:
 - The Kathleen Valley lithium project, which was sanctioned for development in August 2022 and began production in July 2024.
 - The P1000 expansion of the Pilgangoora lithium operation, which was sanctioned in March 2023 and will increase the project's production by 47% to 1 million tonnes a year.

Lithium prices



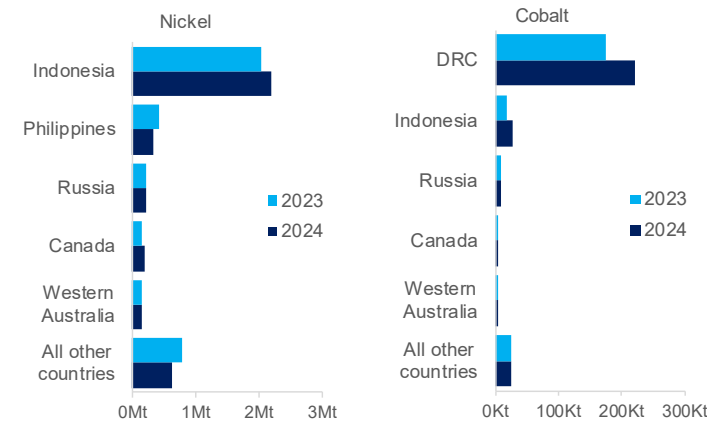
¹ Price per tonne. (a) Cost, insurance, and freight Asia. (b) Concentrate free-on-board Australia.
Note – Spodumene concentrate prices are available from January 2022.
Source: S&P Global Market Intelligence.

- Lithium prices fell further in 2024 due to a large rise in global supply and slowing demand for lithium from China's passenger plug-in electric vehicle sector.
- In 2024, the annual average price of lithium spodumene fell 75% to US\$912 a tonne and the annual average price of lithium hydroxide fell 74% to US\$12,403 a tonne.
- In April 2025, the monthly average price for:
 - lithium spodumene was US\$836 a tonne, 1% lower than the previous month and 18% lower than a year ago.
 - lithium carbonate was US\$9,000 a tonne, 7% lower than the previous month and 33% lower than a year ago.
 - lithium hydroxide was US\$8,825 a tonne, 1% lower than the previous month and 37% lower than a year ago.
- The Office of the Chief Economist forecasts lithium prices to stay low over the next year, with the annual average price of:
 - lithium spodumene forecast to be US\$877 a tonne in 2025 and US\$925 a tonne in 2026.
 - lithium hydroxide forecast to be US\$10,542 a tonne in 2025 and US\$12,500 a tonne in 2026.



Nickel and cobalt

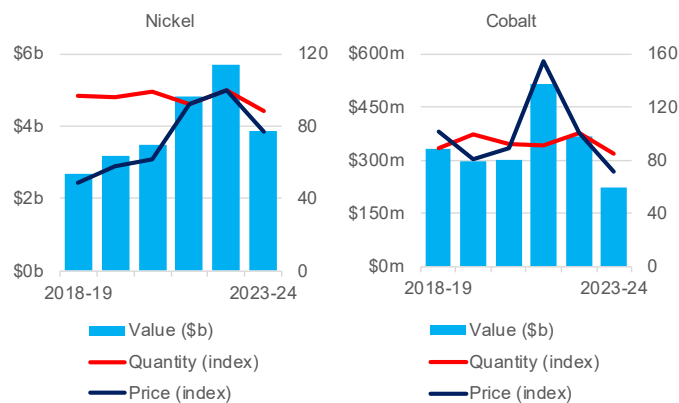
Nickel and cobalt supply¹



DRC = Democratic Republic of Congo. Mt = Million tonnes. Kt = Thousand tonnes. ¹ Nickel and cobalt content from mine production.
Source: US Geological Survey, Mineral Commodity Summaries.

- Nickel is mainly used to make stainless steel. Around 15% of the world's nickel is consumed in batteries.
- Western Australia is the 5th largest nickel supplier in the world, accounting for 4% of global supply in 2024. Nickel supply from Western Australia fell 5% to 149,000 tonnes in 2024.
- Indonesia is by far the largest nickel supplier in the world, accounting for 59% of global nickel supply in 2024.
- Cobalt is mainly used in rechargeable battery electrodes. Over 80% of the world's consumption of cobalt is for manufacturing rechargeable batteries.
- Western Australia is the 5th largest cobalt supplier in the world, despite accounting for only 1% of global supply in 2024. Cobalt supply from Western Australia fell 31% to 3,600 tonnes in 2024.
- The DRC is by far the largest cobalt supplier in the world, accounting for 76% of global cobalt supply in 2024.

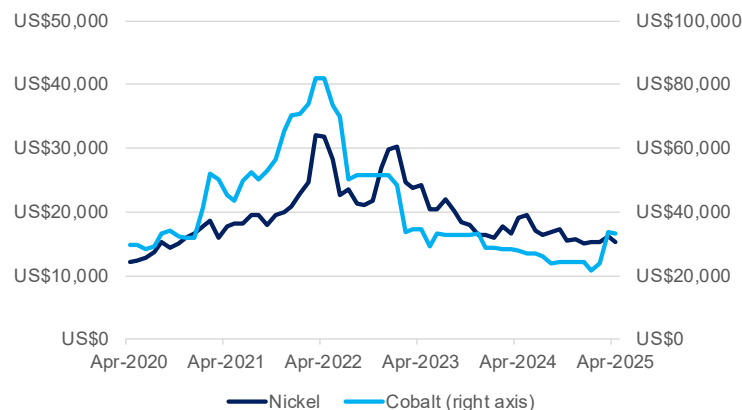
Western Australia's nickel and cobalt sales



Index 2022-23 = 100.
Source: WA Department of Energy, Mines, Industry Regulation and Safety, Resource Data Files.

- In 2023-24, the value Western Australia's nickel sales fell 32% to \$3.9 billion, as a result of the:
 - average unit price of sales falling 23%
 - quantity of sales falling 12% to 141,000 tonnes.
- In 2023-24, the value Western Australia's cobalt sales fell 40% to \$222 million, as a result of the:
 - average unit price of sales falling 29%.
 - quantity of sales falling 15% to 5,000 tonnes.
- BHP has announced the suspension of its Nickel West operations from October 2024. Nickel West was Western Australia's largest nickel operation in 2023 with its two largest mines, Mt Keith and Leinster, accounting for 30% of the State's paid nickel mine production in 2023.
- Murrin Murrin is Western Australia's largest nickel mine, accounting for 21% of the State's paid nickel mine production in 2023. The Murrin Murrin mine also accounted for 67% of the State's paid cobalt mine production in 2023.

Nickel and cobalt prices¹



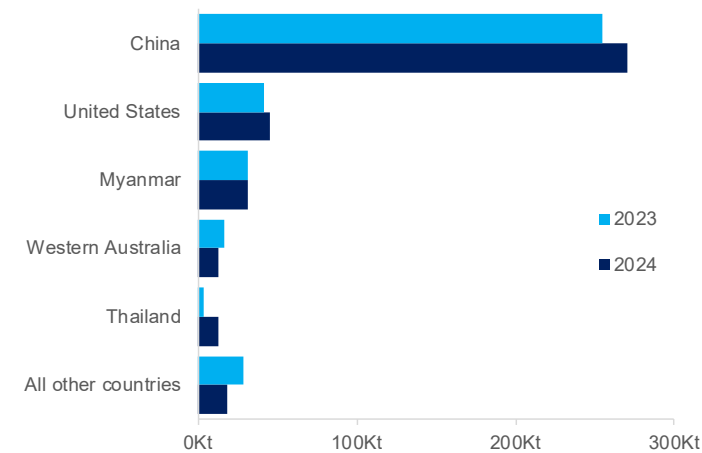
¹ Price per tonne, London Metal Exchange (LME) Cash.
Source: S&P Global Market Intelligence.

- Nickel and cobalt prices fell sharply in 2023 and 2024 as global supply rose and demand from China's passenger plug-in electric vehicle sector weakened.
 - The annual average nickel price fell 21% to US\$16,869 a tonne in 2024.
 - The annual average cobalt price fell 23% to US\$26,155 a tonne in 2024.
- In April 2025, the monthly average price for:
 - nickel was US\$15,219 a tonne, 6% lower than the previous month and 20% lower than a year ago.
 - cobalt was US\$33,258 a tonne, 1% lower than the previous month but 20% higher than a year ago.
- A modest recovery in prices for nickel and cobalt is expected in 2025 and 2026.
 - The Office of the Chief Economist forecasts the annual average nickel price will be US\$16,317 a tonne in 2025 and US\$17,375 a tonne in 2026.
 - S&P Global Market Intelligence forecasts the annual average price of cobalt will be US\$34,089 a tonne in 2025 and US\$38,036 a tonne in 2026.



Rare earths

Rare earths supply¹



Kt = Thousand tonnes. ¹ Rare earth oxide equivalent content from mine production.
Source: US Geological Survey, Mineral Commodity Summaries.

- Rare earths are used in high-tech consumer products and defence applications.
 - Neodymium is used in electric vehicle motor magnets and wind turbines
 - Praseodymium is used in aircraft engines
 - Cerium is used in catalytic converters for cars
 - Lanthanum is used in lenses for cameras and telescopes.
- Western Australia is the 4th largest rare earths supplier in the world, accounting for 3% of global supply in 2024.
- China is by far the largest rare earths supplier in the world, accounting for 69% of global supply in 2023, followed by the United States (12%) and Myanmar (8%).
- In 2024, rare earths supply from:
 - China rose 6% to 270,000 tonnes
 - United States rose 8% to 45,000 tonnes
 - Myanmar remained steady at 31,000 tonnes
 - Western Australia fell 19% to 13,000 tonnes.

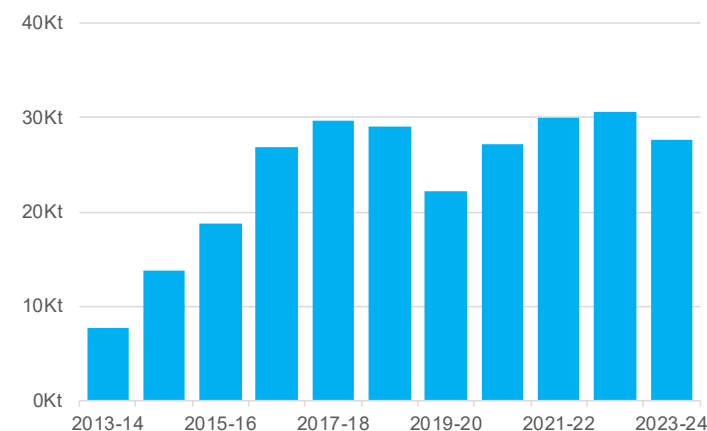
Neodymium prices¹



¹ Price per tonne.
Source: WA Department of Jobs, Tourism, Science and Innovation based on data from Trading Economics.

- Prices for rare earths rose sharply in 2020 and 2021 as demand outstripped supply. Demand for rare earths was high due its uses in decarbonisation-based applications. However, as global production of rare earths has ramped up in recent years, especially in China, the price of rare earths has fallen back to near pre-2020 levels.
- The annual average neodymium price fell 27% to US\$68,088 a tonne in 2024.
- The monthly average neodymium price fell 7.9% to US\$71,231 a tonne in April 2025.

Western Australia's rare earths sales



Kt = Thousand tonnes.
Source: WA Department of Energy, Mines, Industry Regulation and Safety, Resource Data Files.

- The quantity of Western Australia's rare earths sales fell 10% to 27,700 tonnes in 2023-24.
- Sales values for rare earths are not available for most years due to data confidentiality restrictions.
- Western Australia's rare earths production mainly comes from the Mt Weld mine. Production capacity of the Mt Weld mine is being expanded to supply a rare earths processing plant under construction in Kalgoorlie. The plant will produce 38,000 tonnes of rare earths carbonate a year by 2025.
- Other rare earths projects in Western Australia include:
 - The Yangibana rare earths project (15,000 tonnes a year starting in 2025).
 - The Eneabba rare earths refinery (20,000 tonnes a year starting in 2025).
 - The Browns Range Stage 2 proposed development (3,000 tonnes a year).