



Department of Energy, Mines,  
Industry Regulation and Safety

Western Australian Mineral and Petroleum

# Statistics Digest 2023-24





The Fimiston Open Pit, known as the Super Pit, in the Goldfields region.

## Acknowledgement of Country

The Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) respectfully acknowledges Aboriginal peoples as being the traditional custodians of Western Australia. We acknowledge the enduring connection Aboriginal people continue to share with the land, sea and sky through both their ancestral ties and custodianship to Country. We pay our respect to Elders both past and present, and acknowledge the value brought to our department through the collective contribution of Aboriginal and Torres Strait Islander peoples across Western Australia.

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Cover photo: The Port of Port Hedland, the world's largest bulk export port, with exports including iron ore, lithium and salt.

Photo provided by Pilbara Ports



# Statistics Digest 2023–24

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## Foreword

I am pleased to present the Department of Energy, Mines, Industry Regulation and Safety's Western Australian (WA) Mineral and Petroleum Statistics Digest 2023–24.

The department, in its various forms, has been publishing data on WA's resources sector since 1894.

'The Digest', as it is colloquially known, is the annual document of record on the WA resources sector, its economic importance, and its place in global commodity markets.

It presents a consistent source of information on WA's mining and petroleum industries, describing key trends and patterns and diagnosing why they happened, in addition to tracking noteworthy activities and developments.

The Digest is compiled by a dedicated team of industry watchers and utilised by government organisations, academics, market analysts, consultants, investment banks, industry associations and industry professionals all over the world.

While the WA resources sector delivered another strong performance overall across the mining value chain, the past year was one of contrasts.

The iron ore industry enjoyed a period of record production and employment, as well as higher exploration expenditure, supported by higher prices. Gold similarly glittered, achieving a record sales value and employment numbers in addition to continued strength in exploration spending amid all-time prices.

On the downside, the lithium and nickel industries were affected by temporary market downturns, albeit from record highs, resulting in mine suspensions as well as the postponement of expansions and new projects. However, the longer-term outlook for these commodities remained positive, supported by the decarbonisation ambitions of economies worldwide.

The Liquefied Natural Gas (LNG) industry was also down due to relatively weaker market conditions and the natural decline of fields at the North West Shelf project.

WA's resources industry is a renowned global leader and this publication outlines the state of the sector for the past year as well as the range of projects in development that will continue to build a sustainable industry into the future.

### **Richard Sellers**

Director General  
Department of Energy, Mines, Industry  
Regulation and Safety

# Overview

WA's resources sector achieved sales on production valued at \$238 billion in 2023–24.

While this is a strong result overall, it does represent a decline from the absolute peak levels of more than \$250 billion in recent years.

The iron ore industry had sales valued at \$142 billion, the third highest level for a single calendar or financial year, supported by higher prices and record levels of production of 866 million tonnes (Mt).

The gold industry achieved an all-time high sales value of \$21 billion on the back of the highest gold prices ever recorded.

However, the solid performances of the iron ore and gold industries were more than offset by weaker market conditions and prices for several other major commodities compared to previous record highs:

- LNG production was valued at \$36 billion, compared to a record \$57 billion in 2022–23.
- Lithium sales were valued at \$8.4 billion, compared to a record \$21 billion in 2022–23.
- Nickel sales were valued at \$3.9 billion, compared to one of the highest levels in 15 years of \$5.7 billion in 2022–23.

The sector was assisted by an overall weaker Australian dollar (as most commodities are priced in United States [US] dollars). It averaged US 66 cents for the financial year, compared to US 68 cents in 2022–23, due to strength in the US dollar amid inflation and expectations of higher interest rates.

## Minerals

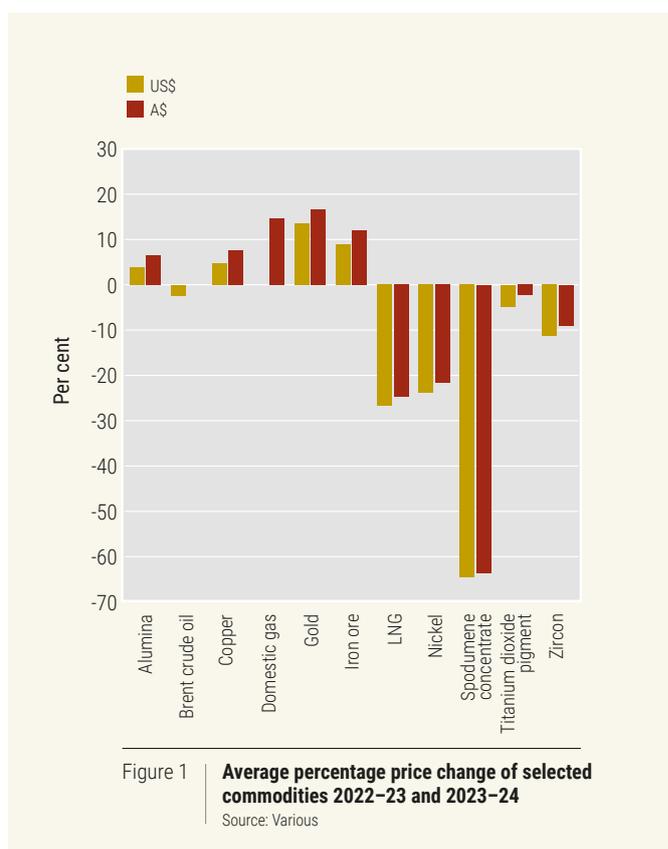
Minerals production maintained its place as the dominant activity in the State's resources sector with \$187 billion in sales in 2023–24.

This was an increase of nearly \$3 billion from 2022–23, but lower than the record of \$193 billion in 2023.

Minerals accounted for 79 per cent of all resources sector sales, which was around its 10-year average level.

Iron ore had sales valued at \$142 billion, once again making it the State's top resource commodity. This was the third highest value on record, below only the \$158 billion in 2021 and \$156 billion in 2020–21 which was a period of very high prices.

US dollar iron ore prices were higher year-on-year at an average of around US\$120 per tonne, up from US\$110 per tonne in 2022–23. Australian dollar prices were further boosted by a weaker Australian dollar achieving an average of around \$180 per tonne, up from around \$160 per tonne.



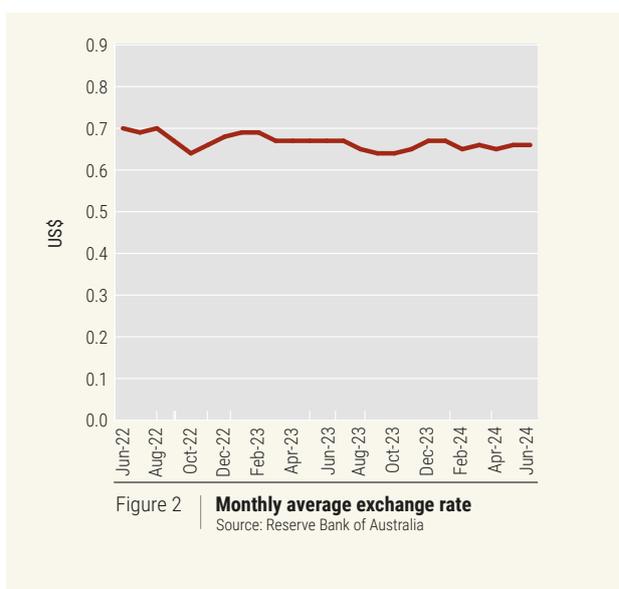
Iron ore prices shifted higher to the end of 2023 driven by signs of a turnaround in China's troubled property sector, plus new stimulus measures in China to support steel demand.

However, they trended lower through the first six months of 2024 as Chinese demand was subdued and the property sector remained troubled despite support in the form of expanded stimulus measures.

Almost 866 Mt of iron ore was produced in 2023–24 – the highest level for a single calendar or financial year.

During the year:

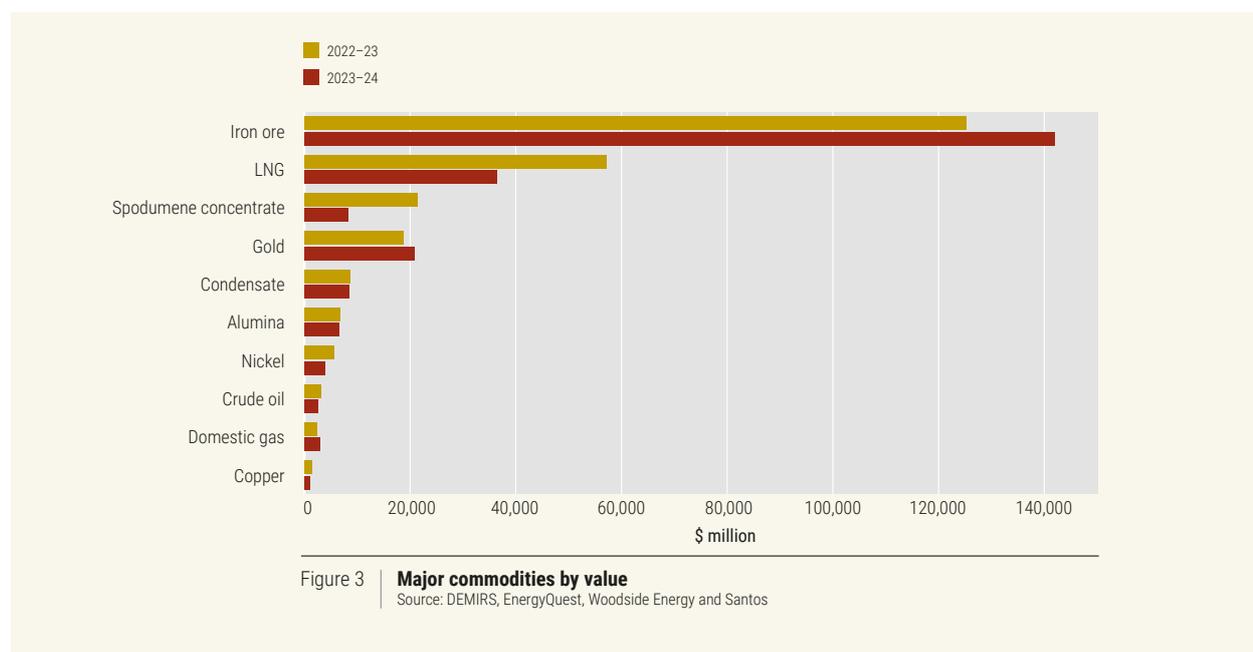
- Rio Tinto's output was lower with the ramp-up of the Gudai-Darri mine and productivity improvements from implementation of the Safe Production System, offset by weather disruptions at ports early in 2024 and a train collision in May 2024.
- BHP achieved record production on increased capacity unlocked through port debottlenecking, as well as the completion of ramp-up at South Flank.
- Fortescue's production was stable on the balance of factors including a train car derailment in late 2023 and weather disruptions in the new year, as well as first magnetite concentrate shipments from Iron Bridge.



The iron ore industry's share of sales was 76 per cent of mineral sales and 60 per cent of total resources sector sales, which are greater than the average levels over the last decade.

Gold achieved a record \$21 billion in sales in 2023–24, re-cementing its position as the second most valuable mineral produced in WA on the back of all-time high prices and despite lower output.

Gold prices trended higher across the financial year reaching new heights of nearly US\$2,500 (\$3,500) per ounce with geopolitical tensions and global economic uncertainty driving



**Table 1. Mineral and petroleum quantity Western Australia vs Rest of Australia vs Rest of World 2023**

Commodity	Western Australia	Rest of Australia	Rest of World	Global Ranking
Alumina	9.3%	4.4%	86.3%	2
Cobalt	2.3%	0.0%	97.7%	4
Copper	0.5%	3.1%	96.4%	>13
Crude oil	0.1%	0.03%	99.9%	46
Garnet	36.1%	0.0%	63.9%	1
Gold	7.0%	2.6%	90.3%	3
Ilmenite	2.9%	2.0%	95.1%	8
Iron ore	35.0%	0.4%	64.5%	1
Lead	0.8%	9.7%	89.5%	>12
Lithium	47.5%	1.4%	51.1%	1
LNG	11.9%	8.1%	80.0%	3
Manganese	3.0%	14.6%	82.4%	8
Nickel	4.2%	0.1%	95.7%	6
Rare earth oxides	7.9%	0.0%	92.1%	4
Rutile	19.3%	16.5%	64.2%	2
Salt	4.2%	0.9%	94.9%	6
Zinc	0.4%	8.5%	91.1%	>11
Zircon	10.8%	20.4%	68.8%	3

central banks to purchase gold bullion in record amounts and investors to buy futures.

A total of 6.6 million ounces (204 tonnes) of gold was produced in WA in 2023–24, the lowest level in seven years.

Production was notably lower from Newmont’s Boddington operations, due to lower ore grades as a stripping campaign was undertaken and its Telfer operation, which was suspended from April 2024 due to issues with tailings storage facilities. Production was also impacted by:

- Reduced performance from Jundee after a processing plant fire resulted in 10 days of downtime and reduced sales in the December quarter 2023.

- Planned lower production from St Ives during the first half of 2024 as well as delays in development of new open pits at the mine.
- The suspension of Dacian Gold’s Mt. Morgans project in April 2023, resulting in nil sales during 2023–24.

These factors more than offset the start-up of the Bellevue gold project, increased production from Vault Minerals’ (formerly Red 5’s) expanded King of the Hills project following ramp-up, as well as Aurene Group’s restarted Bottle Creek project.

Lithium sales were valued at \$8.4 billion, making it the State's third most valuable mineral. This was down significantly from a peak of \$21 billion in 2022–23, though it was still the fourth highest lithium sales value for a single calendar or financial year on record.

Lithium prices continued to decline throughout 2023–24, falling to the lowest levels since the second half of 2021 amid an ongoing supply surplus and weaker demand for electric vehicles.

The quantity of spodumene concentrate sold reached a new record of 3.6 Mt, supported by the ongoing optimisation and expansion of processing facilities at Pilbara Minerals' Pilgangoora operations, the ramp-up of expanded production capacity (albeit at reduced grades) at Mineral Resources' Wodgina and Mount Marion projects, as well as first sales from Covalent Lithium's Mount Holland mine and concentrator project. However, production and sales from Greenbushes was lower as inventories were built to match the requirements of its joint venture (JV) owners (Tianqi Lithium and IGO, and Albemarle Corporation).

The alumina industry had \$6.6 billion in sales in 2023–24, which is broadly the same level as in previous years.

The price of alumina trended higher particularly through the first half of 2024 on steady demand and supply constraints. It achieved its highest level in two years at an average of more than \$600 per tonne in June 2024.

The quantity of alumina produced declined to 12.4 Mt, its lowest level in more than a decade. Alcoa completed the curtailment of its Kwinana refinery in June 2024 and continued to be affected by reduced bauxite quality. South32's Worsley project was affected by the temporary outage of a bauxite conveyer which impacted supply to the alumina refinery during the June quarter 2024.

The value of nickel sales was \$3.9 billion, down by one-third from one of the highest levels in the last 15 years of \$5.7 billion in 2022–23.

The price of nickel trended down across the second half 2023 amid plentiful low-cost supply, particularly from Indonesia, as well as weak Chinese demand. It ended 2023 and began 2024 at an average of around US\$16,000 per tonne. The nickel price staged a recovery through May 2024 reaching a monthly average of nearly US\$20,000 per tonne, supported by supply concerns amid restrictions on Russian nickel supply and civil unrest in New Caledonia. However, it was short-lived with nickel shifting lower again in June 2024 on weakening Chinese demand.

The quantity of nickel sales decreased to 141 thousand tonnes (kt) principally on:

- First Quantum Minerals initially suspending mining and shift to alternative processing of existing stockpiles from January 2024 at its Ravensthorpe mine, and then subsequently putting the operation into care and maintenance from May 2024.
- Operational challenges at IGO's Nova project, as well as the ramp down of IGO's Forrester operations including the Flying Fox mine, which was closed in November 2023, and the Spotted Quoll mine, which was expected to finish mining during the September quarter 2024.
- The completion of scheduled maintenance and the phasing of the subsequent rampup at Glencore's Murrin Murrin operations.
- Administrators for Panoramic Resources putting the Savannah project into care and maintenance in January 2024.

The suspension of BHP's Nickel West operations, which commenced from July 2024 and was to be completed in October 2024, will affect production quantities in the coming years.

Copper sales were valued at \$1.1 billion, the lowest level since the Global Financial Crisis and continuing a downward trend in recent years.

The price of copper was fairly subdued through most of 2023–24. It rose strongly from March to May 2024 and achieved a two-year high of US\$10,000 per tonne on global supply concerns, particularly following the suspension of the Cobre mine in Panama, and rising manufacturing demand.

Sales volumes were 85 kt, a near 20-year low, as the DeGrussa project wound down and transitioned to care and maintenance. This result was also affected by lower copper byproduct sales from Boddington and Telfer, as well as the suspension of the Jaguar (in September 2023) and Savannah (in January 2024) projects.

The remaining significant other mineral sales for 2023–24 included:

- Mineral sands – \$1.2 billion.
- Salt – \$814 million (the highest on record).
- Coal – \$463 million (the highest on record).
- Manganese – \$341 million.
- Construction Materials – \$239 million (a decade high).
- Cobalt – \$223 million (down by around 40 per cent from 2022–23).

## Petroleum

The petroleum sector, comprising LNG, condensate, crude oil, domestic gas and Liquefied Petroleum Gas (LPG), had sales of \$51 billion.

This is the third highest value since records began, but down considerably down from more than \$70 billion in sales in 2022–23 and the 2022 calendar year.

The sector's share of total mineral and petroleum sales was 21 per cent, lower than in 2022–23 but around its 10-year average share.

LNG was the most valuable petroleum product produced in WA at \$36 billion (72 per cent of petroleum sales), followed by condensate at \$8.4 billion (17 per cent), domestic gas at \$2.9 billion (six per cent), crude oil at \$2.5 billion (five per cent) and LPG at \$554 million (one per cent).

The value of sales was down for most products primarily because of weaker market conditions across 2023–24 relative to previous levels:

- Oil prices were stable overall on a balance of factors including slow economic growth, weaker demand, declining supply from major producers, and geopolitical uncertainties.
- LNG spot prices were at the lowest level in several years on muted demand, including from a milder than expected northern winter.

WA produced 47.3 Mt (2,625 petajoules [PJ] or 2.20 trillion cubic feet [Tcf]) of LNG in 2023–24, down from a record 50.3 Mt (2,791 PJ or 2.33 Tcf) in 2022–23. Lower output largely reflected reduced production from the North West Shelf due to planned maintenance activities and natural field decline. Gorgon continued to outperform as did Pluto, which also benefitted from previous maintenance activities. Wheatstone was impacted by outages to the Julimar subsea

system and Wheatstone facility during the first half of 2024, while Prelude achieved more consistent production against improved reliability.

Condensate production was 11.7 gigalitres (GL), which is around its recent levels. It was supported by record production from the Ichthys floating, production, storage, and offloading (FPSO) facility. At the same time, condensate production was lower from the North West Shelf (described above) and Prelude, largely due to nil shipments in the December quarter 2023.

Oil production was 3.2 GL, among its lowest level since the late-1980s. The result was mostly due to planned maintenance on the Pyrenees FPSO and a shut-in following the identification of a water leak in the subsea facility.

Domestic gas was an exception among petroleum products, achieving a new record sales value on higher prices reflecting increased demand for gas-fired generation and tighter supply conditions.

Production was also at a five-year high, largely due to the doubling of the volumes of gas from Pluto processed through the North West Shelf for the domestic market, new supply from Walyering, as well as higher production from Varanus Island following a significant outage that affected output in the previous year.

## Available resource data



The department publishes detailed resource data on its website. Three separate Excel files are available:

- 1 **Major commodities** – contains information about the scale and scope of WA's mineral and petroleum industries, as well as detailed information about the State's major commodities. It includes data relating to sales values and quantities, prices, exports, as well as production compared with the rest of Australia and the rest of the world.
- 2 **Economic indicators** – contains information about how the State's mineral and petroleum industry contributes to the economy through exploration, investment, employment and royalties.
- 3 **Spatial and regional** – contains information about mining and petroleum tenements, the distribution of the value of mineral and petroleum sales and royalties, and mining employment across the State.

Throughout this digest there are references for more detailed information.

While this report contains data from the 2023–24 financial year, information on some key announcements after the financial year has been included for broader context.

# 1. Industry activity

## 1.1 Principal resource projects

WA's mining industry consisted of 138 predominantly higher value and export-oriented mining projects in 2023–24, up from 134 in 2022–23 and the highest number since DEMIRS began tracking projects on this basis in 2014–15.

The number of gold projects fell to 49 in 2023–24, down from 52 during 2022–23, and the gold industry once again had a high degree of turnover and activity:

- There were several new and re-started gold projects during the year, that notably included:
  - ▶ Auric Mining's Jeffrey's Find
  - ▶ Bellevue Gold's Bellevue
  - ▶ Ramelius Resources' Symes.
- However, they were more than offset by gold projects from 2022–23 that either were under the threshold (i.e. they did not produce more than 2,500 ounces of gold), had completed mining, been wound down, or entered care and maintenance. They most notably included Genesis Minerals' Mt Morgans, Novo Resources' Beatons Creek, Pantoro's Halls Creek, Ramelius Resources' Vivien, and Spartan Resources' Dalgara.
- Westgold Resources' Beta Hunt project was reclassified as a nickel project for 2023–24 after being primarily a gold project in 2022–23.

Several gold projects also changed hands in 2023–24, including:

- Telfer was acquired by Newmont Corporation through its acquisition of Newcrest Mining in November 2023.
- Beta Hunt and Higginsville were acquired by Westgold Resources after it merged with previous owner Karora Resources in August 2024.
- Deflector and Mt Monger (previously owned by Silver Lake Resources), as well as Darlot and King of the Hills (previously owned by Red 5) became part of Vault Minerals, a newly formed company arising from the merger of Silver Lake and Red 5 in September 2024.

The number of iron ore projects increased from 33 to 36 most notably on Fortescue's Iron Bridge completing its first shipment in September 2023, and Mineral Resources' Onslow achieving its first ore on ship in May 2024. Smaller iron ore operations including Kimberley Metals Group's Ridges, Extension Hill's Mount Gibson, Hedland Mining's Poondano, and Twin Peaks (owner 10M subsequently entered administration in June 2024), restarted, while Newcam Minerals also achieved first production at Mt Gould. Some iron ore projects were reclassified with BHP's South Flank project now considered a principal project after previously being part of the Mining Area C project, while Solomon is now included under Fortescue's Western project and Mineral Resources' Koolyanobbing and Parker Range fall under its Yilgarn project, which was due to transition to care and maintenance in early 2025.

The nickel industry endured a difficult financial year. While the number of nickel projects increased from nine to 11, due to a single quarter of sales from IGO's Cosmos project and the reclassification of the Beta Hunt project, several projects were put on care and maintenance amid weak market conditions. This included BHP's Nickel West operations, First Quantum Minerals' Ravensthorpe, Mincor Resources' Kambalda, Panoramic Resources' Savannah, and IGO's Cosmos. IGO's Forrester project also reached the end of its current economic life.

The number of lithium projects increased from six to seven due to the opening of Covalent Lithium's Mt Holland project in March 2024. However, amid lower for longer prices, several projects were put into or are transitioning to care and maintenance after the end of the 2023–24 financial year. Mineral Resources put Bald Hill into care and maintenance in early December 2024 while Arcadium Lithium is transitioning the Mt Cattlin project into care and maintenance by mid-2025. The Ngungaju plant, part of the Pilgangoora operations, was also to be placed into care and maintenance from December 2024.

There was an increase in the number of mineral sands projects from 10 to 11 with the commencement of production at Kimberley Mineral Sands' Thunderbird project in October 2023.

The classification of Global Advanced Metals' Wodgina tantalite project as a principal project brought the number of tantalum projects up from one to two. Wodgina tantalite has been operating on and off since 2010, but its sales values surpassed \$5 million for the first time.

While there was no change in the number of manganese projects, mining was suspended at Element 25's Butcherbird project in late 2023, with stockpile processing operations concluding in the March quarter 2024.

The State's single producing potash project, Beyondie, was suspended after its owner Kalium Lakes, entered administration in August 2023 and ultimately liquidation.

There was no change to the number of bauxite, coal, copper-lead-zinc, rare earths, salt, silica sands, and talc projects. However, there were some notable events for copper-lead-zinc projects with Aeris Resources' Jaguar suspended in September 2023 and Sandfire Resources' DeGrussa project reaching its end of life with final sales of stockpiles in the September quarter 2024.

The State's mining industry also comprised hundreds of quarries and small mines in 2023–24 that largely produced the basic raw materials required for the local construction and agricultural industries. Such materials included clays, construction materials (aggregate, gravel, rock and sand), dimension stone, gypsum, limestone, limesand and spongolite. There were 12 principal producers of these materials.

In 2023–24, there were 16 major mineral processing operations that transformed bauxite into alumina, gold doré into gold bars, nickel ore into nickel concentrate (through toll treatment) and nickel concentrate into nickel matte, nickel powder, nickel briquettes, and nickel sulphate; rutile and synthetic rutile into titanium dioxide pigment; zircon into fused zirconia; silica sand into silicon metal; spodumene concentrate into lithium hydroxide; and rare earth concentrate into rare earth carbonate.

This was one higher than the 15 in 2022–23, with Lynas Rare Earths’ Kalgoorlie cracking and leaching plant commencing the production of mixed rare earth carbonate during the June quarter 2024. However, there were some notable developments at mineral processing projects during the year with the curtailment of production at Alcoa’s Kwinana alumina refinery in June 2024, and the suspension of BHP’s Nickel West operations, which include the Kalgoorlie nickel smelter, Kambalda nickel concentrator, and Kwinana nickel refinery from October 2024.

WA’s petroleum industry consisted of 20 projects that produced oil, gas and condensates from 50 fields in onshore and offshore areas of the State in 2023–24. Many of these petroleum projects had associated processing plants for LNG exports and domestic gas sales.

The number of projects was one higher than in 2022–23 with the addition of Strike Energy’s Walyering onshore domestic gas project, which achieved first gas production in September 2023.

Notably, Cliff Head had its final oil sales in August 2024.

### **A note about principal resource projects**

A principal mining project is defined as a project that produced minerals valued at more than \$5 million (or more than 2,500 ounces of gold) in a given financial year. Also included in this definition are mining projects on private land, for which production values are not required to be reported, where full-time equivalents (FTEs) are greater than 50.

Mining projects are grouped according to the main commodity produced and sold from them.

For basic raw materials (i.e. sand, aggregate, rock, limestone, and limesand), only those producers with sales valued at more than \$5 million are captured. Basic raw materials projects are not specifically captured.

All major producing downstream mineral processing operations are captured.

A principal petroleum project is any project that produced LNG, condensate, oil, domestic gas, LPG in onshore and offshore areas of the State.



A list of the principal resource projects, including project details and notable events, is available on the department’s website and at Table 13, 14 and 15.

## 1.2 Employment

WA's mining industry achieved another record level of employment with 134,871 FTEs in 2023–24, reflecting strong levels of mining and construction activity in the State.

This is the seventh consecutive calendar year of growth, the last five of which have been record highs.

The rate of growth in employment, however, did slow to 5.8 per cent, down from 7.1 per cent in 2022–23.

The major contributors to onsite mining employment continued to be the iron ore (62,950 FTEs), gold (31,884 FTEs), lithium (11,386 FTEs), nickel (10,434 FTEs), and alumina and bauxite (7,021 FTEs) industries.

FTEs on mining operations was up year-on-year for most minerals with the major movers being lithium (up by more than 3,000 FTEs), gold (up by more than 1,800 FTEs), and iron ore (up by more than 1,700 FTEs).

FTEs decreased for:

- copper-lead-zinc by almost 500 FTEs as the DeGrussa project wound down and ceased production and sales (in May 2023) and the Jaguar mine was put onto care and maintenance (in September 2023); and
- alumina and bauxite by almost 200 FTEs as production was curtailed from Alcoa's Kwinana alumina refinery.

While employment was up in the nickel industry year-on-year, the extent of the job losses following a range of operational suspensions started to become apparent with employment decreasing by 1,349 FTEs in the March quarter and 1,238 FTEs in the June quarter 2023.

Employment on mineral exploration sites was 4,163 FTEs, the second consecutive fall from a record level of almost 4,700 FTEs in 2021–22.

Employment in the petroleum sector dropped to 8,010 people in 2023–24, its lowest level since 2011–12.

This is likely being driven by shorter-term market dynamics including weaker prices, as well as a longer-term decline in new oil and gas developments in the State.



The economic indicators file provides detailed employment data, including:

- Employment data for the mining industry by commodity, as well as the minerals exploration and petroleum industries.
- Mining employment data by site.



The spatial and regional file provides detailed employment data by Local Government Area (LGA) and region.

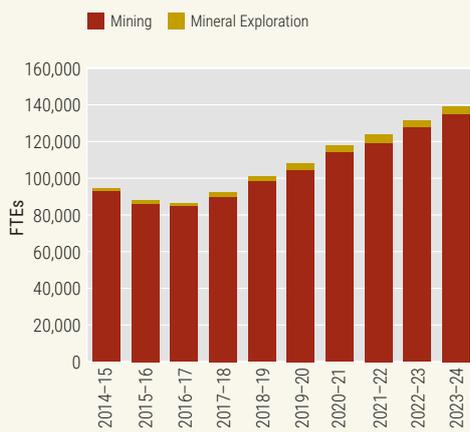


Figure 4 **Mining and mineral exploration employment**  
Source: DEMIRS

### A note about employment data

Mining and mineral exploration employment data is based on reporting under the *Work Health and Safety Act 2020* and, prior to April 2022, the *Mines Safety and Inspection Act 1994*.

Data is submitted monthly (before March 2022) or quarterly (from April 2022).

The reporting provides the number of hours worked on operating sites in the State by those people on site, and, from March 2008, exploration personnel working on greenfield sites. It does not include personnel in administrative locations located outside of operating sites. Port authorities were previously included under the *Mines Safety and Inspection Act 1994* and are now excluded under the *Work Health and Safety Act 2020*. No attempt has been made to adjust for this change.

Data is adjusted to full-time equivalents based on the number of hours workers with an FTE

considered to be 2,000 hours worked in a year, 500 hours worked in a quarter, and 166.7 hours worked in a month.

By contrast, petroleum employment data is from the Australian Bureau of Statistics (ABS) and represents the numbers of persons employed in 'Oil and Gas Extraction' class of the Australian and New Zealand Standard Industrial Classification in WA.

This data includes onshore, coastal waters, and offshore areas and includes persons mainly engaged in producing crude oil, natural gas or condensate through the extraction of oil and gas deposits, including LNG facilities.

It does not include employees engaged in natural gas and petroleum exploration.

Importantly, the mining and mineral exploration and petroleum employment data is not directly comparable and should not be combined.

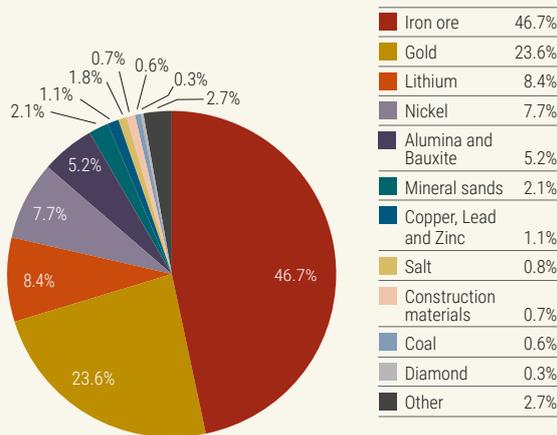


Figure 5 | **Mining employment by commodity 2023-24**  
FTEs 134,871  
Source: DEMIRS



Figure 6 | **Petroleum employment last 10 financial years**  
Source: Australian Bureau of Statistics

## 1.3 Investment



The economic indicators file contains historic and current mining investment data, including:

- Mining investment in WA.
- Mining share of new capital investment in WA.

### 1.3.1 Mining investment

More than \$32 billion was invested in WA's mining and petroleum industries throughout 2023–24.

This result continues the overall upwards trend in investment since mid-2019.

This result was supported by ongoing construction on major LNG projects including Woodside Energy's Scarborough project and Shell's Crux project, as well as major iron ore developments including Onslow (now in the production phase) and Western Range. The increase also likely reflects cost pressures with mining construction projects reporting higher capital costs in recent years.

The level of spending was, however, still only roughly two-thirds of the investment during the peak of the mining investment boom a decade ago.

WA's share of national mining and petroleum investment increased from recent years to 62 per cent, reflecting a higher rate of growth in spending in WA compared to the rest of the country.

The share was greater than the 10-year average, but below previous highs of 60 to 70 per cent during the tail-end of the mining investment boom.

The resources sector was again the major contributor (72 per cent) to total new capital expenditure in WA, though its share remained below the peak of greater than 80 per cent during the mining investment boom.

### 1.3.2 Investment pipeline

DEMIRS also monitors and collects information on mineral, petroleum and associated infrastructure projects in the investment pipeline, and estimates the capital costs of these projects.

Analysis of this information shows that as of September 2024 there were \$50 billion in projects committed and under construction, down from the \$55 billion in projects in March 2024.

This change was due to the completion of construction and start of production on several significant projects:

- Mineral Resources' Onslow iron ore project achieved first ore on ship in May 2024.
- Liontown Resources' Kathleen Valley lithium project produced first spodumene concentrate in July 2024 with an inaugural shipment following in September 2024.
- Pilbara Minerals' Pilgangoora 680 lithium expansion project was officially opened in August 2024.

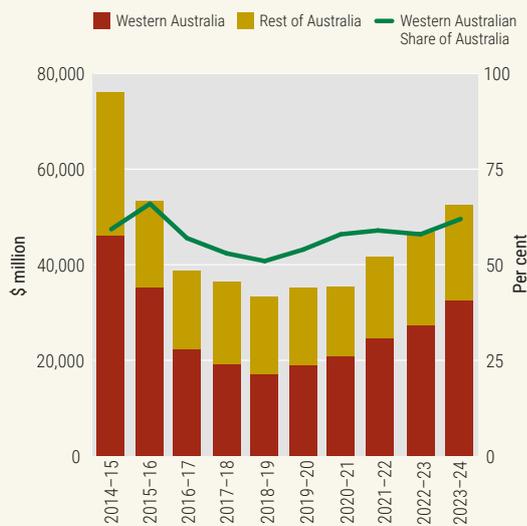


Figure 7 | Mining investment  
Source: Australian Bureau of Statistics

Some other significant projects were suspended and put onto care and maintenance, including:

- BHP announced that its West Musgrave copper-nickel project would transition to care and maintenance from July 2024 and be suspended in October 2024.
- Albemarle Corporation announced in July 2024 that it would stop construction activities on Train 3 at the Kemerton lithium hydroxide plant, after previously stopping construction activities on Train 4.

These losses were only partially offset by significant upward revisions in the capital cost of Woodside Energy's Scarborough project as well as Mitsui & Co and Beach Energy's Waitsia Stage 2 expansion, as well as a positive Final Investment Decision on Atlas Iron's McPhee Creek project and Rio Tinto's Desalination Plant to support its coastal operations.

The estimated capital cost of medium to longer-term possible and planned projects (i.e. undergoing scoping, pre-feasibility and definitive feasibility study) was \$119 billion as of September 2024, down by around \$800 million from March 2024.

The most notable new medium to longer-term projects announced were Legacy Iron Ore's Mt Bevan iron ore project and Pilbara Minerals' Pilgangoora 2000 lithium expansion project, while a new capital cost estimate was provided for Mineral Resources' Lockyer Deep gas project.

Some medium to longer-term projects will not be proceeding including the Murchison Technology Metals project, following Technology Metals Australia's merger with Australian Vanadium. The Kunpupintil Lake potash project will not be proceeding after the project tenements were surrendered by Reward Minerals.

**Table 2. Major Projects (as at September 2024)**

Sector	Commodity	Capital expenditure (\$ million)	
		Under Construction and Committed	Planned and Possible
Minerals	Gold	2,901	5,079
	Iron ore	5,085	33,288
	Lithium	4,018	4,666
	Nickel	0	10,340
	Copper, lead and zinc	0	2,888
	Rare earths	2,724	1,393
	Infrastructure	2,841	8,854
	Other minerals	2,040	8,952
	<b>Sub-total minerals</b>	<b>19,609</b>	<b>75,460</b>
Petroleum	Crude oil	0	3,000
	Domestic gas	0	1,703
	LNG	30,095	38,656
	Pipelines and infrastructure	0	200
	<b>Sub-total Petroleum</b>	<b>30,095</b>	<b>43,559</b>
<b>Total Forecast Investment</b>		<b>49,704</b>	<b>119,019</b>

## A note about investment pipeline data

Information on investment projects is obtained from various sources including Australian Stock Exchange announcements, the Office of the Chief Economist's major projects data, resources sector market analysts and consultants, as well as media reports.

Projects are categorised based on the following criteria:

- Under construction – those actually under construction.
- Committed – company has reached a positive Final Investment Decision (FID).
- Planned – those that have completed advanced feasibility studies including Definitive and Bankable Feasibility Studies and Front End Engineering and Design (FEED).
- Possible – those at an early stage of development including initial Scoping and Pre-Feasibility Studies.

## 1.4 Exploration



The economic indicators file contains detailed exploration expenditure data, including:

- Mineral exploration expenditure in WA and the rest of Australia.
- Mineral exploration expenditure by commodity in WA compared with the rest of Australia.
- Mineral exploration expenditure and drilling metres on new and existing mineral deposits.
- Petroleum exploration expenditure in WA and the rest of Australia.

### 1.4.1 Minerals

WA's mineral exploration expenditure was \$2.58 billion in 2023–24, an increase from 2022–23 but down on the record \$2.6 billion spend in 2023.

This result reflects, in part, ongoing efforts to discover new minerals, as well as the impact of rising costs, particularly for labour, equipment and fuel, within the exploration sector.

When combined with a reduction in the number of metres drilled and exploration employment (both indicators of activity), it may well suggest that the level of exploration activity in WA has peaked during the current commodity cycle.

Gold, iron ore, and other minerals (including lithium and rare earths), plus nickel/cobalt and copper, were the main target of spending:

- Exploration expenditure for gold was \$884 million, though its lowest level since 2019–20.
- Iron ore exploration expenditure increased marginally to \$674 million, its highest level in more than a decade.
- Other minerals (including lithium and rare earths) exploration expenditure was at another record of \$575 million driven by forecasts of global demand for electric vehicles and other battery technologies.

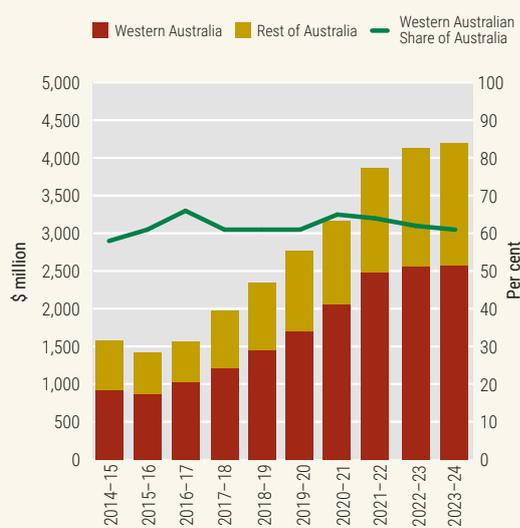


Figure 8 | **Mineral exploration expenditure**  
Source: Australian Bureau of Statistics

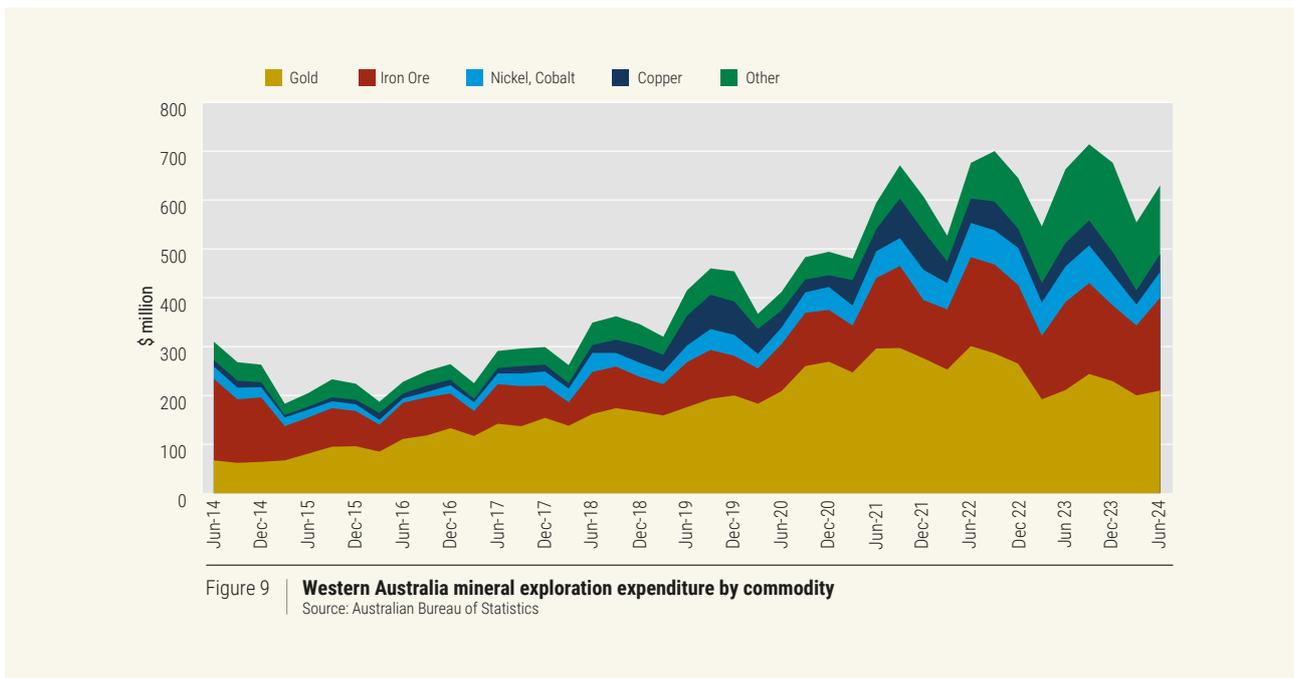
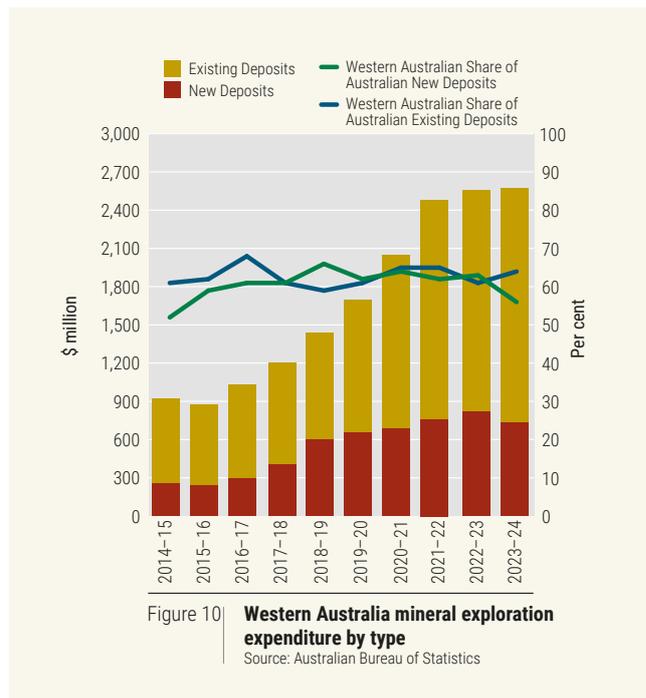
- Exploration expenditure for nickel and cobalt was \$236 million, down from its 15-year highs in recent years likely due to challenging market conditions.
- Copper exploration expenditure was \$162 million, down from its peak of more than \$250 million in the 2021 calendar year and 2021–22.

Spending continued to be largely focused on brownfields areas or existing deposits with these areas attracting the highest spend on record of \$1.84 billion in 2023–24. In comparison, spending in greenfield locations decreased to \$731 million. As a result, the share of expenditure on new deposits fell to 26 per cent.

This may well reflect that brownfields exploration is lower cost and lower risk than greenfields exploration, which means it is likely to be favoured in the current higher cost environment. There has also been recent renewed interest in exploration for commodities on mature ground which had not previously been targeted such as lithium and rare earths.

WA remained the leading destination for exploration investment in Australia. It accounted for 62 per cent of the national spend in 2023–24, which is around its long-term average.

Notably, the amount of exploration undertaken for other minerals (including lithium and rare earths) is disproportionately higher in WA compared to the rest of Australia.



## 1.4.2 Petroleum

Petroleum exploration expenditure in WA continued its recovery from some of its lowest levels in a quarter of a century to be valued at \$569 million in 2023–24 – its highest level in five years.

This upswing was likely largely due to a drilling program by INPEX Corporation in the Browse Basin related to the Ichthys project, as well as campaigns in the Perth Basin.

WA's share of national petroleum exploration expenditure was 45 per cent, up from its lowest ever level in 2022–23 but still well below its peak of 15 years ago.

This was on account of petroleum exploration expenditure in WA increasing by more than the rest of Australia due to a reduced spend in the Northern Territory.

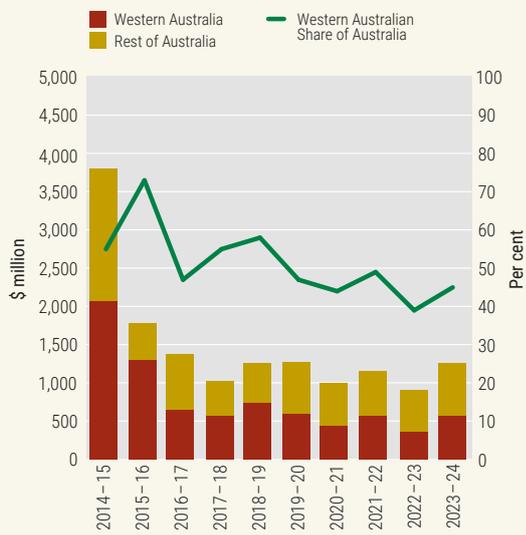


Figure 11 | **Petroleum exploration expenditure**  
Source: Australian Bureau of Statistics

## 1.5 Royalties

The WA Government received \$12.7 billion in royalties and royalty-related grants from minerals and petroleum producers in 2023–24.

This was another strong return but was lower than the record for a single calendar or financial year of \$14 billion in 2021.

The result was supported by higher receipts from the iron ore and gold industries, though offset by a lower return from the North West Shelf project, the lithium industry, and the nickel industry.

The iron ore industry remained the dominant royalty payer, accounting for 82 per cent of total royalties and royalty-related grants.

Despite lower prices, the lithium industry was still the second largest payer with \$710 million in royalties (five per cent), albeit down from a record of more than \$1 billion in the 2023 calendar year.

The North West Shelf project was the third most significant payer, though grants more than halved from \$1.5 billion in 2022–23 to \$694 million in 2023–24 on account of lower prices and reduced production from field decline.

The gold industry had its highest royalty payments on record of \$497 million amid all-time high prices.

Royalty receipts from the nickel industry declined from \$140 million to \$98 million due primarily to lower prices.

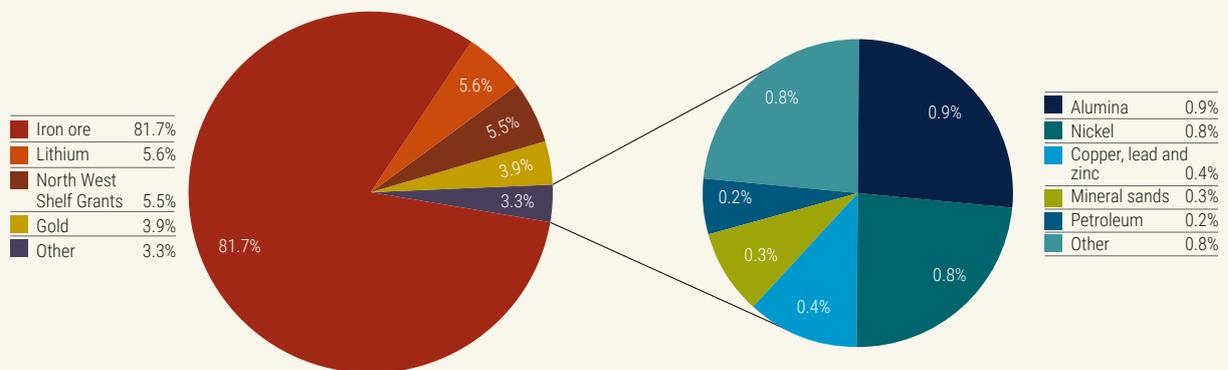


Figure 12 | **Royalty receipts and North West Shelf grants 2023–24**  
**\$12.7 billion**  
 Source: DEMIRS and Department of Treasury

**Table 3. Royalty receipts and North West Shelf grants**

Commodity	2022–23	2023–24	2023–24 Growth	
	(\$ Million)	(\$ Million)	(\$ Million)	%
Alumina	113.6	109.1	-4.5	-4.0%
Copper, lead and zinc	74.8	52.0	-22.8	-30.5%
Gold	436.0	496.8	60.7	13.9%
Iron ore	9,393.1	10,372.3	979.2	10.4%
Lithium	929.9	710.2	-219.7	-23.6%
Mineral sands	46.6	43.2	-3.4	-7.2%
Nickel	139.7	98.5	-41.2	-29.5%
Petroleum	78.7	101.3	22.6	28.7%
Other minerals	15.3	22.9	7.6	49.9%
<b>North West Shelf grants</b>	<b>1,528.4</b>	<b>694.4</b>	<b>-834.0</b>	<b>-54.6%</b>
<b>Total royalty receipts</b>	<b>11,227.7</b>	<b>12,006.3</b>	<b>778.5</b>	<b>6.9%</b>
<b>Total revenue</b>	<b>12,756.1</b>	<b>12,700.7</b>	<b>-55.4</b>	<b>-0.4%</b>

### A note about royalties

The WA Government received royalties for all minerals and petroleum produced on State land and in State waters.

The figure reported in this publication is the actual cash the WA Government received for the relevant period, i.e. 2023–24. This means the royalty receipts are offset from sales figures by one quarter.

Included in the royalty receipts for petroleum is the both the State's and Commonwealth's share of royalties collected under the *WA Petroleum (Submerged Lands) Act 1967* (PSLA). The State's share of the Resource Rent Royalty for the Barrow Island project is included, but the Commonwealth's share is not included.

Included in the State's royalty receipts for iron ore is an additional lease rental amount, which is currently applied under *Iron Ore State Agreement Acts* and the *Mining Act 1978*.

The additional lease rental applies to iron ore obtained from a mining lease following 15 years from the date the iron ore was first obtained from the mining tenement by the lessee.

The WA Government also receives about 65 per cent of the royalties from the petroleum produced by the North West Shelf project, in the form of Commonwealth grant, in accordance with an agreement between the WA and Australian governments.



The economic indicators file contains royalty receipts by commodity and North West Shelf grants.



The spatial and regional file contains royalty receipts by region.

## 1.6 Exports

WA's minerals and petroleum exports were valued at an estimated \$232 billion in 2023–24 and accounting for 93 per cent of the State's \$251 billion in total merchandise exports.

This was a strong result, albeit down from record levels in 2022–23 of \$252 billion in mineral and petroleum exports and \$269 billion in total merchandise exports.

WA was responsible for an estimated 56 per cent of the nation's \$415 billion in minerals and petroleum exports, leaving it unrivalled as the nation's major mineral and petroleum export earner.

This was around the same level as in recent years, but lower than previous highs of 68 per cent in 2020–21 primarily on account of lower value iron ore exports from WA and higher value coal exports from Queensland and New South Wales.

WA's minerals and petroleum resources continued to be exported to a wide range of countries, but the share of exports remained highly concentrated.

The exports of WA's minerals and petroleum continued to be dominated by China, followed by Japan, South Korea, Singapore and Taiwan.

### A note about exports

Mineral and petroleum exports include gold, mineral sands and nickel refined or processed in WA but mined in other States and Territories of Australia and overseas.



The major commodities and economic indicators files contain information about mineral and petroleum exports including export destinations of key commodities produced in WA including iron ore, petroleum, lithium, gold, alumina, nickel, copper, lead, zinc, and mineral sands.



Figure 13 **Merchandise exports 2023–24**  
**\$251 billion**  
 Source: DEMIRS and Australian Bureau of Statistics

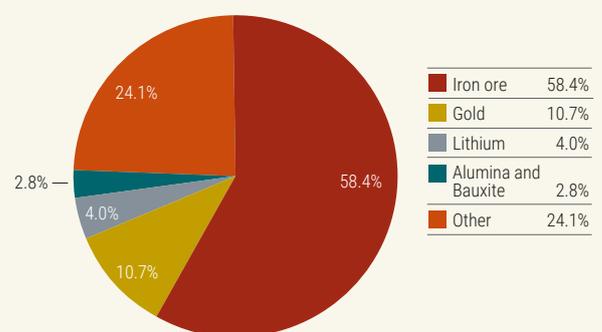


Figure 14 **Mineral and petroleum exports 2023–24**  
**\$233 billion**  
 Source: DEMIRS and Australian Bureau of Statistics

## 1.7 Tenements and titles

### A note about tenements and titles

Mining tenements are administered under the *Mining Act 1978*. They include prospecting and exploration licences, mining leases, miscellaneous licenses, general purpose leases, retention leases, special prospecting licences for gold, and mineral claims. There is also some tenure under the *Mining Act 1904*.

State petroleum titles are administered under three Acts:

- 1 The PSLA generally applies to the State's territorial sea up to the three-nautical mile mark, including the territorial sea around State islands.
- 2 *The Petroleum and Geothermal Energy Resources Act 1967* (PGERA) generally covers all onshore areas of the State, including its islands. Most areas under petroleum titles are covered under this Act.

- 3 *The Petroleum Pipelines Act 1969* (PPA) applies to petroleum pipelines on land within the State.

Reported mining tenements in force represent live tenements only. Tenements granted post a given year and invalid and dead tenements are not included in the totals.

In the reported petroleum titles in force, the total area for the PSLA excludes Pipeline Licences due to different units (i.e. kilometres square (km<sup>2</sup>) vs kilometres (km)). The total area is the sum of the Total Area for the PSLA and PGERA and does not include the Total Area of the PPA due to different units (i.e. km<sup>2</sup> vs km).

**Table 4. Mining tenements in force**

	2019–20		2020–21		2021–22		2022–23		2023–24	
	Number	'000 hectares (ha)	Number	'000 ha						
Prospecting licences	5,147	634	5,362	658	5,633	692	5,788	711	6,289	763
Exploration licences	5,791	41,937	6,581	48,854	7,659	61,074	8,137	64,417	9,232	69,419
Mining leases	5,890	3,171	5,954	3,226	5,983	3,275	5,998	3,318	6,051	3,362
Other	4,160	3,320	4,187	3,475	4,357	3,874	4,528	3,776	4,788	4,887
Mineral Claims and Other 1904 Act	379	2,098	379	2,098	379	2,098	379	2,114	378	2,158
<b>Total mining tenements</b>	<b>21,367</b>	<b>51,160</b>	<b>22,463</b>	<b>58,312</b>	<b>24,011</b>	<b>71,013</b>	<b>24,830</b>	<b>74,335</b>	<b>26,751</b>	<b>77,509</b>

At the end of 2023–24, there were 26,751 mining tenements overlaying more than 77.5 million hectares (MH) of land within WA.

This is a land area slightly smaller than that of New South Wales (80.1 MH) and is around 31 per cent of WA's total land area.

Actual exploration and mining activities, however, were over a much smaller area.

This was a new record due predominantly to an increase in the number and land area of Exploration Licences, as well as other tenements which includes Miscellaneous Licences and General Purpose Leases which support mining and exploration activities, and Retention Leases.

There was a total of 271 petroleum titles in force in WA as at 26 September 2024. This was a considerable increase from a year ago (238 petroleum titles in force).

The area of the titles was 121 thousand square kilometres over 1,553 blocks. This was also an increase on around the same time last year.

This is an area bigger than the Netherlands, Belgium, Luxembourg and Switzerland combined and is around five per cent of WA's total land area, though actual operations or works were over a much smaller area.

The most notable changes were to the area and number of blocks of Exploration Permits under the PGERA – they were up year-on-year. There was also an increase in the area and number of blocks of Production Licences following the grant of an additional title, as well as a reduction in the Retention Lease area under the PGERA.

Under the PSLA, the area and number of blocks of Retention Leases was higher, while the area overlaid by Production Licences also increased.



The spatial and regional file contains information about the number, area and types of mineral and petroleum tenements.

**Table 5. Petroleum titles in force (as at 26/09/2024)**

Title type	Area	Blocks	Number of titles
<b>PSLA</b>	<b>3,273.9081 km<sup>2</sup></b>	<b>72</b>	<b>46</b>
Access authority	–	4	3
Exploration permit	335.4011 km <sup>2</sup>	14	1
Pipeline licence	659.3561 km	0	26
Production licence	2,007.8641 km <sup>2</sup>	31	10
Retention lease	930.6429 km <sup>2</sup>	23	6
<b>PGERA</b>	<b>117,962.9794 km<sup>2</sup></b>	<b>1,472</b>	<b>112</b>
Access authority	–	57	30
Exploration permit	113,055.6020 km <sup>2</sup>	1,335	54
Petroleum lease	260.1000 km <sup>2</sup>	9	1
Production licence	3,887.7427 km <sup>2</sup>	58	22
Retention lease	759.5347 km <sup>2</sup>	13	5
<b>PPA</b>	<b>8,028.0931 km</b>	<b>9</b>	<b>113</b>
Pipeline licence	8,028.0931 km	9	113
<b>Total</b>	<b>121,236.8875 km<sup>2</sup></b>	<b>1,553</b>	<b>271</b>

## 2. Commodity review

### 2.1 Minerals

#### 2.1.1 Iron ore

##### Prices

The benchmark grade (62 per cent iron ore fines spot Cost and Freight [CFR] China) iron ore price rose strongly over the second half of 2023 to the highest point in around two years at an average of more than US\$135 per tonne (or more than \$200 per tonne) in December 2023.

It was supported by the roll out of stimulus measures and expectations of further stimulus measures in China aimed at boosting the country's beleaguered property sector and fuelling hopes for a revival in steel demand. However, iron ore lost most of its gains by March 2024 and continued to trend lower to an average of US\$106 per tonne in June 2024 as Chinese demand was subdued and the property sector remained troubled.

Overall, iron ore prices were higher year-on-year at an average of around US\$120 per tonne (around \$180 per tonne), up from US\$110 per tonne (around \$160 per tonne) in 2022–23, and remained above the average over the past decade.

##### Quantity and value

Iron ore continued its dominance of the WA resources sector representing 76 per cent of all mineral sales and 60 per cent of total mineral and petroleum sales in 2023–24, greater than the average levels over the past decade.

The \$142 billion in sales for 2023–24 was the third highest amount for a single calendar or financial year on record, below only the 2020–21.

This result was supported by higher prices (described above) and record levels of production of 866 Mt.

The three largest producers, Rio Tinto, BHP and Fortescue, continued to produce the lion's share of iron ore, accounting for 86 per cent of the State's sales by volume which was roughly in line with previous years:

- Rio Tinto's output was lower in 2023–24, with the ramp-up of the Gudai-Darri mine and productivity improvements from implementation of the Safe Production System, offset by weather disruptions at ports early in 2024 and a train collision in May 2024.

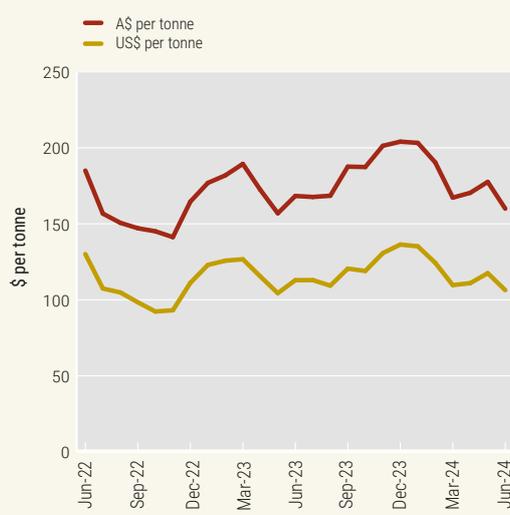


Figure 15 | **Iron ore monthly average prices**  
Source: Argus Media



Figure 16 | **Iron ore quantity and value by quarter**  
Source: DEMIRS

- BHP achieved record production on increased capacity unlocked through port debottlenecking, as well as the completion of ramp-up at South Flank.
- Fortescue’s production was stable on the balance of factors including a train car derailment in late 2023 and weather disruptions in the new year, as well as first magnetite concentrate shipments from Iron Bridge.

Other notable production trends included Mount Gibson Iron achieved record sales from its Koolan Island project, particularly in the second half of 2023, while production was down from Citic Pacific Mining’s Sino Iron operations with the company announcing in February 2024 that it would reduce output due to tenure constraints.

WA was again the world’s largest iron ore producer, accounting for 35 per cent of global output and responsible for 99 per cent of Australia’s production.

WA iron ore export destinations were dominated by China (84 per cent), followed by Japan (six per cent), South Korea (five per cent), Taiwan (two per cent) and Vietnam (one per cent).



Figure 17 **Iron ore quantity Western Australia vs Rest of Australia**  
Source: DEMIRS and Office of the Chief Economist

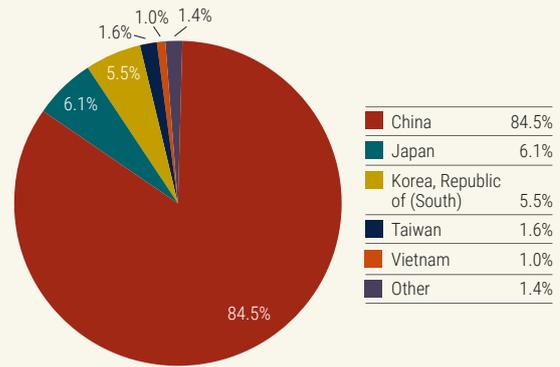


Figure 18 **Iron ore exports 2023-24**  
**\$136.1 billion**  
Source: Australian Bureau of Statistics

### Notable events

- Mineral Resources announced in June 2024 that it will transition its high-cost Yilgarn iron ore hub, which is comprised of the Koolyanobbing, Parker Range and Carina mine sites, into care and maintenance from early 2025.
- Fortescue achieved a first shipment from its Iron Bridge magnetite project in July 2023.
- Mineral Resources achieved first production and ore on ship from its Onslow iron ore project in May 2024.
- Mineral Resources completed the acquisition of the Iron Valley project assets from BCI Minerals in July 2024. Mineral Resources has been operating the Iron Valley project since 2014.
- BHP announced approval in February 2024 for the execution of the Western Ridge Crusher project (WRC), which is a production sustaining project for the Newman operations with first production expected in the September quarter 2026.
- Atlas Iron made FID on its McPhee Creek iron ore project in September 2024 with first ore delivery expected late in the December quarter 2025.

- Fortescue broke ground in August 2024 on its green hydrogen powered iron smelter near its Christmas Creek mine. It will process magnetite and hematite ores using hydrogen and renewable electricity to produce a high-purity pig iron with first production planned for 2025.
- Fenix Resources announced in July 2024 it will bring the Shine mine back online in the December quarter 2024. This came in the aftermath of it completing the acquisition of Mount Gibson Iron's Mid West iron ore, rail and port assets, including the Shine and Extension Hill iron ore mines in July 2023. The Shine operation was previously suspended by Mt Gibson Iron in October 2021.
- GWR Group announced in December 2023 its divestment of its Wiluna West iron ore project rights to Gold Valley. Gold Valley subsequently made its first shipment of iron ore from its Wiluna West mine via the Port of Esperance in October 2024.
- CuFe completed the sale of its mining rights for the JWD mine (part of the broader Wiluna West project) to Newcam Minerals in November 2024. The mine had been placed into care and maintenance since August 2024, pending the sale and to preserve the value of ore in the ground.
- Miracle Iron Holdings acquired the Paulsens East project (currently on care and maintenance) from Strike Resources in March 2024.
- BHP and Rio Tinto announced in February 2024 a partnership with BlueScope to jointly investigate the development of an ironmaking electric smelting furnace pilot plant with several locations in Australia under assessment for the proposed facility.
- BHP and Rio Tinto announced in May 2024 a partnership to test large battery-electric haul truck technology to decarbonise Pilbara iron ore operations.
- Fortescue deployed Australia's first operational electric excavator at its Cloudbreak mine in December 2023.



The major commodities file contains detailed information about iron ore, including:

- Iron ore prices.
- Quantity and value of iron ore sales.
- Value of iron ore exports by destination.
- Iron ore production in WA compared with the rest of Australia.

## 2.1.2 Gold

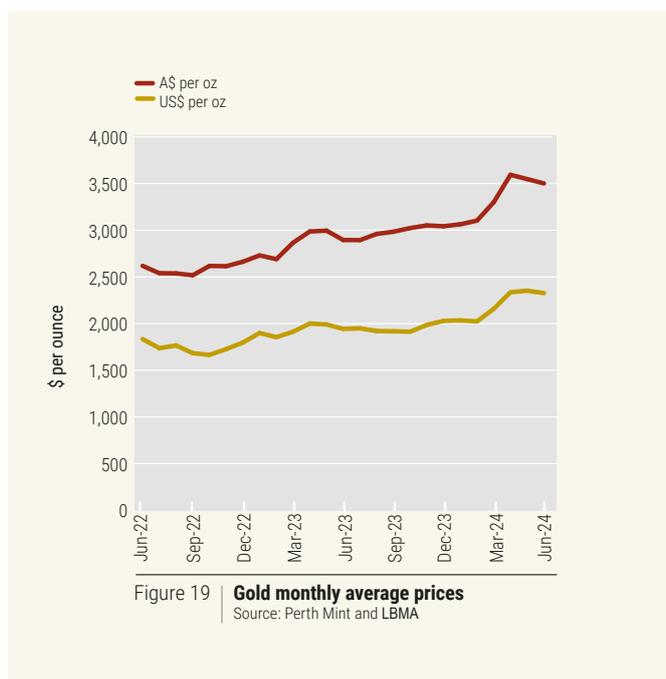
### Prices

The price of gold reached new heights.

Gold trended higher across 2023–24, reaching a monthly average record of more than US\$2,300 per ounce in April 2024 and almost \$3,600 per ounce in May 2024.

Prices increased across the year by 21 per cent in US dollar terms and 23 per cent Australian dollar terms.

This was supported by geopolitical tensions and global economic uncertainty driving central banks to purchase gold bullion in record amounts and investors to buy futures.



## Quantity and value

On the back of all-time high prices, gold achieved a record \$21 billion in sales in 2023–24, re-establishing its position as the second most valuable mineral produced in WA (behind iron ore).

Gold accounted for 11 per cent of the value of minerals sold and nine per cent of the total value of mineral and petroleum sales in 2023–24.

This result was despite the lowest levels of gold production in seven years, with 6.6 million ounces (204 tonnes) of gold produced in WA in 2023–24.

Production was notably lower from Newmont’s Boddington operations, due to lower ore grades as a stripping campaign was undertaken and its Telfer operation, which was suspended from April 2024 due to issues with tailings storage facilities.

Production levels were also impacted by:

- Reduced performance at Northern Star’s Jundee mine after a processing plant fire resulted in 10 days of downtime and reduced sales in the December quarter 2023.
- Planned lower production from Gold Fields’ St Ives mine during the first half of 2024 as well as delays in development of new open pits at the mine.
- The suspension of Dacian Gold’s Mt Morgans project in April 2023, resulting in nil sales during 2023–24.

These factors more than offset the start-up of the Bellevue gold’s namesake project, increased production from Vault Minerals’ (formerly Red 5) expanded King of the Hills project following ramp-up, as well as Aurene Group’s restarted Bottle Creek project.

Exports of gold from WA increased to an all-time high of \$25 billion in 2023–24.

Hong Kong (36 per cent) was the largest destination for gold exports from WA, followed by China (21 per cent), the United Kingdom (13 per cent), India (11 per cent), and Singapore (8 per cent).

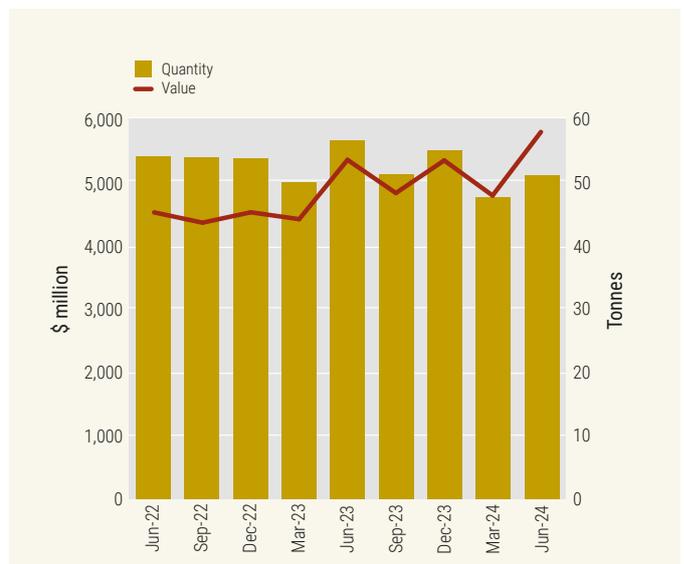


Figure 20 | **Gold quantity and value by quarter**  
Source: DEMIRS



Figure 21 | **Gold quantity Western Australia vs Rest of Australia**  
Source: DEMIRS and Office of the Chief Economist

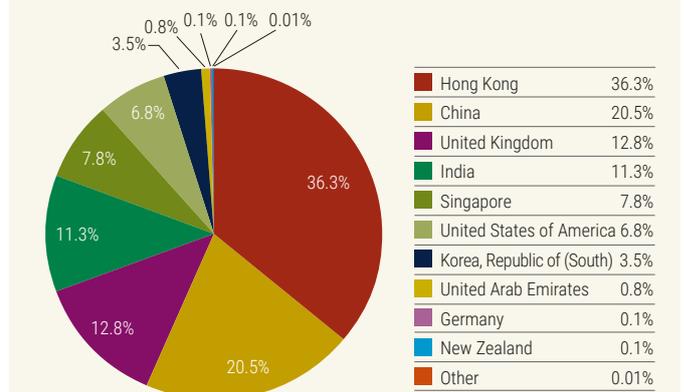


Figure 22 | **Gold exports 2023–24**  
**\$24.9 billion**  
Source: Australian Bureau of Statistics

## A note about gold exports

The ABS releases WA exports data that shows exports of gold that are higher than the value of gold produced in WA.

This is because Gold Corporation, or as it is more commonly known, The Perth Mint, refines gold produced in other States and Territories, gold from surrounding countries and also secondary gold, mainly from Asia.

Overseas imported gold also includes scrap, which is refined in WA and exported.

## Notable events

There was notable change in the gold industry during the year, with operations suspending production, commencing production, and achieving FID:

- Calidus Resources went into receivership in June 2024 with its Warrawoona gold mine placed into care and maintenance in July 2024.
- Ramelius Resources announced in July 2024 plans to process existing stockpiles at its Edna May gold mine and then place the operation into care and maintenance in 2025, following a decision not to proceed with investment to prolong its life.
- Auric Mining poured first gold at its Jeffreys Find project in July 2023.
- First gold was poured at Bellevue Gold's namesake project in October 2023.
- Brightstar Resources achieved first gold pour in March 2024 at its Selkirk deposit that forms part of the Menzies project.
- Horizon Minerals mined first ore at its Boorara project in October 2024.
- Black Cat Syndicate achieved first gold dore from the Mhyree deposit at its Kal East project in October 2024.
- Westgold Resources approved an expansion to increase the life its Big Bell gold mine in November 2023.

- Regis Resources announced in May 2024 the decision to commence construction on the Garden Well Main gold mine and the Rosemount Stage 3 expansion, with first ore scheduled for the September quarter 2026.
- Ramelius Resources approved the commencement of construction on its Cue gold project in June 2024.
- Ora Banda Mining approved the development of the Sand King underground mine at its Davyhurst project in July 2024.
- Tropicana joint JV partners AngloGold Ashanti and Regis Resources approved the underground development of the Havana mine in September 2024.

Mergers and acquisitions also continued to be a key theme for the gold industry with key announcements during the year including:

- Red 5, owner of the Darlot and King of the Hills projects, and Silver Lake Resources, owner of the Deflector and Mount Monger projects, completed a merger of equals in June 2024. The merged company subsequently changed its name to Vault Minerals.
- Westgold Resources, owner of the Murchison and Bryah projects, and Karora Resources, owner of the Beta Hunt and Higginsville projects, completed a merger in August 2024.
- Newmont, owner of the Boddington project, acquired Newcrest Mining, owner of the Telfer project and a 70 per cent stake in the Havieron development project, in November 2023. Newmont subsequently reached an agreement with Greatland Gold in September 2024 for the divestment of Telfer and its interest in Havieron.
- Ramelius Resources, owner of several gold projects including Edna May, Marda, Mt Magnet and Vivien completed the acquisition of WA-based gold explorer Musgrave Minerals, owner of the Cue and Mt Magnet South development projects, in September 2023.

- Genesis Minerals acquired Dacian Gold, the previous owner of the Mt Morgans project, in December 2023.
- Pantoro agreed in November 2024 to sell its Halls Creek gold project (on care and maintenance since June 2023) to Kimberley Minerals Group.

### Trends in gold prices and local production

The price of gold reached new heights during 2023–24, rising by around 20 per cent over the past year.

However, this is just the latest example in a remarkable period of growth with the price of gold rising by 70 per cent over the past five years, and 400 per cent over the past 20 years, largely reflecting its investment appeal at a time of geopolitical and geoeconomic uncertainties.

Despite record high prices, the quantity of gold production in WA has been largely stagnant over the past 10 years at around 190 to 210 tonnes (6.2 million ounces to 6.9 million ounces).

Amid record prices, WA even had its the lowest levels of gold production in seven years, with 204 tonnes (6.6 million ounces) produced in 2023–24.

Across this period, WA has captured marginally more of the world's gold production, going from 6.5 to seven per cent, and it has become the third largest producer globally (behind China and Russia), up from fourth, as global gold production has been similarly stagnant and even in decline in recent years.

This all points to challenges with supply, not only in WA but around the world that include:

- The depletion of many existing deposits and lower grades as they approach end of life that are not seeing the equivalent gold recovered from the mining of the same volume of ore.
- Rising production costs associated with both the depletion of existing deposits, as well as inflationary and supply chain pressures including labour and energy.

- New and sufficiently large gold deposits being rare and increasingly harder and more expensive to find.
- This is despite, and perhaps a symptom of, gold being the most targeted mineral of exploration in WA and the record levels of exploration expenditure for gold in recent years.
- Globally, gold is also the most targeted mineral, typically accounting for around half of global exploration budgets, however, actual expenditure has been in decline.
- When new deposits are found, they take a long time to develop and are more costly to mine by virtue of their geology and location.

To address the supply issue, many companies have undertaken mergers and acquisitions in recent years, including in WA (described in Gold – Notable events section). However, this only acts to grow production for those companies and does not increase the overall level of supply.

Despite these challenges, there are significant reserves and resources in WA, and around the world, that could sustain or support increased production rates for years to come.

According to Geoscience Australia, at December 2022 WA had 5,828 tonnes (187 million ounces) of reserves, representing 48 per cent of Australia's total reserves of 12,159 tonnes (391 million ounces).

Taken alone, WA had the world's second largest gold reserves after Russia and was responsible for 11 per cent of the 59,000 tonnes (1.9 billion ounces) in total global reserves.



The major commodities file contains detailed information about gold, including:

- Gold prices.
- Quantity and value of gold sales.
- Value of gold exports by destination.
- Gold production in WA compared with the rest of Australia.

## 2.1.3 Lithium

### Prices

Lithium prices continued to decline throughout 2023–24, falling to the lowest levels since the second half of 2021 amid an ongoing supply surplus and weaker demand for electric vehicles.

The Asian Metal spodumene concentrate index price fell to an average of less than \$1,700 per tonne in June 2024, down by around 70 per cent across the financial year and around one-sixth of its peak of more than \$9,200 per tonne in late 2022.

The price of battery-grade lithium hydroxide in China fell to an average of around US\$11,500 in June 2024, down around 70 per cent across the financial year and around one-eighth of its peak of almost US\$80,000 per tonne in late 2022.

While they have decreased drastically, lithium prices remain much higher than the lows for spodumene concentrate of around \$550 per tonne, and battery-grade lithium hydroxide of around US\$7,000 per tonne in late 2020.

### Quantity and value

Lithium sales were valued at \$8.4 billion in 2023–24, making it the State’s third most valuable mineral.

This was down significantly from a high of \$21.5 billion in 2022–23, though it was still the fourth highest lithium sales value for a single calendar or financial year on record.

However, the quantity of spodumene concentrate sold reached a new record of 3.6 Mt supported by:

- The ongoing optimisation and expansion of processing facilities at Pilbara Minerals’ Pilgangoora operations.
- The ramp-up of expanded production capacity (albeit at reduced grades) at Mineral Resources’ Wodgina and Mount Marion projects.
- First sales from Covalent Lithium’s Mount Holland mine and concentrator project.

Production and sales from Talison Lithium Australia’s Greenbushes project was lower as inventories were built up to match the requirements of its JV owners (Tianqi Lithium and IGO, and Albemarle Corporation).

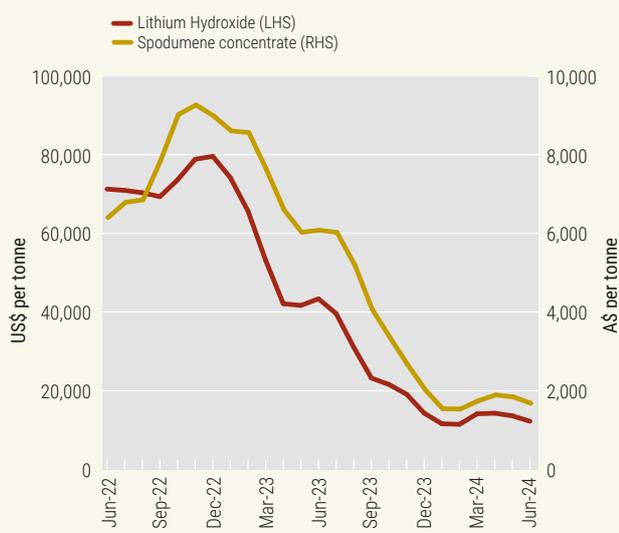


Figure 23 | **Lithium monthly average prices**  
Source: Asian Metal



Figure 24 | **Spodumene concentrate quantity and value by quarter**  
Source: DEMIRS

Exports of spodumene concentrate from WA were overwhelmingly to China (97 per cent), with South Korea (one per cent) and Belgium (one per cent) the next two largest markets.

### Notable events

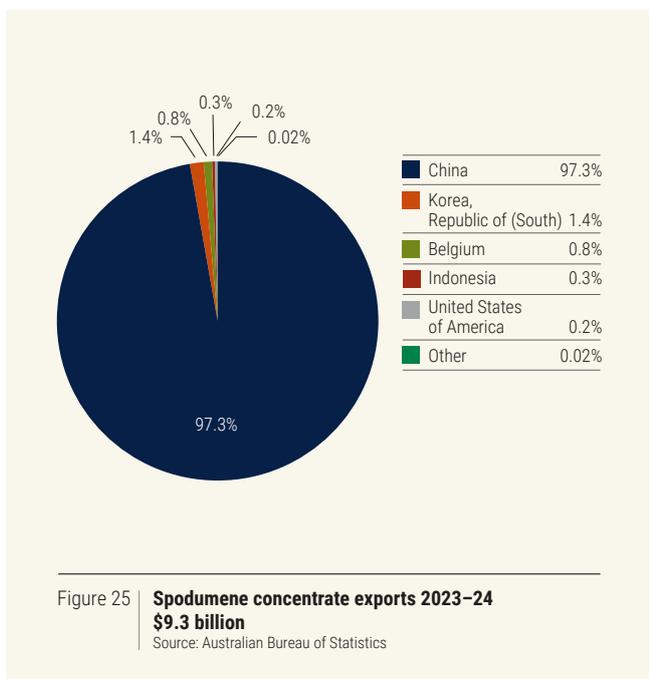
In an environment of lower for longer prices:

- Pilbara Minerals announced in October 2024 that it will put its Ngungaju plant, one of two processing plants at its Pilgangoora operations, into care and maintenance by December 2024. It is also pausing activities on the mid-stream demonstration plant that commenced construction in August 2023 until market conditions improve.
  - ▶ The shift of the Pilgangoora operation to a single processing plant via the Pilgan plant means that once the P1000 development project is ramped-up, Pilgangoora will have a capacity of around 850 thousand tonnes per annum (ktpa) rather than 1 million tonnes per annum (Mtpa), with first ore targeted for the March quarter 2025.

- Mineral Resources announced in November 2024 that the Bald Hill project will be shifted to care and maintenance, with operations to cease by early December 2024.
  - ▶ Mineral Resources had acquired the project from the administrators of Alita Resources in November 2023.
- Arcadium Lithium announced in September 2024 the suspension of production sustaining expansion plans at Mt Cattlin, resulting in Mt Cattlin being put into care and maintenance by mid-2025.
  - ▶ An agreement was subsequently announced in October 2024 for Rio Tinto to acquire Arcadium Lithium.
- Albemarle Corporation announced in July 2024 that while it is continuing rampup and qualification for Train 1 at its Kemerton lithium hydroxide plant, production at Train 2 is to be idled and construction activities on Train 3 stopped. This came after Albemarle reduced capital expenditure and construction activities on Train 4 in January 2024.
- Mineral Resources announced in April 2024 the deferral of commissioning of Train 3 at its Wodgina project.

At the same time, despite relatively softer market conditions:

- Covalent Lithium, the 50:50 JV between Westfarmers and Sociedad Quimica y Minera de Chile SA (SQM) officially opened its Mt Holland mine and concentrator in March 2024, with construction of the Kwinana lithium hydroxide on track for completion in late-2024 for first delivery of lithium hydroxide in mid-2025.



- Lontown Resources announced first spodumene concentrate production from its Kathleen Valley project in July 2024 and the first shipment in September 2024.
  - ▶ Lontown Resources subsequently announced in November 2024 a new mine and production plan targeting an ore production rate of 2.8 Mtpa from the end of 2026–27, with a focus on high margin tonnes and a reduction in development and fixed costs.
- Pilbara Minerals announced in August 2024 that it had completed its P680 Pilgangoora expansion project, increasing production capacity by 30 per cent to 680 ktpa.

In other news:

- It was announced in October 2024 that Talison Lithium Australia had approved a revised budget and timeline for the Chemical Grade Plant 3 project, which is under construction at the Greenbushes lithium project. First ore is now expected in the December quarter 2025 and set to add 500 ktpa of additional spodumene concentrate capacity.
- An updated MARBL JV between Mineral Resources and Albemarle Corporation was announced in July 2023. The JV now involves Mineral Resources and Albemarle Corporation each having a 50 per cent share of the Wodgina mine, with Albemarle Corporation taking full ownership of the Kemerton lithium hydroxide plant.



The major commodities file contains detailed information about lithium, including:

- Spodumene concentrate and lithium hydroxide prices.
- Quantity and value of spodumene concentrate sales.
- Value of spodumene concentrate exports by destination.

## 2.1.4 Alumina

### Prices

Alumina prices were higher overall in 2023–24 at an average of A\$540 per tonne, compared to an average of around A\$500 per tonne in 2022–23.

Broadly stable prices were observed throughout the second half of 2023, with an increase to October, offset by a downturn through November and December on the back of rising Alumina supply from China and falling demand in Asian countries due to sluggish construction activity.

Prices bounced back throughout the first half of 2024, rising to the highest level in two years at an average of more than A\$600 per tonne in June 2024.

This was driven by several factors including bauxite supply concerns both in Guinea and amid lower-grade bauxite production in Australia, as well as refinery curtailments in China. These developments were followed by prohibitions imposed by the United States and United Kingdom on the sale of Russian aluminium on Western metal exchanges in April 2024, alongside market expectations that some alumina producers may reduce production because of ore supply issues. Demand was also improved.



Figure 26 | Alumina monthly average price  
Source: Australian Bureau of Statistics

## Quantity and value

The quantity of local alumina production declined to 12.4 Mt, its lowest level in more than a decade.

Alcoa's production was affected by the curtailment of its Kwinana refinery, announced in January and completed in June 2024, as well as reduced bauxite quality.

South32's Worsley project benefitted from improved calciner availability compared to the previous year but was affected by the temporary outage of its the bauxite conveyor in the June quarter 2024 impacting the supply of bauxite to the refinery.

Despite lower production, the value of alumina sales was \$6.6 billion around the same level as in previous years, supported by higher realised prices by local producers.

## Notable events

- Alcoa announced in January 2024 that it would curtail production from its Kwinana alumina refinery by mid-2024 ahead of a planned by late 2025.
- Alcoa received approval for its five-year mine plan – known as the 2023–2027 Mining and Management Plan – from the State Government in December 2023, to continue bauxite mining at its Huntly and Willwoodale bauxite mines, subject to stringent conditions. The company was also granted an exemption if the Environmental Protection Authority (EPA) decides to undertake a separate assessment on the entirety, or parts of, the Mining Management Plan.
- Alcoa acquired Alumina Limited, its JV partner in Alcoa World Alumina and Chemicals, which included its WA assets, through \$3.4 billion deal completed in August 2024.
- An expansion of South32's Boddington mine was approved by the EPA in July 2024, subject to conditions including exclusion zones around rivers, streams and significant flora and fauna. The expansion will provide feed to the Worsley refinery



Figure 27 Alumina and bauxite quantity and value by quarter  
Source: DEMIRS



Figure 28 Alumina quantity Western Australia vs Rest of Australia  
Source: DEMIRS and Office of the Chief Economist

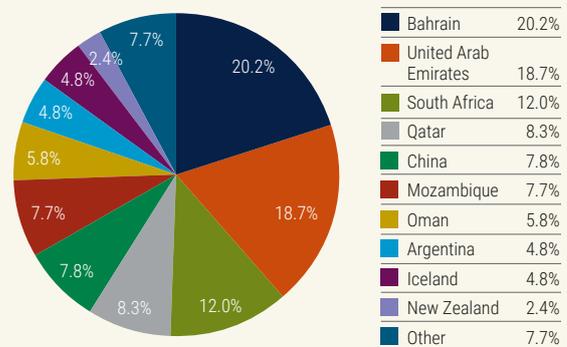


Figure 29 Alumina and bauxite exports 2023-24  
\$6.4 billion  
Source: DEMIRS

for a further 15 years. However, South32 has appealed the approval on the basis that several conditions, if imposed in their current form, would create significant operating challenges for the company and its Worsley operations.

- South32 converted one coal fired boiler at Worsley to natural gas in the September quarter 2023, with the second coal fired boiler converted in the March quarter 2024, to reduce coal consumption, improve energy security, and reduce operational greenhouse gas emissions.



The major commodities file contains detailed information about alumina, including:

- Alumina prices.
- Quantity and value of alumina sales.
- Value of alumina exports by destination.
- Alumina production in WA compared with the rest of Australia.

## 2.1.5 Nickel

### Prices

The price of nickel trended down across the second half 2023 amid plentiful low-cost supply, particularly from Indonesia, as well as weak Chinese stainless steel demand. It ended 2023 and began 2024 at an average of around US\$16,000 per tonne, around 40 per cent lower than a year earlier.

The nickel price staged a recovery through May 2024, reaching a monthly average of nearly US\$20,000 per tonne, supported by supply concerns amid restrictions on Russian nickel supply and civil unrest in New Caledonia. However, it was short-lived with nickel shifting lower again in June 2024 on weakening Chinese demand.

Overall, average US dollar prices were down 24 per cent across 2023–24 compared with 2022–23, when they were at some of the highest levels since the Global Financial Crisis.

### Quantity and value

The value of nickel sales was \$3.9 billion in 2023–24, down by one-third from one of the highest levels in the last 15 years of \$5.7 billion in 2022–23.

This was due to a combination of lower prices and sales with the quantity of nickel sales decreasing to 141 kt principally on:

- First Quantum Minerals initially suspending mining and shifting to alternative processing of existing stockpiles from January 2024 at its Ravensthorpe mine, and then subsequently putting the operation into care and maintenance from May 2024.
- Operational challenges at IGO's Nova project, as well as the ramp down of IGO's Forrestania operations including the Flying Fox mine, which reached its end of life in November 2023, and the Spotted Quoll mine, which suspended in July 2024.
- The completion of scheduled maintenance and the phasing of the subsequent rampup at Glencore's Murrin Murrin operations.
- Administrators for Panoramic Resources putting the Savannah project into care and maintenance in January 2024.

Nickel remained WA's fifth most valuable mineral commodity in 2023–24, representing two per cent of mineral sales, down from three per cent in 2022–23.

WA was the sixth largest nickel producer, accounting for just four per cent of global production, continuing a downwards trend over the last 15 years.

With the restart of the Avebury nickel project in Tasmania in October 2022, WA was responsible for 98 per cent of Australian production. However, the project was put back into care and maintenance in March 2024 in the aftermath of owner Mallee Resources entering administration, leaving WA once again as the country's only nickel producer.

## Notable events

Market conditions in the nickel industry were challenging due to a combination of lower prices and higher production costs driven by an inflationary environment, higher input costs, a tight labour market and supply chain issues. In this environment:

- Administrators for Panoramic Resources put the Savannah project into care and maintenance in January 2024.
  - Zeta Resources (subsequently acquired by UIL) made an agreement in late-September 2024 to acquire Panoramic Resources, subject to conditions.
- First Quantum Minerals initially suspended mining and shifted to alternative processing of existing stockpiles from January 2024 at its Ravensthorpe mine, and then subsequently put the operation into care and maintenance from May 2024.
- Wyloo Metals put its Kambalda nickel operations into care and maintenance from May 2024.
- IGO announced in January 2024 that it would pause construction on its Cosmos nickel development project and put it into care and maintenance from May 2024.

BHP announced in July 2024 it will suspend its Nickel West operations and the West Musgrave nickel-copper development project from October 2024.

At the same time, IGO's Flying Fox mine, part of the Forrestania operations, reached its end of life and was closed in November 2023. The Spotted Quoll mine, also part of the Forrestania operations, completed mining activities after a significant seismic event in July 2024. As a result, the Forrestania operations were transitioned into care and maintenance in October 2024, with final shipments to be completed during the December quarter 2024.

These developments mean that Minara Resources' Murrin Murrin project and IGO's Nova project will be the only major producing nickel projects in WA, until market conditions improve, and there are currently no new nickel projects under construction.

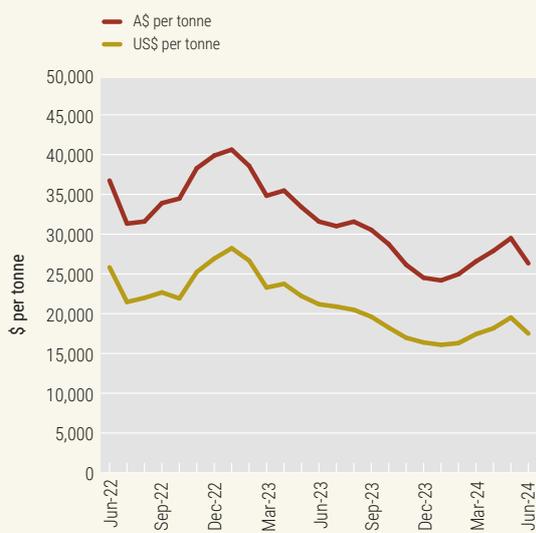


Figure 30 | **Nickel monthly average prices**  
Source: London Metal Exchange

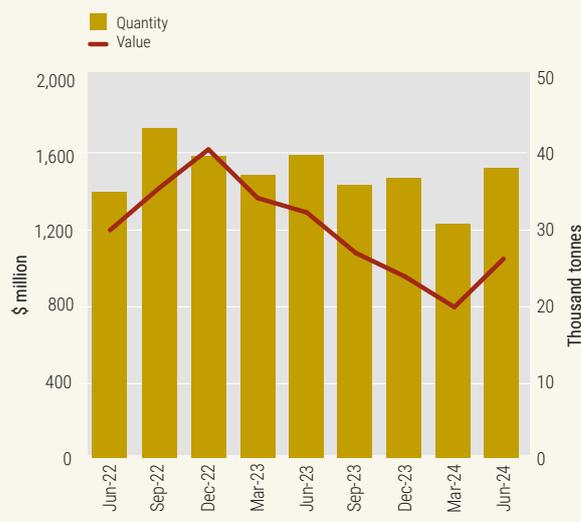


Figure 31 | **Nickel quantity and value by quarter**  
Source: DEMIRS

In other notable developments:

- BHP commissioned a new solar farm and battery storage facility in the Northern Goldfields in November 2023. It includes a 27.4 megawatt (MW) solar farm at Mt Keith, and a 10.7 MW solar farm and 10.1 MW battery at Leinster, which is integrated into TransAlta's Northern Goldfields remote power grid.
- The Commonwealth Government placed nickel on its Critical Mineral List in February 2024 providing the industry with access to financing under the Critical Minerals Facilities and critical minerals grant programs.
- The WA Government announced support for nickel producers in February 2024. The Nickel Financial Assistance Program provides for a 50 per cent rebate on royalties paid on nickel sales each quarter from the March quarter 2024 through to the June quarter 2025.

### **Global nickel market dynamics and the position of WA**

WA's nickel industry has faced significant headwinds over the past 12 to 18 months.

A combination of falling prices and rising costs has seen the suspension of at least half of the State's production since the beginning of 2024.

However, the roots of the headwinds and project suspensions lie in structural changes in the global nickel market over the past decade.

The most significant shift over this period has been growth in supply from Indonesia largely driven by Chinese investment.

According to the United States Geological Survey, Indonesia's mine production has risen from 0.18 Mt in 2014 to an estimated 1.8 Mt in 2023. Its share of global mine production has increased over the same period from seven per cent to more than 50 per cent, representing a lion's share of the market.

Historically, Indonesia had supplied nickel pig iron (a class 2 nickel along with ferronickel) for stainless steel production. It also produced significant quantities of nickel ore for further processing overseas until 2019, after which the Indonesian government has imposed a ban on its export to incentivise the development of a local downstream processing industry.

Today, nickel pig iron for use in stainless steel production remains the major nickel product from Indonesia (around 70 per cent), but over the past five years it has diversified into the production of class 1 nickel products including:

- Mixed Hydroxide Precipitate (MHP) – an intermediate nickel product from the High-Pressure Acid Leach process used in nickel metal and nickel sulphate production.
- Nickel matte – an intermediate nickel product used in nickel metal and nickel sulphate production.

This, in turn, has supported its supply of:

- Nickel metal – an end product used in stainless steel and nickel sulphate production.
- Nickel sulphate – an end product used in precursor cathode active materials for batteries.

The production of additional quantities of nickel matte has been supported by technological advancements enabling its production through the conversion of nickel pig iron.

The economics are also supportive with the cost of producing and dissolving MHP and nickel matte cheaper than using nickel metal to produce nickel sulphate.

Expanded nickel production capacity across a range of products largely delivered at lower cost than elsewhere has enabled Indonesia to:

- soak up most of the nickel demand growth over the past decade from both the stainless steel (up around 40 per cent) and battery markets (up around 400 per cent); and
- displace a portion of the nickel supplies into these markets previously delivered by significant other producers around the world, including WA, but also the Philippines, New Caledonia, Canada, Russia, and in Africa, among other smaller suppliers (around 500 kt).

However, notably, the overall lower cost profile and cheaper price of Indonesia's nickel products have had the benefit of helping to drive down costs for batteries and electric vehicles.

While WA's current position in the global nickel market will be diminished, the potential still exists for it to be a significant global producer of nickel in the future under the right market conditions.

WA has long-term established projects and the world's second largest nickel reserves at 24 Mt or 18 per cent of the world's total estimated reserves, after Indonesia's estimated 55 Mt (42 per cent).

The market-based forces that could support WA's re-emergence in global nickel markets may include:

- growth in future demand growth, especially for battery uses, that exceeds particularly Indonesia's ability to bring new or expanded capacity online;
- a supply reduction or limited supply growth in Indonesia amid falling grades, as well as environmental and labour concerns, and
- a global pricing structure that provides a premium for nickel produced under high environmental, social and governance standards.



The major commodities file contains detailed information about nickel, including:

- Nickel prices.
- Quantity and value of nickel sales.
- Nickel exports by destination.
- Nickel production in WA compared with the rest of Australia.

## 2.1.6 Copper

### Prices

Copper prices recovered slightly to a yearly average of US\$8,680 per tonne in 2022–23, up from less than US\$8,300 per tonne in 2021–23.

This was the second highest level ever for a financial year, only behind the US\$9,640 per tonne in 2021–22.

It was softer to October 2024 on weak Chinese economic data and rapidly increasing stocks at London Metal Exchange warehouses.

It rose strongly from March to May 2024 and achieved a two-year high of US\$10,000 per tonne on concerns that curtailed mine supply, primarily due to the suspension of First Quantum Minerals' Cobre mine in Panama in December 2023, one of the world's largest new copper mines, will struggle to keep up with resurgent global manufacturing demand.

Prices subsequently retreated in June 2024 on global economic concerns and weaker demand, particularly in China.

### Quantity and value

Despite higher prices, copper sales were valued at \$1.1 billion in 2023–24, the lowest level since the Global Financial Crisis and continuing a downward trend in recent years

Sales volumes were 85 kt, a near 20-year low, as the DeGrussa project, previously WA's larger copper producer, wound down and transitioned to care and maintenance. The last of its underground mining operations occurred in October 2022 with final processing in May 2023 and final sales of stockpiles in the September quarter 2023.

The result was also affected by lower copper byproduct sales from Boddington and Telfer due to issues with tailings storage facilities, as well as the suspension of the Aeris Resources Jaguar project (in September 2023) and the Savannah project (in January 2024).

The Jaguar project had been affected by three separate seismic events which caused delays and the cessation of mining in a high-grade area, as well as congestion in the lower levels of the mine, plus limited ventilation.

Despite copper being WA's sixth most valuable mineral, WA remains a minor producer in both a global and an Australian context.

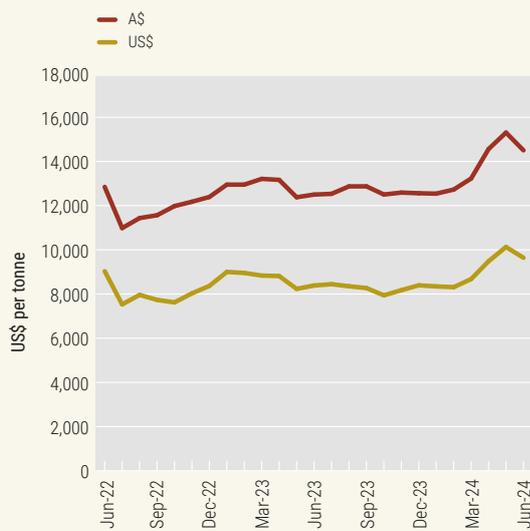


Figure 32 | **Copper monthly average prices**  
Source: London Metal Exchange



Figure 33 | **Copper quantity and value by quarter**  
Source: DEMIRS

## Notable events

- Sandfire Resources transitioned the DeGrussa project to care and maintenance and subsequently began selling its assets including part of the main camp, several administration building and equipment, to help pay down the cost of rehabilitation at the operation. It had previously initiated a sale process for its divestment but a sale did not proceed.
- Aeris Resources announced in September 2023 it was to suspend production and place the Jaguar project on care and maintenance.
- Administrators for Panoramic Resources put the Savannah project into care and maintenance in January 2024.
- BHP announced on 11 July 2024 it will suspend its West Musgrave nickel-copper development project from October 2024.



The major commodities file contains detailed information about copper, including:

- Copper prices.
- Quantity and value of copper sales.
- Copper, lead, and zinc exports by destination.
- Copper production in WA compared with the rest of Australia.

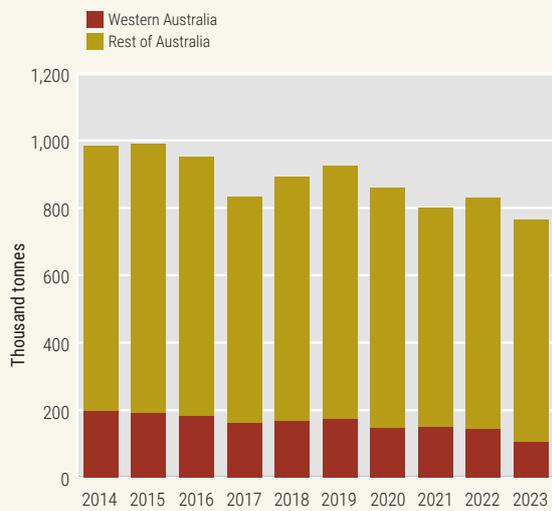


Figure 34 | **Copper quantity Western Australia vs Rest of Australia**  
Source: DEMIRS and Office of the Chief Economist

## 2.1.7 Mineral sands

### Prices

Mineral sands prices trended down across 2023–24 after a period of strong growth over the previous two years.

Prices for titanium dioxide and related feedstocks such as rutile, ilmenite and synthetic rutile declined on softer demand from the pigment market. The consumption of paints and coatings fell following two-years of increased do-it-yourself projects and home building in North America and Europe. The housing and construction sectors were also affected by higher inflation and the subsequent higher cost of projects. Supply issues did emerge in titanium dioxide markets towards the end of the financial year, which may support higher prices going forward.

Zircon prices broadly shifted lower on subdued economic growth and weaknesses particularly in the Chinese real estate market, as well as in Europe, impacting demand for ceramics.

### Quantity and value

Lower prices meant that the total value of mineral sands sales in WA was \$1.1 billion in 2023–24, down from a record \$1.4 billion in 2022–23.

Mineral sands volumes remained relatively stable year-on-year at around 1.2 Mt, primarily due to lower synthetic rutile sales being offset by higher ilmenite sales. Zircon, garnet, and rutile sales were also higher.

- Synthetic rutile sales volumes were affected by Iluka Resources' idling of its Synthetic Rutile (SR) 1 Kiln in late 2023 and for 2024 until demand for additional synthetic rutile is supported by market conditions, as well as a planned major maintenance outage at the SR 2 Kiln from October 2023 to late January 2024.
- Ilmenite sales increased to its highest level in 20 years, following first production and sales from Kimberley Mineral Sands' Thunderbird project and despite final shipments from Image Resources' Boonanarring project.

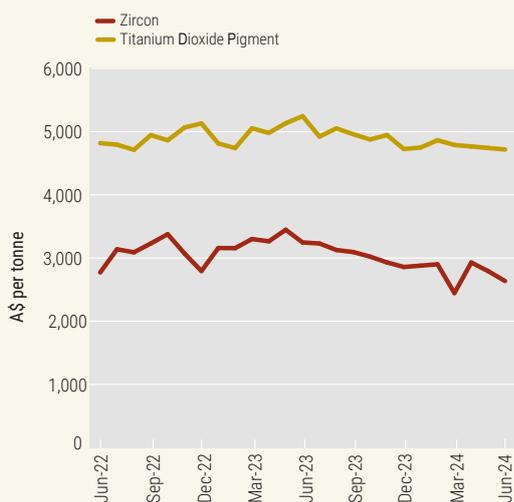


Figure 35 | **Mineral sands monthly average prices**  
Source: Australian Bureau of Statistics



Figure 36 | **Mineral sands quantity and value by quarter**  
Source: DEMIRS

- First production and sales from Thunderbird also supported higher zircon sales volumes, in addition to the ramp-up of Strandline Resources' Coburn project. Iluka Resources' operations. They offset the impact from the idling of Iluka Resources' Narngulu Mineral Separation Plant for the first six weeks of 2024 to manage inventory levels, and final shipments from Boonanarring.
- Marginally higher rutile sales volumes were the result of the mining of higher ore grades throughout the first half of 2024, in conjunction with the commissioning of two new mining units that resulted in increased ore processing rates, at Iluka Resources' Cataby project.
- Garnet sales volumes were supported by the ramp-up of Resource Development Group's Lucky Bay project.

WA continued to be a globally significant producer of mineral sands products. The State was the world's largest producer of garnet (64 per cent) and a top ten producer of zircon, rutile and ilmenite.

## Notable events

- Final ore processing and production at Image Resources' Boonanarring project was completed in the September quarter 2023 with final sales in the December quarter 2023. Following approvals, the company commenced on-ground construction activities in June 2024 at its Atlas heavy mineral sands project, with first heavy mineral concentrate production targeted by 2025.
- First ore was produced at Kimberley Mineral Sands' Thunderbird project in October 2023 with the first shipment of concentrate product achieved in January 2024.
- The first sale of zircon concentrate from Strandline Resources' Coburn Mineral Sands project took place in October 2023. It had previously achieved first heavy mineral concentrate shipment in December 2022.
- Iluka Resources idled its SR 1 Kiln in late 2023 and for 2024 until demand for additional synthetic rutile is supported by market conditions.



The major commodities file contains detailed information about mineral sands, including:

- Zircon and titanium dioxide prices.
- Quantity and value of mineral sands sales.
- Value of mineral sands exports by destination.
- Value of mineral sands production in WA compared with the rest of Australia.

## 2.1.8 Other minerals

### Salt

#### Quantity and value

In 2023–24 11.9 Mt of salt was sold in WA, a slight increase from 11.6 Mt in 2022–23.

The value of the sector was a record \$815 million.

In the past five years, the value of salt production in WA has increased by 167 per cent from \$303 million in 2018–19, with four consecutive record sales values starting in 2020–21. This has been almost entirely on the back of increased salt prices, due to strong international demand over the past five years.

Dampier Salt, with its operations at Dampier, Port Hedland and Lake MacLeod, remained the State's biggest producer of salt. Mitsui & Co was also a prominent producer through its operations at Onslow and Shark Bay. WA's remaining salt production was from Lake Deborah and Bulagin.

WA accounts for the majority of Australia's salt production and is a globally significant producer ranking sixth in the world, dropping slightly from fifth in previous years.

#### Notable events

- Leichhardt Industrials Group completed the purchase of the Lake Macleod operations from Rio Tinto in early December 2024.
- The salt-first component of BCI Minerals' Mardie salt and potash project was 44 per cent complete at the end of 2023–24.

#### A note about salt

Salt is not a standard product and its composition differs based on factors such as purity and production processes. There are also differences in contracts between customers and suppliers as well as shipping costs. These factors mean that sales values vary across the world.

The reported sales value is based on the prices realised by WA salt producers.

Highly detailed audits are carried out and include assessment of invoices associated with getting the salt to market. This includes shipping and handling, as well as the price ultimately paid by the customer in the destination country.

The confidential details of the audits confirm that DEMIRS' reported sales value is an accurate representation of the value of the salt produced.

### Coal

#### Quantity and value

Collie coal sales rebounded to 5.3 Mt in 2023–24, up from the record low of 4.7 Mt tonnes in 2022–23, albeit still very low historically.

Coal production from the Griffin and Premier Coal operations had been in decline in recent years with stockpiles drawdown to meet sales demand and obligations.

The value of the coal produced increased to a second consecutive record high of \$463 million, up from \$376 million in 2022–23, due to higher prices paid by customers.

Prices have doubled from where they were 10 years ago.

## Notable events

- In December 2023, the State Government committed \$220 million to June 2026 to support ongoing mining at the Griffin project.
- Coal supply trials for synthetic rutile production were undertaken by the Griffin operations with mineral sands producers Iluka Resources and Tronox.

## Manganese

### Quantity and value

WA manganese production recovered in 2023–24 to 557 kt of contained manganese sold, up from 497 kt in 2022–23. This was largely driven by increased output from Woodie Woodie.

Correspondingly, the value of manganese sales increased to \$341 million, up from \$306 million in 2022–23.

WA accounted for three per cent of global manganese production and was the eighth largest supplier in the world.

### Notable events

- Element 25 suspended mining at its Butcherbird project at the start of 2024 transitioning to the sale of stockpiles to reduce costs.

## Rare earth elements

### Prices

Rare earths prices in China continued to decrease in 2023–24, down for a second year from record levels in 2021–22, on the back of softer than expected demand for EVs, a global economic downturn, and oversupply concerns.

### Quantity

Sales of rare earths from WA dropped to 27.7 million kilograms in 2023–24, down from last year's record high of 30.6 million kilograms (based on rare earths sold in concentrate).

This was due to major works at Lynas' Malaysia plant in the December quarter 2023, as well as shipping delays and a maintenance shutdown of a kiln in the June quarter 2024.

As Mt Weld was the only producing project, the sales value cannot be reported due to commercial sensitivities.

WA accounted for eight per cent of global rare earths production in 2023 and was the world's fourth largest producer of rare earths. This was down from third in 2022 due to Burmese production returning to normal levels following lower production.

### Notable events

- Lynas Corporation's Kalgoorlie rare earths processing facility started producing mixed rare earth carbonate in the June quarter 2024. Meanwhile at its Mt Weld Expansion, Stage 1 (Concrete Dewatering) finished construction by the end of the financial year and Stage 2 (Balance of Plant) was expected to be completed by the end of 2024–25.
- Construction on Hastings Technology Metals' Yangibana Project was 32 per cent complete, as of 30 June 2024, with an ongoing need to secure the balance of project funding.

## 2.2 Petroleum

The petroleum sector, comprising LNG, condensate, crude oil, domestic gas and LPG, had sales of \$51 billion.

This is the third highest value since records began, but down considerably down from more than \$70 billion in sales in 2022–23 and the 2022 calendar year.

The sector's share of total mineral and petroleum sales was 21 per cent, lower than in 2022–23 but around its 10-year average share.

The overwhelming majority of these sales were from Commonwealth offshore areas, particularly the Northern Carnarvon Basin, with a relatively small share in State onshore areas of the Perth Basin.

### A note about petroleum quantity and value

Prior to 2016 DEMIRS received from the Australian Government, for statistical purposes, sales quantity and value data related to offshore fields in WA. This included data on oil and gas projects such as Pyrenees, Varanus Island, Van Gogh, Macedon, Reindeer/Devil Creek, Enfield, and Cliff Head.

Beginning with the March quarter 2016, DEMIRS has used data from EnergyQuest and Woodside for petroleum quantities for WA, with estimates made of the value of production based on prevailing market prices.

The data for the different periods is not directly comparable.



The major commodities file contains more detailed information, including the:

- Crude oil, LNG, and domestic gas prices.
- Quantity and value of crude oil, condensate, LNG, domestic gas and LPG.
- Petroleum exports by destination.
- Crude oil and condensate production and LNG production in WA compared with the rest of Australia.

## 2.2.1 LNG

### Prices

Gas prices and gas pricing mechanisms vary from region to region around the world.

Almost all of the LNG produced in WA is exported to the Asia Pacific region, with Japan, South Korea, Singapore, China and Taiwan among the main importers. LNG is sold via longterm contracts tied to a lagged percentage or slope of the crude oil price. Local producers are also increasingly exposed to LNG spot prices or gas hub indices.

Australian LNG prices were an average of \$16 per million British thermal units (Mmbtu), down from previous record levels of almost \$22 per Mmbtu on average across 2022–23.

Compared to the previous year, LNG prices were overall relatively subdued throughout 2023–24 with monthly averages within a range of around \$15 to \$17 per Mmbtu.

They trended marginally higher to the end of 2023, peaking at an average of 17.28 Mmbtu in November, on oil prices growth amid production cuts during the September quarter while spot prices were supported by strong imports ahead of the northern winter.

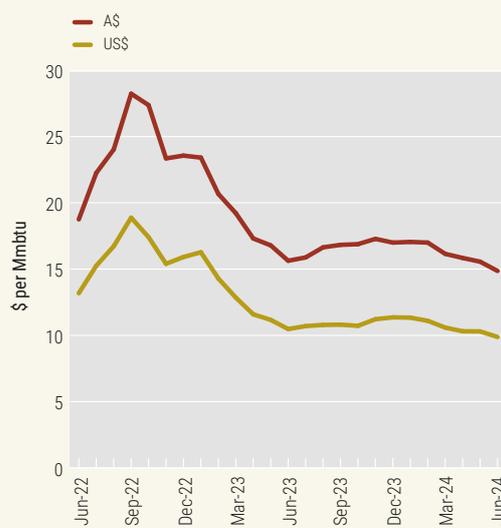


Figure 37 | **LNG monthly average prices**  
Source: Australian Bureau of Statistics

Prices weakened to an average of \$14.86 per Mmbtu in June (the lowest level since September 2021), as oil prices fell on weaker demand amid concerns around the global economy. Spot prices were lower on higher gas storage levels in major importers in the aftermath of a milder northern winter.

### Quantity and value

LNG was the most valuable petroleum product produced, and second most valuable resource commodity overall, in WA at \$36 billion.

LNG accounted for 72 per cent of petroleum sales and 15 per cent of all mineral and petroleum sales.

This was down from \$57 billion in 2022–23, and 79 per cent and 22 per cent respectively, due to weaker market conditions, as well as reduced local supply, relative to previous record highs.

WA produced 47.3 Mt (2,625 PJ or 2.20 Tcf) of LNG in 2023–24 down from a record 50.3Mt (2,791 PJ or 2.33 Tcf) in 2022–23.

Lower output largely reflected reduced production from the North West Shelf due to planned maintenance activities and natural field decline.

Wheatstone was also impacted by outages to the Julimar subsea system and Wheatstone facility during the first half of 2024.

Gorgon, WA's largest LNG producer, continued to outperform as did Pluto which benefitted from previous maintenance activities.

Prelude achieved more consistent production and improved reliability against a host of issues in the previous year including industrial action as well as technical and safety interruptions. It was, however, affected by a prolonged maintenance shutdown during the second half of 2023.

Australia was the world's third largest LNG exporter behind the United States and Qatar.

WA accounted for 60 per cent of the nation's production and, taken alone, was the world's third largest LNG producer.

LPG, which is produced as a by-product of LNG production, was valued at \$554 million on production of 667 kt. This was down from the highest levels in a decade of \$751 million and 761 kt in 2022–23.

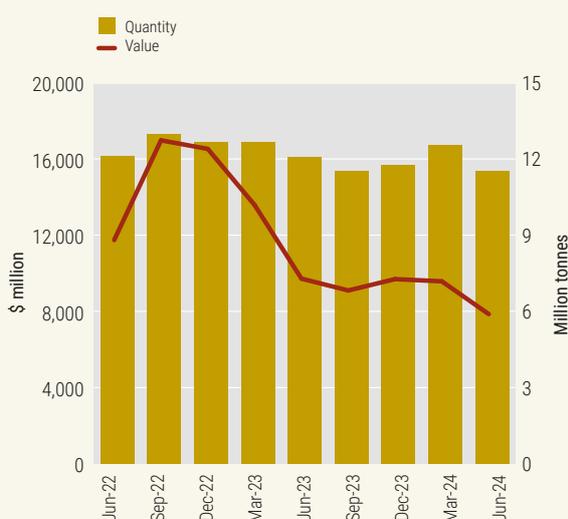


Figure 38 | **LNG quantity and value by quarter**  
Source: DEMIRS, EnergyQuest and Woodside Energy

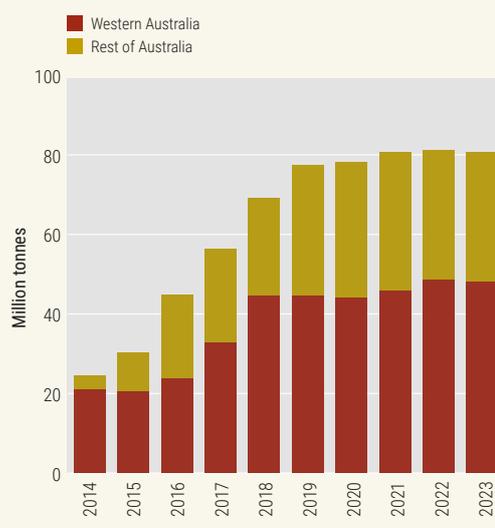


Figure 39 | **LNG quantity Western Australia vs Rest of Australia**  
Source: DEMIRS, EnergyQuest and Woodside Energy

## Notable events

- Woodside Energy announced that planning was underway for the retirement of one LNG train at the North West Shelf between late-2024 and mid-2025.
- Woodside Energy also completed the sale of the following interests in the Scarborough energy project:
  - ▶ on 26 March 2024, the sale of a 10 per cent interest to a subsidiary of Sumitomo Corporation, Sojitz Corporation and Japan Organization for Metals and Energy Security for US\$910 million; and
  - ▶ on 31 October 2024, the sale of a 15.1 per cent interest to JERA, an equal JV of Japanese electric power companies TEPCO Fuel & Power and Chubu Electric Power Company, for approximately US\$1.4 billion.
- The estimated cost of the Scarborough energy project was updated mid-year to US\$12.5 billion, up from the estimate at FID of US\$12 billion, due to maturation of the scope of modifications to Pluto Train 1. The project remains on target for a first LNG cargo in 2026.
- Mitsui & Co and Beach Energy's Waitsia project delivered its first cargo of LNG and condensate into the North West Shelf in January 2024. It was comprised of production and stored volumes from the Xyris gas plant, together with third-party gas supplied via a swap arrangement. A second similarly sourced LNG cargo was delivered to the North West Shelf mid-year with a third in October 2024.
  - ▶ Toll processing of gas through the North West Shelf from the Waitsia gas plant under construction as part of the Waitsia Stage 2 project was delayed to early-2025 (from mid-2024) after quality issues were identified during pre-commissioning. As a result, the estimated cost of the project increased to between \$1.2 and \$1.3 billion.

- The North West Shelf project participants made a FID at the start of 2024 on the Lambert West project, which is a tieback to the Angel production system that will be commissioned in 2025 and will moderate natural field decline.
- A FID was also taken by Pluto project participants on the Xena-3 well at the start of 2024 to support ongoing production from Pluto LNG.

## 2.2.2 Crude oil and condensate

### Prices

Crude oil prices were stable overall year-on-year on a balance of factors including slow economic growth, weaker demand, declining supply from major producers, and geopolitical uncertainties.

They were fairly flat throughout 2023–24, within a band of around US\$80 per barrel to US\$100 per barrel.

Oil prices increased to a year-long high of almost US\$100 per barrel in September 2023 on strong demand growth, particularly in China, an extension of voluntary production cuts by Saudi Arabia and Russia, while inventories were drawn to low levels.



Figure 40 | Crude oil monthly average prices  
Source: WA Treasury Corporation

They eased to around US\$80 per tonne to the end of the year on macroeconomic concerns, lower demand growth, and supply strength. Concerns that the Israel-Hamas conflict may impact supply and boost prices did not materialise.

An upward shift coincided with the new year and continued to April 2024 when oil prices reached more than US\$90 per barrel on oil supply security concerns amid heightened tensions between Israel and Iran, before a slide back towards US\$80 per barrel in May and June 2024 on weaker demand growth and increasing oil inventories that pointed to an adequately supplied market.

Condensate prices were similar to oil prices.

### Quantity and value

The value of condensate production was \$8.4 billion. While this is down from its peak of more than \$9 billion a few years ago, it remains around its recent levels.

It was the second most valuable petroleum product, accounting for 17 per cent of the value of petroleum production, and fourth most valuable resource commodity overall, up from fifth in 2022–23 due to a decline in the value of lithium sales.

Condensate production was 11.7 GL, which while also down from its peak of more than 12 GL a few years ago is around its recent levels.

It was supported by record production from the Ichthys FPSO facility.

At the same time, condensate production was lower from the North West Shelf (described above) and Prelude, largely due to nil shipments in the December quarter 2023.

Crude oil production was valued at \$2.5 billion, or five per cent of the value of petroleum production.

Oil production was 3.2 GL, among its lowest level since the late-1980s.

The result was mostly due to planned maintenance on Woodside Energy’s Pyrenees FPSO and a shut-in following the identification of a water leak in the subsea facility.

Production was also marginally lower from the Enfield/Vincent (the State’s largest oil producing project), North West Shelf (described above), Van Gogh (due to planned maintenance and cyclone activities), and Buru Energy’s Ungani (operations were suspended in August 2023) projects.

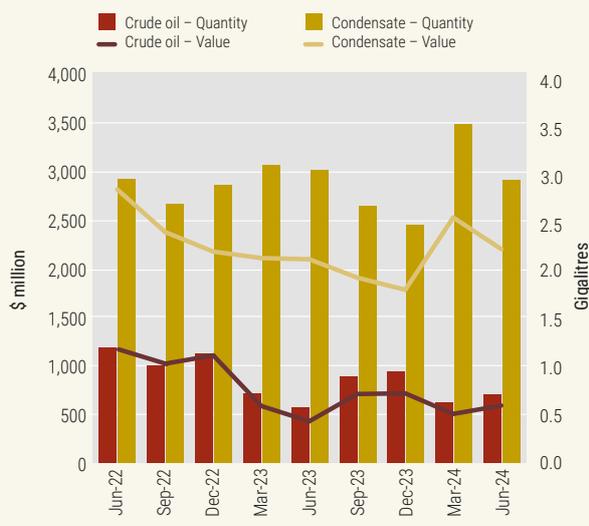


Figure 41 **Crude oil and condensate quantity and value by quarter**  
Source: DEMIRS and EnergyQuest



Figure 42 **Crude oil and condensate Western Australia vs Rest of Australia**  
Source: DEMIRS, EnergyQuest

It was up from Jadestone Energy-owned and operated Stag, following infill drilling campaigns in previous years, as well as Vermilion Energy's Wandoo, after a restart in September 2023 following a 10-month shutdown for inspection and repairs.

### Notable events

- Triangle Energy completed final sales of oil from its Cliff Head project in August 2024. It also entered an agreement for the sale of the asset and a project to convert it to a carbon, capture and storage project to Pilot Energy.
- Buru Energy assumed full ownership of the Ungani project in September 2023 following agreement with Roc Oil for its 50 per cent interest in the asset. Buru Energy subsequently entered into a farm-in agreement in June 2024 under which Sabre Energy could earn a 70 per cent interest in the Ungani project. However, this agreement was terminated in September 2024 after Sabre Energy was unable to meet its commitments under the agreement.
- Jadestone Energy acquired BP's stake in the oil-producing fields of the North West Shelf in November 2023.
- INPEX Corporation's Ichthys Stage II subsea expansion, which comprised the drilling and connecting of a further 15 development wells, was completed in January 2024. It will support condensate production.
- Santos and Carnarvon Energy's Dorado oil project, which is the only major oil project in the development pipeline in Australia, was set to re-enter FEED on a scaled down project during the December quarter 2024 for a targeted FID in 2025. It had been targeting FID in 2024.

## 2.2.3 Domestic gas

### Prices

The average estimated WA domestic gas price was \$7.10 per gigajoule (GJ) (\$7.49 per Mmbtu) in 2023–24. This was a new all-time high, up from the previous high of 6.15 per GJ (4.48 per Mmbtu) in 2022–23.

The average estimated price trended higher across the financial year, peaking at a record \$7.29 per GH (\$7.69 per Mmbtu) in June 2024.

Higher prices reflected increased demand for gas-fired generation and tighter supply conditions however, spot gas prices eased across the year falling on average below \$9 per GJ (\$9.5 per Mmbtu) in June 2024, after averaging more than \$10 per GJ (\$10.6 per Mmbtu) at the end of 2022–23.

These prices were still considerably lower than on the east coast of Australia and WA continued to have one of the lowest gas prices in the developed world.

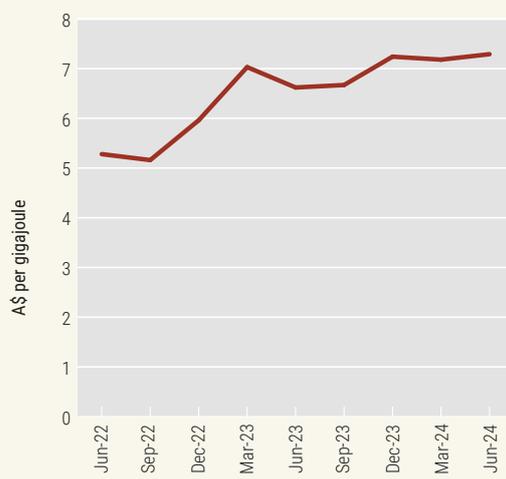


Figure 43 Domestic gas quarterly average price  
Source: DEMIRS, Woodside Energy and Santos

## A note about domestic gas prices

Prior to 2016, the average domestic gas price was derived from all domestic gas sales into WA.

Beginning with the March quarter 2016, the average domestic gas price was estimated only from domestic gas sales reported to the State Government in relation to the administration of royalties from projects such as the North West Shelf, Waitsia and Beharra Springs.

Over time, the share of domestic gas sales captured through this methodology had diminished considerably.

DEMIRS, therefore, undertook a review of its methodology for deriving a domestic gas price for WA in 2022.

The outcome of review has been the development of a new domestic gas price and production value series backdated to 2016.

This new data series is reflected in this data publication.

It is based on a broader set of available pricing data including Woodside and Santos published prices, in combination with prices derived from domestic gas sales data reported to the WA Government.

Under the new data series, a domestic gas price is applied to a project based on a determination of the best available price, combination of prices, or average prices at any one time.

The result is a domestic gas price and production value data series that captures a larger subset of the value of domestic gas sales at any one time.

The data for 2016 and earlier is not directly comparable to the data for the post-2016 period.

This series is also not comparable to the previous domestic gas series published by DEMIRS. The previous price series is available from DEMIRS upon request.

Note that the prices quoted here represent average estimated producer prices, i.e. the sales price at the point of entry of domestic gas into the Dampier to Bunbury Natural Gas Pipeline, or where applicable, the Goldfields Gas Transmission Pipeline or the Parmelia pipeline.

The prices quoted do not include transport costs, other downstream costs, nor any mark-up paid by customers to wholesalers. They are distinct from other published prices achieved on the spot market or that represent the price paid by gas users.

## Quantity and value

Domestic gas production was value at a record \$2.9 billion, or around six per cent of the total value of petroleum production.

Domestic gas was exceptional as the only petroleum product that achieved a record production value or even a greater production value than in 2022–23.

Production was also at a five-year high of 11 billion cubic metres (413 PJ or 0.39 Tcf) with most projects reporting increased output.

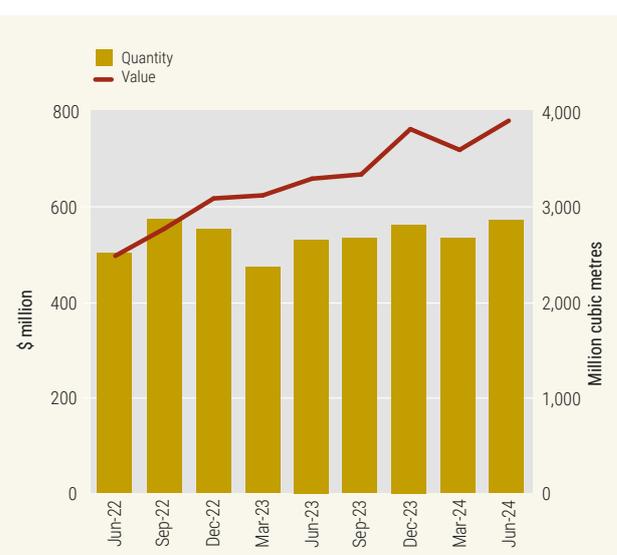


Figure 44 | Domestic gas quantity and value by quarter  
Source: DEMIRS, EnergyQuest, Woodside Energy, and Santos

The five-year high was largely due to the doubling of the volumes of gas from Pluto processed through the North West Shelf for the domestic market, new supply from Strike Energy's Walyering, as well as higher production from Santos' Varanus Island hub following a significant outage that affected output in the previous year.

Santos' Reindeer project had the most notable fall in production as it approaches its end of life, which was expected in 2024. It is slated to become a Carbon Capture and Storage project with FID in 2025.

### Notable events

- In September 2024, the State Government announced an update to its Domestic Gas Policy requiring new onshore gas project to reserve 80 per cent of gas production for WA domestic use, and thereby permitting 20 per cent of gas production to be exported, until 31 December 2030. After this date, these projects will be required to reserve 100 per cent of gas production for the local market. The 15 per cent reservation for offshore LNG projects remains unchanged, while a 15 per cent reservation also remain in place for the first mover in the Canning Basin.
- Strike Energy achieved first gas from the Walyering project in September 2023, marking the first greenfield domestic gas development in WA in 10 years.
- APA Group commissioned and officially opened its Northern Goldfields Interconnector pipeline in July 2023.
- Mineral Resources completed construction in September 2024 on a gas pipeline extending 16 kilometres from the Goldfields Gas Pipeline to the gas-fired power station at its Ken's Bore mine site, part of the Onslow iron ore project.
- First gas from the Waitsia gas plant currently under construction as part of Mitsui & Co and Beach Energy's Waitsia Stage 2 project was delayed to early-2025 (from mid-2024) after quality issues were identified during pre-commissioning. As a result, the estimated cost of the project increased to between \$1.2 and \$1.3 billion.
- Mineral Resources and Hancock Prospecting (Hancock) reached an agreement in October 2024 for Hancock to acquire 100 per cent of Mineral Resources' Exploration Permits 368 and 426 in the Perth Basin (containing the Lockyer Deep discovery and Moriary Deep prospect), as well as a 50 per cent share in Mineral Resources' other Perth Basin and Carnarvon Basin permits, for a cash consideration of \$1.1 billion.
- Strike Energy acquired Talon Energy, owner of several interests in the Perth Basin including a 45 per cent interest in the Walyering gas field, effective December 2023.

### 3. Supplementary information

**Table 6. Quantity and value of minerals and petroleum**

Commodity	Unit	2022–23		2023–24	
		Quantity	Value \$	Quantity	Value \$
<b>Alumina and bauxite</b>					
Alumina	t	13,040,577	6,683,755,275	12,408,629	6,581,008,466
Bauxite	t	0	0	0	0
<b>Total alumina and bauxite</b>			<b>6,683,755,275</b>		<b>6,581,008,466</b>
<b>Copper-lead-zinc</b>					
Copper metal	t	118,726	1,393,615,344	85,216	1,055,120,726
Lead metal	t	12,742	41,052,466	45,349	146,445,374
Zinc metal	t	62,242	265,341,546	44,496	176,135,502
<b>Total copper-lead-zinc</b>			<b>1,700,009,356</b>		<b>1,377,701,602</b>
<b>Chromite</b>	t	0	0	0	0
<b>Clays</b>	t	20,218	2,675,589	26,833	2,954,217
<b>Coal</b>	t	4,772,894	375,827,701	5,341,133	462,992,460
<b>Cobalt</b>	t	5,864	368,503,313	4,970	221,825,257
<b>Construction materials</b>					
Aggregate	t	3,178,301	103,898,634	4,012,927	164,240,143
Gravel	t	431,101	4,022,190	87,540	nfp
Rock	t	1,308,454	28,450,575	1,675,682	32,405,494
Sand	t	3,691,408	39,500,595	3,521,590	41,033,409
<b>Total construction materials</b>			<b>175,871,994</b>		<b>238,673,424</b>
<b>Diamonds</b>	ct	0	0	0	0
<b>Dimension Stone</b>	t	5,612	2,340,031	7,017	3,277,958
<b>Gems and semi-precious stones</b>	kg	440,950	937,946	376,259	1,357,353
<b>Gold</b>	kg	212,984	18,639,981,725	203,850	20,747,768,580
<b>Gypsum</b>	t	1,338,191	35,341,304	1,649,331	48,890,490
<b>Iron ore</b>	t	861,836,824	125,299,643,703	865,645,000	141,981,973,927
<b>Limesand-limestone-dolomite</b>	t	5,721,834	59,304,517	4,780,965	49,414,088
<b>Lithium</b>					
Spodumene	t	3,323,197	21,456,054,765	3,589,968	8,359,998,186
Lithium hydroxide	t	0	0	0	0
<b>Total lithium</b>			<b>21,456,054,765</b>		<b>8,359,998,186</b>
<b>Manganese</b>	t	497,024	306,441,062	557,140	341,452,714

**Table 6. Quantity and value of minerals and petroleum cont.**

Commodity	Unit	2022–23		2023–24	
		Quantity	Value \$	Quantity	Value \$
<b>Mineral sands</b>					
Garnet	t	343,580	nfp	359,907	nfp
Ilmenite	t	237,924	93,119,565	360,126	112,072,208
Leucoxene	t	21,626	32,184,400	14,194	16,837,748
Rutile	t	97,880	151,452,977	112,092	110,382,472
Zircon	t	196,730	526,406,339	220,978	463,751,175
Synthetic rutile	t	282,240	517,025,576	169,905	315,728,975
Other (may include garnet, monazite, rutile, staurolite, and synthetic rutile)	t		114,293,342		128,354,129
<b>Total mineral sands</b>			<b>1,434,482,199</b>		<b>1,147,126,706</b>
<b>Nickel</b>					
	t	159,681	5,686,680,483	141,179	3,861,855,565
<b>Petroleum</b>					
Condensate	kl	11,833,974	8,743,621,082	11,718,761	8,405,288,712
Crude oil	kl	3,475,981	3,153,460,040	3,225,399	2,533,422,990
LNG	t	50,341,174	57,064,537,328	47,349,313	36,490,156,638
LPG - Butane and propane	t	760,519	751,076,805	667,576	554,378,423
Domestic gas	'000m3	10,689,277	2,459,657,482	11,044,902	2,936,078,141
<b>Total petroleum</b>			<b>72,172,352,738</b>		<b>50,919,324,904</b>
<b>Platinum group elements</b>					
	kg	568	41,321,184	519	24,450,594
<b>Potash</b>					
	t	5,954	nfp	1,967	nfp
<b>Rare earths</b>					
	kg	30,591,770	nfp	27,651,858	nfp
<b>Salt</b>					
	t	11,592,184	714,153,622	11,871,782	814,536,885
<b>Silica sands</b>					
	t	1,224,713	23,945,891	954,662	24,649,086
<b>Silver</b>					
	kg	115,537	120,540,245	95,610	112,819,973
<b>Tin and tantalum</b>					
Tantalum	t	171	nfp	306	nfp
Tin Metal	t	151	nfp	184	nfp
<b>Total tin and tantalum</b>			<b>55,108,924</b>		<b>56,963,335</b>
<b>Other</b>					
			0		994,378
(May include Rare Earths, Manganese, Spongolite, Talc, and Cesium)					
<b>Total minerals</b>			<b>183,815,908,031</b>		<b>186,742,446,534</b>
<b>Total minerals and petroleum</b>			<b>255,988,260,769</b>		<b>237,661,771,438</b>

**Table 7. Value of minerals by region by commodity group 2023–24**

Region	Value \$	Region	Value \$
<b>Pilbara region</b>		<b>Wheatbelt region</b>	
Iron ore	138,374,244,689	Iron ore, nickel and cobalt	1,414,143,135
Spodumene and tantalum pentoxide	3,169,942,121	Mineral sands	654,254,154
Gold	904,962,024	Gold and silver	609,503,306
Salt	631,732,878	Spodumene and silica	28,361,527
Manganese and copper	446,475,398	Gypsum	13,213,805
Construction materials and dimension stone	174,228,310	Salt	12,381,856
Silver and gems and semi-precious stones	5,444,974	Limesand limestone	4,016,730
<b>Pilbara total</b>	<b>143,707,030,394</b>	Clays	2,172,478
<b>Goldfields-Esperance region</b>		Construction materials	1,036,283
Gold	14,945,985,145	<b>Wheatbelt total</b>	<b>2,739,083,273</b>
Nickel	3,530,201,178	<b>Perth region</b>	
Spodumene and tantalum pentoxide	1,580,115,581	Limesand limestone	27,585,647
Rare earth oxide, iron ore and potash	606,617,018	Construction materials and silica	25,034,427
Cobalt, palladium and platinum	225,527,005	<b>Perth total</b>	<b>52,620,074</b>
Copper and zinc	202,089,653	<b>Great Southern region</b>	
Silver	43,307,737	Silica, limesand limestone and spongolite	10,504,719
Construction materials	32,194,118	<b>Great Southern total</b>	<b>10,504,719</b>
Limesand limestone, gypsum and granite	16,679,394	<b>Peel region</b>	
<b>Goldfields-Esperance total</b>	<b>21,182,716,828</b>	Alumina, gold, copper and silver	9,022,025,802
<b>Mid West region</b>		<b>Peel total</b>	<b>9,022,025,802</b>
Gold	2,296,690,986	<b>South West region</b>	
Iron ore	1,423,067,909	Tin tantalum lithium	3,644,996,076
Copper	300,136,956	Coal and mineral sands	560,293,805
Zinc and lead	305,218,208	Limesand limestone	4,097,570
Mineral sands	239,751,103	Construction materials and sandstone	441,816
Silver	41,274,331	<b>South West total</b>	<b>4,209,829,267</b>
Manganese and talc	30,157,594	<b>Gascoyne region</b>	
Limesand limestone	2,202,503	Salt	170,422,151
Gypsum and construction materials	1,127,498	Mineral sands and gypsum	112,969,233
Clays	781,739	Construction materials	1,749,806
Gems and semi-precious stones	72,928	Gems and semi-precious stones	901,859
<b>Mid West total</b>	<b>4,640,481,755</b>	Limesand limestone and spongolite	450,030
<b>Kimberley region</b>		<b>Gascoyne total</b>	<b>286,493,079</b>
Iron ore	677,807,573	<b>Grand total</b>	
Nickel industry, mineral sands and copper	199,061,680	<b>186,742,446,534</b>	
Construction materials and sandstone	14,792,089		
<b>Kimberley total</b>	<b>891,661,343</b>		

**Table 8. Value of minerals and petroleum by region by local government area 2023–24**

Region	Value \$	Region	Value \$
<b>Perth region</b>		<b>Gascoyne region</b>	
Swan and Kalamunda	18,752,727	Shark Bay	147,683,167
Cockburn	17,030,318	Carnarvon	136,989,266
Wanneroo	9,802,325	Exmouth and Upper Gascoyne	1,820,646
Kwinana	7,034,704	<b>Gascoyne total</b>	<b>286,493,079</b>
<b>Perth total</b>	<b>52,620,074</b>	<b>Goldfields-Esperance region</b>	
<b>Pilbara region</b>		Laverton	4,897,940,885
Ashburton	70,311,101,729	Leonora	4,328,621,399
East Pilbara	67,242,305,846	Coolgardie	3,965,303,661
Karratha	3,963,309,800	Kalgoorlie-Boulder	2,665,272,729
Port Hedland	2,190,313,019	Menzies	2,098,729,251
<b>Pilbara total</b>	<b>143,707,030,394</b>	Wiluna	1,280,070,352
<b>South West region</b>		Dundas	980,760,648
Bridgetown-Greenbushes and Manjimup	3,645,023,698	Ravensthorpe	963,184,527
Collie and Donnybrook-Balingup	463,015,376	Esperance	2,833,377
Busselton and Augusta-Margaret River	101,366,262	<b>Goldfields-Esperance total</b>	<b>21,182,716,828</b>
Harvey	423,931	<b>Mid West region</b>	
<b>South West total</b>	<b>4,209,829,267</b>	Perenjori	1,097,203,876
<b>Wheatbelt region</b>		Meekatharra	1,041,963,809
Yilgarn	1,580,122,532	Yalgoo	941,490,739
Dandaragan	620,935,864	Cue	777,955,082
Kondinin	250,769,142	Mount Magnet	295,828,035
Narembeen and Wickepin	150,359,929	Sandstone and Three Springs	235,532,761
Westonia	79,536,791	Northampton	140,205,740
Gingin	40,663,620	Carnamah	99,753,376
Moora and Northam	7,372,556	Murchison	7,906,071
Lake Grace	4,576,143	Irwin	1,371,411
Dalwallinu	2,013,986	Coorow	1,270,855
Koorda	1,293,777	<b>Mid West total</b>	<b>4,640,481,755</b>
Nungarin and Kellerberrin	904,462	<b>Great Southern region</b>	
Wyalkatchem and Dowerin	534,472	Albany, Denmark and Plantagenet	10,504,719
<b>Wheatbelt total</b>	<b>2,739,083,273</b>	<b>Great Southern total</b>	<b>10,504,719</b>
<b>Kimberley region</b>		<b>Peel region</b>	
Derby-West Kimberley	671,266,043	Boddington and Murray	9,022,025,802
Halls Creek and Wyndham-East Kimberley	138,281,491	<b>Peel total</b>	<b>9,022,025,802</b>
Broome	82,113,809	<b>Grand total</b>	
<b>Kimberley total</b>	<b>891,661,343</b>	<b>186,742,446,534</b>	

**Table 9. Value of petroleum by basin by commodity 2023–24**

Basin	Value \$
<b>Browse Basin</b>	
Condensate, LNG and LPG	5,436,543,006
<b>Browse Basin total</b>	<b>5,436,543,006</b>
<b>Perth and Canning Basins</b>	
Domestic gas	177,882,366
Crude oil	25,209,138
Condensate	5,590,143
<b>Perth and Canning Basins total</b>	<b>208,681,648</b>
<b>Carnarvon Basin</b>	
LNG	34,928,260,553
Condensate	4,694,153,212
Domestic gas	2,758,195,775
Crude oil	2,505,440,921
LPG	385,276,860
<b>Carnarvon Basin total</b>	<b>45,271,327,320</b>
<b>Grand total</b>	<b>50,919,324,904</b>

**Table 10. FTE employment in mining by commodity and mineral exploration**

<b>Commodity</b>	<b>2018–19</b>	<b>2019–20</b>	<b>2020–21</b>	<b>2021–22</b>	<b>2022–23</b>	<b>2023–24</b>
Alumina and bauxite	6,924	6,765	6,840	6,733	7,202	7,021
Coal	711	700	642	675	824	861
Construction materials	766	706	680	779	885	883
Copper-lead-zinc	2,256	2,075	1,894	2,072	1,994	1,499
Diamond	836	618	276	256	357	384
Gold	25,660	26,287	28,419	30,766	30,074	31,884
Iron ore	45,116	52,321	60,488	59,725	61,203	62,950
Lithium	4,855	2,563	1,846	3,801	8,092	11,386
Mineral sands	2,053	1,957	1,870	2,419	2,939	2,892
Nickel	6,232	7,500	7,553	8,301	9,826	10,434
Salt	614	645	622	824	999	1,086
Other	2,253	2,278	2,788	2,687	3,138	3,590
<b>Total mining</b>	<b>98,278</b>	<b>104,416</b>	<b>113,919</b>	<b>119,038</b>	<b>127,533</b>	<b>134,871</b>
<b>Mineral exploration</b>	<b>2,859</b>	<b>3,355</b>	<b>4,170</b>	<b>4,685</b>	<b>4,206</b>	<b>4,163</b>
<b>Total mining and mineral exploration</b>	<b>101,137</b>	<b>107,771</b>	<b>118,089</b>	<b>123,723</b>	<b>131,738</b>	<b>139,034</b>

**Table 11. FTE employment in mining by LGA**

Region and Local Government Area	2019-20	2020-21	2021-22	2022-23	2023-24
<b>Pilbara</b>					
Ashburton	13,749	18,236	18,561	16,309	19,813
East Pilbara	30,842	33,583	33,017	36,118	35,408
Karratha	5,841	5,755	5,797	6,282	6,555
Port Hedland	3,865	3,693	4,106	5,330	5,261
<b>Pilbara Total</b>	<b>54,296</b>	<b>61,268</b>	<b>61,481</b>	<b>64,039</b>	<b>67,036</b>
Goldfields-Esperance					
Coolgardie	3,277	3,217	3,323	4,423	5,171
Dundas	863	939	1,075	1,229	1,362
Esperance	160	181	148	28	31
Kalgoorlie-Boulder	4,508	4,738	5,686	6,605	6,653
Laverton	5,921	6,385	6,921	6,552	6,720
Leonora	4,410	4,511	5,468	6,808	8,052
Menzies	2,567	2,823	3,074	3,275	3,882
Ngaanyatjarraku	0	0	0	175	635
Ravensthorpe	755	1,284	1,313	1,361	1,234
Wiluna	2,504	3,128	3,158	3,465	4,402
<b>Goldfields-Esperance Total</b>	<b>24,964</b>	<b>27,204</b>	<b>30,165</b>	<b>33,922</b>	<b>38,139</b>
<b>Peel</b>					
Boddington	2,231	2,074	1,880	1,891	2,073
Mandurah	1	1	1	1	1
Murray	2,080	2,109	2,158	2,294	2,287
Serpentine-Jarrahdale	123	113	114	108	114
Waroona	1,192	1,301	1,134	1,264	1,315
<b>Peel Total</b>	<b>5,626</b>	<b>5,598</b>	<b>5,286</b>	<b>5,557</b>	<b>5,790</b>
<b>Mid West</b>					
Carnamah	82	86	136	144	184
Chapman Valley	0	0	0	0	0
Coorow	4	4	3	4	2
Cue	623	793	918	672	783
Greater Geraldton	342	321	349	319	322
Irwin	23	35	35	32	23
Meekatharra	1,868	2,286	2,422	2,348	2,129

**Table 11. FTE employment in mining by LGA cont.**

Region and Local Government Area	2019-20	2020-21	2021-22	2022-23	2023-24
Morawa	0	0	0	0	0
Mount Magnet	802	845	766	309	209
Murchison	15	13	2	2	15
Northampton	74	68	160	218	253
Perenjori	1,337	1,500	1,550	1,764	1,673
Sandstone	8	12	97	118	109
Three Springs	22	12	18	18	15
Yalgoo	1,680	1,790	1,684	1,705	1,735
<b>Mid West Total</b>	<b>6,881</b>	<b>7,766</b>	<b>8,140</b>	<b>7,653</b>	<b>7,451</b>
<b>South West</b>					
Augusta-Margaret River	8	8	8	5	7
Bridgetown-Greenbushes	267	207	299	381	596
Bunbury	753	537	869	1,505	1,796
Busselton	67	45	55	66	69
Capel	336	297	356	380	378
Collie	2,415	2,314	2,303	2,629	2,687
Dardanup	0	0	0	0	0
Donnybrook-Balingup	3	4	3	1	1
Harvey	678	660	728	761	821
<b>South West Total</b>	<b>4,526</b>	<b>4,072</b>	<b>4,623</b>	<b>5,728</b>	<b>6,355</b>
<b>Perth</b>					
Armadale	77	83	95	99	73
Belmont	99	87	96	115	69
Canning	0	0	0	0	0
Cockburn	27	20	18	11	26
Fremantle	3	2	3	2	3
Gosnells	137	114	126	106	91
Kwinana	1,418	1,418	1,561	2,010	2,285
Mundaring	5	7	8	8	9
Rockingham	728	678	607	641	698
Stirling	0	0	0	0	0
Swan	89	96	98	112	95
Wanneroo	78	91	106	87	92
<b>Perth Total</b>	<b>2,660</b>	<b>2,595</b>	<b>2,716</b>	<b>3,193</b>	<b>3,441</b>

**Table 11. FTE employment in mining by LGA cont.**

Region and Local Government Area	2019-20	2020-21	2021-22	2022-23	2023-24
<b>Wheatbelt</b>					
Brookton	0	1	0	0	0
Chittering	216	267	192	189	196
Cunderdin	0	0	0	0	0
Dalwallinu	2	2	2	2	2
Dandaragan	552	559	596	647	796
Dowerin	1	0	0	0	0
Gingin	240	232	222	196	48
Goomalling	0	0	0	0	0
Kellerberrin	5	6	9	5	6
Kondinin	336	327	282	291	227
Koorda	0	1	1	1	1
Lake Grace	196	200	193	206	200
Moora	14	13	13	15	19
Mount Marshall	0	3	3	4	5
Narembeen	0	32	173	135	3
Narrogin	2	3	2	1	3
Northam	73	66	78	83	94
Toodyay	15	18	20	15	16
Wagin	2	0	0	0	0
West Arthur	0	0	0	0	0
Westonia	233	337	295	267	277
Wickepin	0	5	21	21	26
Wyalkatchem	0	0	0	0	0
Yilgarn	1,412	1,712	2,240	2,523	2,245
<b>Wheatbelt Total</b>	<b>3,300</b>	<b>3,785</b>	<b>4,343</b>	<b>4,603</b>	<b>4,165</b>
<b>Kimberley</b>					
Broome	5	6	83	355	357
Derby-West Kimberley	544	612	678	652	651
Halls Creek	631	264	545	527	258
Wyndham-East Kimberley	630	411	294	357	406
<b>Kimberley Total</b>	<b>1,809</b>	<b>1,293</b>	<b>1,600</b>	<b>1,891</b>	<b>1,672</b>

**Table 11. FTE employment in mining by LGA cont.**

Region and Local Government Area	2019-20	2020-21	2021-22	2022-23	2023-24
Gascoyne					
Carnarvon	135	106	138	174	173
Exmouth	2	2	3	3	4
Shark Bay	69	77	359	476	396
Upper Gascoyne	0	0	1	143	33
<b>Gascoyne Total</b>	<b>207</b>	<b>185</b>	<b>501</b>	<b>796</b>	<b>606</b>
<b>Indian Ocean Territories</b>					
Christmas Island	115	124	149	117	173
<b>Indian Ocean Territories Total</b>	<b>115</b>	<b>124</b>	<b>149</b>	<b>117</b>	<b>173</b>
<b>Great Southern</b>					
Albany	23	21	23	24	26
Cranbrook	0	0	0	0	0
Denmark	0	0	1	0	0
Jerramungup	0	0	0	1	6
Plantagenet	8	8	11	9	11
Woodanilling	0	0	0	0	0
<b>Great Southern Total</b>	<b>31</b>	<b>30</b>	<b>34</b>	<b>34</b>	<b>43</b>
<b>Grand Total</b>	<b>104,416</b>	<b>113,919</b>	<b>119,038</b>	<b>127,533</b>	<b>134,871</b>

**Table 12. Royalties by region 2021–24**

	<b>2021–22</b>	<b>2022–23</b>	<b>2023–24</b>
<b>Region</b>	<b>(\$ Million)</b>	<b>(\$ Million)</b>	<b>(\$ Million)</b>
Pilbara	10,747.40	9,513.68	10,411.48
Goldfields-Esperance	479.87	648.83	575.75
Peel	168.05	183.32	187.77
Mid West	206.69	168.99	186.07
Great Southern	0.23	0.31	0.25
Wheatbelt	143.30	130.84	139.51
Kimberley	14.72	35.50	64.84
South West	101.70	537.16	430.12
Gascoyne	1.18	2.92	5.07
Perth Metropolitan and Offshore	5.57	6.18	5.40
<b>Total Royalty Receipts</b>	<b>11,868.69</b>	<b>11,227.74</b>	<b>12,006.27</b>

**Table 13. Principal mining projects 2023–24**

<b>Principal mining projects</b>		
<b>Company</b>	<b>Project(s)</b>	<b>Comments</b>
<b>Bauxite</b>		
<b>Alcoa</b>	Huntly	Alcoa acquired Alumina Limited, its JV partner in Alcoa World Alumina and Chemicals (AWAC), which included its WA assets, in August 2024. Alcoa previously held a 60 percent ownership interest in AWAC.
	Willowdale	
<b>South32</b>	Boddington	
<b>Coal</b>		
<b>Griffin Coal Mining Company</b>	Collie	
<b>Yancoal</b>	Premier	
<b>Copper-lead-zinc</b>		
<b>29Metals</b>	Golden Grove	
<b>Aeris Resources</b>	Jaguar	Aeris Resources announced in September 2023 that it was to suspend production at the Jaguar project and place it into care and maintenance.
<b>Abra Mining</b>	Abra	Abra Mining is owned by Galena Mining (60 per cent) and Toho Zinc Co. (40 per cent).
<b>Sandfire Resources</b>	DeGrussa	Mining was completed in October 2022 with processing operations continuing until the project's transition to care and maintenance in late June 2023. The final sales of stockpiles from the project occurred in the September quarter 2024.
<b>Gold</b>		
<b>AngloGold Ashanti</b>	Sunrise Dam	
	Tropicana	Tropicana is owned by a joint venture of AngloGold Ashanti (70 per cent) and Regis Resources (30 per cent).
<b>Aurenne Group Mining</b>	Mt Ida	New project. Commissioned in May 2023.
<b>Auric Mining</b>	Jeffrey's Find	New project. A first gold pour from initial stage of mining occurred in July 2023, with sales completed in August 2023. A second stage commenced in March 2024, with sales in April 2024.
<b>Barto Gold Mining</b>	Southern Cross	Minjar Gold manages the Southern Cross project on behalf of Barton Gold.
<b>Beacon Minerals</b>	Jaurdi	
<b>Bellevue Gold</b>	Bellevue	New project. Commissioned in May 2023.
<b>Brightstar Resources</b>	Menzies	New project. The maiden gold pour and mining campaign from the Selkirk open-pit cutback within the project occurred in March 2024. The Selkirk deposit is jointly owned by Brightstar Resources and Selkirk Mining.

**Table 13. Principal mining projects 2023–24 cont.**

<b>Principal mining projects</b>		
<b>Company</b>	<b>Project(s)</b>	<b>Comments</b>
	Second Fortune	Brightstar Resources completed the acquisition of Linden Gold Alliance, the previous owner of the Second Fortune gold project, in May 2024.
<b>Catalyst Metals</b>	Plutonic	
<b>Calidus Resources</b>	Warrawoona	Calidus Resources went into receivership in June 2024 with its Warrawoona gold mine placed into care and maintenance in July 2024.
<b>Capricorn Metals</b>	Karlawinda	
<b>Evolution Mining</b>	Mungari	Includes the Mungari and Kundana mines.
<b>FMR Investments</b>	Gordon - Sirdar	
<b>Focus Minerals</b>	Coolgardie	
<b>Genesis Minerals</b>	Gwalia	
<b>Gold Fields</b>	Agnew	
	Granny Smith	
	Gruyere	Gruyere is a joint venture of Gold Fields (50 per cent) and Gold Road Resources (50 per cent).
	St Ives	
<b>Legacy Iron Ore</b>	Mt Celia	New project. Mining commenced in November 2023.
<b>Newmont Corporation</b>	Boddington	
	Telfer	Newmont Corporation acquired Newcrest Mining, the previous owner of Telfer project, in November 2023. Processing operations were suspended at Telfer in January 2024 due to issues with tailings storage facilities. Newmont Corporation subsequently entered into a binding agreement with Greatland Gold for the sale of the project in September 2024.
<b>Northern Star Resources</b>	Carosue Dam	Part of the Kalgoorlie production centre. Includes Carosue Dam and Porphyry.
	Fimiston / Mt Charlotte	Part of the Kalgoorlie production centre.
	Jundee	Part of the Yandal production centre.
	Kanowna Belle	Part of the Kalgoorlie production centre.
	Thunderbox	Part of the Yandal production centre. Includes Thunderbox and Bundara (Wonder).
	South Kalgoorlie	Part of the Kalgoorlie production centre.
	Bronzewing	Part of the Yandal production centre.

**Table 13. Principal mining projects 2023–24 cont.**

<b>Principal mining projects</b>		
<b>Company</b>	<b>Project(s)</b>	<b>Comments</b>
<b>Norton Gold Fields</b>	Paddington	Norton Gold Fields is a subsidiary of Zijin Mining. Includes Paddington and Binduli.
<b>Ora Banda Mining</b>	Davyhurst	
<b>Pantoro</b>	Norseman	
<b>Ramelius Resources</b>	Edna May	Part of the Edna May production centre. Ramelius Resources announced in July 2024 plans to process existing stockpiles at Edna May and then place the operation into care and maintenance in 2025.
	Marda	Part of the Edna May production centre.
	Mt Magnet	Part of the Mt Magnet production centre.
	Penny	Part of the Mt Magnet production centre.
	Symes	Re-started project. Mining operations commenced and were completed at Symes within the 2023–24 financial year. The haulage of the stockpiled ore at Symes to Edna May will continue into 2024–25.
	Tampia	Part of the Edna May production centre. Mining operations were completed in May 2023 with the haulage of stockpiled ore from the project to Edna May for processing ongoing.
<b>Regis Resources</b>	Duketon	Includes Duketon and Garden Well.
<b>Resource Mining</b>	Goongarrie Lady	Restarted project. There were several mining campaigns across 2023–24.
<b>Resources &amp; Energy Group</b>	East Menzies	Restarted project. There was a single period of sales for the March quarter 2024 related to the Maranoa deposit.
<b>Vault Minerals</b>	Darlot	Red 5 was the previous owner of Darlot. It merged with Silver Lake Resources to form Vault Minerals in June 2024.
	Deflector	Silver Lake Resources was the previous owner of Deflector. It merged with Red 5 to form Vault Minerals in June 2024.
	Mt Monger	Includes Mt Monger and Aldiss.
	King of the Hills	Red 5 was the previous owner of King of the Hills. It merged with Silver Lake Resources to form Vault Minerals in June 2024.

**Table 13. Principal mining projects 2023–24 cont.**

<b>Principal mining projects</b>		
<b>Company</b>	<b>Project(s)</b>	<b>Comments</b>
<b>Westgold Resources</b>	Murchison	Includes Murchison, Cue and Fortnum.
	Higginsville	Includes Higginsville, Spargos Reward, and Polar Bear. Karora Resources was the previous owner of Higginsville. It merged with Westgold Resources in August 2024 with the new entity trading as Westgold Resources.
<b>Wiluna Mining</b>	Wiluna	Wiluna Mining entered voluntary administration in July 2022 and was subsequently under the control of FTI Consulting. Despite the cessation of mining at the Wiluna project in December 2022, the ramp-up of the company's Wiltails retreatment circuit has continued to date with first ore processed in October 2023.
<b>Iron ore</b>		
<b>10M</b>	Twin Peaks	Restarted project. The first shipment from the re-start took place in March 2024, under an ore purchase agreement between 10M and Fenix Resources. 10M was later taken into administration in June 2024.
<b>Atlas Iron</b>	Miralga Creek	Atlas Iron is a subsidiary of Hancock Prospecting.
	Mt Webber	
	Sanjiv Ridge	
<b>BHP</b>	Jimblebar	
	Mining Area C	
	Newman	Includes Newman East and Newman West.
	South Flank	
	Yandi	
<b>Extension Hill</b>	Mt Gibson	Restarted project. Extension Hill acquired the asset from Fenix Resources in November 2023, with first sales in the March quarter 2024.
<b>CITIC Pacific Mining Management</b>	Sino Iron	
<b>Fenix Resources</b>	Iron Ridge	
<b>Fortescue</b>	Chichester	Includes Cloudbreak and Christmas Creek.
	Iron Bridge	New project. It achieved its first shipment in September 2023. The project is a JV between Fortescue (69 per cent) and Formosa Steel (31 per cent).
	Western	Includes Solomon and Eliwana.
<b>Gold Valley Wiluna West</b>	Wiluna West	Gold Valley West Wiluna acquired the Wiluna West project from GWR Group in December 2023.
<b>Hancock Prospecting</b>	Roy Hill	A JV between Hancock Prospecting (70 per cent), Marubeni Corporation (15 per cent) and Pohrang Iron and Steel Co (12.5 per cent).

**Table 13. Principal mining projects 2023–24 cont.**

<b>Principal mining projects</b>		
<b>Company</b>	<b>Project(s)</b>	<b>Comments</b>
<b>Hedland Mining</b>	Poondano	Restarted project. It had a single period of sales in the March quarter 2024.
<b>Karara Mining</b>	Karara	Karara Mining is a subsidiary of Ansteel Group Corporation.
<b>Kimberley Metals Group</b>	Ridges	Restarted project.
<b>Mineral Resources</b>	Yilgarn	Includes Koolyanobbing, and Parker Range. In June 2024, it was announced that the Yilgarn operations would transition to care and maintenance in early 2025.
	Onslow	
	Pilbara	Includes Iron Valley and Wonmunna. Mineral Resources acquired BCI Minerals' Iron Valley assets in July 2024. It has previously been the operator of the project.
<b>Mount Gibson Iron</b>	Koolan Island	
<b>Newcam Minerals</b>	Mt Gould	New project.
<b>Rio Tinto</b>	Brockman 2 – Nammuldi – Silvergrass	
	Brockman 4	
	Greater Paraburdoo	Includes Channar, Paraburdoo and Eastern Range.
	Gudai-Darri	
	Hope Downs	Includes Hope Downs 1 and 4.
	Marandoo	
	Mount Tom Price	Includes Tom Price and Western Turner Syncline.
	Robe Valley	Includes Mesa A and Mesa J.
	West Angelas	
	Yandicoogina	
<b>Sinosteel Midwest Corporation</b>	Blue Hills	Operated by Kimberley Metals Group.
<b>Lithium</b>		
<b>Arcadium Lithium</b>	Mt Cattlin	The Mt Cattlin project is to be transitioned to care and maintenance by mid-2025. It was announced in October 2024 that Rio Tinto had entered into a transaction agreement to acquire Arcadium Lithium, owner of Mt Cattlin, with the transaction expected to close by mid-2025.
<b>Covalent Lithium</b>	Mt Holland	New project. It was officially opened in March 2024, with a first shipment of spodumene concentrate occurring in the same month. Covalent Lithium is a joint venture between Wesfarmers (50 per cent) and SQM (50 per cent).

**Table 13. Principal mining projects 2023–24 cont.**

<b>Principal mining projects</b>		
<b>Company</b>	<b>Project(s)</b>	<b>Comments</b>
<b>Mineral Resources</b>	Bald Hill	Mineral Resources acquired the Bald Hill project and its associated companies in November 2023. The project was transitioned into care and maintenance in early December 2024.
	Mount Marion	Mount Marion is owned under a Joint Venture between Mineral Resources (50 per cent) and Jiangxi Ganfeng Lithium Co., (50 per cent). The project is operated by Mineral Resources.
	Wodgina	Wodgina is owned by the MARBL JV, with Mineral Resources holding a 50 per cent interest and Albemarle Corporation holding a 50 per cent interest. The project is operated by Mineral Resources.
<b>Pilbara Minerals</b>	Pilgangoora	The Ngungaju plant, part of the Pilgangoora operations, was to be placed into care and maintenance from December 2024.
<b>Talison Lithium</b>	Greenbushes Lithium	Talison Lithium is a JV of Tianqi Lithium and IGO (51 per cent) and Albemarle Corporation (49 per cent).
<b>Manganese</b>		
<b>Consolidated Minerals</b>	Woodie Woodie	
<b>Element 25</b>	Butcherbird	Butcherbird ceased mining with production shifting to processing stockpiles in late 2023. Processing operations were subsequently suspended in the March quarter 2024.
<b>Mineral sands</b>		
<b>Australian Garnet</b>	Lucky Bay	
<b>Doral</b>	Yalyalup mine and Picton dry separation plant	Doral is owned by Iwatani Corporation.
	Keysbrook	
<b>GMA Garnet</b>	Port Gregory mine and Geraldton dry plant	
<b>Iluka Resources</b>	Mid West	Active operations at Mid West comprised the Cataby mine and the Narngulu mineral separation plant.
	South West	Active operations at South West comprised the two synthetic rutile kilns at North Capel (SR1 and SR2). SR1 was placed offline in October 2023 due to reduced demand. SR2 was also placed offline for planned maintenance in October 2023, recommencing operations in February 2024 .
<b>Image Resources</b>	Boonanarring	The final sales from Boonanarring were completed in November 2023.

**Table 13. Principal mining projects 2023–24 cont.**

<b>Principal mining projects</b>		
<b>Company</b>	<b>Project(s)</b>	<b>Comments</b>
<b>Kimberley Mineral Sands</b>	Thunderbird	New project. First ore was produced in October 2023 with a maiden shipment completed in January 2024.
<b>Tronox</b>	Cooljarloo mine and Chandala mineral separation plant	
	Wonnerup North mine and North Shore mineral separation plant	
<b>Strandline Resources</b>	Coburn	
<b>Nickel</b>		
<b>BHP</b>	Cliffs	BHP announced in July 2024 it will suspend its Nickel West operations from October 2024. It intends to review the decision by February 2027.
	Leinster	
	Mt Keith	
<b>First Quantum Minerals</b>	Ravensthorpe	Ravensthorpe was placed into care and maintenance in May 2024.
<b>IGO</b>	Cosmos	Cosmos was transitioned into care and maintenance in June 2024. The commissioning of the processing plant at Cosmos was completed in the December quarter 2023, with the first concentrate produced in mid-November. The first shipment of concentrate was completed in April 2024.
	Forrestania	Forrestania was transitioned into care and maintenance in October 2024, with final shipments to be completed during the December quarter 2024.
	Nova	
<b>Minara Resources</b>	Murrin Murrin	Minara Resources is a subsidiary of Glencore Plc.
<b>Mincor Resources</b>	Kambalda	Mincor Resources is a wholly owned subsidiary of Wyloo Metals. Wyloo Metals put the Kambala operations into care and maintenance from May 2024.
<b>Panoramic Resources</b>	Savannah	Panoramic Resources entered administration in December 2023. Administrators for Panoramic Resources subsequently put the Savannah project into care and maintenance in January 2024.
<b>Westgold Resources</b>	Beta Hunt	Both gold and nickel were produced from Beta Hunt during 2023–24 with nickel being the primary commodity. Karora Resources was the previous owner of Beta Hunt. It merged with Westgold Resources in August 2024 with the new entity trading as Westgold Resources.
<b>Rare earths</b>		
<b>Lynas Corporation</b>	Mt Weld	

**Table 13. Principal mining projects 2023–24 cont.**

<b>Principal mining projects</b>		
<b>Company</b>	<b>Project(s)</b>	<b>Comments</b>
<b>Salt</b>		
<b>Dampier Salt</b>	Dampier	Dampier Salt is a JV of Rio Tinto (68 per cent), Marubeni Corporation (22 per cent) and Sojitz Corporation (10 per cent).
	Port Hedland	
<b>Leichhardt Industrials</b>	Lake MacLeod	Leichhardt Industrials acquired Dampier Salt's Lake Macleod operation in December 2024.
<b>Onslow Salt</b>	Onslow	Onslow Salt is a subsidiary of Mitsui & Co.
<b>Shark Bay Salt</b>	Shark Bay	Shark Bay Salt is a subsidiary of Mitsui & Co.
<b>WA Salt Koolyanobbing</b>	Lake Deborah	
<b>Silica sand</b>		
<b>Heidelberg Materials</b>	Gnangara	
<b>T T Sand</b>	Mindijup	
<b>Simcoa Operations</b>	Moora	
<b>Talc</b>		
<b>Imerys Talc Australia</b>	Three Springs	
<b>Tantalum</b>		
<b>Global Advanced Metals</b>	Greenbushes Tantalum	Project has been operating on and off since 2010, but sales value was above the threshold for inclusion on the list for the first time in 2023–24.
	Wodgina Tantalite	

<b>Basic Raw Materials</b>
<b>Company</b>
Aglime of Australia (Westdeen Holdings)
Boral
Brookdale Contractors
Cockburn Cement (Adbri)
Heidelberg Materials
Holcim
Kimberley Quarry
MLG Oz
Mobile Concreting Solutions
North West Quarries
Spinifex Crushing & Screening Services
Urban Resources

**Table 14. Principal mineral processing operations 2023–24**

<b>Principal mineral processing operations</b>		
<b>Company</b>	<b>Project(s)</b>	<b>Comments</b>
<b>Alumina</b>		
<b>Alcoa</b>	Kwinana alumina refinery	The curtailment of production at the Kwinana refinery was announced in January 2024 and completed in June. Alcoa acquired Alumina Limited, its JV partner in AWAC, which included its WA assets, in August 2024. Alcoa previously held a 60 per cent ownership interest in AWAC.
	Pinjarra alumina refinery	
	Wagerup alumina refinery	
<b>South32</b>	Worsley alumina refinery	
<b>Gold</b>		
<b>Gold Corporation</b>	Perth Mint	
<b>Nickel</b>		
<b>BHP</b>	Kalgoorlie nickel smelter	BHP announced in July 2024 it will suspend its Nickel West operations from October 2024. It intends to review the decision by February 2027.
	Kambalda nickel concentrator	
	Kwinana nickel refinery	
<b>Minara Resources</b>	Murrin Murrin nickel refinery	
<b>Mineral sands</b>		
<b>Tronox</b>	Bunbury pigment plant	The Bunbury pigment plant comprises facilities at Kemerton and Australind.
	Kwinana pigment plant	
<b>Doral</b>	Rockingham fused zirconia plant	Doral is owned by Iwatani Corporation.
<b>Rare earths</b>		
<b>Lynas Rare Earths</b>	Kalgoorlie cracking and leaching plant	The facility started producing mixed rare earth carbonate in the June quarter 2024.
<b>Silica sand</b>		
<b>Simcoa</b>	Kemerton silicon smelter	
<b>Lithium</b>		
<b>Tianqi Lithium</b>	Kwinana lithium hydroxide plant	The plant is owned by the Tianqi Lithium Energy Australia Joint Venture of Tianqi Lithium (51 per cent) and IGO (49 per cent).
<b>Albemarle Corporation</b>	Kemerton lithium hydroxide plant	

**Table 15. Principal petroleum projects 2023–24**

<b>Principal petroleum projects</b>					
<b>Operator</b>	<b>Project(s)</b>	<b>Field(s)</b>	<b>Type</b>	<b>Area</b>	<b>Comments</b>
<b>Beach Energy</b>	Beharra Springs	Beharra Springs Deep	Domestic gas	Onshore	Beharra Springs is owned by Beach Energy (50 per cent) and Mitsui & Co (50 per cent).
<b>Buru Energy</b>	Ungani	Ungani	Oil	Onshore	<p>Production from Ungani was temporarily suspended in July 2023 as a result of unseasonal rain in the Kimberley, and the closure of the temporary low-level river crossing at Fitzroy Crossing. They were suspended once again in August 2023 due to uncertainties regarding the Fitzroy River crossing.</p> <p>Buru Energy assumed full ownership of the Ungani Oilfield on 30 September 2023, following agreement for Roc Oil for its 50 per cent interest in the asset.</p> <p>Buru Energy subsequently entered into a farm-in agreement in June 2024 under which Sabre Energy could earn a 70 per cent interest in the Ungani project. However, this agreement was terminated in September 2024 after Sabre Energy was unable to meet its commitments under the agreement.</p>
<b>Chevron Corporation</b>	Barrow Island	Barrow Island	Oil	Onshore	Barrow Island is owned by Chevron (57.14 per cent), Santos (28.57 per cent) and ExxonMobil (14.29 per cent).
	Gorgon	Jansz-lo, Gorgon	LNG, condensate and domestic gas	Offshore	Gorgon is owned by Chevron (47.33 per cent); ExxonMobil (25 per cent); Shell (25 per cent); Osaka Gas (1.25 per cent); MidOcean Energy (1 per cent) and JERA (0.42 per cent)
	Wheatstone	Brunello, Iago, Julimar, Wheatstone	LNG, condensate and domestic gas	Offshore	<p>Wheatstone is a joint venture of Chevron (64.14 per cent); Kuwait Petroleum Corp (KPC) (13.4 per cent); Woodside (13 per cent); JOGMEC (3.36 per cent); Mitsubishi Corp (3.18 per cent); Kyushu Electric (1.46 per cent); Nippon Yusen Kabushiki Kaisha (NYK Line) (0.82 per cent) and JERA (0.64 per cent).</p> <p>The Julimar and Brunello fields are owned by Woodside Energy (65 per cent) and Kuwait Foreign Petroleum Exploration Company (35 per cent).</p>

**Table 15. Principal petroleum projects 2023–24 cont.**

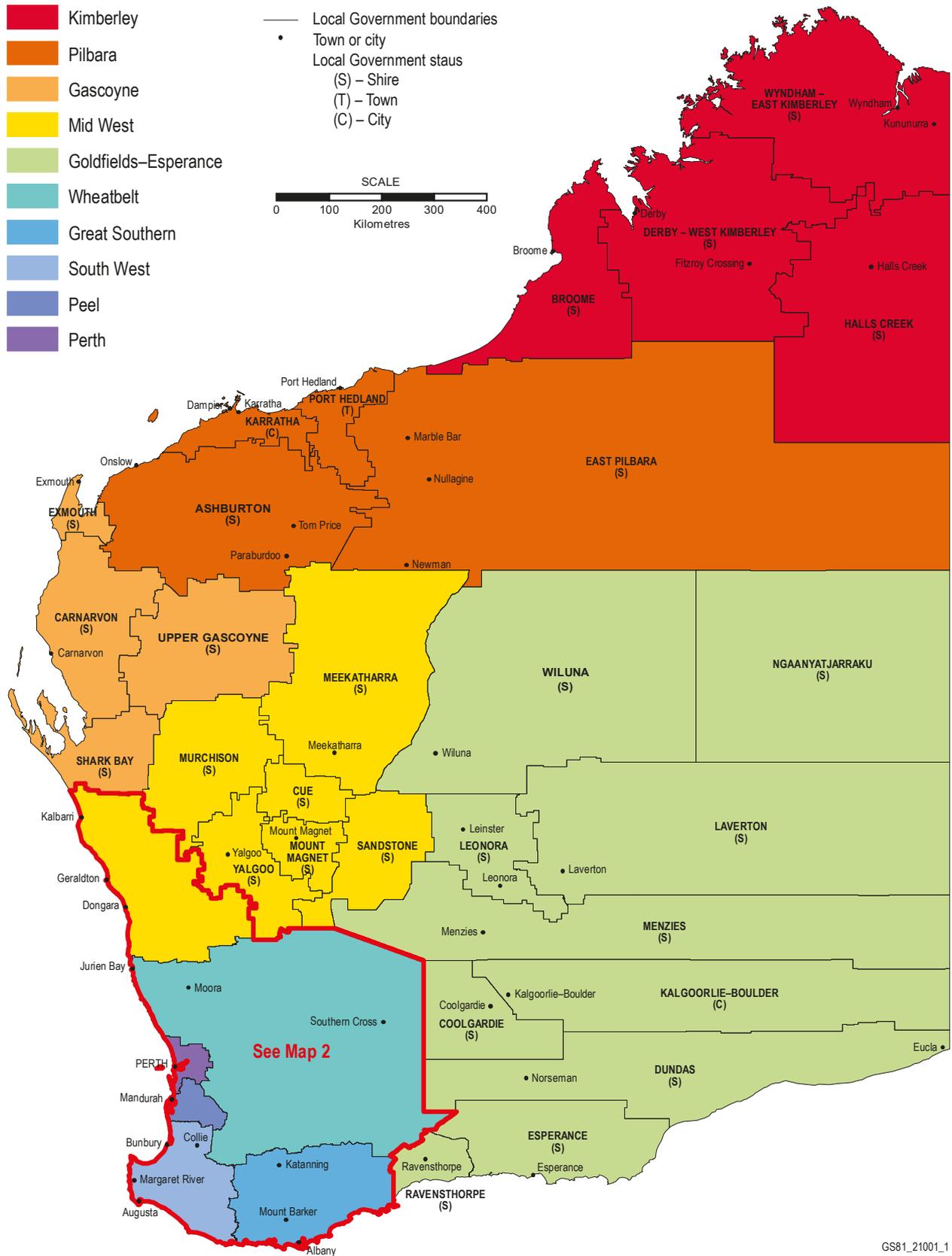
<b>Principal petroleum projects</b>					
<b>Operator</b>	<b>Project(s)</b>	<b>Field(s)</b>	<b>Type</b>	<b>Area</b>	<b>Comments</b>
<b>INPEX Corporation</b>	Ichthys	Ichthys	Condensate	Offshore	<p>Ichthys is a joint venture of INPEX Corporation (66.25 per cent); Total (26 per cent); CPC (Taiwan) (2.63 per cent); Tokyo Gas (1.58 per cent); Kansai Electric (1.2 per cent); Osaka Gas (1.2 per cent); JERA (0.73 per cent) and Toho Gas (0.41 per cent)</p> <p>Only the condensate produced via a FPSO installation is considered as a project for WA. The gas fields are located off the coast of WA but natural gas is transported to Darwin for processing and export.</p>
<b>Jadestone Energy</b>	Stag	Stag	Oil	Offshore	
<b>Mitsui &amp; Co</b>	Waitsia	Waitsia	Domestic gas	Onshore	Waitsia is a joint venture of Mitsui & Co (50 per cent) and Beach Energy (50 per cent).
<b>Santos</b>	Reindeer/ Devil Creek	Reindeer	Domestic gas and condensate	Offshore	The Reindeer field is expected to reach its end of life in late 2024.
	Van Gogh	Coniston, Novara, Van Gogh	Oil	Offshore	Van Gogh is owned by Santos (52.5 per cent) and INPEX Corporation (47.5 per cent).
	Varanus Island	Greater East Spar (Spar, Halyard and East Spar), John Brookes, Spartan	Domestic gas and condensate	Onshore	
<b>Shell</b>	Prelude	Prelude	LNG, condensate, and LPG	Offshore	Prelude is jointly owned by Shell (67.5 per cent), INPEX Corporation (17.5 per cent), Korea Gas Corporation (10 per cent), and CPC Corporation (5 per cent).
<b>Strike Energy</b>	Walyering	Walyering	Domestic gas	Onshore	New project. The first gas from the Walyering project was produced in September 2023.
<b>Triangle Energy</b>	Cliff Head	Cliff Head	Oil		Cliff Head had its final oil sales in August 2024 and is subject to a sale to Pilot Energy.

**Table 15. Principal petroleum projects 2023–24 cont.**

<b>Principal petroleum projects</b>					
<b>Operator</b>	<b>Project(s)</b>	<b>Field(s)</b>	<b>Type</b>	<b>Area</b>	<b>Comments</b>
<b>Vermilion Energy</b>	Wandoo	Wandoo	Oil	Offshore	Wandoo restarted in September 2023 following a 10-month shutdown for inspection and repairs.
<b>Woodside Energy</b>	Enfield/Vincent	Cimatti, Laverda Canyon, Norton over Laverda, Vincent	Oil	Offshore	Enfield/Vincent is owned by Woodside Energy (60 per cent) and Mitsui & Co (40 per cent).
	Macedon	Macedon	Domestic gas	Offshore	Macedon is owned by Woodside Energy (71.4 per cent) and Santos (28.6 per cent).
	North West Shelf	Cossack, Goodwyn, Hermes, Keast/Dockrell, Lady Nora/Pemberton, Lambert, Lambert Deep, North Rankin, Persephone, Perseus/Searipple, Rankin, Sculptor, Tidepole, Wanaea	LNG, condensate, oil, domestic gas, and LPG	Offshore	The North West Shelf project is owned by a range of JVs.
	Pluto	Pluto, Pyxis, and Xena	LNG, condensate, domestic gas, and LPG	Offshore	Pluto is owned by Woodside Energy (90 per cent), Kansai Electric (5 per cent) and MidOcean Energy (5 per cent).
	Pyrenees	Crosby, Moondyne, Ravensworth, Stickle, Tanglehead, Wild Bull	Oil	Offshore	Pyrenees is owned by Woodside Energy, Santos and INPEX Corporation.

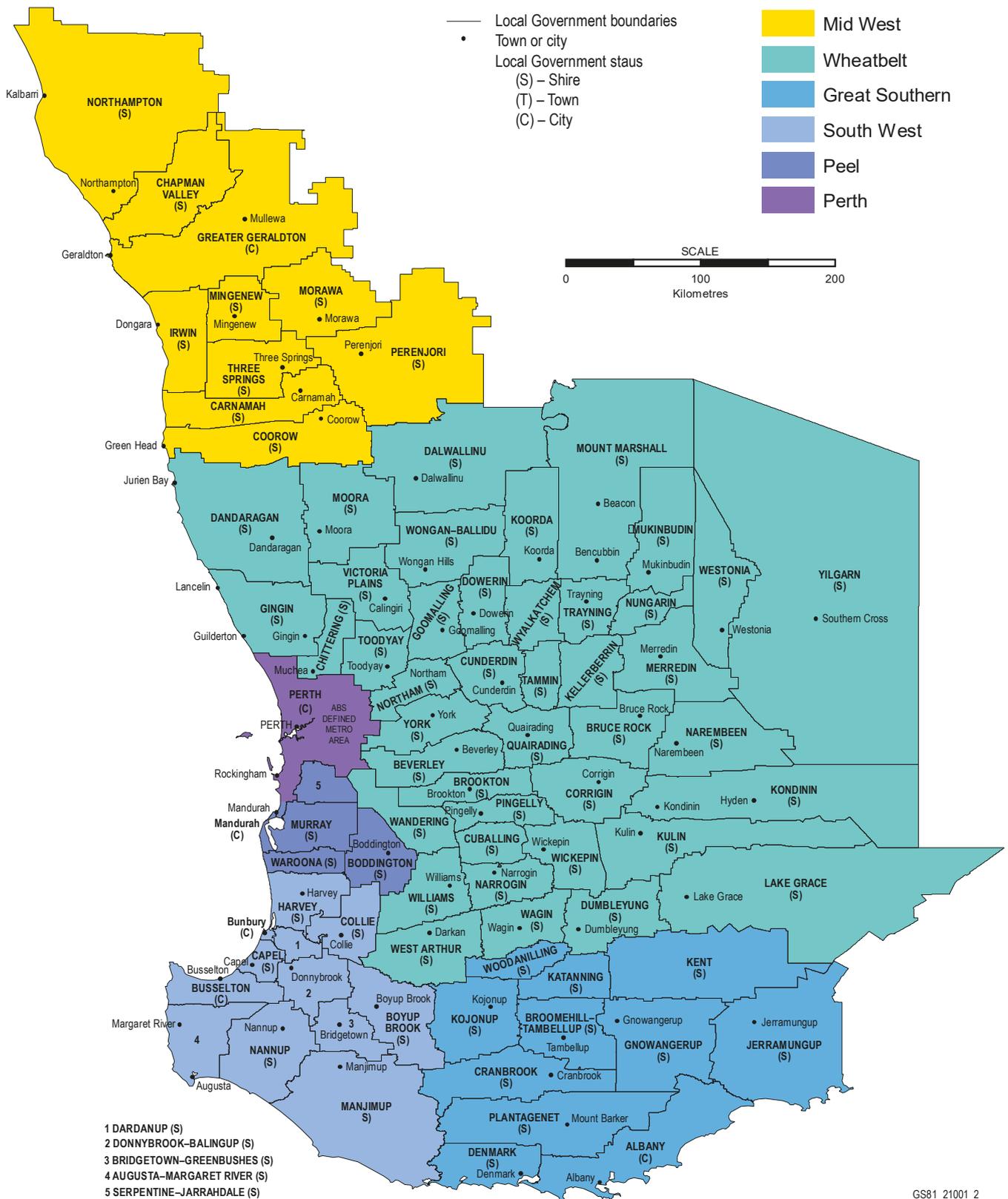
## Abbreviations

000	Thousand
A\$	Australian dollar
ABS	Australian Bureau of Statistics
AWAC	Alcoa World Alumina and Chemicals
CFR	Cost, insurance and freight
ct	Carat
DEMIRS	Department of Energy, Mines, Industry Regulation and Safety
FEED	Front End Engineering and Design
FID	Final Investment Decision
FOB	Free-on-Board
FPSO	Floating, Production, Storage and Offloading Facility
FTE	Full-time Equivalent
GJ	Gigajoule
GL	Gigalitre
ha	Hectares
ktpa	Thousand tonnes per annum
kg	Kilograms
kl	Kilolitre
km	Kilometres
km <sup>2</sup>	Kilometres square
kt	Thousand tonnes
LGA	Local Government Area
LNG	Liquefied natural gas
LPG	Liquefied petroleum gas
m <sup>3</sup>	cubic metres
MH	Million Hectares
MHP	Mixed hydroxide precipitate
Mmbtu	Million British thermal units
Mt	Million tonnes
Mtpa	Million tonnes per annum
MW	Megawatt
nfp	Not for publication
PGERA	<i>Petroleum and Geothermal Energy Resources Act 1967</i>
PJ	Petajoules
PPA	<i>Petroleum Pipelines Act 1969</i>
PSLA	<i>Petroleum (Submerged Lands) Act 1967</i>
SQM	Sociedad Quimica Y Minera De Chile S.A.
SR	Synthetic rutile
Tcf	Trillion cubic feet
US	United States of America
US\$	United States dollar
WA	Western Australia



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Map 1. Local Government and Regional boundaries



Map 2. Local Government and Regional boundaries – enlargement

Government of Western Australia

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