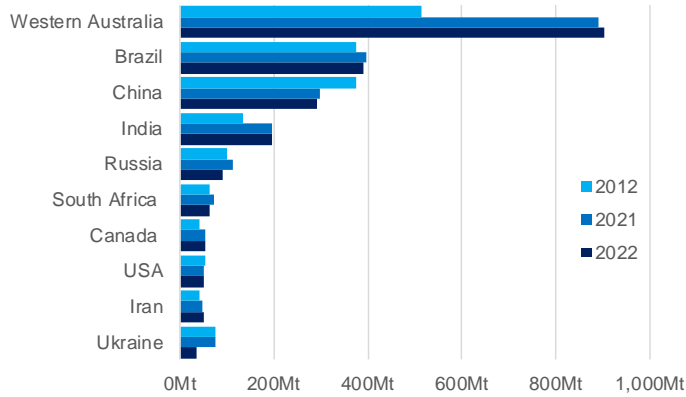




## WESTERN AUSTRALIA IRON ORE PROFILE – September 2023

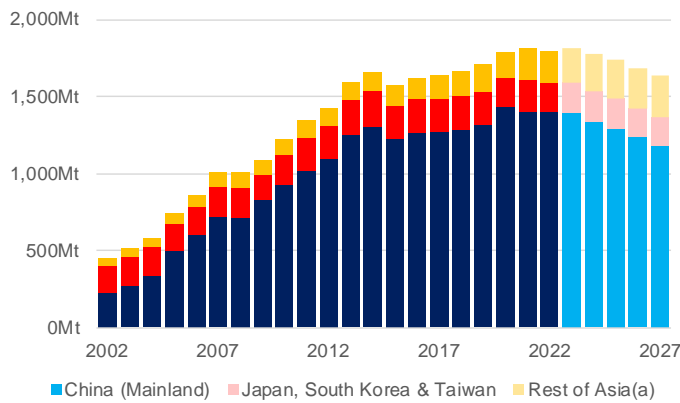
### Major global iron ore suppliers<sup>1</sup>



Mt = Million tonnes. <sup>1</sup> Iron ore mined production.  
Source: CRU, Iron Ore Market Outlook – Statistical Review – July 2023 (Quarterly).

- Western Australia is the largest iron ore supplier in the world, accounting for 39% of global supply in 2022, followed by Brazil (17%).
- China (13%), India (8%) and Russia (4%) are major global iron ore suppliers, but retain most of their iron ore for domestic steel manufacturing.
- In 2022, iron ore supply from:
  - Western Australia rose 1% to 902 million tonnes
  - Brazil fell 1% to 391 million tonnes
  - China fell 2% to 292 million tonnes
  - India fell 1% to 194 million tonnes
  - Russia fell 19% to 91 million tonnes.
- Western Australia's iron ore supply increased by 387 million tonnes between 2012 and 2022. The increase in supply from Western Australia was greater than the net increase in global iron ore supply between 2012 and 2022 (342 million tonnes) as supply from China and some other countries fell over this period.

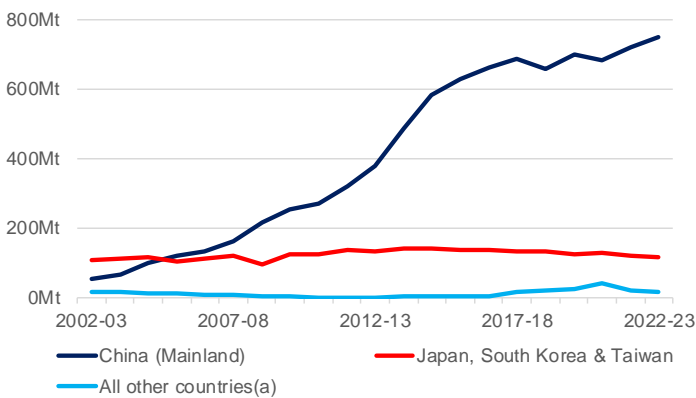
### Iron ore demand<sup>1</sup> in Asia



Mt = Million tonnes. <sup>1</sup> Total iron ore consumption. (a) India and other Asian countries.  
Source: CRU, Iron Ore Market Outlook – Statistical Review – July 2023 (Quarterly).

- Asia accounted for 80% of global iron ore demand in 2022. Among Asian countries, China (62%), India (8%), Japan (4%) and South Korea (3%) had the largest shares of global iron ore demand.
- In 2022, Asia's iron ore demand fell 1% to 1,800 million tonnes. Within Asia, iron ore demand from:
  - China fell 0.3% to 1,403 million tonnes
  - Japan, South Korea and Taiwan combined fell 10% to 186 million tonnes
  - The rest of Asia rose 5% to 211 million tonnes.
- CRU forecasts Asia's iron ore demand will fall by 163 million tonnes between 2022 and 2027, with the forecast decrease in demand over this period from China (down 218 million tonnes) and Japan, South Korea and Taiwan combined (down 4 million tonnes) more than offsetting forecasted higher demand from the rest of Asia (up 59 million tonnes).

### Western Australia's iron ore exports by market

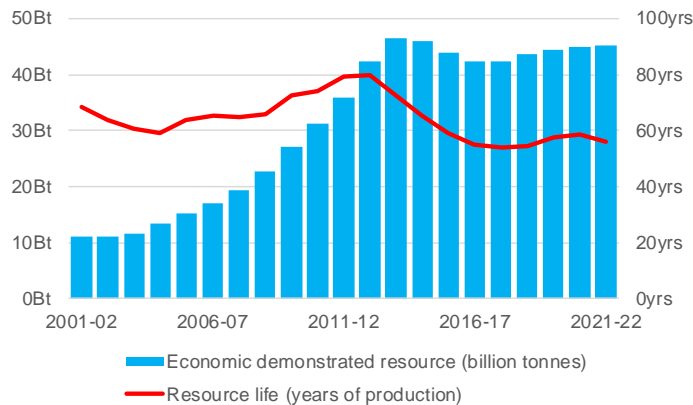


Mt = Million tonnes. (a) Includes mainly Vietnam, Indonesia, Singapore, Hong Kong (SAR of China), Malaysia and India.  
<sup>1</sup> Excludes China, Japan, South Korea and Taiwan.  
Source: Based on data from ABS 5368.0 International Trade in Goods and Services, Australia (Monthly).

- Western Australia's iron ore industry has established long-term trade relationships across Asia. In 2022-23, Western Australia accounted for the majority of iron ore imported by China (68%), Japan (52%) and South Korea (65%).
- In 2022-23, China accounted for 85% of Western Australia's iron ore export volumes. The volume of the State's iron ore exports to China rose 4% to 753 million tonnes in 2022-23.
- The volume of Western Australia's iron ore exports to Japan, South Korea and Taiwan combined fell 5% to 116 million tonnes in 2022-23.
- The volume of Western Australia's iron ore exports to all other countries<sup>1</sup> fell 17% to 16 million tonnes in 2022-23.
- In June 2023, the value of Western Australia's iron ore exports to:
  - China rose 15% to \$10.2 billion
  - Japan, South Korea and Taiwan combined fell 17% to \$1.3 billion
  - All other countries fell 23% to \$119 million (mainly due to lower iron ore exports to Indonesia).



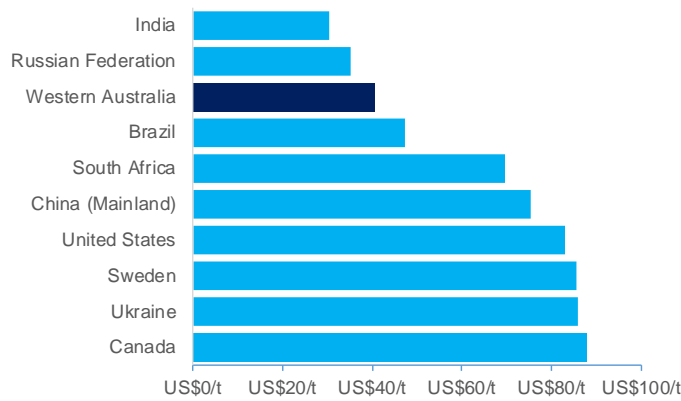
### Western Australia's iron ore resources<sup>1</sup>



<sup>1</sup> Estimated as 87% of Australia's economic demonstrated iron ore resources taken from Geoscience Australia's Australia's Identified Mineral Resources 2022. <sup>2</sup> US Geological Survey.  
Source: Based on data from ABS 5204.0 Australian System of National Accounts (Annual).

- Western Australia has large iron ore reserves, accounting for 24% of the world's crude iron ore reserves in 2022.<sup>2</sup>
- Western Australia had an estimated 45.2 billion tonnes of economic demonstrated iron ore resource in 2021-22, which could sustain production for 56 years at 2021-22 production rates.
- Western Australia's reserves had an average iron content of 53% in 2022, above the world average of 47%.<sup>2</sup>
- The value of Western Australia's exploration expenditure on iron ore rose 10% to \$648 million in 2022-23.

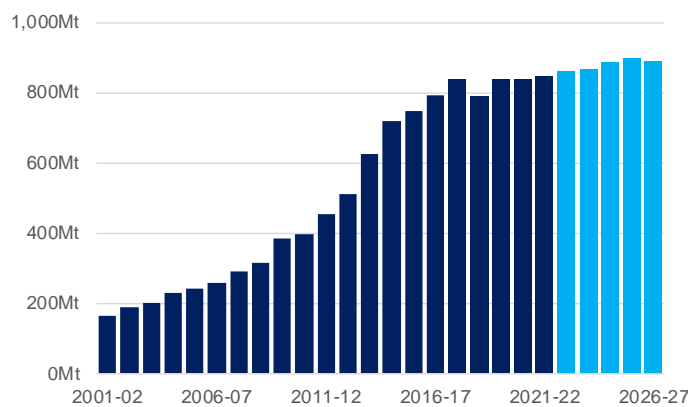
### Total cash cost<sup>1</sup> of global iron ore production<sup>2</sup>: 2022



<sup>1</sup> Total cash cost per dry metric tonne in US dollars, cost and freight (CFR). <sup>2</sup> Includes the ten largest iron ore producers only.  
<sup>3</sup> CRU, Iron Ore Market Outlook - Price tables - May 2023 (Monthly).  
Source: S&P Global Market Intelligence (Annual).

- Western Australia's iron ore miners are among the world's lowest cost seaborne iron ore exporters.
- The average total cash cost of Western Australia's iron ore exports was US\$40.7 a tonne in 2022, below the world average of US\$52.1 a tonne, and below its main competitor in Brazil (US\$47.1 a tonne).
- Western Australia's major iron ore ports are close to the largest iron ore markets in Asia, reducing shipping costs relative to some of its competitors.
- According to CRU, the iron ore freight rate for capesize vessels from Western Australia to China rose 3% to US\$9.6 a wet tonne in 2022. The iron ore freight rate for capsize vessels from Brazil to China rose 5% to US\$24.0 a wet tonne in 2022.<sup>3</sup>

### Western Australia's iron ore sales

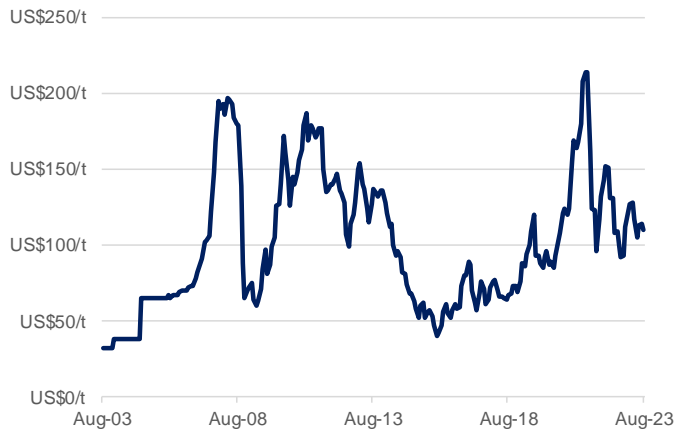


Mt = Million tonnes.  
Source: WA Department of Mines, Industry Regulation and Safety, Resource Data Files (Bi-Annual); and WA State Budget 2023-24 (May 2023).

- The volume of Western Australia's iron ore sales rose 0.7% to 845 million tonnes in 2021-22.
- The WA State Budget 2023-24 forecasts Western Australia's iron ore sales volumes will rise to 898 million tonnes in 2025-26, before declining to 890 million tonnes in 2026-27.
- According to S&P Global Market Intelligence, Western Australia produced mainly iron ore fines (72%) in 2022, followed by lump (25%) and concentrate (3%).
- Western Australia's major iron ore fines products in 2022 were FMG's Chichester Hub Fines (91.5 million tonnes), BHP's Mining Area C Fines (81.8 million tonnes) and Rio Tinto's Yandicoogina Fines (54.6 million tonnes).
- Western Australia's major iron ore lump products in 2022 were BHP's Mining Area C Lump (35.3 million tonnes), Rio Tinto's Brockman Lump (26.1 million tonnes) and Hancock Prospecting's Roy Hill Lump (23.9 million tonnes).
- Western Australia also produced iron ore concentrates in 2022 from CITIC Pacific's Sino Iron (19.1 million tonnes) and Gindalbie's Karara (7.5 million tonnes) operations.



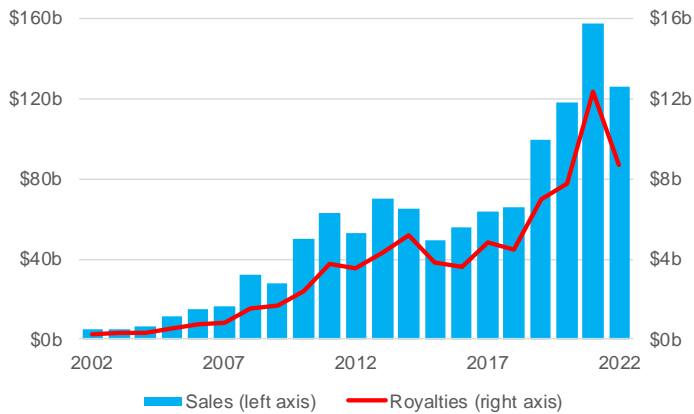
### Iron ore price<sup>1</sup>



<sup>1</sup> The monthly average benchmark (62% iron content) iron ore price delivered to China inclusive of cost and freight. Source: World Bank, Commodity Markets (Monthly).

- The average monthly iron ore price fell 4% to US\$110.2 a tonne in August 2023, due to weaker iron ore demand from Chinese steel producers.
- The average annual iron ore price fell 21% to US\$110.8 a tonne in 2022-23 due to higher seaborne iron ore supply from Australia and Brazil and slower than expected growth in steel demand in China.
- The WA State Budget 2023-24 forecasts the iron ore price will average US\$74.1 a tonne in 2023-24, before returning to its long-term annual average of US\$66.0 a tonne in 2024-25.

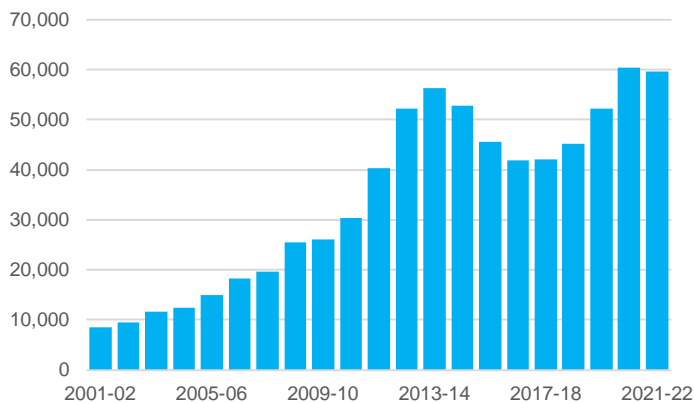
### Western Australia's iron ore sales and royalty revenue<sup>1</sup>



<sup>1</sup> Actual royalties paid during the year. Regulation 86A of the Mining Regulations 1981 requires that royalties be paid within 30 days following the end of a quarter. As a result, cash receipts are necessarily offset by one quarter. Royalty income published in the State Budget (and associated financial statements) differ in value because they are recorded in the year that they are earned rather than paid. <sup>2</sup> Excludes North West Shelf Grants. Source: WA Department of Mines, Industry Regulation and Safety, Resource Data Files (Bi-Annual).

- The iron ore industry is a large part of Western Australia's economy, accounting for an estimated 29% of the State's gross state product in 2021-22.
- In 2022, iron ore accounted for 47% of the value of Western Australia's exports of goods.
- The value of Western Australia's iron ore sales fell 20% to \$126.4 billion in 2022, in contrast to the compound annual growth of 9% over the past 10 years.
- Iron ore royalties in Western Australia fell 30% to \$8.7 billion in 2022.
- In 2021-22, iron ore accounted for 89% of Western Australia's royalty revenue<sup>2</sup> and 24% of State government general revenue.
- The WA State Budget 2023-24 forecasts iron ore royalty income will fall from \$9.9 billion in 2021-22 to \$9.3 billion in 2022-23 and continue to decline to \$5.1 billion in 2026-27 (based on the assumption, noted above, that the iron ore price will return to its long-term annual average).

### Western Australia's iron ore industry employment<sup>1</sup>

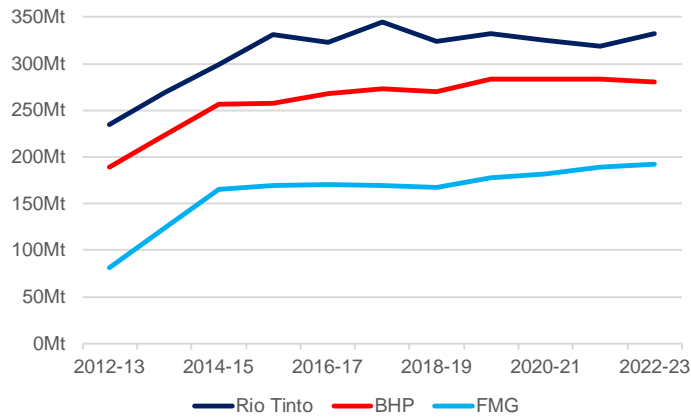


<sup>1</sup> Direct employment. Full-time equivalent (average on site). Source: WA Department of Mines, Industry Regulation and Safety, Resource Data Files (Bi-Annual).

- Direct full-time equivalent employment in Western Australia's iron ore industry fell 1.3% (764) to 59,724 in 2021-22.
- Iron ore accounted for 51% of direct full-time equivalent employment in Western Australia's minerals mining industry in 2021-22 (excluding exploration).
- Western Australia's largest employing iron ore mine sites in 2021-22 were:
  - FMG's Solomon (4,283 or 7.2% of iron ore employment in Western Australia)
  - BHP's Mining Area C (3,676 or 6.2%)
  - Hancock Prospecting's Roy Hill (3,484 or 5.8%)
  - FMG's Christmas Creek (3,019 or 5.1%)
  - FMG's Cloudbreak (2,997 or 5.0%).



### Western Australia's iron ore sales by major producer<sup>1</sup>



Mt = Million tonnes. <sup>1</sup> Western Australian operations only. Inclusive of third party tonnes. Wet tonnes.  
Source: Rio Tinto, BHP and Fortescue Metals Group Investor Information, Operations reports (Quarterly).

- Rio Tinto, BHP and FMG are the largest global iron ore producers behind Vale from Brazil.
- Rio Tinto's iron ore sales volumes from Western Australia rose 4.1% to 332 million tonnes in 2022-23. Production guidance for 2023 is 320 to 335 million tonnes. Rio Tinto's rail and port capacity is 360 million tonnes a year and it is developing new mines so its production meets this capacity.
- BHP's iron ore sales volumes from Western Australia fell 1.1% to 281 million tonnes in 2022-23. Production guidance for 2023-24 is 282 to 294 million tonnes. BHP is expanding its port capacity to 330 million tonnes a year.
- FMG's iron ore sales volumes from Western Australia rose 1.6% to 192 million tonnes in 2022-23 and its sales guidance for 2023-24 is 192 to 197 million tonnes. FMG is expanding its port capacity to 210 million tonnes a year for the additional production from its Iron Bridge project.

### Major iron ore projects<sup>1</sup> in Western Australia

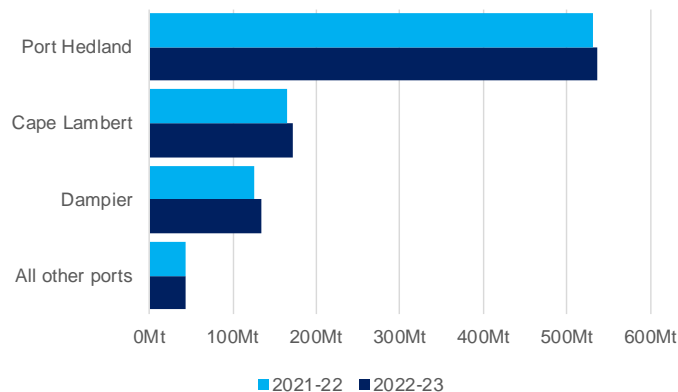
Operator	Mine/deposit	Capex (\$m)	Capacity (Mtpa)	Fe content <sup>2</sup>	Start of operations
<b>Recently completed</b>					
FMG	Eliwana	1,800	30	60	2020
GWR Group	Wiluna West	200	10	60	2020
Atlas Iron	Sanjiv Ridge	53	5	57	2020
BHP	South Flank	4,700	80	62	2021
Rio Tinto	West Angelas C+D	735	n.a.	62	2021
Mt Gibson	Shine	20	1.5	59	2021
Rio Tinto	Western Turner Syncline 2	1,000	30	62	2021
Rio Tinto	Gudai-Darri	4,300	43	59	2022
Rio Tinto	Robe Valley	1,200	n.a.	62	2022
FMG	Iron Bridge 2*	5,600	22	67	2023
<b>Under construction or committed</b>					
MRL	Onslow Iron	2,500	30	58	2024
Rio Tinto	Western Range	3,000	25	62	2025

Mtpa = million tonnes per annum. n.a. – not available or not applicable. \* Magnetite. <sup>1</sup> Includes mines and rail and port infrastructure. <sup>2</sup> Product grade if available, otherwise reserve grade for direct shipping ores.

Source: S&P Global Market Intelligence; CRU, Iron Ore Market Outlook – Project list; and company investor information (announcements, reports and presentations).

- Rio Tinto's Gudai-Darri project delivered first ore in June 2022 and will ramp up production to 43 million tonnes a year in 2023 (with a potential expansion to 70 million tonnes a year). Rio Tinto started developing its Western Range project in early 2023, with annual production of 25 million tonnes of iron ore expected to start in 2025. Rio Tinto will also complete an Order of Magnitude study in 2023 to develop the Rhodes Ridge deposit to produce 40 million tonnes of iron ore a year post-2030.
- BHP completed its development of South Flank in May 2021, which is ramping up production to 80 million tonnes a year by 2024. BHP is studying options to develop its Western Range deposits adjacent to Mt Whaleback. The project would add 20 million tonnes a year of production, replacing production volumes from the Orebody 24 mine.
- Fortescue Metals Group (FMG) has developed Iron Bridge (Magnetite) Stage 2. The project will produce 22 million tonnes a year of high-grade magnetite concentrate.
- Construction on Mineral Resources Limited's (MRL) Onslow Iron project began in August 2022. Iron ore shipments from the project are expected to start in June 2024.

### Western Australia's iron ore exports by port



Mt = Million tonnes.  
Source: Based on data from ABS 5368.0 International Trade in Goods and Services, Australia (Monthly).

- Port Hedland, the world's largest bulk export port, accounted for 61% of Western Australia's iron ore sales volumes in 2022-23. The next largest ports in Western Australia for iron ore sales volumes in 2022-23 were Cape Lambert (19%) and Dampier (15%).
- In 2022-23, the volume of iron ore exports from:
  - Port Hedland rose 1% to 536 million tonnes
  - Cape Lambert rose 4% to 172 million tonnes
  - Dampier rose 7% to 133 million tonnes
  - All other ports rose 1% to 44 million tonnes.
- Rio Tinto expanded Cape Lambert and Dampier in 2015, raising annual capacity to 210 million tonnes and 150 million tonnes respectively.
- The Port of Port Hedland is planning to increase iron ore export capacity to 660 million tonnes a year. FMG has approval to expand its material handling capacity at Herb Elliott Port to 210 million tonnes a year.