# WESTERN AUSTRALIA IRON ORE PROFILE – February 2022

**Major global iron ore suppliers1: Calendar years**



Mt = Million tonnes. 1 Mined iron ore on a marketable tonne basis.

Source: Wood Mackenzie, Global Iron Ore Markets Iron Ore Q4 2021 (Quarterly).

* Western Australia is the largest iron ore supplier in the world, accounting for 38% of global supply in 2021, followed by Brazil (17%).
* China (11%), India (10%) and the Russian Federation (4%) are major global iron ore suppliers, but retain most of their iron ore for domestic steel manufacturing.
* In 2021, iron ore supply from:
  + Western Australia fell 1% to 905 million tonnes.
  + Brazil rose 8% to 413 million tonnes.
  + China fell 12% to 254 million tonnes.
  + India rose 15% to 237 million tonnes.
* Western Australia’s iron ore supply increased by 443 million tonnes between 2011 and 2021, which was greater than the increase in global iron ore supply over this period as supply fell from China and other countries.

**Iron ore demand1 in Asia: Calendar years**

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Mt = Million tonnes. 1 Total iron ore consumption. (a) India, Indonesia, Vietnam and other Asian countries.

Source: Wood Mackenzie, Global Iron Ore Markets Iron Ore Q4 2021 (Quarterly).

* Asia accounted for 78% of global iron ore demand in 2021, with China (59%), India (9%), Japan (5%) and South Korea (3%) having the largest shares of world demand in Asia.
* In 2021, Asia’s iron ore demand fell 4% to 1,742 million tonnes. Within Asia, iron ore demand from:
  + China fell 8% to 1,314 million tonnes.
  + Japan, South Korea and Taiwan combined rose 7% to 196 million tonnes.
  + Rest of Asia rose 9% to 232 million tonnes.
* Wood Mackenzie forecasts Asia’s iron ore demand will fall by 112 million tonnes between 2021 and 2050, with the forecast increase in demand from the rest of Asia (455 million tonnes) being more than offset by forecasted lower demand from China (down 522 million tonnes) and Japan, South Korea and Taiwan combined (down 45 million tonnes).

**Iron ore1 and steel product2 prices: Financial years3**



1 China spot price in nominal US dollars, cost and freight (CFR). 2 China steel product price index (2010-11 = 100.0). 3 Annual average.

Source: World Bank, Commodity Markets (Monthly); CEIC, China Premium Database (Monthly); and WA Government Mid-year Financial Projections Statement 2021-22 (December 2021).

* Iron ore and steel product prices tend to move in the same direction because iron ore is the most significant input in the steel‑making process. However, steel product prices are also affected by other input costs, such as other raw materials (coking coal), labour and energy, as well as steel demand and competition between steel producers.
* In 2020-21, the iron ore price rose 65% to US$155 a tonne and steel product prices rose 19%. Strong Chinese steel demand and disruptions to Brazilian iron ore supply raised prices for iron ore and steel in 2020-21.
* The WA Government Mid-year Financial Projections Statement 2021-22 forecasts the price of iron ore delivered to north China (including cost and freight) will average US$105 a tonne in 2021-22, as it starts to return to its long‑term annual average of US$66 a tonne in 2022-23 and 2023-24.

**Iron ore1 prices: Months**



1 China spot price in nominal US dollars, cost and freight (CFR).

Source: World Bank, Commodity Markets (Monthly).

* The monthly iron ore price rose in December 2021 and January 2022, as construction activity improved in China from lower interest rates and newly approved government infrastructure investment. Supply constraints related to border closures in Australia and heavy rain in Brazil also contributed to higher prices.
* In January 2022, the average monthly iron ore price rose 13.3% to US$133 a tonne.
* The recent recovery in iron ore prices followed a period where prices fell from US$214 a tonne in June 2021 to US$96 a tonne in November 2021. The fall in iron ore prices reflected weaker steel demand in China from property market uncertainty caused by the liquidity crisis at Evergrande and China’s aim to reduce steel production and energy use in energy‑intensive industries to meet emission reduction targets.

**China’s iron ore imports: Months**

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(a) Included mainly South Africa, Peru, Chile, Ukraine and Canada in 2021.

1 Excludes China, Japan, South Korea and Taiwan.

Source: CEIC, China Premium Database (Monthly).

* China’s iron ore imports fell 18.0% (19 million tonnes) to 86 million tonnes in December 2021.
* The decline in China’s iron ore imports in December 2021 was spread across major suppliers of:
  + Western Australia down 8 million tonnes (13.2%) to 54 million tonnes.
  + Brazil down 7 million tonnes (25.9%) to 20 million tonnes.
  + All other countries1 down 4 million tonnes (23.8%) to 11 million tonnes.
* Western Australia’s share of China’s iron ore imports rose from 60% in November 2021 to 63% in December 2021.

**Western Australia’s iron ore exports by market: Months**



(a) Included Hong Kong (SAR of China), Vietnam, Indonesia, Malaysia and India in 2021.

1 Excludes China, Japan, South Korea and Taiwan.

Source: ABS 5368.0 International Trade in Goods and Services, Australia (Monthly).

* The value of Western Australia’s iron ore exports to China rose 20.3% to $6.6 billion in December 2021. This was the first increase in the value of the State’s iron ore exports to China since June 2021.
* The value of Western Australia’s iron ore exports to Japan, South Korea and Taiwan combined rose 40.6% to $2.1 billion in December 2021, following three successive monthly declines.
* The value of Western Australia’s iron ore exports to all other countries1 rose from $91 million in November 2021 to $506 million in December 2021, mainly driven by increased exports to Hong Kong (SAR of China), Vietnam, Indonesia and India.

**Western Australia’s iron ore resources1: Financial years**



1 Estimated from Australia’s iron ore resources using Western Australia’s share of Australia’s iron ore production. 2 US Geological Survey.

Source: ABS 5204.0 Australian System of National Accounts (Annual).

* Western Australia has large iron ore reserves, accounting for 28% of the world’s crude iron ore reserves in 2021.2
* Western Australia had an estimated 48.8 billion tonnes of economic demonstrated iron ore resource in 2020-21, which could sustain production for 56 years at 2020-21 production rates.
* Western Australia’s reserves had an average iron content of 49% in 2021, above the world average of 47%.2
* Western Australia’s iron ore production had an average iron content of 62% in 2021, in line with the world average of 62%.2
* The value of Western Australia’s exploration expenditure on iron ore rose 38% to $527 million in 2021.

**Total cash cost1 of global iron ore production2:**

**2021 calendar year**



1 Total cash cost per dry metric tonne in US dollars, cost and freight (CFR). 2 Includes the 10 largest iron ore producers only.

Source: S&P Global Market Intelligence, Mine Economics Model (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$31.8 a tonne in 2021, below the world average of US$41.8 a tonne, and below its main competitor in Brazil (US$36.6 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 Wood Mackenzie, the iron ore freight rate from Western Australia to China rose 84% to an average of US$12.2 a wet tonne in 2021, well below the iron ore freight rate from Brazil to China of US$27.1 a wet tonne in 2021.

**Major iron ore projects1 in Western Australia**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Operator | Mine/deposit | Capital expenditure ($m): | Capacity (Mtpa) | Grade  (Fe content)2 | Start of operations |
| Recently completed | | | | | |
| FMG | Solomon Hub | 9,600 | 70 | 58 | 2013 |
| Gindalbie | Karara\* | 2,600 | 8-16 | 66 | 2013 |
| CITIC Pacific | Sino Iron\* | 12,000 | 24 | 66 | 2013 |
| BHP | Jimblebar | 3,800 | 35-55 | 63 | 2013 |
| Rio Tinto | Nammuldi | 2,200 | 10-20 | 62 | 2014 |
| Hancock Prospecting | Roy Hill | 13,700 | 55-60 | 61 | 2015 |
| Rio Tinto | Silvergrass | 338 | 10-20 | 62 | 2017 |
| 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 |
| Under construction or committed | | | | | |
| Rio Tinto | Robe Valley | 1,200 | n.a. | 62 | 2022 |
| Rio Tinto | Gudai-Darri | 3,600 | 43 | 59 | 2022 |
| FMG | Iron Bridge 2\* | 4,600 | 22 | 67 | 2022 |
| FMG | Queens Valley | 400 | n.a. | 58 | 2022 |

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

Source: S&P Global Market Intelligence; Wood Mackenzie, Global Iron Ore Markets Long-term Outlook Data; and company investor information (announcements, reports and presentations).

* Western Australia has around $10 billion of major iron ore projects under construction or committed.
* Rio Tinto’s Western Turner Syncline 2 project started operating in November 2021. Rio Tinto’s Gudai-Darri project is expected to start production in the June quarter 2022 and reach full capacity of 43 million tonnes a year in 2023. Rio Tinto is also proposing to expand production at Gudai‑Darri to 70 million tonnes a year in the next decade.
* BHP completed its development of South Flank in May 2021, which will start to replace Yandi mine production. South Flank will ramp up production to 80 million tonnes a year over the next 3 years. BHP is studying options to develop its Western Ridge deposits adjacent to Mt Whaleback. The project will cost $500 million and add 20 million tonnes a year of production to replace Orebody 24 production.
* FMG completed its development of Eliwana in December 2020, which will begin to replace Firetail mine production. FMG is also developing Iron Bridge (Magnetite) Stage 2 and Queens Valley (Solomon Hub), both of which are due to start operations in 2022.

**Western Australia’s iron ore sales: Financial years**



Mt = Million tonnes.

Source: WA Department of Mines, Industry Regulation and Safety, Resource Data Files (Bi-Annual); and WA Government Mid‑year Financial Projections Statement 2021-22 (December 2021).

* The volume of Western Australia’s iron ore sales rose 0.2% to 839 million tonnes in 2020-21.
* The WA Government Mid-year Financial Projections Statement 2021-22 forecasts Western Australia’s iron ore sales volumes will rise to 862 million tonnes in 2024-25.
* According to S&P Global, Western Australia produced mainly iron ore fines (72%) in 2021, followed by lump (25%) and concentrate (3%).
* Western Australia’s major iron ore fines products in 2021 were FMG’s Chichester Hub Fines (91.5 million tonnes), FMG’s Solomon Hub Fines (62.7 million tonnes), BHP’s Mining Area C Fines (55.6 million tonnes) and Rio Tinto’s Yandicoogina Fines (54.6 million tonnes).
* Western Australia’s major iron ore lump products in 2021 were Rio Tinto’s Brockman Lump (26.1 million tonnes), Hancock Prospecting’s Roy Hill Lump (23.2 million tonnes) and BHP’s Mining Area C Lump (21.3 million tonnes).
* Western Australia also produced iron ore concentrates in 2021 from CITIC Pacific’s Sino Iron (19.7 million tonnes) and Gindalbie’s Karara (7.5 million tonnes) operations.

**Western Australia’s iron ore sales and royalty revenue: Financial years**



1 Includes 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 25% of gross state product in 2019-20.
* In 2020-21, iron ore accounted for 67% of the value of Western Australia’s exports of goods.
* The value of Western Australia’s iron ore sales rose 48% to $154.7 billion in 2020-21, above compound annual growth of 10% over the past 10 years.
* Iron ore accounted for 89% of Western Australia’s royalty revenue1 and 28% of State government general revenue in 2020-21.
* Iron ore royalties in Western Australia rose 26% to $9.8 billion in 2020-21.

**Western Australia’s iron ore industry employment1:**

**Financial years**



1 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 rose 17% (8,843) to 60,810 in 2020-21.
* Iron ore accounted for 59% of direct full-time equivalent employment in Western Australia’s minerals mining industry in 2020-21 (excluding exploration).
* Western Australia’s largest employing mine sites in 2020-21 were:
  + FMG’s Solomon (4,004 or 6.6% of iron ore employment).
  + FMG’s Christmas Creek (3,546 or 5.8%).
  + BHP’s Newman (3,173 or 5.2%).
  + Hancock Prospecting’s’ Roy Hill (3,087 or 5.1%).
  + CITIC Pacific’s Sino Iron (3,072 or 5.1%).
  + BHP’s South Flank (2,870 or 4.7%).
  + FMG’s Cloudbreak (2,831 or 4.7%).
  + BHP’s Mining Area C (2,736 or 4.5%).
  + Rio Tinto’s Tom Price (2,156 or 3.5%).

**Western Australia’s iron ore exports by market:**

**Calendar years**



Mt = Million tonnes. (a) Included mainly Vietnam, Indonesia, Hong Kong (SAR of China) and Malaysia in 2021.

1 Excludes China, Japan, South Korea and Taiwan.

Source: 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.
* China is Western Australia’s largest iron ore market, accounting for 82% of iron ore export volumes in 2021.
* The volume of Western Australia’s iron ore exports to China rose 3% to 709 million tonnes in 2021.
* The volume of Western Australia’s iron ore exports to Japan, South Korea and Taiwan combined rose 9% to 130 million tonnes in 2021.
* The volume of Western Australia’s iron ore exports to all other countries1 fell 56% to 21 million tonnes in 2021, as the State’s exports ceased to Singapore and fell 85% to Hong Kong (SAR of China).
* In 2021, Western Australia accounted for the majority of iron ore imported by China (63%), Japan (50%) and South Korea (75%).

**Western Australia’s iron ore sales by major producer1: Calendar years**



Mt = Million tonnes. 1 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 fell 3% to 322 million tonnes in 2021 due to above average rainfall, cultural heritage management and project delays. Production guidance for 2022 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 can meet this capacity.
* BHP’s iron ore sales volumes from Western Australia fell 2% to 284 million tonnes in 2021 due to rail labour shortages related to border restrictions and major planned maintenance. Production guidance for 2021‑22 is 278 to 288 million tonnes. BHP has begun port debottlenecking to expand its port capacity to 330 million tonnes a year.
* FMG’s iron ore sales volumes from Western Australia rose 2% to 185 million tonnes in 2021 and its sales guidance for 2021‑22 is 180 to 185 million tonnes. FMG is expanding its port capacity to 210 million tonnes a year to allow for the additional production from its Iron Bridge development.

**Western Australia’s iron ore exports by port:**

**Calendar years**



Mt = Million tonnes.

Source: ABS 5368.0 International Trade in Goods and Services, Australia (Monthly).

* Port Hedland is the largest bulk export port in the world.
* Port Hedland accounted for 61% of Western Australia’s iron ore sales volumes in 2021, followed by Cape Lambert (19%), Dampier (15%) and all other ports (5%).
* In 2021, the volume of iron ore exports from:
  + Port Hedland rose 1% to 521 million tonnes.
  + Cape Lambert fell 4% to 167 million tonnes.
  + Dampier fell 1% to 127 million tonnes.
  + All other ports rose 9% to 46 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.