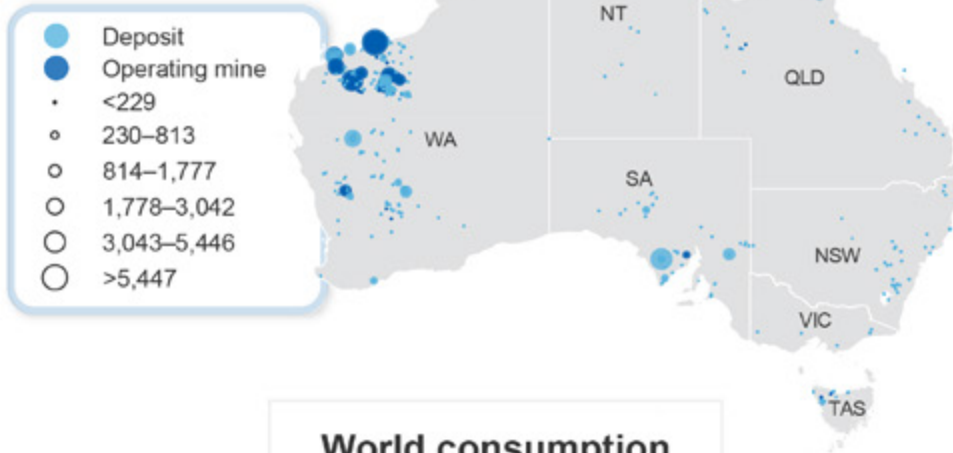


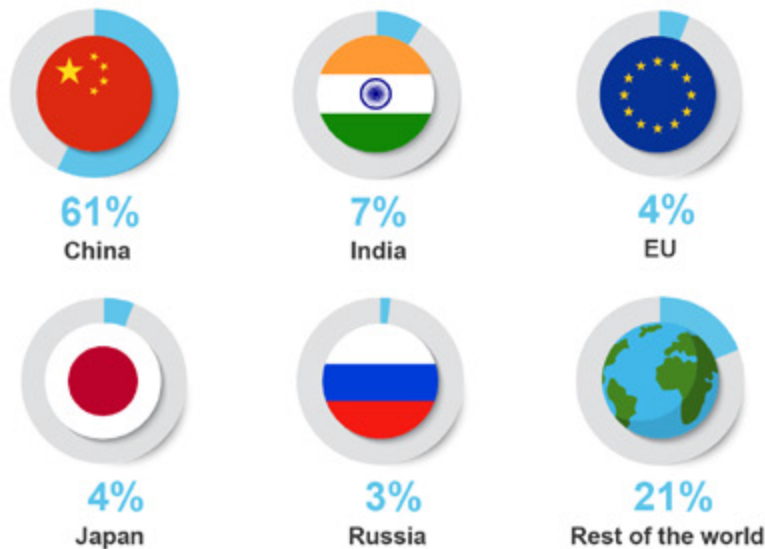


Iron Ore

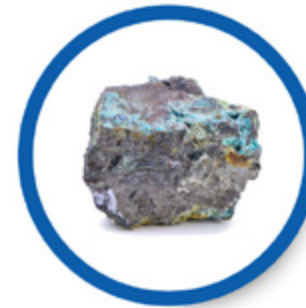
Major Australian iron ore deposits (Mt)



World consumption



Iron ore



Iron is the most abundant element on earth, forming much of the **planet's core**



Iron ore deposits were originally **formed by algae**

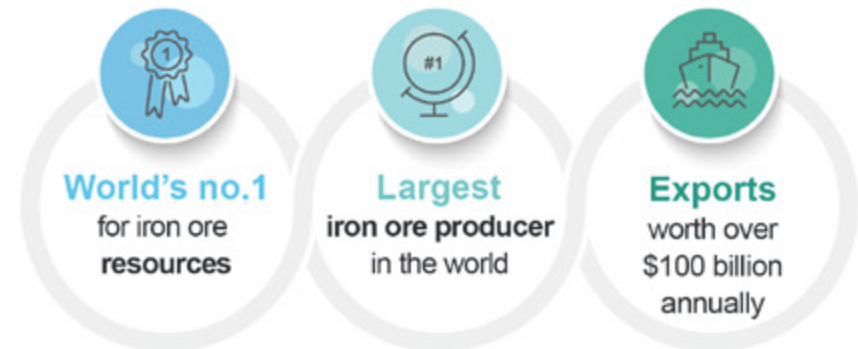


Humans have been working with iron for at least **5,000 years**



Iron was central to the **industrial revolution**

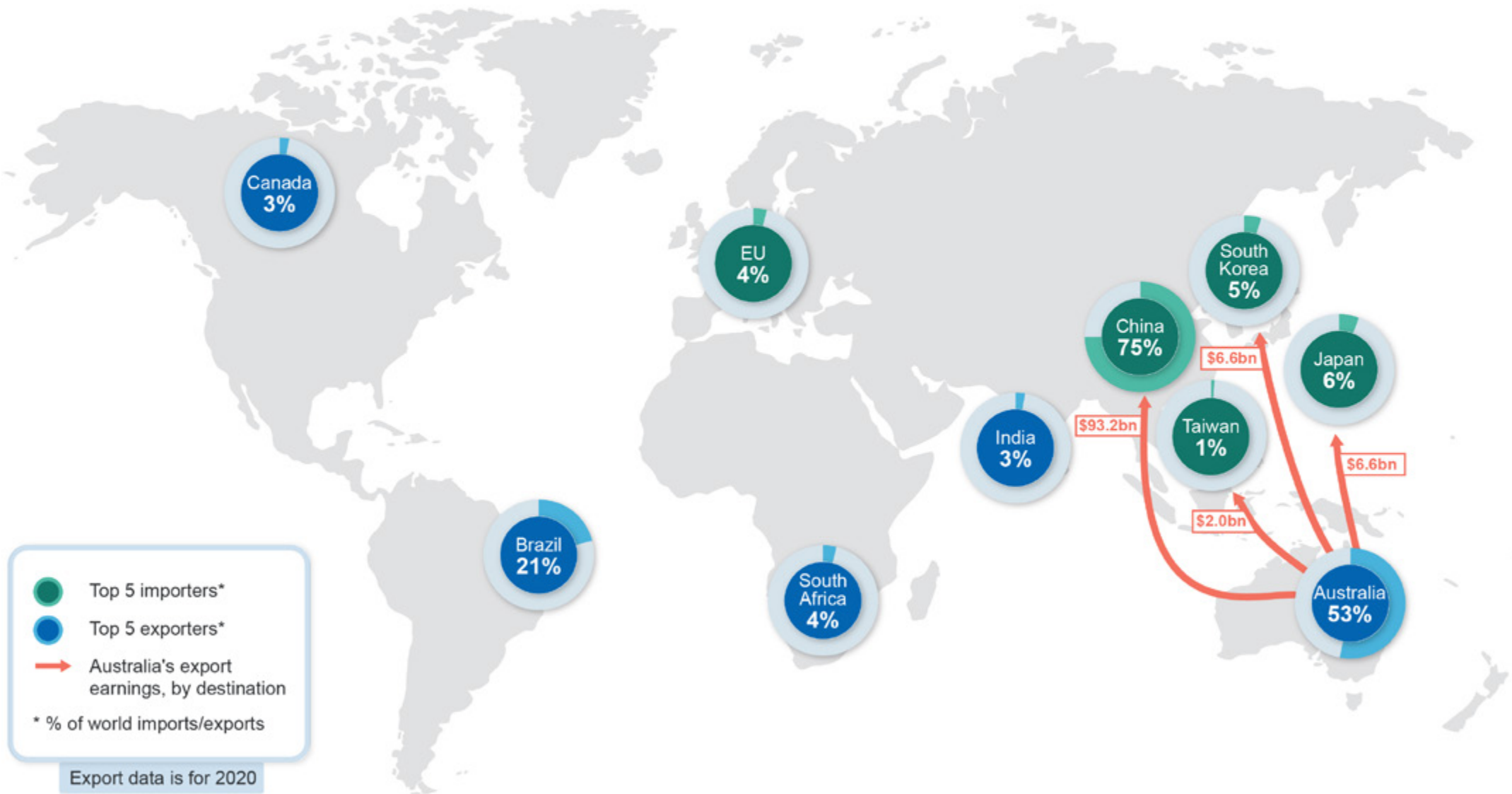
Australia's iron ore





Iron Ore

Trade map | June 2021



4.1 Summary

- Iron ore prices surged to record highs in 2021, surpassing US\$200 a tonne in early May. The continuing rebound in economic activity in China and other advanced economies has led to an elevated demand for steel and consumption goods, in the midst of ongoing tightness in global iron ore supply.
- Australian export volumes are expected to grow steadily, from 871 million tonnes in 2020–21 to 954 million tonnes by 2022–23. This reflects the commencement of several new mines in Western Australia.
- Australia's iron ore export values are estimated to have risen from \$103 billion in 2019–20 to \$149 billion in 2020–21, on the back of record prices and growing volumes. An easing in prices from the latter half of 2021 is forecast to lower export earnings to \$113 billion by 2022–23.

4.2 Prices

Strong demand for steel is driving the price of iron ore to all-time highs

Iron ore prices continued to hit record highs during the second quarter of 2021, reaching US\$238 a tonne in early May. The average spot price for 62% Fe iron ore fines at Chinese ports in May was an increase of 37% since the start of 2021, and around 120% from the end of May 2020.

The surge in prices reflects the strong demand for steel products in China and other advanced economies, as the global recovery continues to pick up pace coming out of the COVID-19 pandemic. In China, fiscal stimulus has targeted new infrastructure investment throughout 2020 and into 2021, driving higher construction activity and demand for steel.

At the same time, the slower recovery of supply chains in major economies, such as the EU and US, is contributing to increased global demand for Chinese steel and consumer goods. This follows the recent shift in global consumer spending towards goods — reflecting the impact of COVID-19 lockdowns and restrictions on movement.

Figure 4.1: Iron ore price vs China steel production growth



Notes: China import Iron ore fines 62% Fe spot (CFR Tianjin port)

Source: Bloomberg (2021) China import prices; World Steel Association (2021)

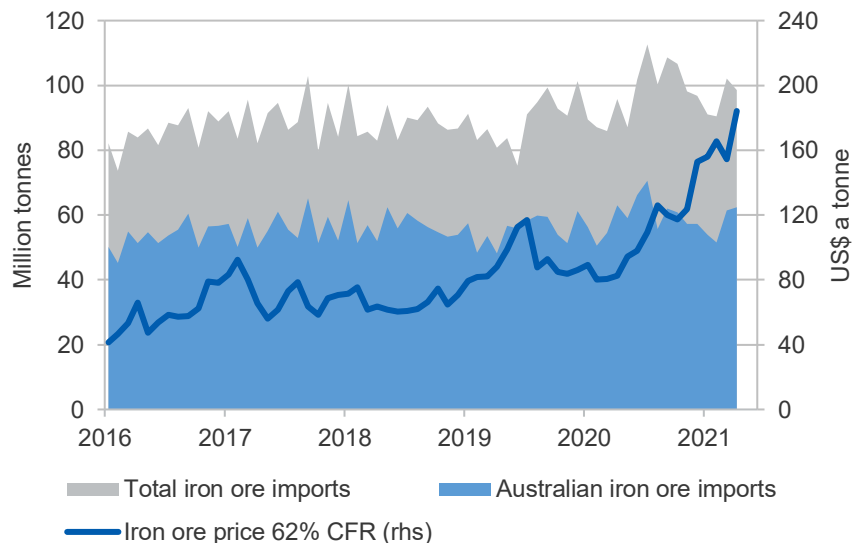
Production cuts imposed on a number of steel mills in Tangshan — in an effort to reduce emissions (see *Steel* chapter) — are yet to curtail China's total steel production. Instead, concerns around future shortages appear to have elevated current demand, contributing to the substantial rise in prices. Production curbs in Hebei Province are encouraging greater utilisation rates amongst competing mills, and more replacement supply is being brought online — with China's monthly steel output to April hitting a record high (Figure 4.1).

As Chinese mills capitalise on increasing demand for steel products, this demand pressure has flowed through to materials such as iron ore. Record steel prices have created multiyear highs in margins for Chinese mills in April and May 2021, in spite of the corresponding high prices for iron ore. This has blunted the typical mitigating effect that elevated iron ore prices have on overall levels of steel production.

The high capacity utilisation rates of steel mills is reflected in China's total imports of iron ore, which have been elevated but stable since the second half of 2020 (Figure 4.2). Chinese port inventories in 2021 are also tracking closely to the five year average, suggesting mills have not drastically altered stockpiling behaviour in response to elevated prices. As such, the rising concerns of steel and iron ore shortages appear to have influenced price more than volumes so far in 2021.

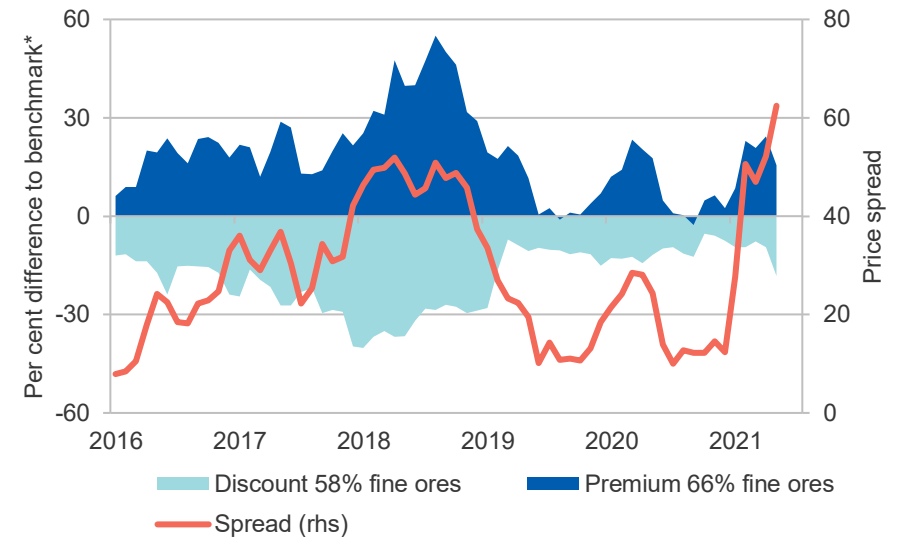
However, the current restrictions appear to have driven greater demand for higher quality iron ore types (62% Fe and above). These types have comparatively lower emissions-intensities and often do not require energy-intensive processes such as sintering. This has seen the spread between premium 66% and discount 58% fines in May 2021 jump to its highest level since April 2018 (Figure 4.3).

Figure 4.2: China's monthly iron ore imports and spot prices



Notes: The OCE forecasts the FOB (free on board) Australia iron ore price, not the benchmark CFR (cost and freight) North China iron ore price.
Source: Bloomberg (2021); Department of Industry, Science, Energy and Resources (2021)

Figure 4.3: Iron ore price spread between grades



Notes: *Benchmark used is 62% iron fines CFR
Source: Bloomberg (2021); China import prices

Tightness in supply from the world's two major producers — Australia and Brazil — has also contributed to the substantial rally in iron ore prices. This is due to safety-related mine closures and COVID-19 disruptions in Brazil, and seasonal weather disruptions in both countries in the March quarter 2021. Vale reported a 19.5% fall in total output in the March quarter 2021, while Rio Tinto and Fortescue reported falls of 12% and 9%, respectively, in total shipments in the year to the March quarter 2021.

Iron ore prices to ease, but remain well above US\$100 a tonne in 2021

The recovery in steel output by major ex-Chinese producers is expected to continue in coming months, and will bring greater supply to the market. This should put further downward pressure on steel prices and margins of Chinese steel mills, leading to a softening in iron ore prices. It is also expected that China's strong demand for steel will abate in the second half of 2021.

Domestic efforts to curb China's total steel output are likely to start taking hold in coming months, and should have a dampening effect on the price of iron ore. New measures announced by the National Development and Reform Commission (NDRC) and Ministry of Industry and Information Technology in early May 2021 will see steelmakers forced to further scale back production capacity from June, and will place limits on new and replacement capacity. With the recent surge in commodity prices, regulators have flagged potential strengthening of the enforcement of production curbs, as well as clamping down on speculative behaviour in steel and iron ore markets.

China has removed export tax rebates from the start of May 2021, which is expected to reduce the level of exports of steel products. The changes were announced as part of the effort to reduce the industry's total energy consumption, though are likely to also bolster domestic supplies of steel and ease current demand pressures.

The current ramp up in China's steel output — typically seen from April each year during the construction sector's busy season — should ease by mid-year. China also appears to be stepping up efforts to address surging property prices, which may help to soften the boom in construction activity. The introduction of lending restrictions from late 2020, and market-cooling policies introduced for Tier 1 cities in early 2021 has seen loan and credit growth slow in April. Current expectations are for restrictions to soon be extended to Tier 2 and Tier 3 cities, following ongoing price rises in these cities through April.

Any disruptions to iron ore imports from Australia could add to current upward price pressures, as could emissions-related production cuts which outpace the expected easing in steel demand.

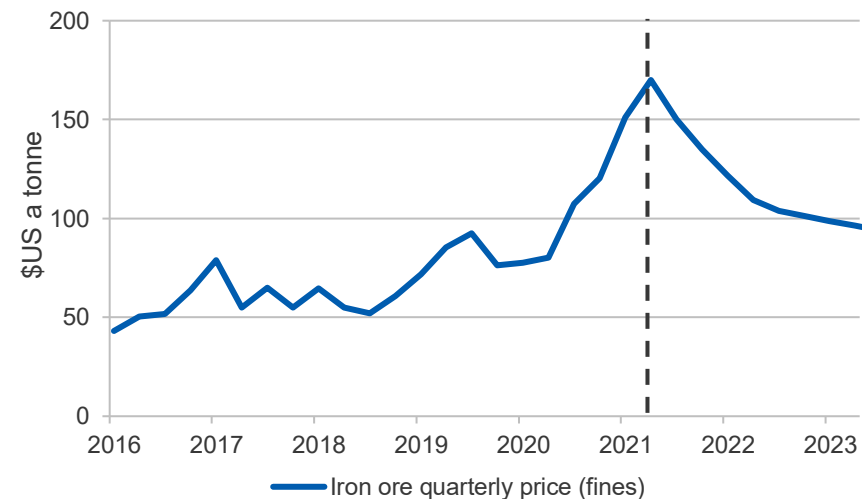
The sources of tight global supply in iron ore are expected to ease throughout 2021. Total volumes shipped from Australia and Brazil should increase, following weather-affected falls in production and shipments — which typically have the most significant effects in the first quarter of each year. Production guidance in 2021 for major producers such as Rio Tinto, BHP and Fortescue is unchanged.

Vale's Brazilian operations are steadily returning to output levels last seen prior to the January 2019 Brumadinho tailings dam collapse. The company has announced that it expects to reach an iron ore capacity of 400 million tonnes per year by the end of 2022. More rapid progress on this front could lower prices more swiftly.

Heavy rains, which sometimes disrupt operations in Brazil, and cyclonic activity which periodically affects Australian shipments, present risks to growing global supply. Australian producers have also flagged skilled labour shortages as an ongoing concern, with both factors having potential to prolong the current upswing in prices through the second half of 2021.

Prices are forecast to average around US\$150 a tonne in 2021, before falling to below US\$100 a tonne by the end of 2022, as Brazilian supply recovers and Chinese steel production softens (Figure 4.4).

Figure 4.4: Iron ore price outlook, quarterly



Notes: China import iron ore fines 62% Fe spot (FOB)

Source: Bloomberg (2021); Department of Industry, Science, Energy and Resources (2021)

4.3 World trade

Australia's dominance of iron ore markets will face challenges

Global trade remains dominated by Australia, which exported more than half of all seaborne iron ore in 2020. However, growing output from Brazil and Africa may provide some pushback to Australia's dominance over the coming years (Figure 4.5).

In May 2021, the Chinese government announced it will seek to diversify its iron ore supply, of which Australia currently accounts for more than 60% of the country's iron ore imports. China is expected to undertake greater exploration and development of domestic resources, and seek to secure alternative sources of overseas supply. Efforts to expand its domestic supply will face headwinds, given the relatively low quality of available deposits and the associated high production and refining costs. Chinese domestic output of iron ore is also likely to trend down over time, as the existing mines deplete.

China is investigating a number of possible iron ore mines in Africa, including large deposits in Gabon and Madagascar. The most notable prospect in Africa is the proposed Simandou iron ore mine, located in Guinea.

The Simandou project remains a number of years away from generating significant output. Extensive rail and port infrastructure needs to be developed before the iron ore can be shipped, including a new deep water port and more than 650 kilometres of railway. With potential full production capacity of 200 million tonnes per year, this is around 15-20% of output currently produced in the Pilbara region of Western Australia.

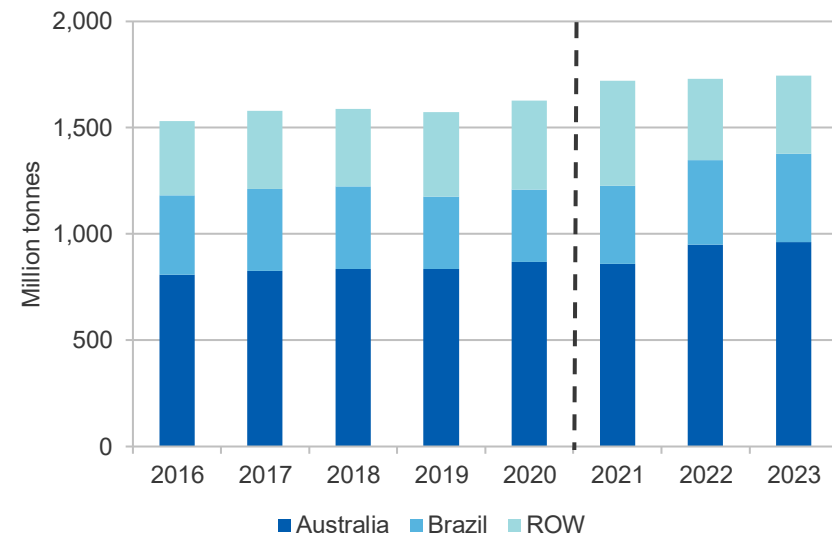
Despite the fall in production in the March quarter 2021, Brazilian iron ore output is expected to recover over the next two years. Vale is projecting total production of 315-335 million tonnes in 2021, with the aim of 400 million tonnes per annum by the end of 2022. This would include planned recommissioning and expansion of its Timbopeba and Northern System operations. However, progress may be checked by the complexity of the projects, reflected in a series of already-missed deadlines in the

company's recovery plans. Conditions in Brazil remain challenging, due to the COVID-19 pandemic and lingering impacts from the Brumadinho tailings dam collapse.

Beyond 2022, Vale's US\$1.5 billion Serra Sul 120 project is due to be commissioned in the first half of 2024. With its completion, total production capacity of Vale's Northern System is expected to rise to 260 million tonnes per annum. However, this is expected to be at least partially offset by declining output in the producer's Southern System.

Global iron ore markets are expected to remain tight, with slow growth in both supply and demand over the next few years. Market structure is not expected to alter significantly, with Australia's market share expected to hold up. A recovery in Brazilian supply is likely in the short-term, but a number of high-cost mines in Brazil and China are also expected to face closure or depletion over the next 10 years.

Figure 4.5: Outlook for global iron ore exports



Source: World Steel Association (2021); Department of Industry, Science, Energy and Resources (2021)

4.4 Australia

Iron ore export earnings are set to reach a new record in 2020–21

Australia's iron ore export value reached a record \$38 billion in the March quarter 2021. This included a new monthly record of \$14 billion of iron ore exported in the month of March. The strong result reflects soaring global iron ore prices, with total export values in the March quarter 2021 rising 8.8% from the December quarter 2020, and around 65% from the same period in 2020.

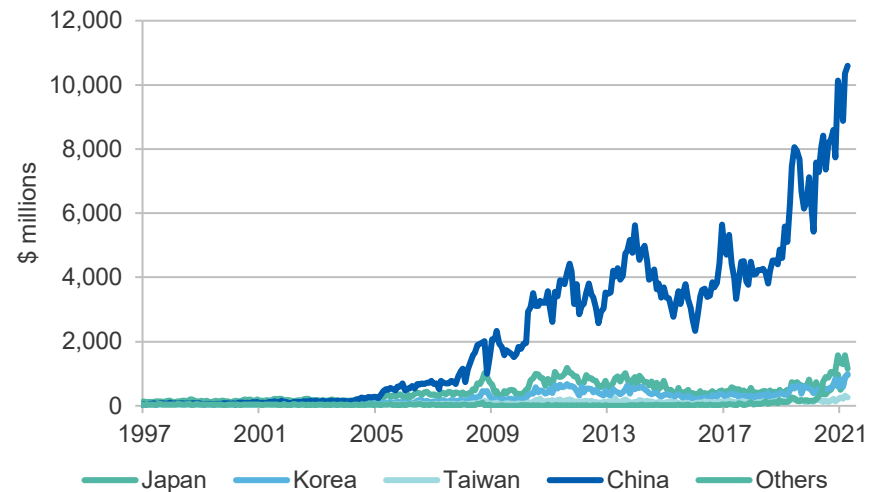
The unprecedented rise in prices has helped to overcome a fall of 8.0% quarter-on-quarter in total export volumes in the March quarter 2021. The drop is attributable to seasonal weather disruptions, typically experienced during the early months of each calendar year. However, the outcome for the March 2021 quarter still represents a 4.9% rise in total export volumes compared with the same quarter in 2020.

Iron ore exports to China totalled around A\$28.8 billion in the March quarter 2021, constituting around three-quarters of total Australian iron ore export value for the period. Total export value to China for the March quarter 2021 rose 9.0% quarter-on-quarter, and was over 50% higher than the same period in 2020 (Figure 4.6). The outcome reflects the significant role that elevated iron ore prices are having for Australian exporters, with March quarter 2021 export volumes to China falling 8.0% from the December quarter (while rising by a modest 4.9% year-on-year).

Despite modest falls in export volumes for a number of Australia's major producers in the March quarter 2021, domestic operations continue to perform strongly. Total export volumes of iron ore are estimated at 871 million tonnes in 2020–21, up 1.4%.

Rio Tinto's 2021 guidance (for 325 to 340 million tonnes of production) remains on track despite of seasonal weather disruptions and labour shortages encountered through the March quarter 2021. This remains subject to around 90 million tonnes of replacement mine capacity expected to come online at Robe Valley and West Angelas hubs, along with the new Gudai-Darri (formerly Koodaideri) mine.

Figure 4.6: Australia's iron ore export destinations, monthly



Source: ABS (2021); Department of Industry, Science, Energy and Resources (2021)

BHP was able to achieve 4% quarter-on-quarter growth in the March quarter 2021, in spite of weather impacts and planned maintenance. Guidance for the 2020–21 financial year remains at 245–255 million tonnes. BHP also reported first delivery from its South Flank project in May. The project is expected to ramp up to 80 million tonnes per year, though it will largely act as a replacement for its depleted Yandi mine.

Fortescue's total exports fell by 9% in quarterly terms, to 42 million tonnes in the March quarter 2021. However, quarterly results were mostly stable in year-on-year terms. This has come as Fortescue's newly developed Eliwana project successfully ramps up in 2021, with output expected to reach almost 30 million tonnes per year.

High iron ore prices have seen efforts to bring a number of new and idled projects back online in 2021 – with up to 10 million tonnes of new capacity potentially coming online from smaller producers in 2021.

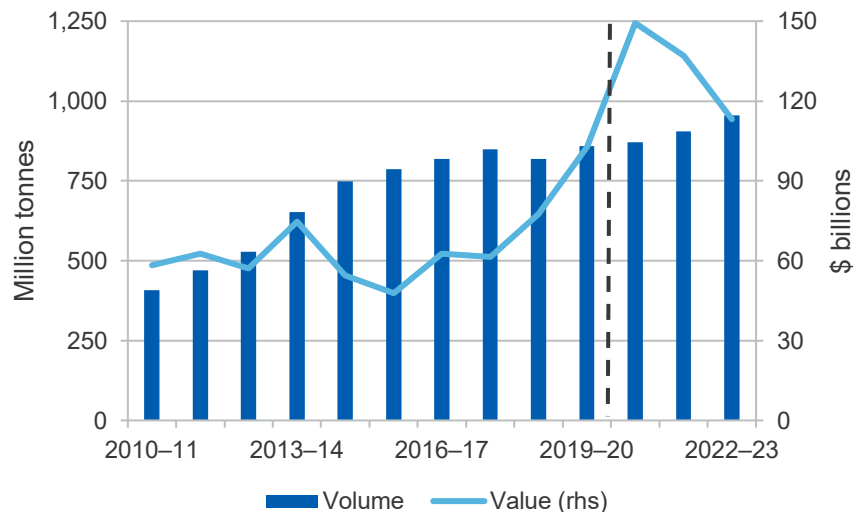
The Roper Bar mine in the Northern Territory has recently restarted production, with the project expected to ramp up to 1.5–2 million tonnes of

production each year from 2021. NT Bullion's new Frances Creek mine is also producing on schedule, following its opening in August 2020. Output is shortly expected to reach 2 million tonnes per year.

Other sources of new production include Fenix Resources' Iron Ridge project which began shipments from February this year; Strike Resources' Paulsens East project in Western Australia, and Mount Gibson's Shine project in mid-west Western Australia.

With Australian iron ore production growing steadily, against a backdrop of record prices, export earnings are expected to reach a new record of \$149 billion in 2020–21. Prices for iron ore are expected to ease from the second half of 2021, leading to some moderation in earnings over the subsequent two years. Total export value for iron ore is forecast to be \$137 billion in 2021–22 and \$113 billion in 2022–23 (Figure 4.7).

Figure 4.7: Australia's iron ore export volumes and values



Source: ABS (2021) International Trade, Australia, 5368.0; Department of Industry, Science, Energy and Resources (2021)

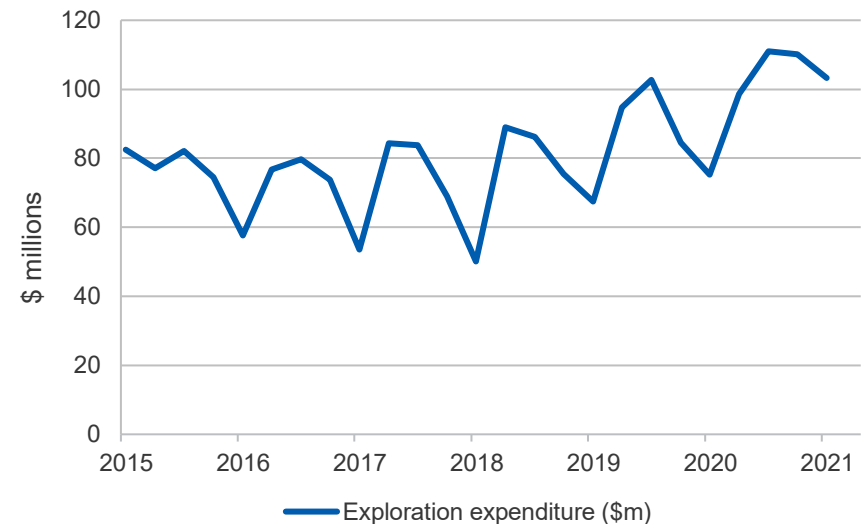
Iron ore exploration expenditure is growing as prices lift

A total of \$103 million was spent on iron ore exploration in the March quarter 2021. This is 6.4% lower than exploration in the December quarter 2020, but 37% higher than in March quarter 2020. Exploration has been elevated in recent quarters as iron ore prices have continued to reach historical highs (Figure 4.8).

Revisions

Forecast export earnings for 2020–21 have been revised upwards from \$136 billion in the March 2021 *Resources and Energy Quarterly* (in nominal terms) to just over \$149 billion in this edition. This reflects stronger-than-expected Chinese demand and record prices. The strength in prices has also resulted in Australian export earnings being revised up by around \$22 billion for 2021–22, and by around \$5 billion in 2022–23.

Figure 4.8: Australian iron ore exploration



Source: ABS (2021) Mineral and Petroleum Exploration, 8412

Table 4.1: World trade in iron ore

	Million tonnes				Annual percentage change		
	2020	2021 ^f	2022 ^f	2023 ^f	2021 ^f	2022 ^f	2023 ^f
Total world trade	1,626	1,720	1,731	1,746	5.8	0.6	0.9
Iron ore imports							
China	1,170	1,279	1,285	1,280	9.3	0.4	-0.3
Japan	99	108	111	114	8.9	2.8	2.6
South Korea	70	75	77	79	5.9	2.8	2.6
European Union	63	78	78	78	23.6	0.0	0.0
Iron ore exports							
Australia	867	860	949	962	-0.9	10.4	1.4
Brazil	342	367	399	417	7.3	8.7	4.5
South Africa	66	91	67	64	39.3	-26.7	-4.1
Canada	55	70	52	50	26.7	-25.2	-4.1
India	52	73	53	51	39.9	-27.8	-4.1

Notes: ^f forecast.

Source: World Steel Association (2021); International Trade Centre (2021); Department of Industry, Science, Energy and Resources (2021)

Table 4.2: Iron ore outlook

World	Unit	2020	2021 ^f	2022 ^f	2023 ^f	Annual percentage change		
						2021 ^f	2022 ^f	2023 ^f
Prices ^{bc}								
– nominal	US\$/t	96	152	109	95	57.3	-28.1	-12.7
– real ^d	US\$/t	99	152	106	90	53.8	-29.7	-15.2
Australia	Unit	2019–20	2020–21 ^s	2021–22 ^f	2022–23 ^f	2020–21 ^s	2021–22 ^f	2022–23 ^f
Production								
– Steel ^h	Mt	5.48	5.64	5.85	5.85	3.0	3.7	0.0
– Iron ore	Mt	916	919	934	978	0.4	1.6	4.7
Exports								
Steel ^h	Mt	0.88	0.80	1.00	1.00	-8.9	25.6	0.0
– nominal value	A\$m	1,011	754	911	873	-25.4	20.9	-4.2
– real value ⁱ	A\$m	1,022	754	896	844	-26.3	18.9	-5.8
Iron ore	Mt	858	871	904	954	1.4	3.8	5.6
– nominal value	A\$m	102,861	149,284	136,893	113,036	45.1	-8.3	-17.4
– real value ⁱ	A\$m	103,992	149,284	134,622	109,264	43.6	-9.8	-18.8

Notes: **b** fob Australian basis; **c** Spot price, 62% iron content basis; **d** In 2021 US dollars; **f** forecast; **h** Crude steel equivalent; Crude steel is defined as the first solid state of production after melting. In ABS Australian Harmonized Export Commodity Classification, crude steel equivalent includes most items from 7206 to 7307, excluding ferrous waste and scrap and ferroalloys; **i** In 2020–21 Australian dollars; **s** estimate.

Source: ABS (2021) International Trade in Goods and Services, Australia, 5368.0; Bloomberg (2021) Metal Bulletin; World Steel Association (2021); AME Group (2021); Company Reports; Department of Industry, Science, Energy and Resources (2021)