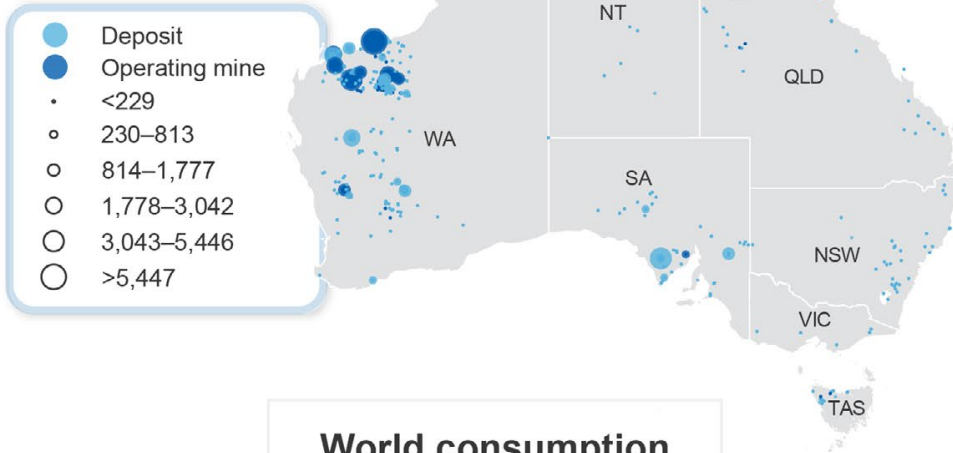


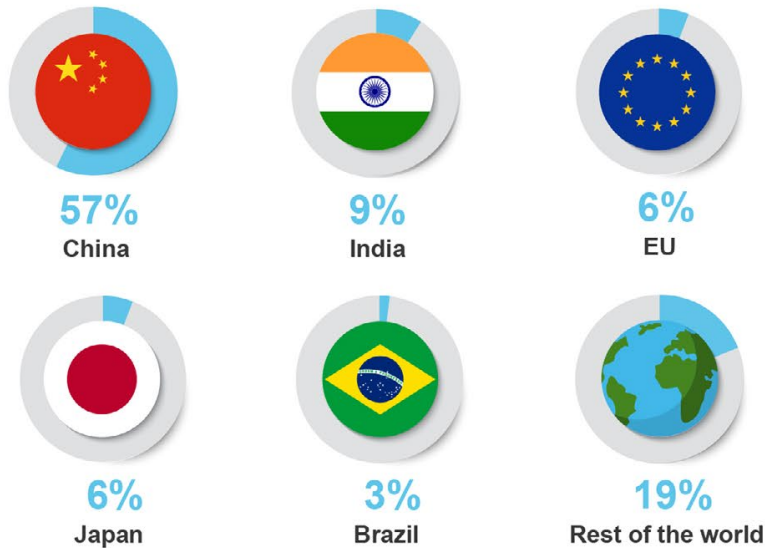


Iron Ore

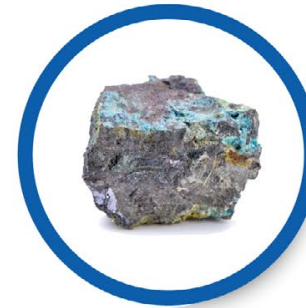
Major Australian iron ore deposits (Mt)



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**

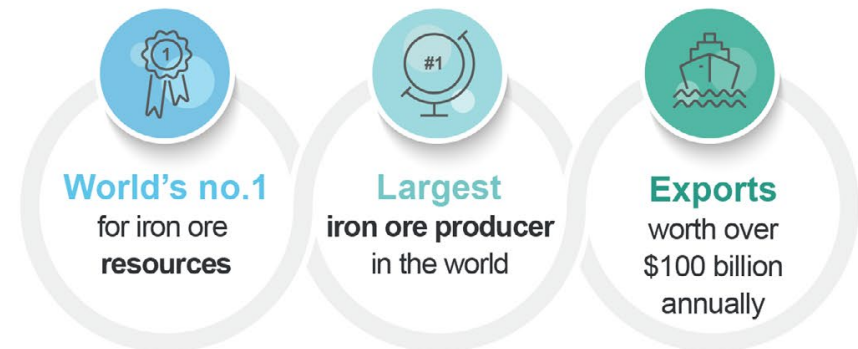


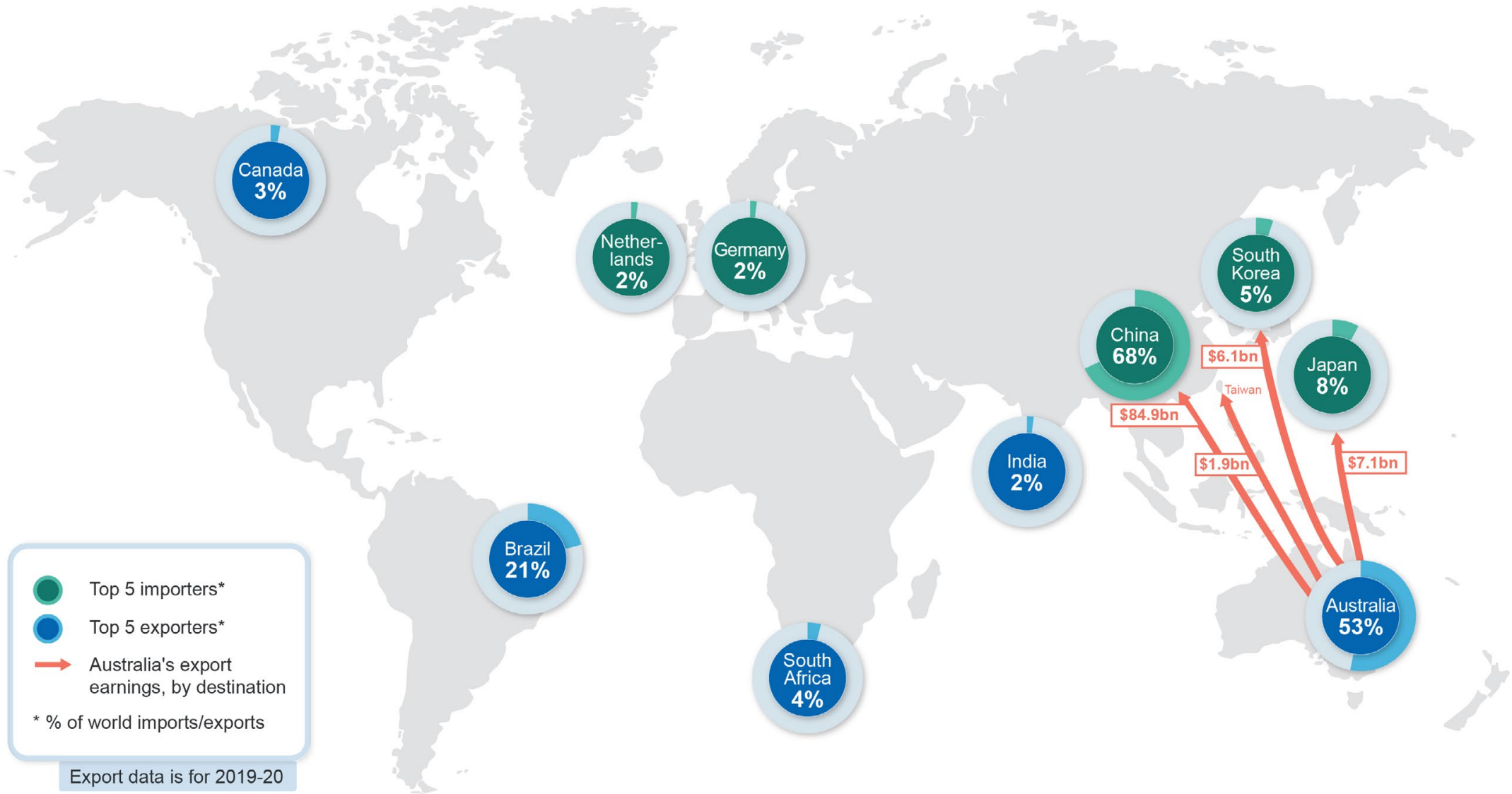
Humans have been working with iron for at least **5,000 years**



Iron was central to the **industrial revolution**

Australia's iron ore





4.1 Summary

- The iron ore price has risen sharply in recent months, supported by robust demand in China linked to government stimulus measures. The iron ore price is expected to remain well above US\$100 a tonne until mid-2021 before easing to just over US\$75 by the end of 2022.
- Australian export volumes are expected to grow from 858 million tonnes in 2019–20 to 906 million tonnes by 2021–22 as mines open or expand in Western Australia (see [Australia section](#)).
- Stronger prices are expected to push Australia’s iron ore export values up to a peak of \$123 billion in 2020–21. An easing in prices and stronger Australian dollar are subsequently expected to push earnings back to a still strong \$95 billion by 2021–22.

4.2 Prices

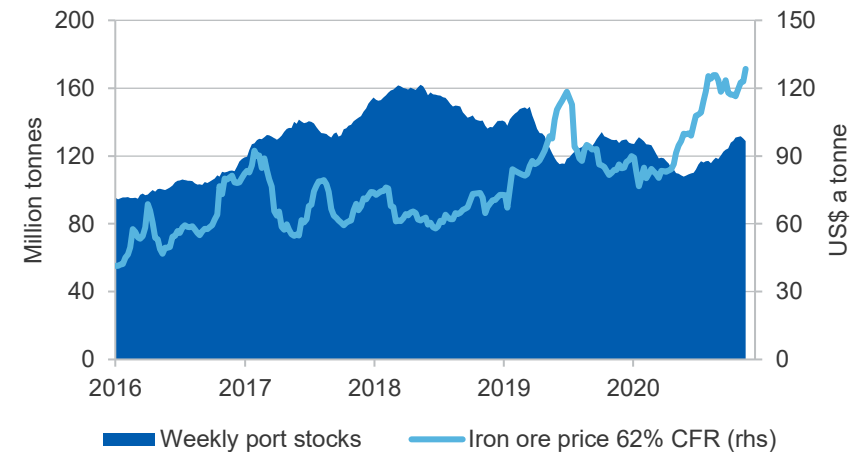
Iron ore prices remain strong due to supply disruptions

Iron ore prices surged in mid-2020 as a result of growing Chinese demand and ongoing disruptions to Brazilian supply. Subsequently, prices have held up at high levels, moving up again in recent weeks (Figure 4.1).

Slight growth in Brazilian supply has led to some reduction in the price premium for higher grades (Figure 4.2). The price premium has also been curbed by a seasonal slowdown in construction across China, though Chinese construction remains strong overall, and seasonal effects are likely to be temporary.

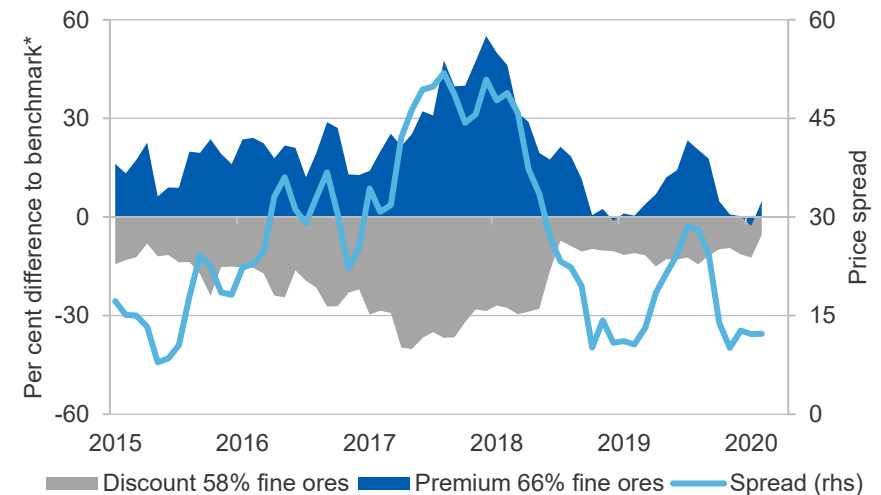
Iron ore prices have proven highly sensitive to movements in demand over 2020. Prior to 2020, many large iron ore miners cut back investment, closed mines, and attempted to retire debt. This left the industry without substantial spare capacity, magnifying the impact of supply disruptions and recent growth in Chinese steel use. With China continuing to direct substantial spending towards investment in infrastructure and property, domestic steel stockpiles are now being run down. This is likely to keep pressure on prices over the short term, even though many steel mills in other parts of the world are yet to return to full production.

Figure 4.1: China's iron ore port stocks and spot price



Notes: China import Iron ore fines 62% Fe spot (CFR Tianjin port)
Source: Bloomberg (2020) Antaika iron ore port stocks and Metal Bulletin

Figure 4.2: Iron ore price spread between grades



Notes: *Benchmark used is 62 per cent iron fines CFR
Source: Bloomberg (2020) China import prices

Iron ore prices are likely to stay robust into 2021

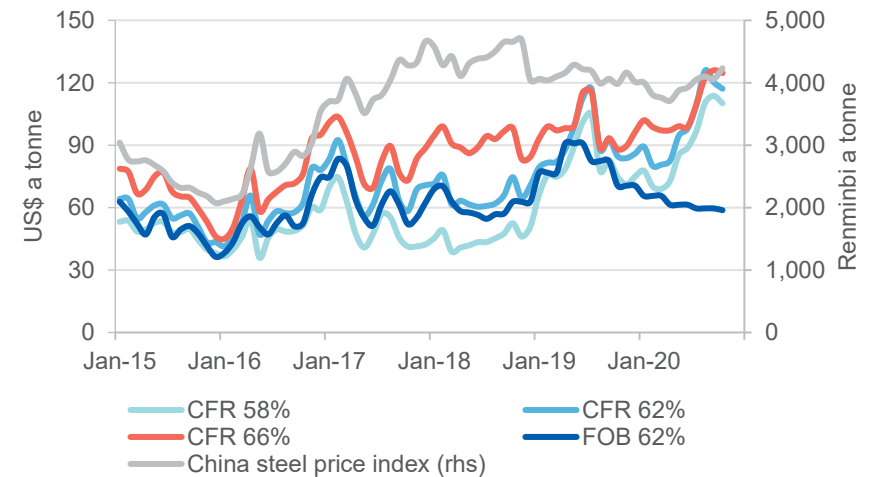
Prices are expected to remain strong for the next six months. China's demand is expected to remain high, though China's steelmakers may seek to modestly reduce production should prices remain at a level which renders many of them unprofitable (see Figures 4.3 and 4.4). Demand in many other countries is expected to remain below its 2019 level: a range of steelmakers in Europe and South Asia remain on hiatus or shut down, and are not expected to return to production until iron ore prices drop.

Prices have been held up by a combination of production constraints in Brazil, ongoing stimulus-driven demand in China, and the relatively low price of metallurgical coal, which gives steelmakers added flexibility to pay more for iron ore. These factors are likely to persist for at least another six months. On December 2, Vale released an update to its guidance, which reduced its expected output for 2020 from 310-330 million tonnes to 300-305 million tonnes. This will add significantly to supply pressures over the coming year, with demand likely to be met through drawdown of inventories, a potential restart of currently closed mines in China, or a lift in high-cost production from India. Persistently strong prices will likely be needed to bring sufficient supply to the market.

Prices will also be supported by recovery in the global economy, and a linked recovery in steel production outside of China. A substantial amount of steelmaking capacity remains shut down across much of the world, but many of these plants have retained their workforce and are capable of a rapid power-up should it become profitable for them to do so. With global steelmaking now more China-centred than ever before, many governments may seek to ensure their domestic capacity is not permanently lost, while governments seeking rapid expansion in their domestic industries (such as India) may wish to ensure that such plans are not delayed for too long by COVID-19.

Risks remain evenly split in both directions. China's dominance in iron ore consumption gives it considerable capacity to set global prices, though the relative concentration of the iron ore supply chain may act as a counter-balance. Any easing in Chinese stimulus measures will also lead to

Figure 4.3: Iron ore price by grade and China steel price index



Source: Bloomberg (2020); Department of Industry, Science, Energy and Resources (2020)

Figure 4.4: Iron ore price vs China steel production growth

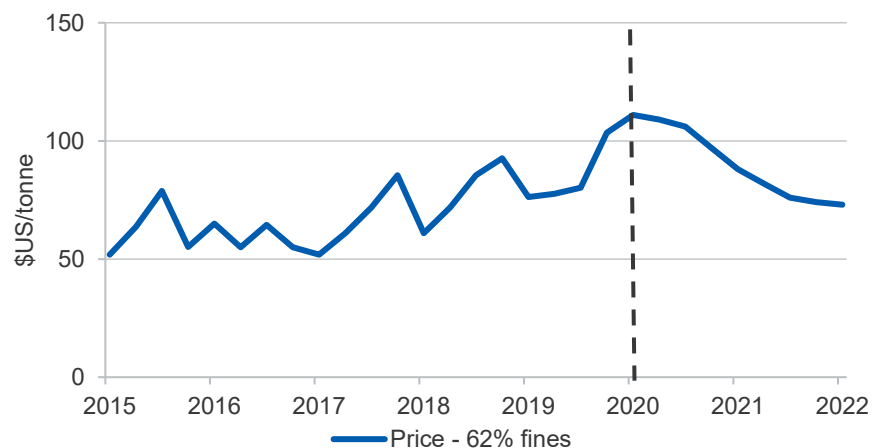


Notes: China import Iron ore fines 62% Fe spot (CFR Tianjin port)
Source: Bloomberg (2020) China import prices; World Steel Association (2020)

fairly rapid downward shifts in prices from the current forecast level.

On balance, it is expected that prices will remain above US\$100 a tonne until mid-2021, before easing gradually to around US\$75 by the end of 2022 as Brazilian supply recovers and Chinese stimulus eases back (see Figure 4.5).

Figure 4.5: Iron ore price outlook, quarterly



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

Source: Bloomberg (2020) Department of Industry, Science, Energy and Resources (2020)

4.3 World trade

Brazilian iron ore supply is recovering

China has become steadily more dominant as a global iron ore destination, with steel production in a range of other countries subject to recessionary conditions in the latter half of 2020. China now accounts for more than 70 per cent of global iron ore imports, though its power to set prices has been somewhat checked by the relative market concentration among iron ore producers.

Most Chinese imports come from three large companies: BHP, Vale, and Rio Tinto. Of these three, BHP and Rio Tinto remain on track to meet their

previous guidance for output in 2020, and are expected to produce 324-333 million tonnes and 276-286 million tonnes (respectively).

However, output from Vale remains under pressure, as previously noted. In November, the company announced that 33 of its 104 Brazilian dam structures had failed stability assessments, with nearly all of the affected dams connected to iron ore facilities. The company remains subject to a range of legal actions, added regulatory processes and other requirements in the wake of the Brumadinho Dam collapse in 2019. The COVID-19 pandemic also led to significant disruptions of port and rail facilities in the south of Brazil, adding further logistical difficulty.

The company did achieve significant milestones across its southern operations in the second half of 2020, with shipments rising from 64 million tonnes in the June quarter to 82 million tonnes in the September quarter. However, this has not been sufficient to enable the company to meet its initial production guidance for 2020.

The longer term outlook for Vale is stronger, with the company making significant progress on its US\$1.5 billion Serra Sul 120 project, expected to be completed by 2024. This upgrade will open access to additional mining areas, incorporate extra processing lines and provide a duplicate long-distance conveyor. Mine plant capacity is expected to expand by 20 million tonnes a year, allowing Vale to maintain its productive capacity as new production and licencing restrictions affect its output adversely.

With Vale's output set to recover over time, the three largest iron ore producers remain in a dominant market position, with the relative lack of competition and high entry barriers somewhat moderating China's power to set prices in the market. In response, China has stepped up its effort to source alternative supplies during 2020.

By far the largest prospective alternative mine is at Simandou in the Nzérékoré region of Guinea. In recent months, China has stepped up efforts to develop the project, which has potential to extract 70-150 million tonnes of iron ore a year (depending on whether both the northern and southern blocks can be brought into production). This would represent a

large new source of seaborne iron ore, though the market impact would be somewhat limited given the scale of the overall seaborne market (where supply is rising towards 2 billion tonnes a year).

The Simandou deposit is subject to complex ownership arrangements. The southern blocks of Simandou are controlled by a joint venture between Rio Tinto and Chinalcom, while much of the northern area is controlled by a separate Chinese joint venture, which has recently announced plans to push ahead with its project.

The project faces significant logistical issues. Rio Tinto has estimated that project infrastructure costs are likely to exceed US\$20 billion. The project will require about 650 kilometres of new railway, which would cut through mountainous and inaccessible regions. The profitability for the mine would be somewhat clouded by the fact that any significant price falls brought about by the project would reduce profitability of other Rio Tinto facilities around the world.

Overall, it is not expected that production at Simandou will occur within the next five years, and potentially longer. Little progress has been made over the past 10 years, and a large quantity of complex infrastructure will need to be built.

One new iron ore mine has recently received formal approval to proceed, with Champion Iron's Bloom Lake expansion in Canada now expected to be completed in December 2022. This would almost double output from the site to 15 million tonnes annually from 2023.

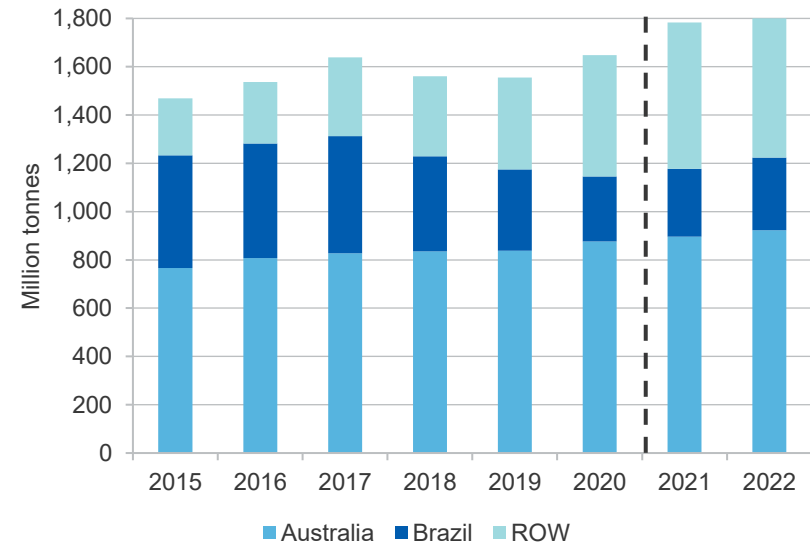
In aggregate, demand for iron ore remains strongly China-centred, with Chinese steel blast furnaces continuing to operate at above-normal capacity. Much of this output is being used in building infrastructure, with the Chinese government progressing with plans for new bridges, rail, and subway lines. Steel production has also recovered somewhat in India and South Korea, creating the possibility of a more diverse and broadly based steel market in 2021.

Chinese demand for iron is likely at its peak, with a decline expected over the next 10 years as a growing share of its steel production is drawn from

domestic recycling. This will result in reduced Chinese dependence on the seaborne iron ore market.

While demand continues to evolve, iron ore supply is expected to remain broadly unchanged in its structure, with Australia continuing to play a dominant role (Figure 4.6).

Figure 4.6: Outlook for global iron ore exports



Source: World Steel Association (2020); Department of Industry, Science, Energy and Resources (2020)

4.4 Australia

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

Australian iron ore export values set a new record of \$10.9 billion in October. This is more than one third higher than the total for October 2019. The bulk of this growth is made up of Chinese imports from Australia, which have risen strongly in recent months. The refurbishment of a railcar dumper at BHP's Port Hedland facilities is expected to help the company meet this demand into 2021, with the conclusion of site

maintenance at Rio Tinto facilities also expected to support exports over the December quarter.

A new mine is set to open in the Pilbara, where Strike Resources has announced the completion of a feasibility study into its Paulsens East project. This mine is expected to produce an initial output of about 6 million tonnes over four years, with the study finding low technical risks and robust economics given the relatively high quality of output and the current price environment. First production from the site is targeted for mid-2021.

Overall trends for investment in iron ore can be viewed in the 2020 *Resources and Energy Major Projects* publication.

Australia's iron ore export volumes are forecast to grow

Export volumes are expected to increase from 858 million tonnes in 2019–20 to be above 900 million tonnes by 2021–22 (see Figure 4.7). Output is expected to grow from several expanding projects in the Pilbara region. Prices are expected to remain strong over the outlook period, with export earnings expected to peak at \$123 billion in 2010–21 before easing to \$95 billion by 2021–22. However, exports will remain sensitive to conditions in China, which remains our dominant market (Figure 4.8).

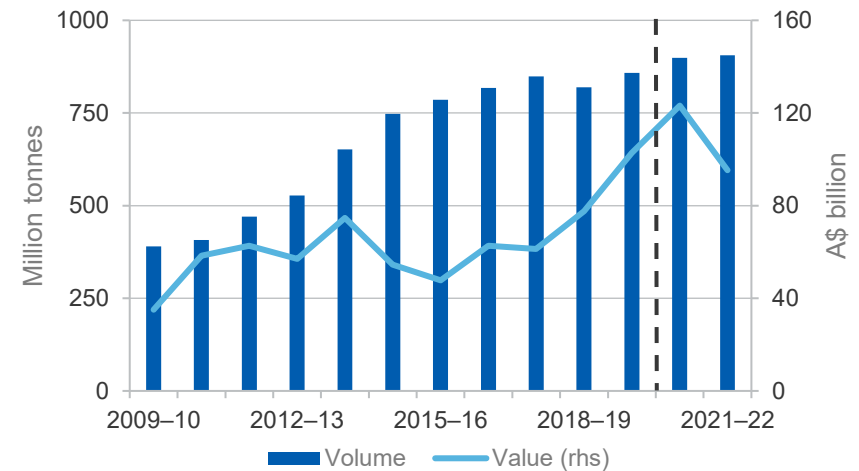
Iron ore exploration expenditure is growing as prices lift

Iron ore exploration has picked up in recent quarters as prices have lifted. A total of \$111 million was invested in exploration in the September quarter. This is around 8 per cent higher than in the September quarter 2019, and reflects favourable prices in the first half of 2020-21.

Revisions

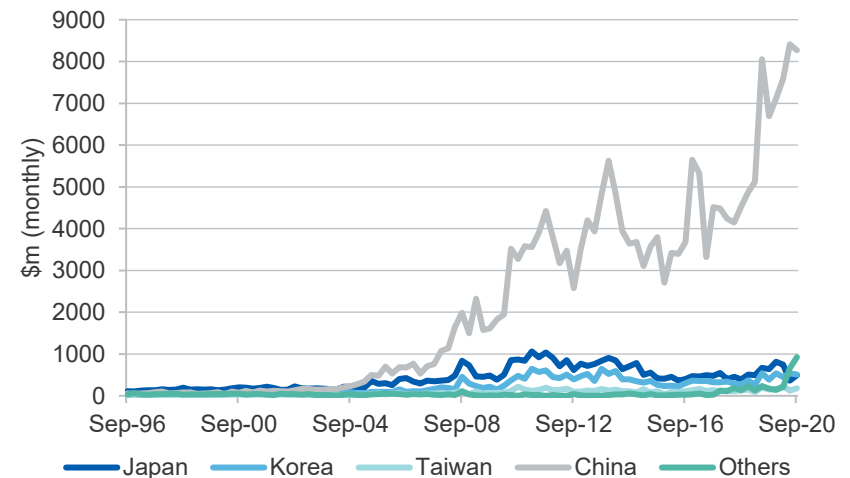
Forecast export earnings for 2020–21 have risen considerably, from \$97 billion in the September *Resources and Energy Quarterly* to just over \$120 billion in this edition. This results from a stronger than expected Chinese demand and recent large cuts in Vale's production guidance, which will likely lead to a supply shortfall and significantly higher prices over the year. Earnings have been revised up for 2021–22, though to a lesser degree.

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



Source: ABS (2020) International Trade, Australia, 5368.0; Department of Industry, Science, Energy and Resources (2020)

Figure 4.8: Australia's iron ore export destinations



Source: ABS (2020) Department of Industry, Science, Energy and Resources (2020)

Table 4.1: World trade in iron ore

	Million tonnes				Annual percentage change		
	2019	2020 ^e	2021 ^f	2022 ^f	2020 ^f	2021 ^f	2022 ^f
Total world trade	1,555	1,647	1,783	1,861	6.0	8.2	4.4
Iron ore imports							
China	1,071	1,209	1,343	1,421	13.0	11.0	5.8
European Union	137	128	125	125	-7.0	-2.2	0.0
Japan	120	98	101	100	-18.3	3.2	-1.0
South Korea	74	69	74	75	-6.4	7.1	1.3
India	5	5	5	5	-6.5	-2.1	0.0
Iron ore exports							
Australia	836	876	896	923	4.9	2.3	3.0
Brazil	336	269	281	301	-20.1	4.5	7.1
Ukraine	44	50	62	64	12.9	24.0	3.2
India	40	52	62	65	28.2	21.3	3.6

Notes: **e** estimate; **f** forecast

Source: World Steel Association (2020); International Trade Centre (2020); Department of Industry, Science, Energy and Resources (2020)

Table 4.2: Iron ore outlook

World	Unit	2019	2020 ^e	2021 ^f	2022 ^f	Annual percentage change		
						2020 ^f	2021 ^f	2022 ^f
Prices ^{bc}								
– nominal	US\$/t	81.5	93.1	100.0	76.3	14.2	7.4	-23.7
– real ^d	US\$/t	82.6	93.1	98.0	73.2	12.8	5.3	-25.3
Australia	Unit	2018–19	2019–20	2020–21 ^f	2021–22 ^f	2019–20 ^e	2020–21 ^f	2021–22 ^f
Production								
– Steel ^{hs}	Mt	6.05	5.48	5.49	5.52	-9.5	0.3	0.6
– Iron ore	Mt	924	919	929	930	-0.6	1.1	0.1
Exports								
Steel	Mt	1.21	0.88	0.90	0.95	-27.6	2.3	5.9
– nominal value	A\$m	1 287	1 010	833	861	-21.6	-17.5	3.4
– real value ^{hi}	A\$m	1 316	1 019	833	847	-22.6	-18.3	1.7
Iron ore	Mt	818	858	899	906	4.9	4.7	0.7
– nominal value	A\$m	77,553	102,815	123,178	95,245	32.6	19.8	-22.7
– real value ⁱ	A\$m	79,291	103,732	123,178	93,685	30.8	18.7	-23.9

Notes: **b** fob Australian basis; **c** Spot price, 62 per cent iron content basis; **d** In 2020 US dollars; **e** Estimate; **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.

Source: ABS (2020) International Trade in Goods and Services, Australia, 5368.0; Bloomberg (2020) Metal Bulletin; World Steel Association (2020); AME Group (2020); Company Reports; Department of Industry, Science, Energy and Resources (2020)