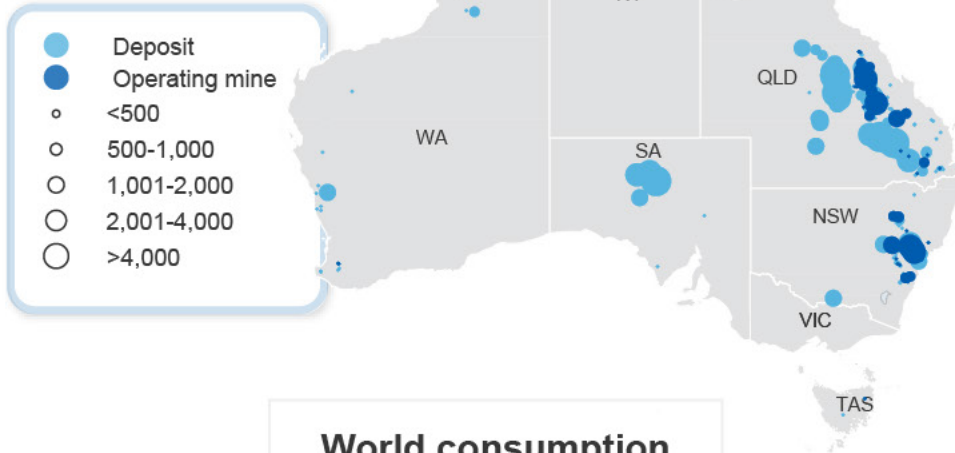


Metallurgical coal

Major Australian coal deposits (Mt)



Metallurgical coal



Metallurgical coal is primarily used to make steel



Contains more carbon and less ash & moisture than thermal coal



1x tonne of steel made in a blast furnace uses 780kg of met coal



Electric arc furnaces don't use met coal as a raw material

World consumption



59%
China



10%
India



7%
Russia



5%
EU28



5%
Japan



4%
South Korea

Australia's metallurgical coal



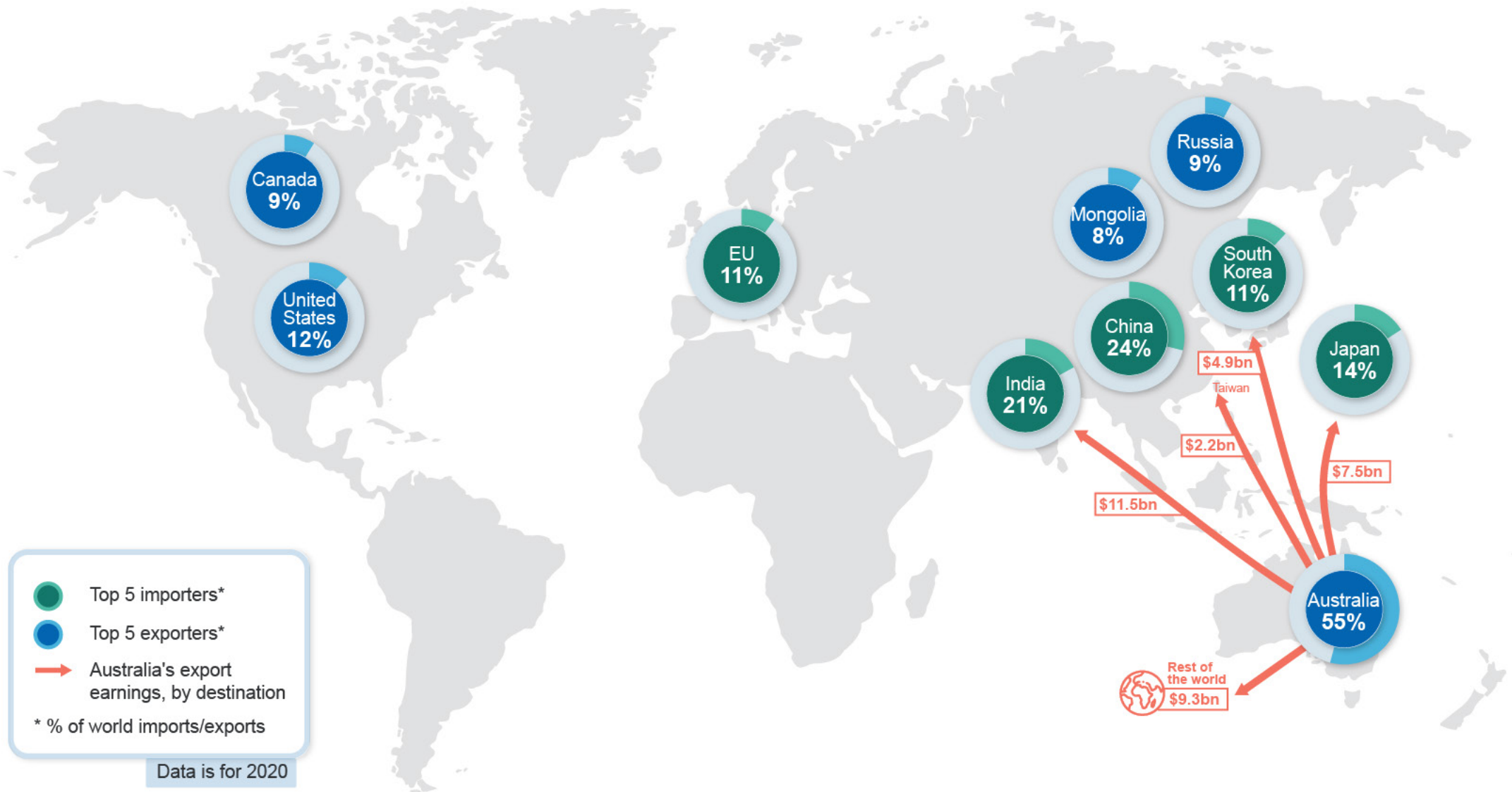
World's no.1
metallurgical coal
exporter



170m tonnes
of metallurgical
coal exported
each year



Almost all
of Australia's
met coal is
exported



5.1 Summary

- Metallurgical coal prices hit historic highs as the year turned, and surged again following the Russian invasion of Ukraine. The Australian premium hard coking coal price is forecast to average over US\$300 a tonne in 2022, but is expected to fall by almost half as supply conditions return to normal in 2023. Prices are ultimately expected to reach US\$133 a tonne by 2027 (in real terms).
- Australia's exports are forecast to rise from 171 million tonnes in 2020–21 to 184 million tonnes by 2026–27. The result reflects increased production in NSW and Queensland.
- Australia's metallurgical coal export values are forecast to track with price movements, rebounding from \$24 billion in 2020–21 to peak above \$60 billion in 2021–22, before falling back to \$26 billion by 2026–27.

5.2 World trade

After reaching record highs in October, metallurgical coal prices fell back slightly in late 2021 before surging again in January and February 2022. The recent lift reflects supply issues due to weather disruptions in Australia and the Russian invasion of Ukraine. Australia has faced both heavy rainfall (which affected production and transport in Queensland), and a sharp rise in COVID-19 cases, which disrupted workforces at several coal operations.

Russia faced bottleneck issues in 2021, with production consistently exceeding transport capacity. The invasion of Ukraine adds significant new uncertainty, with coal shipping potentially disrupted and sanctions limiting Russian access to crucial imports of machinery and equipment.

Further disruptions remain in prospect for Australia, with floods in New South Wales and Queensland likely to affect mining and transport. The March-April period also often correlates with high cyclone activity in the oceans off Queensland and heavy rainfall in the Bowen Basin. It is expected that tight global trade conditions will continue to affect metallurgical coal, with most issues being on the supply side.

Metallurgical coal demand remains relatively contained. Chinese imports edged down late in 2021 as steel production was placed under more constraints. Lunar New Year holidays and the Winter Olympics appear to have further moderated Chinese demand in February, but prospects are growing for a recovery in March and April.

Demand elsewhere remains similarly flat. This may be due to recent record prices and supply difficulties, which have encouraged caution among potential buyers. This caution leaves significant room for demand to lift as steelmaking increases, with the result that global markets will likely remain tight — and prices above US\$150 a tonne — for the next 2-3 years. However, prices are expected to trend down slowly, approaching their historical average over the second half of the outlook period.

On balance, world metallurgical coal trade is forecast to increase from 314 million tonnes in 2020 to 343 million tonnes in 2027. The bulk of growth in trade is expected early in the outlook period, as steelmaking picks up and economies around the world recover from the effects of the COVID-19 pandemic. However this recovery faces greater risks following the invasion of Ukraine.

5.3 World imports

Chinese metallurgical coal imports are trending down

Chinese imports of metallurgical coal fell in 2021, as curbs on steelmaking reduced blast furnace requirements. Steelmaking and Chinese industry demand also remain subject to uncertainties caused by the country's ongoing zero-COVID policy. The entire of Jilin province was placed under lockdown in March 2022, as was the city of Shenzhen, which holds extensive tech and industry hubs. At the time of writing almost 40 million people are under lockdown, with potential for lockdowns to expand into other population centres, transport networks and industrial zones.

Previous fiscal stimulus packages have targeted the Chinese steel industry, and any renewed stimulus could push up steel usage again, potentially lifting metallurgical coal prices in turn. The recent announcement that the steel industry's peak emissions target would move

from 2025 to 2030 also points to higher potential steel output. However, domestic coal production in China also rose solidly in January and February. If sustained, this could keep pace with steel production.

Informal import restrictions against Australia continue to complicate the picture within China, where domestic prices have reached over US\$600 a tonne. In January the Chinese Government released around 5.6 million tonnes of Australian metallurgical coal previously held in Hong Kong warehouses. The release of stored coal does not imply any change in overall Chinese policy, which is assumed to be maintained over the outlook.

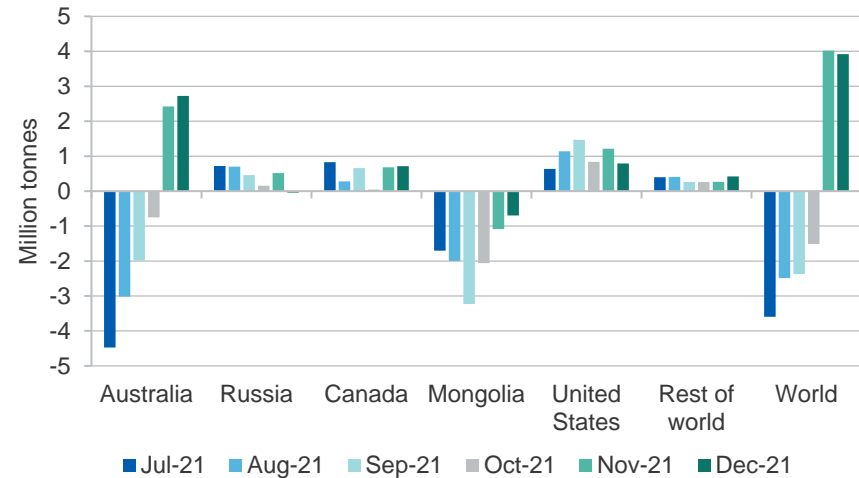
Chinese metallurgical coal imports eased over much of 2021 (Figure 5.1), constrained by steel production caps and by the Winter Olympics. Imports are expected to hold at just under 50 million tonnes annually through the outlook period, with steel production peaking and domestic coal production largely keeping pace with domestic demand.

India's metallurgical coal imports are recovering

Indian steel production showed strong signs of growth in the second half of 2021, but was checked somewhat by high metallurgical coal prices and supply problems. Australia accounted for almost three-quarters of metallurgical coal imports to India over 2021, while import shares from Canada and the US slumped to 3% and 5%. Recent heavy rainfall and COVID-19 issues in Australia thus create particular risks for India in an environment where most non-Australian supply is monopolised by China. Expansions in rail capacity between Russia and India are expected to broaden Indian import sources over the longer term, but the prospects for this have become less certain following the invasion of Ukraine.

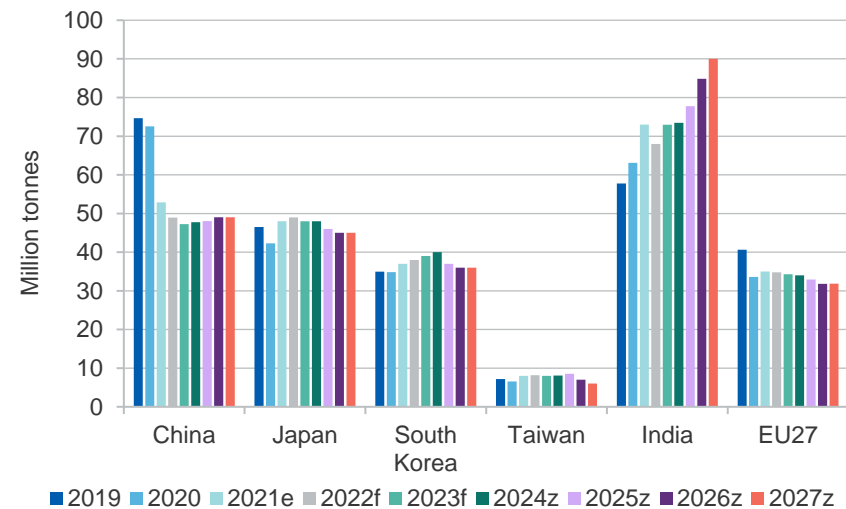
India's metallurgical coal needs are likely to grow during the outlook period. Indian steelmakers have announced projects worth a total of US\$11 billion over the next five years (though final investment decisions are yet to be made in many cases). Metallurgical coal imports, already the largest in the world, are expected to grow in tandem, increasing from 63 million tonnes in 2020 to 90 million tonnes by 2027 (Figure 5.2).

Figure 5.1: China's metallurgical coal imports, year-on-year change



Notes: China customs released combined January/February data.
Source: Bloomberg (2022); China customs (2022)

Figure 5.2: Metallurgical coal imports



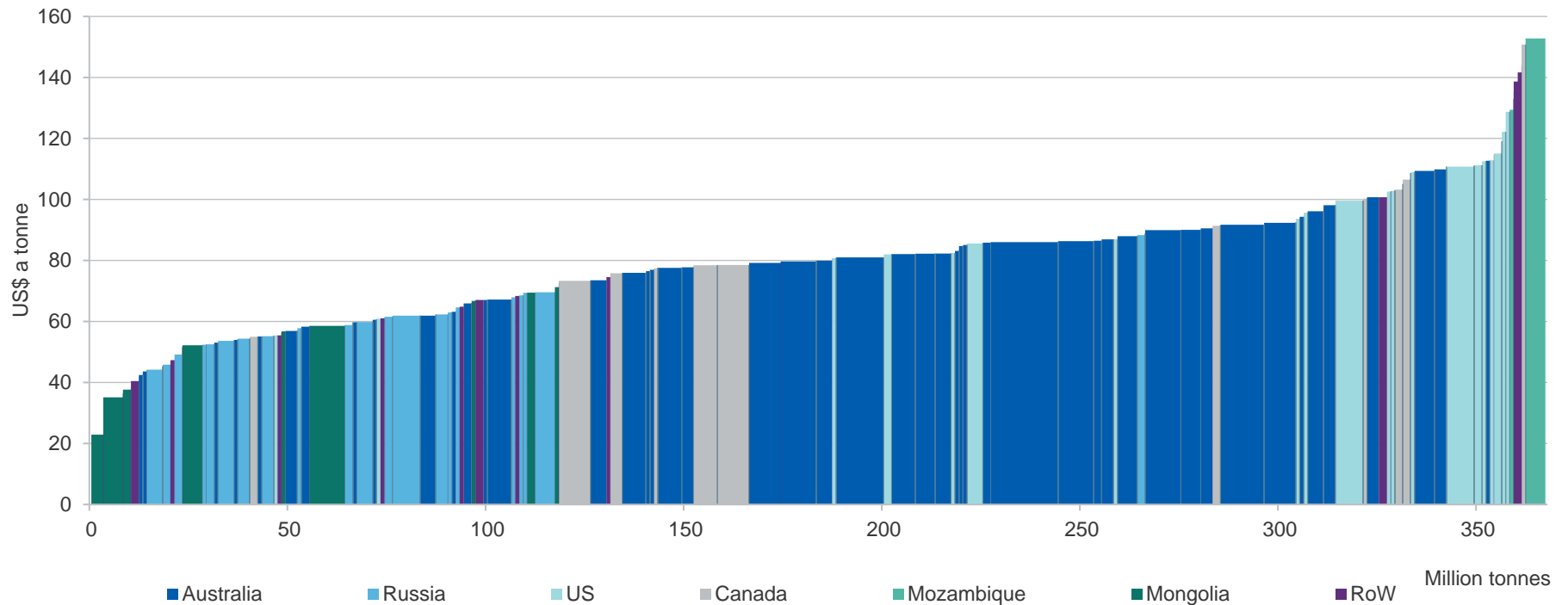
Notes: f Forecast.
Source: IHS (2022); Department of Industry, Science, Energy and Resources (2022)

Japanese and South Korean imports are picking up faster

Japanese steelmaking is rising following a significant decline in 2020, with manufacturing conditions and consumer white goods sales increasing. Metallurgical coal imports are expected to have risen from 42 million tonnes to 48 million tonnes in 2021, with a marginal increase to 49 million tonnes expected for 2022. In the second half of the outlook period, import needs are expected to ease, as some Japanese steel plants reach the end of their useful operating life, and steelmaking shifts offshore.

Steelmaking in South Korea was relatively less affected by the COVID-19 pandemic, with the result that metallurgical coal imports were largely steady in 2020 and 2021. South Korean metallurgical coal imports are forecast to lift slowly over the outlook period, peaking at 40 million tonnes in 2024 and then subsequently easing slightly as efficiency improves and industrial use peaks.

Figure 5.3: Metallurgical coal (including hard coking, PCI and semi-soft) global cost curve, FOB



Notes: FOB is Free on Board. RoW is rest of world.

Source: AME Group (2021); Department of Industry, Science, Energy and Resources (2022)

5.4 World exports

COVID-19 impacts are hampering US efforts to capitalise on strong prices

Metallurgical coal production in the US was virtually flat in the December quarter 2021, edging up by less than 250,000 tonnes to remain under 14 million tonnes. Metallurgical coal producers continue to face labour shortages linked to the COVID-19 pandemic, which undermined attempts by US producers to raise output and capitalise on supply disruptions elsewhere.

The effects of COVID-19-related labour shortages have also spread to transportation and port infrastructure in recent months. While much of this has affected rail transportation, CSX's large Curtis Bay export terminal also experienced recent outages, with shipments facing disruptions in early 2022.

Over the longer term, US supply remains subject to high production costs (Figure 5.3) and high transport costs due to the inland location of coal reserves. The recent surge in prices should support profitability in the short-term, but labour shortages may inhibit companies' ability to capitalise. High costs and prior mine closures mean the US is not seen as a strong growth prospect in the longer term, with exports unlikely to match their 2019 peak at any point over the next five years (Figure 5.4).

Mongolia's exports have stopped falling, as COVID-19 impacts peak

Mongolian exports have steadied after a sharp fall during 2020, when trade was disrupted by Chinese efforts to contain the COVID-19 pandemic. Chinese investment has supported new and expanded infrastructure connections, including a new railway between Mongolia and China. It is expected that this expanded capacity will come fully online during the outlook period, lifting Mongolian exports and reducing some pressure on the Chinese market. Exports are expected to increase from 22 million tonnes in 2022 to 29 million tonnes by 2027.

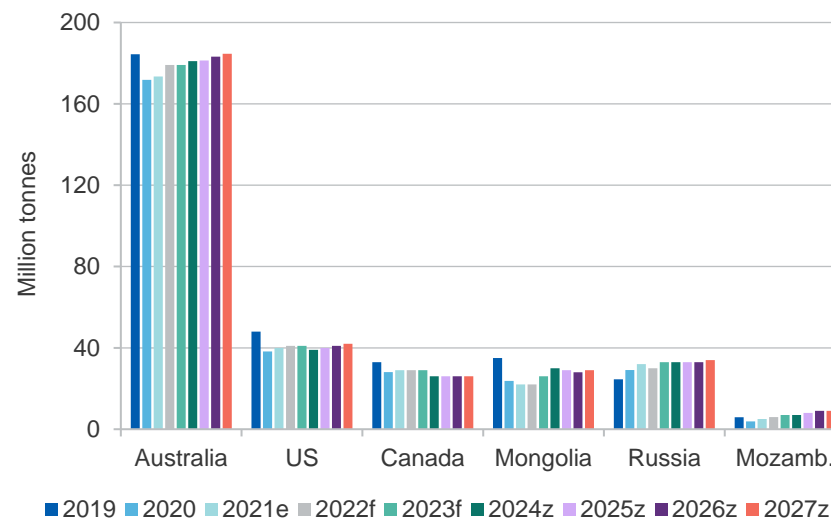
Russia's exports are recovering, supported by new infrastructure

In 2021, Russian exports exceeded their 2020 level by more than 10%, largely due to a 50% lift in exports to China. However, Chinese demand

has led to growing strain on Russian shipping infrastructure to the Asian market. In response to bottlenecks, a large quantity of rail capacity is being considered for upgrade, with some already under development. A significant quantity of new capacity is scheduled to come online between 2022 and 2024. However, the Russian invasion of Ukraine has led to sanctions which are likely to restrict access to imported machinery and equipment crucial to the expansion.

The full implications of the invasion of Ukraine are not yet clear, but the situation has already forced some Russian coal trains to divert to Poland, with resulting delays and potential reduction in landborne supply. Neither Russia nor Ukraine are globally significant metallurgical coal consumers, so any effects are likely to impact mainly on the supply side, representing an upside risk for prices. Sanctions targeting Russia also have potential to expand, with unpredictable effects on steelmaking in the EU and on metallurgical coal supply from Russia. The overall effect on prices is likely to be mixed, but with greater risks on the upside.

Figure 5.4: Metallurgical coal exports



Notes: e estimate f forecast

Source: IHS (2022); Department of Industry, Science, Energy and Resources (2022)

With recent infrastructure maintenance largely completed, and bottlenecks set to ease, Russian exports are forecast to recover from a 2020 low of 29 million tonnes to 32 million tonnes in 2021. However, further growth is likely to be stymied by economic instability and a lack of access to imported machinery following the invasion of Ukraine (Figure 5.4). Russian coal is highly suited to north Asian markets, being low cost and unusually low in sulphur. Key demand sources in the region (including China) have demonstrated less intention to target Russia with sanctions and other trade restrictions. However, a long-term shift away from Russian coal may occur even in the absence of formal state sanctions.

Exports from Canada are set to rise as a new mine ramps up

Canadian metallurgical coal exports are expected to lift slightly in 2022, supported by the restart of Canada Coal's Grand Cache mine (which has historically produced about 2 million tonnes of coal annually). The mine was shut down in 2020 following the outbreak of the COVID-19 pandemic, and while the restart may take some time (given the eighteen month period of care and maintenance), it is expected to be finished by end 2022 or early 2023, with most new output feeding the Chinese market.

The return of production at Grand Cache, and generally strong conditions for Canadian exporters, are expected to see exports lift from 28 million tonnes in 2020 to 29 million tonnes by 2023 (Figure 5.4). Beyond this, exports are set to edge down marginally as existing mines deplete, with no other large or high quality deposits now in prospect in Canada.

Mozambique's exports will take time to recover

Mozambique's exports fell sharply to 4 million tonnes in 2020, as low prices severely affected the country's relatively high cost producers. Exports are forecast to recover to 7 million tonnes by 2023 and 9 million tonnes by 2027. This growth is expected to be supported by Vale's Moatize mine — where work has finished on a preparation plant upgrade — and by upgrades to the Nacala logistics corridor rail line and port. Higher output at the Moatize site may be temporarily affected by seasonal heavy rainfall, but growth to at least 8 million tonnes of metallurgical coal (annually) is expected at the site over the longer term.

5.5 Prices

Metallurgical coal prices are expected to ease gradually

Metallurgical coal prices have been volatile over recent quarters (Figure 5.5), rising sharply in the September quarter and then falling rapidly in November on lower Chinese steel production. Prices subsequently surged back in January 2022, as global steelmaking showed further signs of recovery and new supply disruptions began to emerge.

Figure 5.5: Metallurgical coal prices – Australian Prime Hard vs US Low Vol, FOB



Source: IHS (2022). Low vol = low volatile coking coal.

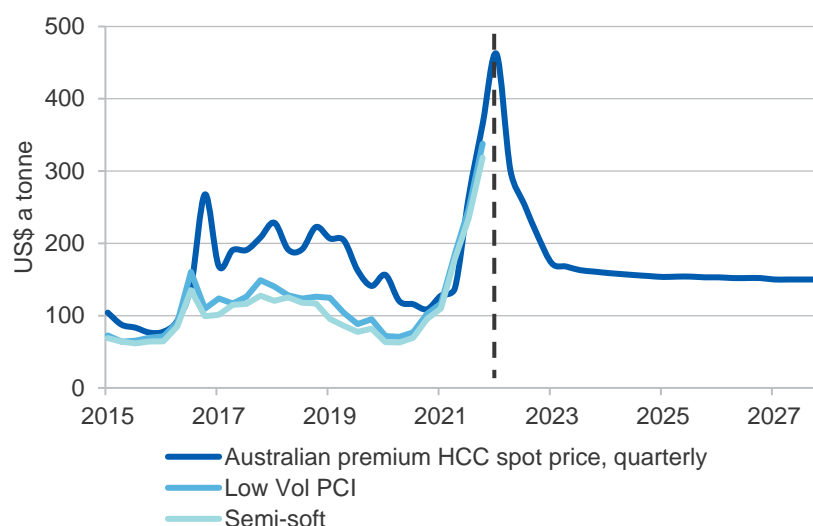
A series of weather disruptions affecting coal mines in Mongolia and China resulted in upward price movements in late 2021, with the largest effect following weeks of heavy rains in September and October. While weather disruptions in central Asia have now partly abated, prices had little time to correct before heavy rains and mudslides crippled various coal infrastructure in Canada. Subsequent to that, heavy rainfall linked to La Niña weather conditions disrupted Australian supply, with exports now subject to damaging weather events for four consecutive months.

Non-weather supply disruptions have also picked up early in 2022, with infrastructure bottlenecks constraining output in Russia, and COVID

impacts starting to affect output from Australia. On top of this, the Russian invasion of Ukraine sent prices to new records in March.

It is expected that disruptions will ease on some fronts over the remainder of 2022, allowing prices to start correcting. Over the outlook period, hard coking coal prices are expected to ease back from a war-affected peak of around US\$460 a tonne in the March quarter 2022, to reach US\$172 a tonne by the March quarter 2023. Prices are then expected to stabilise at around US\$150 a tonne towards the end of the outlook period (Figure 5.6).

Figure 5.6: Australian metallurgical coal spot price, quarterly



Source: Platts (2022); Department of Industry, Science, Energy and Resources (2022)

Despite the downwards trend, risks remain weighted to prices remaining high for longer. Factors that could hold prices high include further developments in the war against Ukraine, changes in Chinese government policy, the ongoing La Niña weather event and associated weather disruptions (which often peak in Australia each March quarter), and new developments in the COVID-19 pandemic. Risks remain mostly on the supply side, with low inventories likely to exacerbate the impact of any further supply disruptions in 2022.

5.6 Australia

Metallurgical coal export earnings have risen despite supply issues

As previously noted, disruptions to Australian output have accounted for much of the recent lift in metallurgical coal prices. These disruptions included the ongoing La Niña event and recent floods in New South Wales and Queensland. Production has also been affected by the rapid growth of COVID-19 cases. This rise has led to unpredictable worker absences in mines across Queensland, though the recent decline in new COVID cases may help to contain further effects.

Metallurgical coal exports appear to be gradually recovering, with volumes lifting by 3% in December 2021. This left export volumes for 2021 broadly the same as in 2020, though the underlying supply chains have reorganised. India is now the top destination for Australian coal (accounting for almost a third of all exports in December), with significant growth also recorded in exports to South Korea, Brazil, Taiwan and Vietnam. These supply chains are expected to remain in place over the outlook period, leaving Australian suppliers with a more diverse market in the wake of informal import restrictions by the Chinese Government.

BHP has reduced its guidance for metallurgical coal output for 2022 (from 39-44 million tonnes to 38-41 million tonnes), as a result of 'significant La Niña related wet weather impacts during the December 2021 quarter coupled with COVID-19 related labour constraints'. These factors are expected to ease over the rest of the year, but are not expected to disappear entirely. Output from BHP is likely to be firmed by the successful completion of a complex longwall move at the company's Broadmeadow site. Maintenance at BHP's Caval Ridge plant was also successfully concluded in the December quarter 2021, clearing the way for stronger output at the site from 2022.

Production at South32's Dendrobium mine in 2022 is likely to fall temporarily, with the company noting that 'Illawarra Metallurgical Coal saleable production decreased by 23% (or 951kt) to 3.1Mt in H1 FY22 as we completed an extended longwall move at the Dendrobium mine in Q2 FY22. Metallurgical coal production declined 15% to 2.8Mt, while energy

coal declined by 55% to 0.4Mt. Other projects, including Appin, are also planning longwall moves, though overall production guidance remains relatively solid.

Glencore has announced that metallurgical coal production across Australia reached an estimated 9.1 million tonnes in 2021: around 20% higher than in 2020.

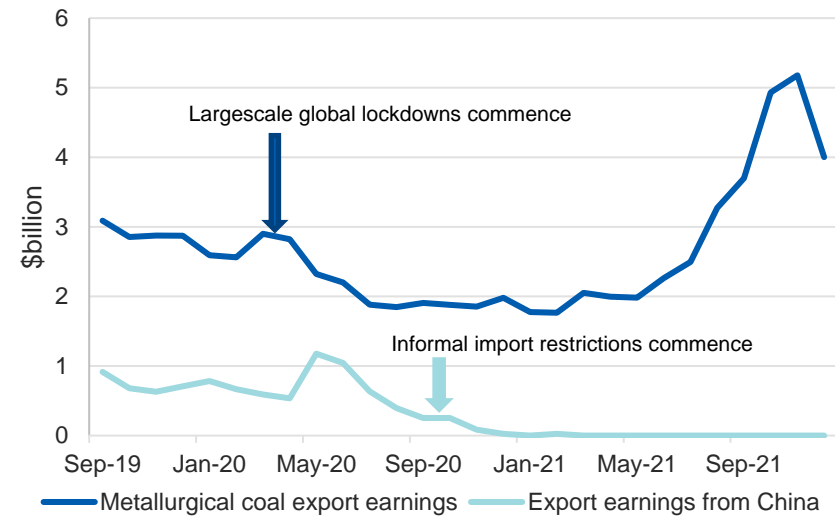
With COVID cases stabilising and producers adjusting to them, the primary risk to Australian production is now weather disruptions, with cyclones often peaking off the Queensland coast during March-April. Floods in New South Wales and Queensland are also leading to uncertainties over supply, though the Bowen Basin, where floods have been particularly significant, is primarily a producing region for thermal coal.

Over the longer term, renewed stimulus measures around the world are expected to offset some of the risk associated with potential further waves of the COVID-19 pandemic, though the timing of this remains unclear (see *Macro economy chapter*). Changes in consumption patterns (as countries seek to reduce carbon emissions) could have unpredictable effects on both supply and demand, with greater risks on the demand side.

On balance, Australian export earnings are expected to remain well above pre-COVID levels through much of the outlook period (Figures 5.8 and 5.9), despite some short-term constraints on volumes. Higher demand from India is expected to support Australian exports over the outlook period, though buyers in Japan, South Korea and Taiwan have also expressed interest in increased Australian supply.

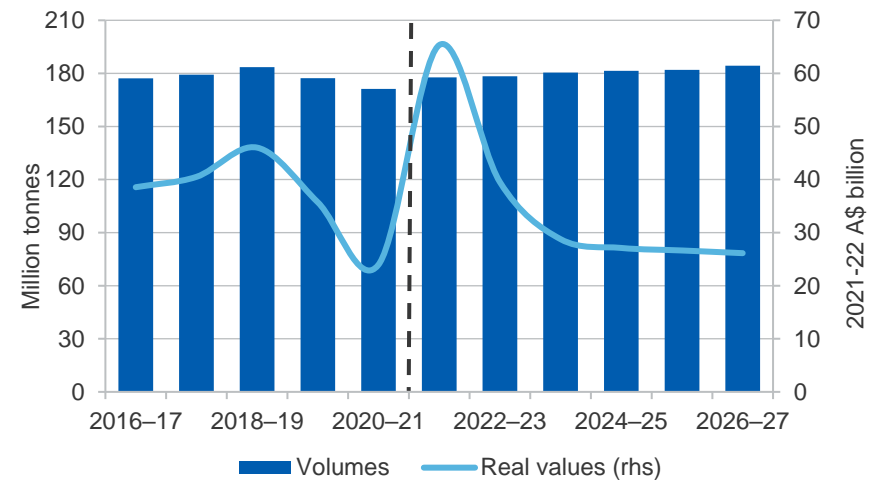
Metallurgical coal export earnings were \$24 billion in 2020–21 (Figure 5.8). Prices are set to deliver a large windfall to metallurgical coal producers in 2021–22, with export values forecast to rise to over \$60 billion, a new record level. A decline to a still-high \$26 billion (in real terms) is expected by 2026–27, as seasonal and short-term supply issues pass and supply and demand come into balance.

Figure 5.7: Australia's metallurgical coal export values, monthly



Source: ABS (2022) International Trade, Australia 5454.0

Figure 5.8: Australia's metallurgical coal exports

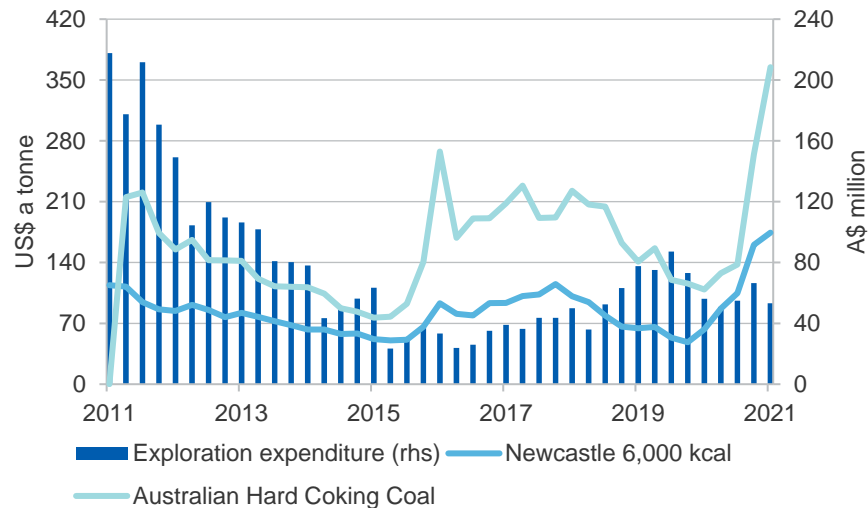


Source: ABS (2022) International Trade, Australia 5454.0; Department of Industry, Science, Energy and Resources (2022)

Coal exploration expenditure has declined

Australia's coal exploration expenditure decreased to \$53 million in the December quarter, to be 9% off the level recorded in December 2020. Prices have risen markedly for Australian coal in recent months, but thermal coal in particular remains subject to significant policy and financial uncertainty. Price increases may improve rates of exploration over coming quarters, particularly for metallurgical coal (Figure 5.9).

Figure 5.9: Australian coal exploration expenditure and prices



Source: ABS (2022); IHS (2022); Platts (2022)

Revisions to the outlook for Australian metallurgical coal exports

The forecast for export earnings has been revised up by \$10 billion (nominal terms) in 2021–22, but slightly reduced in 2022–23, reflecting the impact of unusually severe weather disruptions and the Russian invasion of Ukraine. The forecast for earnings in 2025–26 has been lowered by around \$4 billion from the March 2021 *Resources and Energy Quarterly*. This reflects lower estimates for mine production in some areas, and a recent greater frequency of disruptive weather events, which have been factored in to the long-term forecast.

Table 5.1: World trade in metallurgical coal

	Unit	2021 ^s	2022 ^f	2023 ^z	2024 ^z	2025 ^z	2026 ^z	2027 ^z	CAGR ^r
World trade	Mt	323	321	330	331	334	338	343	1.0
Metallurgical coal imports									
China	Mt	53	49	47	48	48	49	49	-1.3
India	Mt	73	68	73	73	78	85	90	3.6
Japan	Mt	48	49	48	48	46	45	45	-1.1
European Union	Mt	35	35	34	34	33	32	32	-1.6
South Korea	Mt	37	38	39	40	37	36	36	-0.5
Metallurgical coal exports									
Australia	Mt	167	179	179	181	181	183	185	1.7
United States	Mt	40	41	41	39	40	41	42	0.8
Canada	Mt	29	29	29	26	26	26	26	-1.8
Russia	Mt	32	30	33	33	33	33	34	1.0
Mongolia	Mt	22	22	26	30	29	28	29	4.7
Mozambique	Mt	5	6	7	7	8	9	9	10.3

Notes: **f** Forecast; **s** Estimate; **z** Projection.

Source: IEA (2022) Coal Information; IHS (2022); Department of Industry, Science, Energy and Resources (2022)

Table 5.2: Metallurgical coal outlook

World	Unit	2021 ^s	2022 ^f	2023 ^z	2024 ^z	2025 ^z	2026 ^z	2027 ^z	CAGR ^f
Contract prices ^e									
– nominal	US\$/t	194	319	170	157	154	152	150	-4.2
– real ^d	US\$/t	201	319	166	149	142	138	133	-6.7
Spot prices ^g									
– nominal	US\$/t	224	307	166	157	154	152	150	-6.4
– real ^d	US\$/t	231	307	162	149	142	138	133	-8.9
Australia	Unit	2020–21	2021–22 ^f	2022–23 ^z	2023–24 ^z	2024–25 ^z	2025–26 ^z	2026–27 ^z	CAGR ^f
Production ^s	Mt	171	185	184	186	187	187	190	1.8
Export volume	Mt	171	171	178	180	181	182	184	1.2
– nominal value	A\$m	23,187	65,330	40,757	30,457	29,436	29,641	29,804	4.3
– real value ⁱ	A\$m	23,970	65,330	39,523	28,769	27,116	26,638	26,131	1.4

Notes: **d** In 2022 US dollars. **e** Contract price assessment for high-quality hard coking coal. **i** In 2021–22 Australian dollars. **f** Forecast. **z** Projection. **g** Hard coking coal fob Australia east coast ports. **s** Estimate.

Source: ABS (2022) International Trade in Goods and Services, Australia, 5368.0; Department of Industry, Innovation and Science (2022); Platts (2022)