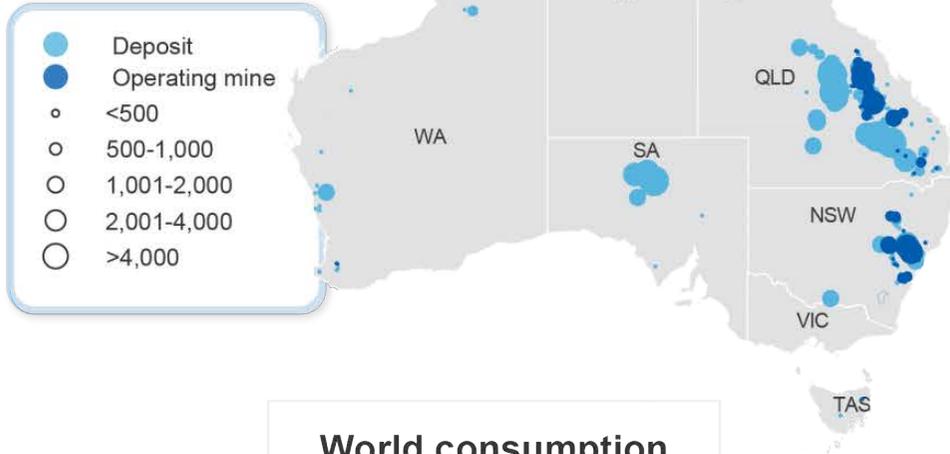
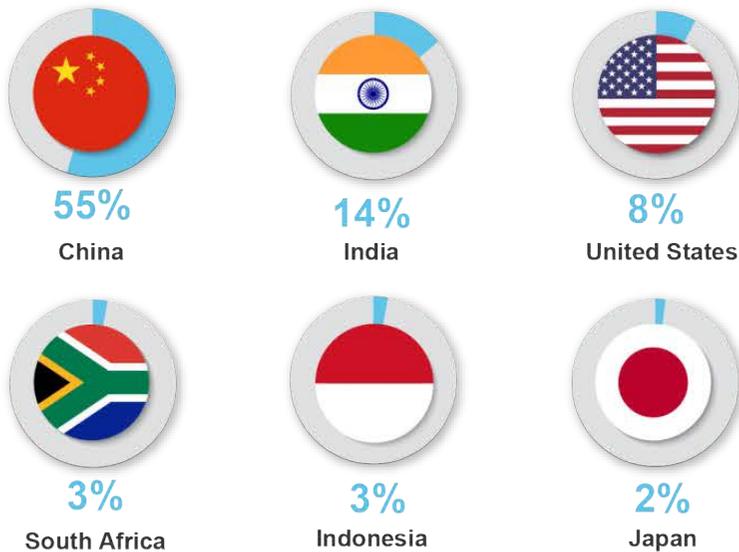


Thermal coal

Major Australian coal deposits (Mt)



World consumption



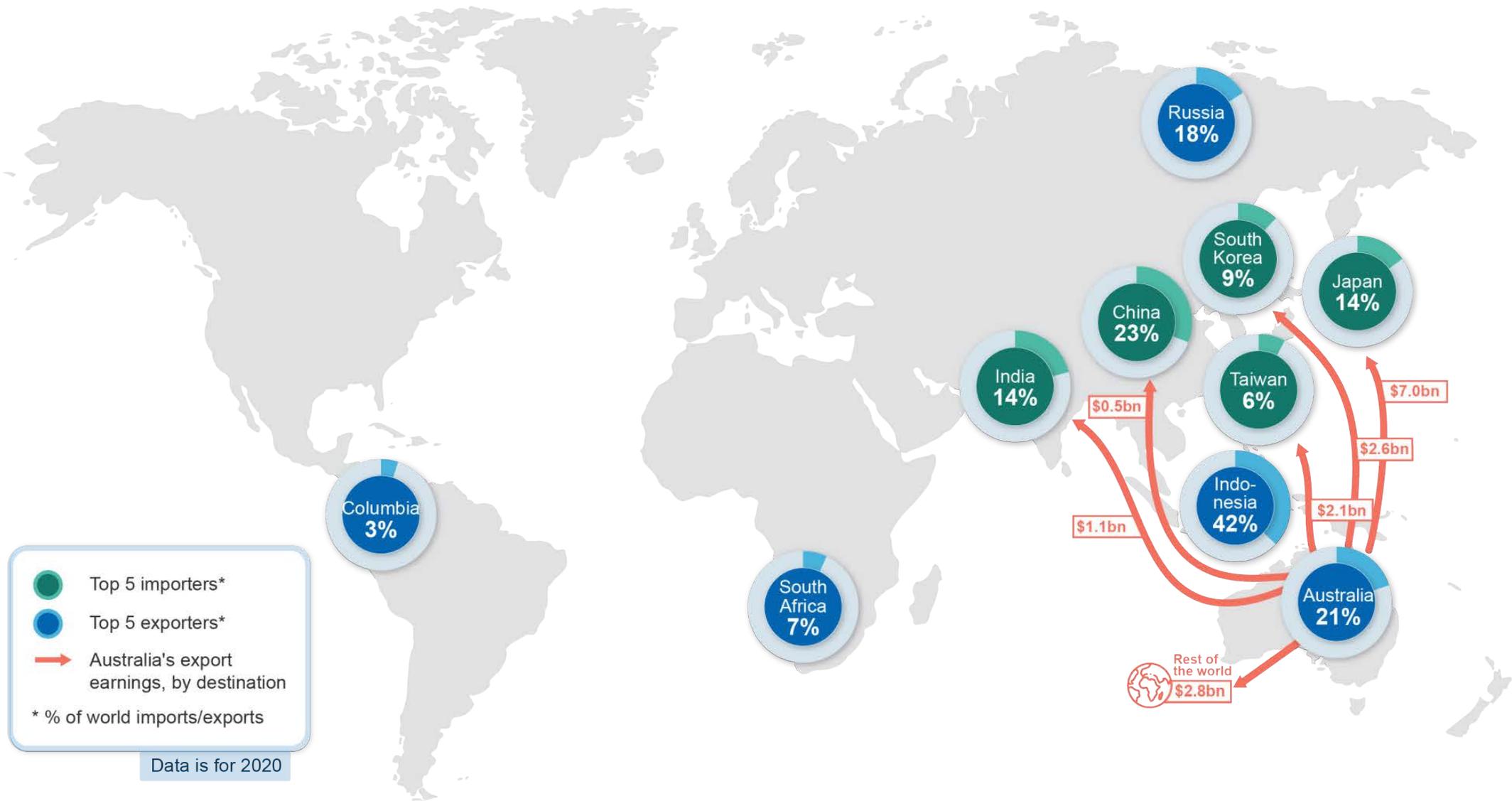
Thermal coal



- Thermal coal is primarily used in **electricity generation**
- Coal accounted for **38%** of power generation globally in 2018
- Mines are open cut or underground depending on the **geology of the deposit**
- Coal formation** began 290-360 million years ago

Australia's thermal coal





6.1 Summary

- Thermal coal spot prices spiked in October as strong Chinese demand hit up against global supply disruptions and capacity constraints. The Newcastle benchmark price is forecast to average US\$134 a tonne in 2021, easing slowly to around US\$90 a tonne by 2023.
- Australian thermal coal exports declined from 213 million tonnes in 2019-20 to 192 million tonnes in 2020–21, but are expected to recover back to 204 million tonnes by 2022–23.
- Surging prices are expected to push export values up to \$35 billion in 2021–22, with a subsequent easing to \$27 billion by 2022–23.

6.2 World trade

Thermal coal demand appears to be recovering more rapidly than supply. Exports remain below pre-COVID-19 peaks, but a rapid global economic recovery and cold Northern Hemisphere Winter has increased demand for power generation among significant thermal coal importers. This has led to rising pressure on inventory levels and surging prices over the second half of 2021. Key importers, including China and India, are now managing severe pressure on inventories after months of destocking, and Europe is also starting to face inventory shortages.

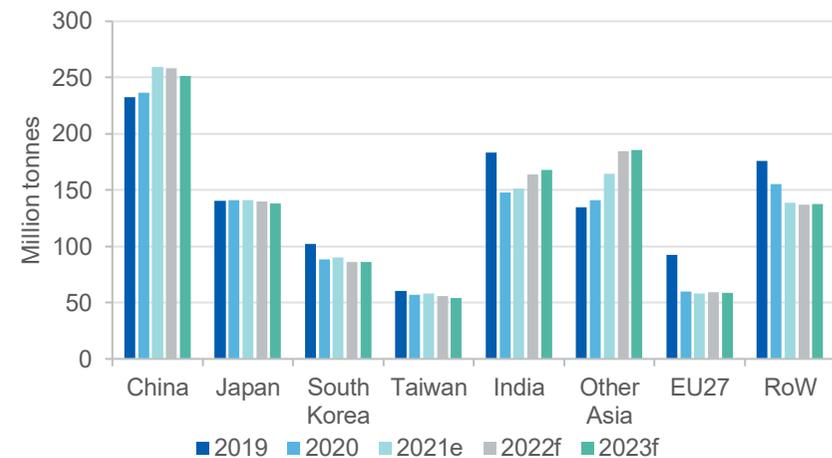
However, surging prices have not led to a rush of coal investment. Investment in coal remains low amidst market and policy pressure, which has been affected by announcements in and around the recent COP26 summit. Recent commitments by a range of countries (covered in more detail in section 6.3 *World imports*) have added to uncertainties over coal investment. This is likely to discourage a number of major investors from responding to the recent price surge, and contribute to a likelihood that thermal coal prices will remain relatively high over the outlook period.

High prices may in turn reduce competitiveness of coal relative to other energy sources, risking potential reductions in its share of global power use. However, some companies and countries with existing coal mining

assets are likely to see a significant benefit to profits, especially in light of the ongoing expansion of coal generation and imports in parts of Asia.

The interaction between short-term factors (recovery from COVID-19 and ongoing rollout of new coal plants in South Asia) and long term factors (new policy announcements emerging from the COP26 summit, difficulties with access to capital and insurance) could create significant volatility in prices and trade over the next two years, however policy announcements are not expected to materially impact demand over the next two years.

Figure 6.1: Thermal coal imports



Note: f Forecast

Source: IHS (2021); IEA (2021) Coal Market Report; Department of Industry, Science, Energy and Resources (2021)

In volume terms, seaborne imports are estimated to have increased by 7% in 2021 (to 1,060 million tonnes) as COVID-19 disruptions pass. Smaller increases are expected in the subsequent two years, with overall imports expected to reach 1,079 million tonnes in 2023, falling just short of their 2019 peak. Supply is expected to largely match demand in 2022 (Figure 6.1).

6.3 World imports

China's import price premium remains high as import restrictions persist

China is likely to become increasingly dominant in global coal markets over the next few years. A range of South-East Asian countries cancelled a significant number of planned coal plant constructions at COP26, leaving China with a dominant share of all coal plants now under development.

Coal use in China has more than recovered from its decline during the early stages of the COVID-19 pandemic. This has placed significant pressure on Chinese coal supplies, with the Government responding to brownouts and power shortages by directing power plants to boost output at all costs. However, following the recent surge in prices, China's National Development Reform Commission imposed a price ceiling (approximating to US\$187 a tonne) in late October. China's size in thermal coal markets — it mines about half of world output — meant that its price cap had a noticeable impact on thermal coal prices, which fell sharply.

The Chinese Government has given no sign of the end of informal import restrictions on Australian coal, even though Australian coal held for some quarters at Chinese ports now appears to have cleared customs.

Domestic output in China is growing, but is encountering significant disruptions. Shanxi — China's largest coal producing province — has faced severe floods, with sixty mines forced to close as a result. Despite this, Shanxi, Shaanxi and Inner Mongolia (all significant coal producing provinces) pledged to raise their output by 145 million tonnes in December. Such a rise would likely reduce pressure on Chinese imports.

China's government has previously announced plans to reduce coal use over the longer term through 'blue sky' and decarbonisation targets, which include a net zero target set for 2060. Attempts to curb coal deployment are also rising in some individual regions of China. This includes the Hong Kong Special Administrative Region (SAR), which continues to progress with long-term proposals to reduce coal imports by converting its largest coal plants (Lamma and Castle Peak) to gas-fired plants. However,

conversions of this kind typically take up to 10 years, with coal imports to Hong Kong likely to continue into the 2030s.

India's coal imports are expected to grow each year of the outlook period

India is expected to increase its use of coal over the next two years, with both demand and domestic supply set to expand. Signalling its ongoing intention to use coal, India (and China) advocated for changes to the text of the final COP26 communique, replacing a universal commitment to 'phase out' coal with a commitment to 'phase down' coal.

With post-COVID-19 recovery now well underway, Indian thermal coal imports are expected to rise over the outlook period. Imports of Indonesian coal have risen especially rapidly in recent months, as Australian coal has lost some of its price advantage (Figure 6.2). While imports have become more expensive, India has thus far avoided any significant power shortages. However, over half of its coal-fired plants are now down to less than 3 days of inventory, and demand is still growing.

Pressure on imports may ease over coming months, as power generators attempt to cut back usage amidst urging from the Government for India to become more self-reliant. However, domestic supply is yet to grow to a level that could noticeably curb import pressure. In November 2021, the Indian Power Ministry instructed power companies to build up stockpiles, in the expectation that demand levels would remain high. The instruction came after heavy September rains in coal-mining areas hit the production and delivery of coal.

The Indian Government is also seeking to reduce dependency on imported coal by providing greater access to domestic deposits. The Government ran a series of auctions for coal blocks in 2021, and at the time of writing just over half of the 38 blocks had been purchased. Should work at the sites proceed on schedule, it is likely that new mines would begin to enter the domestic market from the mid-2020s, potentially providing a long-term curb on imports of lower-grade coal. However, this is not expected to have any noticeable impact during the outlook period.

Japan's imports are expected to hold up through the outlook period

Japan has recently escalated its policies for a transition out of coal, with Prime Minister Kishida announcing at COP26 that the country would invest US\$100 million in transforming coal and gas plants to use nitrogen and hydrogen. Japan has also expanded its climate finance commitments for Asian nations by US\$10 billion, announced plans to close 100 coal plants by 2030, and cancelled its proposals to build more coal-fired power plants.

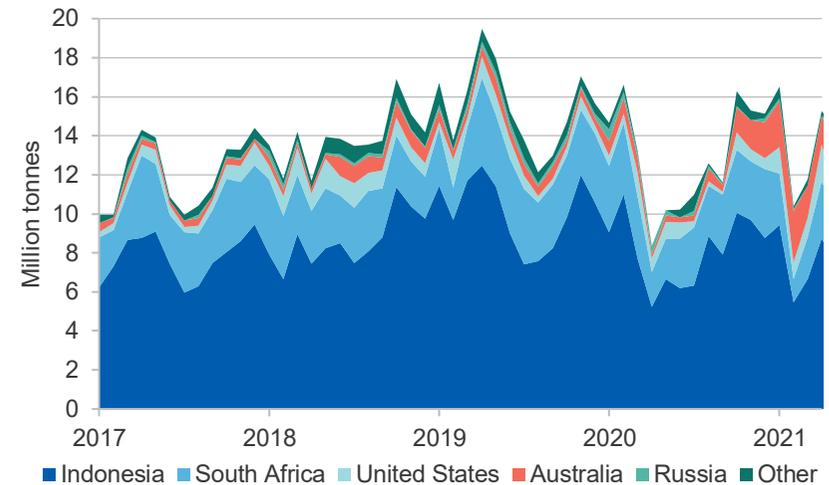
The Japanese Government's 6th energy plan forecasts a significant decrease in coal use by 2030. However, this plan is contingent on large growth in nuclear and renewables, requiring a significant increase in the pace of their reconnection or deployment. Japan also maintains additional coal capacity already under construction, which is unlikely to be cancelled. While recent announcements may affect market sentiment, significant coal imports are expected to last until well beyond the outlook period, albeit with an accelerating decline from the late 2020s.

A notable variable in Japan's coal demand will be the rate of progress in reconnecting its nuclear fleet. Only 10 of the nuclear plants that were closed after the Fukushima accident have re-opened to date, but the Japanese Government has recently indicated that it will seek to accelerate progress on this front. A further 14 plants are expected to open in coming years. Should this occur, coal use and coal imports may decline more rapidly than currently expected.

South Korean coal imports are expected to come under growing pressure

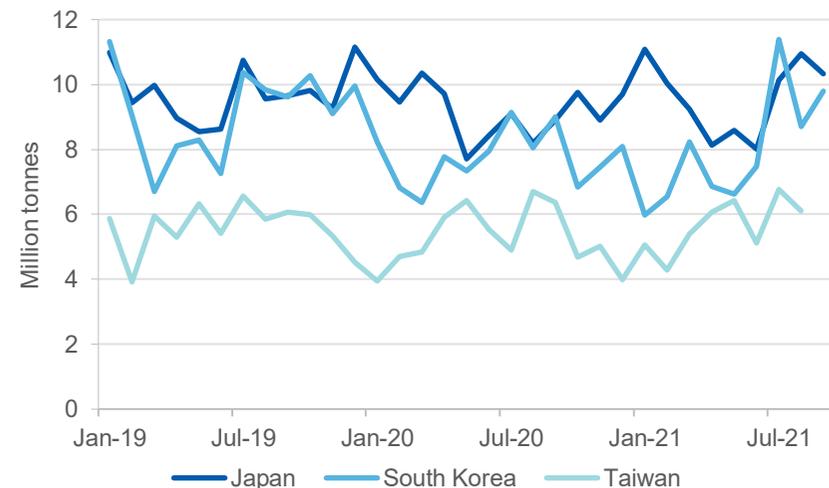
In October, South Korea released a draft plan to reduce coal fired generation from around 42% of electricity generation (in 2018) to 22% (by 2030) and zero (by 2050). This builds on the existing Basic Energy Plan, which seeks to shut about half of the nation's 60 coal fired plants by 2034. Despite these announcements, it is expected that coal generation will nonetheless increase in the near term, with coal imports expected to be supported by high gas prices for the next 2-3 years.

Figure 6.2: India's thermal coal imports, monthly



Source: IHS (2021)

Figure 6.3: Japan, South Korea and Taiwan's thermal coal imports



Source: IHS (2021)

Scheduled maintenance at several nuclear plants may also provide a short-term upside for coal imports, though conditions will likely grow tougher for coal producers towards the end of the outlook period.

Taiwan's imports are expected to start declining slowly

Taiwan has announced that it will cancel all coal plant construction, and reduce the coal share of its power generation from around 45% to 30% by 2025. The Taiwanese Government has also abandoned previous plans to upgrade its coal fleet — much of which was built 30-40 years ago — and will instead seek to convert its coal plants to use gas.

Given the age of Taiwan's coal fleet — around half of which is near end of life — it is expected that coal imports will start to decline modestly during the outlook period, ahead of other countries in the region. However, this may be complicated by plans to downscale nuclear generation in Taiwan, which will add to the scale of energy transition required.

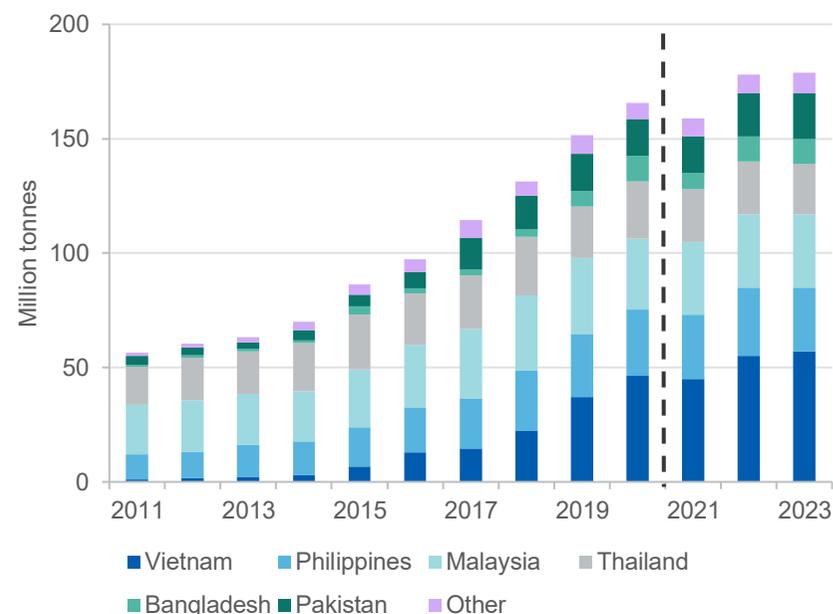
South East and South Asia imports are set to grow

Nations in South East and South Asia (excluding India) collectively import about 150 million tonnes of thermal coal each year. This sum is expected to rise over the outlook period (Figure 6.4), with recent cuts in planned coal capacity not expected to have a measurable impact until the mid-2020s.

In the Philippines, imports have been relatively low over much of 2021, but are expected to rise over the remainder of the year and beyond, especially following the connection of the new Mariveles coal-fired power plant. The Philippines retains a number of coal plants under construction, but has banned greenfield coal projects, and is considering potential early closure of 10 of its 28 existing coal plants.

Thailand's most recent Power Development Plan seeks to phase out coal fired power generation, reducing the share of coal generation by half (to 10%) by 2030. However, industrial demand (notably for cement production) remains robust, and is expected to place a floor under coal imports for the duration of the outlook period at least.

Figure 6.4: South and South East Asia thermal coal imports



Source: IEA (2021) Coal Information; Department of Industry, Science, Energy and Resources (2021); IHS (2021)

Malaysia, which has large, modern and cost-competitive coal plants, is expected to maintain coal imports for the foreseeable future.

Vietnam, which was previously expected to expand its coal power significantly, announced at COP26 that it would dramatically reduce the scale of its coal plant constructions. Vietnam has also recently signed the global “coal to clean power” statement, which effectively commits it to not issuing permits for new unabated coal-fired power generation projects. Other countries to have recently signed the pledge include Canada, Kazakhstan, Poland, Chile, Egypt, Morocco, Korea, and Sri Lanka, along with other countries across Africa and Asia.

6.4 World exports

Global supply chains have successfully reorganised in the wake of Chinese informal import restrictions, with Australian product now being fully redirected to India, Japan, South Korea, and Taiwan.

Indonesia, Russia and Australia remain dominant in global coal export markets, with the former two nations being increasingly drawn to the Chinese market, filling the gap left by Australian supply (Figure 6.5).

Indonesia's exports are rising despite temporary disruptions

Indonesian thermal coal exports remain on track to easily exceed their 2020 levels, recovering solidly (but not completely) from the effects of the COVID-19 pandemic. However, repeated bouts of heavy rainfall through much of 2021 disrupted supply, contributing to recent rises in global thermal coal prices. Access to labour has also been affected by the lingering impacts of the COVID-19 pandemic, and by recent containment efforts.

Indonesia has significant capacity to increase its exports over time. The country has large (albeit relatively low quality) untapped deposits in Kalimantan and Sumatra. Most of these deposits are close to the surface and readily accessible, with good proximity to loading points and ports. However, new coal production is likely to be affected by recent commitments from the Indonesian Government at COP26. These include scrapping future coal plant construction and potentially closing 5.5GW of existing coal plants early in exchange for global support for its wind, solar and geothermal industries.

Government policy has traditionally prioritised domestic supply ahead of exports. However, exports picked up solidly in 2021 as COVID-19 disruptions passed. Exports are expected to hold at around 470-480 million tonnes annually over the rest of the outlook period, while domestic usage grows.

Russia's exports will be supported by improvements in infrastructure

Russian exports have recovered from a series of weather disruptions and accidents during 2021. Russian exports have been heavily supported through 2021 by Chinese restrictions on Australian supply, which created a price premium for Russian product. Expansion of Russian port capacity (from 36 million tonnes to 50 million tonnes annually) is in progress, and is expected to begin operation in 2022. Additional rail freight capacity connecting Russia to markets in East Asia is also under development, with capacity set to grow from 2024.

With bottlenecks on rail supply set to ease, it is expected that Russian exports will grow over the outlook period, and potentially into the late 2020s. Russia has large, high quality and shallow coal deposits. As a result, it has some of the cheapest mining costs in the world, despite the remoteness of many of its deposits.

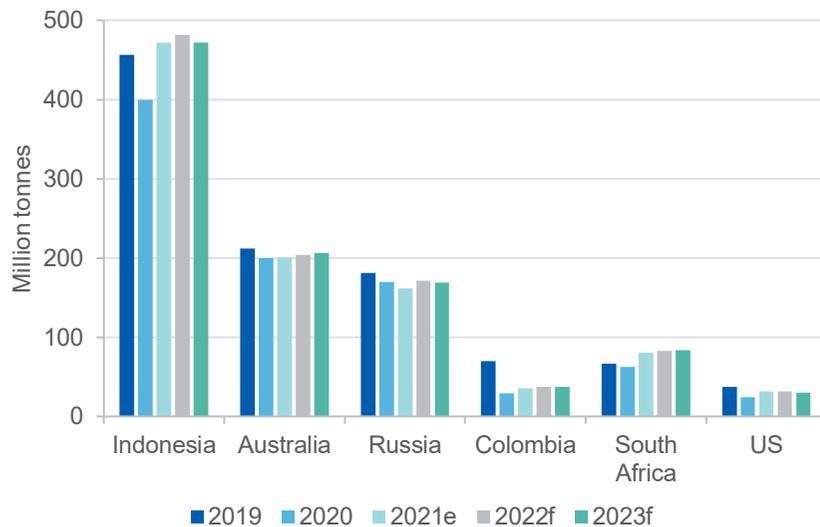
Colombian exports are not expected to recover fully

Colombian exports have faced significant pressure due to declining demand in the European and North American markets. This has pushed remaining exporters to expand their markets in Asia, though export growth on that front is yet to match the declines elsewhere.

Significant mines, including La Jagua and Calenturitas, were also taken offline following falls in regional demand, and are not expected to return to operation in the foreseeable future. The large Cerrejón and Drummond mines remain in operation, though the former continues to face disruptions, most recently to its export route, as a result of protests from indigenous communities and mine workers.

Exports are expected hold their 2021 gains over the rest of the outlook period. However, the permanent closure of some mine sites will prevent exports from recovering to pre-pandemic levels.

Figure 6.5: Thermal coal exports



Notes: e estimate f Forecast.

Source: IHS (2021); IEA (2021) Coal Information; ABS (2021); Department of Industry, Science, Energy and Resources (2021)

US exports have picked up, but long-term cost challenges remain

US exports have often faced competitiveness issues, due to the long transportation distances (notably between Montana and export terminals in Vancouver, which require rail shipment across the Canadian border). The Atlantic market, which is the main destination for most US coal, has also faced steep demand falls in recent years, albeit with some recovery as economies picked up after the COVID-19 pandemic.

It is expected that the US will remain a marginal exporter; recent price growth and global economic recovery should support exports over the outlook period. However, a string of bankruptcies among the country's largest coal producers has affected market confidence and reduced overall capacity, making it unlikely that US coal exports can recover to match the levels of 2018 and 2019.

Conditions are likely to be slightly stronger for some of the smaller thermal coal exporting countries. South African exports, which are generally of high quality, are expected to remain in demand in Asian markets over the outlook period. Exports from Canada are expected to lift from about 4 million tonnes annually to 6 million tonnes by 2023, supported by a ramp-up of output at the Vista mine, which began production in 2019. Longer term, Canadian exports are likely to reduce in line with the Government's pledge to ban thermal coal exports by 2030.

6.5 Prices

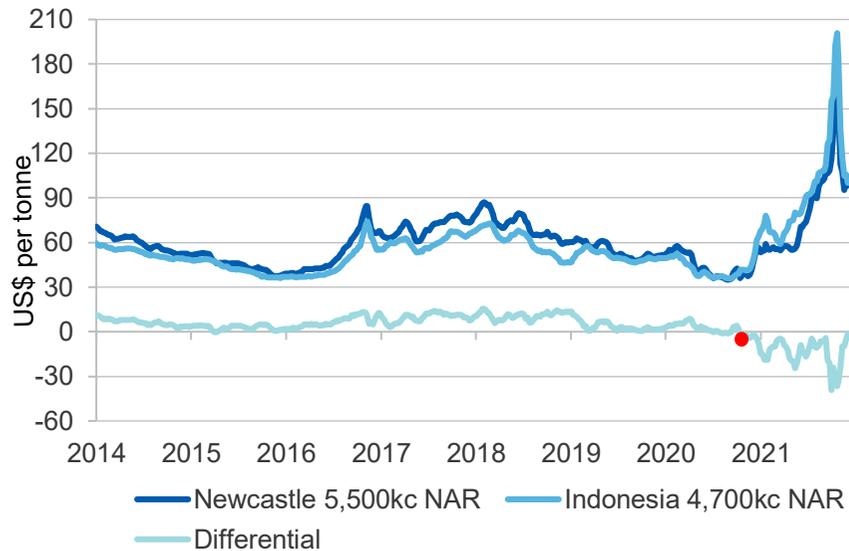
Prices surged during 2021, and are expected to stay volatile and high

Prices rose sharply in the September quarter as a result of a growing supply deficit (Figure 6.6). Pressure on seaborne supply built as China's domestic demand outpaced growth in its domestic supply. Informal import restrictions on Australian coal narrowed China's supply options still further, leading to Chinese domestic prices going over US\$350 a tonne. European gas shortages lifted European coal demand, compounding world shortfalls.

With policy pressure dampening investment in new supply, it is expected that prices will remain high and volatile through the outlook period. Rising imports of thermal coal to India, Vietnam and other parts of Asia are expected to put upward pressure on prices, though policy and economic developments in China may be just as influential. Prices outside China have not risen nearly as far as Chinese domestic prices, but have nonetheless spiked due to low inventories. Price pressure in ex-China Asia has been partially checked by access to more affordable Australian coal, and by a still-incomplete recovery in global demand. It is expected that around half of the fall in global seaborne thermal coal trade recorded in 2020 will have reversed itself in 2021.

On balance, the thermal coal price for Newcastle 6,000kcal product is expected to fall to a still-high US\$120 a tonne in 2022, and to US\$91 in 2023, but there is potential for significant moves in either direction.

Figure 6.6: Thermal coal prices — Australian vs Indonesian



Source: IHS (2021). NAR = Net as received. Red dot indicates timing of Chinese restrictions.

6.6 Australia

Australian thermal coal exporters face volatile conditions in 2021

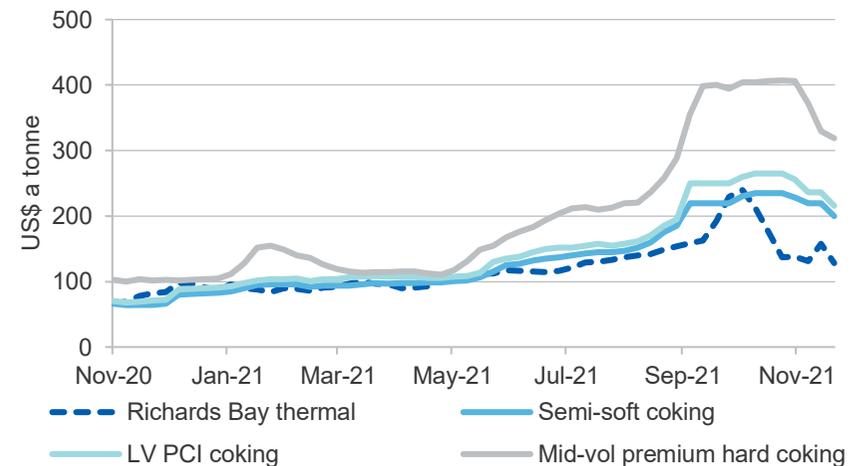
The recent COP26 summit is likely to have mixed effects on Australian coal producers. The recent announcements place additional pressure on long-term prospects for coal demand. Announcements at the summit mean that China will now hold a more dominant share of the world’s remaining prospective coal plants, but informal import restrictions on Australian coal mean that Australia is not well placed to capitalise.

However, by deterring investment, it is likely that recent announcements could place coal prices on a higher footing. This provides a strong profit to existing holders of coal mines, who are expected to benefit from global policy pressures and finance obstacles which reduce the chances for future greenfield projects to be developed.

Some proposed coal projects have recently been withdrawn or abandoned, including proposed mines at Dendrobium and the Bylong Valley. The proposed expansion at New Acland continues to face legal objections, with the owners closing the site in response to the depletion of available resources. Twenty workers will remain employed at the mine to conduct maintenance while the approvals process continues. Shenhua’s Watermark project has also been shelved, with the NSW Government compensating the company \$100 million in exchange for forfeiting development rights at the site.

Partly offsetting this will be the impending ramp-up in output from Bravus’ newly opened Carmichael mine. Other potential projects in the Galilee Basin include GVK Group/Hancock’s Alpha and Kevin’s Corner projects, Waratah Coal’s Alpha North and Galilee projects, and AMCI’s South Galilee Coal Project. None of these potential projects has been committed to yet, but all of them remain possible.

Figure 6.7: Prices for Australian thermal and metallurgical coals



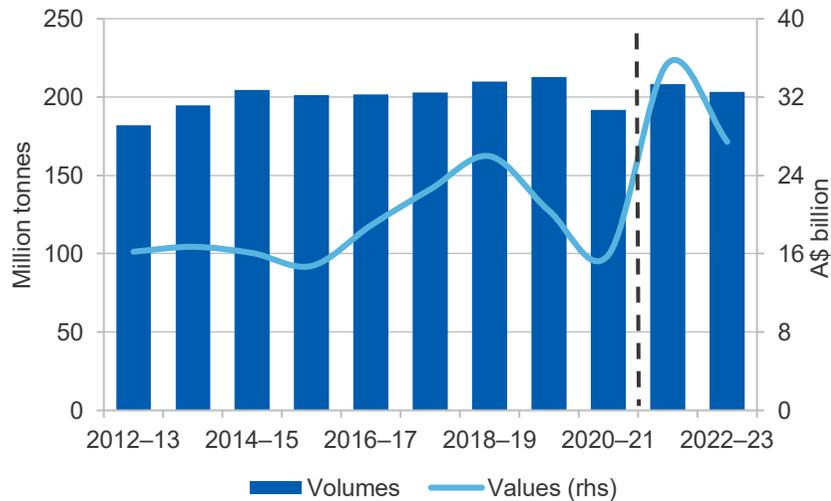
Source: IHS Markit (2021)

Australian coal types remain subject to complex price switching, which has potential to affect export earnings. Notably, premium hard coking coal prices have shifted up relative to lower grade metallurgical coals since mid-2021, and continued to rise for longer (Figure 6.7). The surge in thermal coal prices in October pushed close to parity with lower grade metallurgical coals, providing producers with the incentive to sell unwashed lower grade metallurgical coals into the thermal market. This may have contributed to the recent price fall for Australian thermal coal, and could affect thermal coal export earnings over the next few quarters.

Revisions to the outlook for Australian thermal coal exports

Thermal coal export earnings forecasts have been revised up significantly (more than \$10 billion in 2021–22) from estimates in the September quarter *Resources and Energy Quarterly*. This reflects a sustained surge in coal prices recorded since the previous publication.

Figure 6.8: Australia's thermal coal exports



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

Monthly export earnings are now well above the levels of 2019, despite the persistence of informal import restrictions from China. In volume terms, thermal coal exports are expected to lift noticeably during the outlook period, rising from about 192 million tonnes in 2020–21 to 204 million tonnes by 2022–23 (Figure 6.8). Export values are forecast to rise up from \$16 billion in 2020–21 to \$35 billion in 2021–22, before easing back to \$27 billion in 2022–23.

Table 6.1: World trade in thermal coal

	Unit	2020	2021 ^s	2022 ^f	2023 ^f	Annual percentage change		
						2021 ^s	2022 ^f	2023 ^f
World trade	Mt	1026	1,060	1,084	1,079	7.4	2.3	-0.5
Thermal coal imports								
Asia	Mt	797	864	888	882	8.4	2.8	-0.7
China	Mt	208	259	258	251	24.6	-0.4	-2.7
India	Mt	157	151	164	168	-3.7	8.3	2.5
Japan	Mt	133	141	140	138	6.0	-0.7	-1.4
South Korea	Mt	84	90	86	86	7.1	-4.4	0.0
Taiwan	Mt	53	58	56	54	9.4	-3.4	-3.6
Thermal coal exports								
Indonesia	Mt	399	472	482	472	18.3	2.1	-2.1
Australia	Mt	200	201	204	206	0.5	1.7	0.9
Russia	Mt	177	162	171	169	-8.5	5.6	-1.2
Colombia	Mt	55	36	37	37	-34.5	2.8	0.0
South Africa	Mt	74	80	83	84	7.5	3.8	1.2
United States	Mt	21	32	32	30	52.4	0.0	-6.3

Notes: ^s Estimate ^f Forecast

Source: International Energy Agency (2021); IHS Markit (2021); Department of Industry, Science, Energy and Resources (2021)

Table 6.2: Thermal coal outlook

World	Unit	2020	2021 ^s	2022 ^f	2023 ^f	Annual percentage change		
						2021 ^s	2022 ^f	2023 ^f
Contract prices ^b								
– nominal	US\$/t	69	110	93	77	60.0	-15.8	-16.4
– real ^c	US\$/t	72	110	90	73	53.7	-18.5	-18.5
Spot prices ^d								
– nominal	US\$/t	58	134	120	91	131.3	-10.2	-24.4
– real ^e	US\$/t	60	134	116	85	123.1	-13.2	-26.3
Australia	Unit	2019–20	2020–21	2021–22 ^f	2022–23 ^f	2020–21 ^s	2021–22 ^f	2022–23 ^f
Production	Mt	268	228	258	256	-14.9	13.1	-0.7
Export volume	Mt	213	192	208	204	-9.7	8.4	-2.2
– nominal value	A\$m	20,376	15,998	35,470	27,432	-21.5	121.7	-22.7
– real value ^h	A\$m	21,207	16,385	35,470	26,852	-22.7	116.5	-24.3

Notes: **b** Japanese Fiscal Year (JFY), starting April 1, fob Australia basis. Australia–Japan average contract price assessment for steaming coal with a calorific value of 6700 kcal/kg gross air dried; **c** In current JFY US dollars; **d** fob Newcastle 6000 kcal net as received; **e** In 2021 US dollars; **f** Forecast; **h** In 2020–21 Australian dollars; **s** estimate

Source: ABS (2021) International Trade in Goods and Services, Australia, Cat. No. 5368.0; IHS (2021); NSW Coal Services (2021); Queensland Department of Natural Resources and Mines (2021); Company Reports; Department of Industry, Science, Energy and Resources (2021)