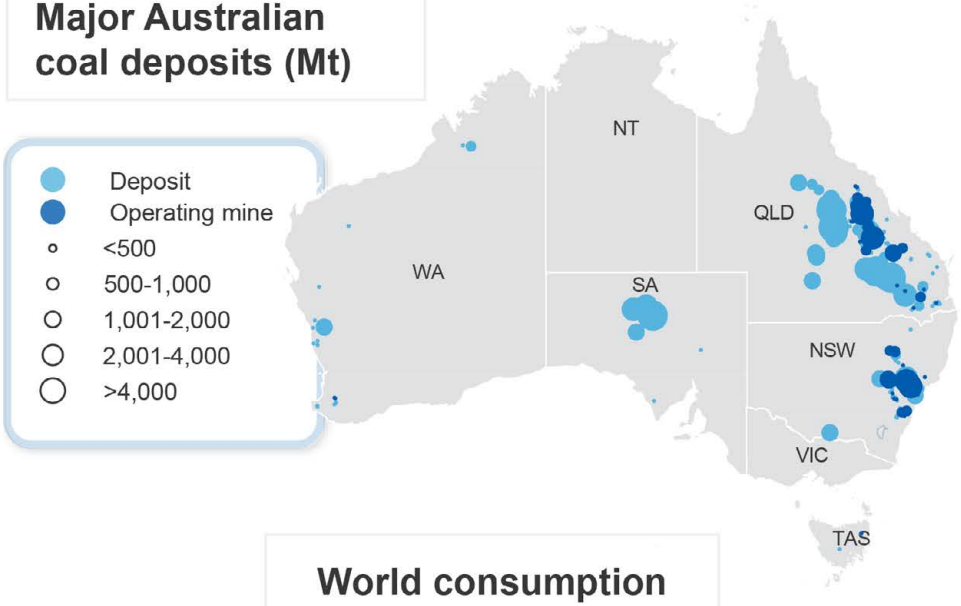
6 C Carbon 12.011

Thermal coal

Major Australian coal deposits (Mt)



Thermal coal

- Thermal coal is primarily used in **electricity generation**
- Coal accounted for **45%** of power generation globally in 2018
- Mines are open cut or underground depending **on the geology deposit**
- **Coal formation** began 290-360 million years ago

World consumption

53% China

14% India

9% United States

3% South Africa

3% EU28

2% Japan

Australia's thermal coal

World's 2nd largest **thermal coal** exporter

World's 4th **largest black coal** resources

75-80% thermal coal **is exported**

6.1 Summary

- The Newcastle benchmark thermal coal spot price is projected to average US$60-75 a tonne in real terms over the five years to 2025, down on US$76 a tonne in 2019. Seaborne imports are expected to edge down slightly, but the lack of new thermal coal projects in the pipeline should provide some support to prices.
- Australia's export volumes are forecast to grow from 210 million tonnes in 2018–19 to 224 million tonnes by 2024–25, as a number of mines ramp up production. The continued shift in world coal trade towards the Asia-Pacific should favour Australia's thermal coal exporters over competitors like the United States and Colombia.
- The real value of Australia's thermal coal exports is projected to decline sharply from $26 billion in 2018–19 to $21 billion in 2019–20, as a result of the recent price decline. Export earnings are then expected to edge down and level out in the $17-20 billion range through to 2024–25, in real terms.

6.2 Prices

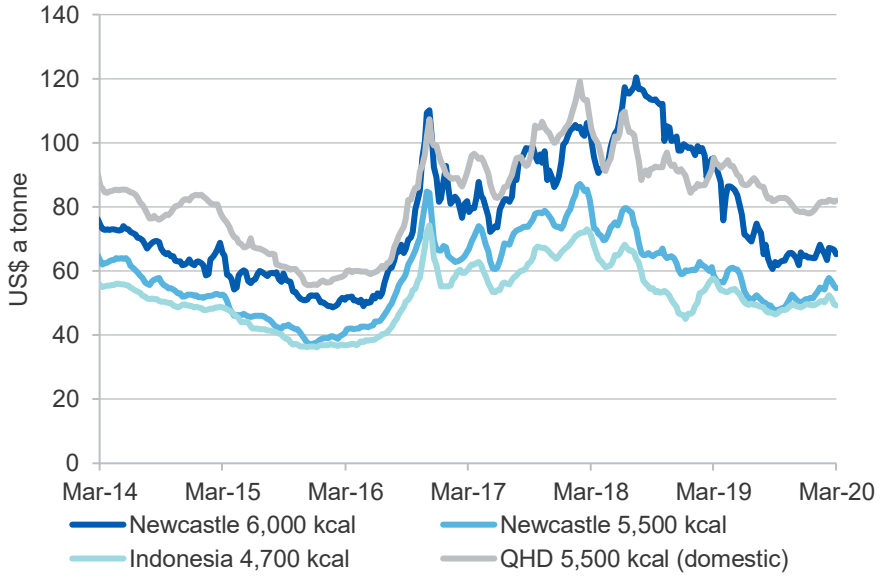
Thermal coal prices stabilized in early 2020 after declining over 2019

The benchmark Australian thermal coal spot price — the Newcastle 6,000 kcal/kg NAR (Net As Received) — stabilised in the US$60-70 a tonne range in the first quarter of 2020, after steadily falling from a peak of US$120 a tonne in mid-2018 (Figure 6.1). The 2018 price spike was driven by supply constraints in Indonesia (due to monsoonal rains), South Africa (where exports were diverted for domestic use) and China (due to coal industry restructuring), combined with strong demand from China (due to weak hydro output and hotter than average summer temperatures) and South Korea (where nuclear reactors were offline). As China increased domestic production and temporary influences receded, prices declined over 2019. Low LNG prices also encouraged coal-to-gas switching, particularly in Europe, and further weighed on thermal coal consumption. The Newcastle spot price averaged US$76 a tonne in 2019 in real terms.

The impact of COVID-19 on thermal coal prices has been modest so far

To date, COVID-19 appears to have had a modest impact on the supply-demand balance in thermal coal markets. Both Chinese domestic and international benchmark prices have lifted slightly since the spread of the virus began to accelerate from late January, with the most significant price rises for the 5,500 kcal coal that China tends to import (Figure 6.1). China's domestic output was initially affected by the spread of the virus, with miners unable to return to work due to restrictions on people movements. However, at the same time, slower economic activity as a result of COVID-19 kept power consumption low and thus reduced thermal coal demand. By late February 2020, the vast majority of China's thermal coal capacity had reportedly resumed production.

Figure 6.1: Thermal coal prices



Notes: Qinhuangdao (QHD) is the largest coal port in China and QHD prices are a key benchmark for coal prices in northeastern China.

Source: IHS (2020)

Thermal coal prices to remain subdued as seaborne demand edges down

The Newcastle 6,000 kcal spot price is expected to remain relatively steady over the next five years, averaging between US$60-75 a tonne on an annual basis in real terms (Figure 6.2). The Japanese Fiscal Year (JFY) contract price, which serves as a benchmark for the Asian market, is also forecast to decline from US$95 for 2019–20 (April 2019 to March 2020), but settle at a premium relative to the spot price. At the time of writing, the 2020–21 (April 2020 to March 2021) contract price had not yet been settled.

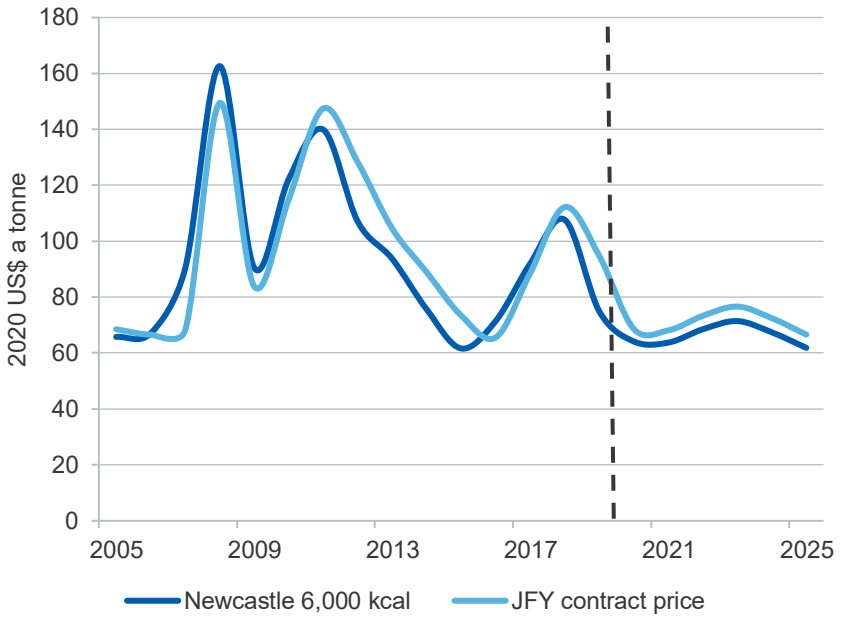
Relatively weak seaborne thermal coal demand is expected to weigh on prices over the next five years. Europe and developed Asian economies look set to reduce thermal coal usage, while the world's two largest consumers (China and India) have signalled their intention to reduce thermal coal imports by increasing domestic production. Growing demand from South and Southeast Asia should mostly offset declining thermal coal imports elsewhere. Competition from LNG is also expected to weigh on thermal coal demand by encouraging coal-to-gas switching, especially while LNG prices remain near record lows in spot and short-term markets (see *gas* chapter).

The supply-side of seaborne thermal coal markets is expected to remain relatively tight, providing some support to prices. Most thermal coal projects in the investment pipeline are designed to sustain production at existing mines and greenfield expansions are rare. Country-specific factors help to explain the tight supply outlook. Indonesia is aiming to reduce thermal coal exports to preserve its coal reserves for domestic use. Domestic challenges have resulted in underinvestment in Colombia's thermal coal sector in recent years.

Uncertainty over the longer-term demand for thermal coal also appears to be deterring investment in new mines and infrastructure capacity. Climate policies are the key source of uncertainty. A ratcheting up of current climate targets, as envisaged in the Paris Agreement, would have implications for thermal coal demand. Under the Paris Agreement, countries have agreed to submit updated climate targets as part of their Nationally Determined Contributions (NDCs) every five years, with each NDC expected to contain more ambitious targets than the last. Stronger-than-expected emissions reductions targets and policy are a key risk to the outlook for thermal coal demand.

Difficulties obtaining finance for new thermal coal projects could also constrain the development of new thermal coal supply. A growing list of lenders have announced they will no longer finance thermal coal projects, and pension and equity funds are divesting from thermal coal. State-owned enterprises and private equity have, to some extent, stepped into the gap to finance new projects and expansions. Other projects such as Carmichael have self-financed. However, financing is likely to be a challenge for some thermal coal project developers moving forward.

Figure 6.2: Thermal coal price outlook



Notes: JFY is Japanese Fiscal Year (April to March).

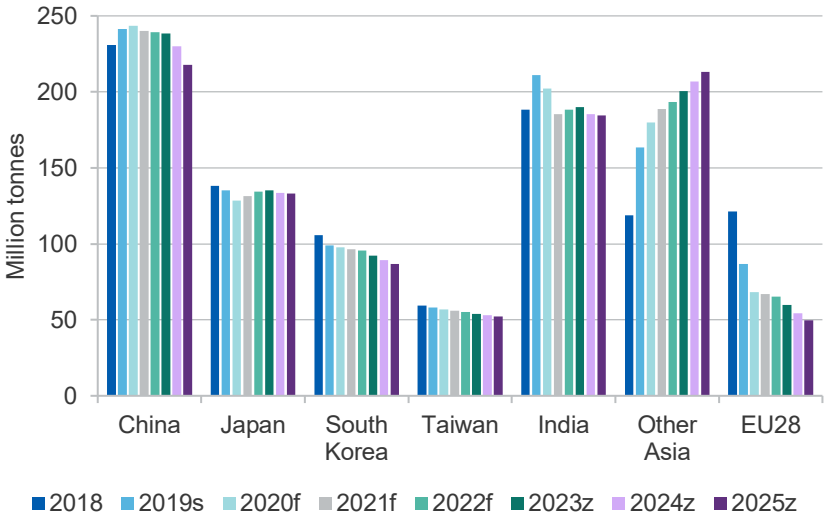
Source: IHS (2020), Department of Industry, Science, Energy and Resources (2020)

6.3 World trade

World thermal coal trade continued to climb in 2019, increasing by an estimated 3 per cent to around 1.1 billion tonnes. This was the fourth consecutive annual increase after the seaborne market contracted in 2015 for the first time this century. Emerging Asia — led by China and India — drove imports higher, offsetting lower demand in Europe, Japan, South Korea and Taiwan.

World trade in thermal coal is expected to decline at an average annual rate of around 1 per cent a year between 2019 and 2025. Thermal coal demand should continue to fall in Europe and developed Asia, and rising coal consumers like India and China are seeking to reduce thermal coal imports (Figure 6.3). However, Southeast and South Asia are expected to increase thermal coal imports as coal-fired power stations currently under construction are completed.

Figure 6.3: Thermal coal imports

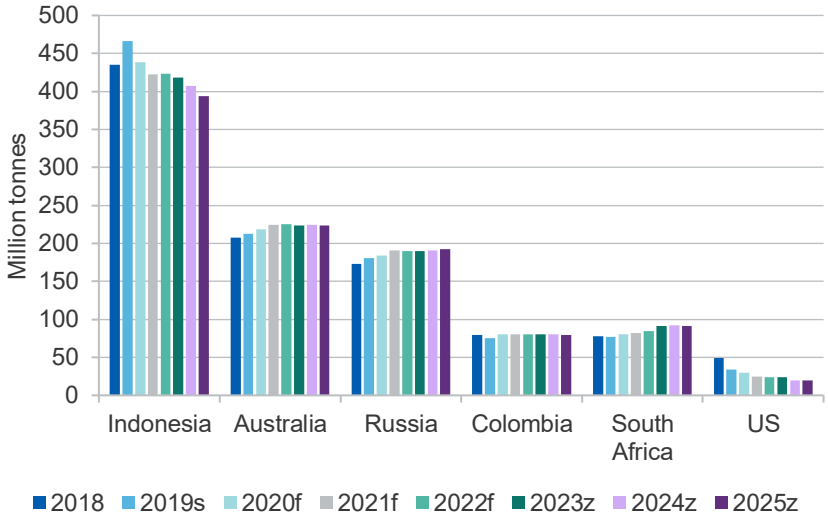


Notes: **s** Estimate **f** Forecast **z** Projection

Source: IHS (2020); IEA (2019) Coal Market Report; Department of Industry, Science, Energy and Resources (2020)

The continued shift of thermal coal consumption away from the Atlantic Basin market and towards the Pacific Basin should see supply increase from Australia, and from producers who can pivot eastward such as Russia and South Africa. Exporters in the US and Colombia, which have historically sold into the declining Atlantic market, are expected to face difficulties securing a foothold in the Pacific market (Figure 6.4).

Figure 6.4: Thermal coal exports



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

Source: IHS (2020); IEA (2019) Coal Market Report; ABS (2019); Department of Industry, Science, Energy and Resources (2020)

6.4 World imports

China's imports to fall driven by government policy

As the world's largest thermal coal consumer and importer, China has exerted a profound influence on seaborne markets. After declining between 2014 and 2016, China's thermal coal consumption appears to have risen for a third straight year in 2019, driven by growing electricity demand. China imported an estimated 241 million tonnes of thermal coal

in 2019, up around 5 per cent on 2018, and domestic output also increased over this period.

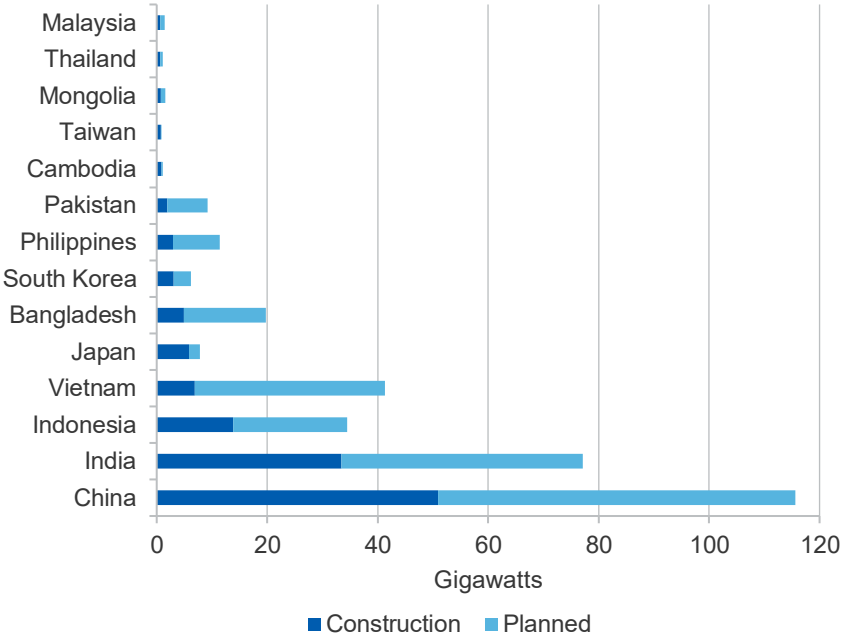
China's thermal coal imports are projected to decline gradually to 218 million tonnes in 2025, with increases in domestic output slightly outpacing consumption growth. China's coal usage is expected to rise over the next two years, before plateauing. Electricity demand in China continues to grow rapidly. While the bulk of new installed capacity is likely to come from hydro and renewable generation, coal-fired power generation is also expected to rise to meet China's growing electricity demand.

China has a substantial pipeline of coal-fired power stations, following the approval of a large amount of new capacity between September 2014 and March 2016. During this period, China's central government delegated permitting for coal-fired power stations to provincial authorities, which had strong incentives to approve new coal-fired power stations to meet economic targets for their provinces. China currently has over 1,000 GW of coal-fired power generation capacity, and in late 2019 there was a further 116 GW under construction or in planning (Figure 6.5). Other data puts these figures higher, at around 121 GW under construction and a further 74 GW at other stages of development, although not all this capacity is expected to proceed.

While China's central government has subsequently acted to rein in the permitting of new coal-fired capacity and cancellations of projects in the pipeline have been rising, the current pipeline is enough to support increased coal-fired power generation over the outlook period to 2025. Given the pipeline of coal projects in China, it is possible that the central government will raise the coal power cap in the country's 14th Five Year Plan (2021-2025) to be released in 2020. China's 13th Five-Year Plan (2016-2020) set a coal power cap of 1,100 GW. State planning bodies have recommended the cap be lifted to between 1,200-1,400 GW. Increases in coal consumption in power generation are likely to be partly offset by falls in coal consumption in residential, commercial and small-scale industry sectors, as a result of China's efforts to reduce air pollution.

China's coal production is expected to increase over the outlook period, increasingly eating into China's import requirements (Figure 6.6). After several years of supply-side reform, the bulk of China's capacity closures have been completed and approvals for new coal mine capacity surged in 2019. While the National Development and Reform Commission (NDRC) has announced a new phase of supply-side reforms, targeting the closure of smaller mines with capacity of less than 0.3 million tonnes per annum (mtpa) and continuing industry consolidation, these are not expected to have the same impact on domestic production as previous reforms. Domestic production will be supported by infrastructure improvements and expansions, including the 60 mtpa Haoji railway commissioned in October 2019, which are increasingly connecting domestic supplies with demand centres.

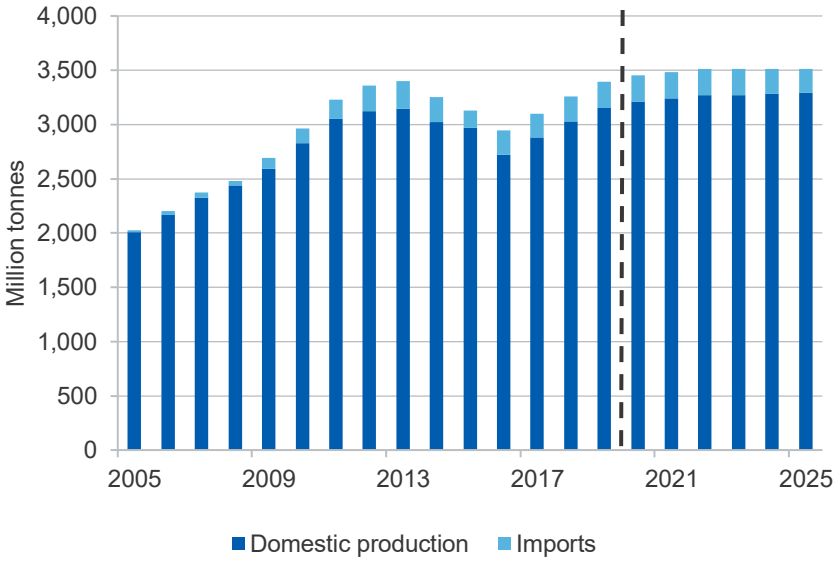
Figure 6.5: Pipeline of coal-fired power stations in Asia



Source: S&P Global Market Intelligence (2019)

Chinese policymakers are expected to shape developments on seaborne thermal coal markets over the outlook period to 2025. China's government has actively sought to manage coal import levels over the past few years, since its efforts to restructure its domestic coal industry led to Chinese miners arguing that imports were being favoured over domestic production. Although no official target was set, China reportedly sought to cap total coal imports at around 280 million tonnes in 2019, at times implementing measures that resulted in extended customs clearance times for vessels at Chinese ports. China's combined (thermal and metallurgical) coal imports easily exceeded this quota in 2019, with Chinese government data putting total coal imports at 300 million tonnes — 225 million tonnes of thermal and 75 million tonnes of metallurgical coal. Nevertheless, moving forward, similar limits — if more strictly enforced — would limit the scope for import growth.

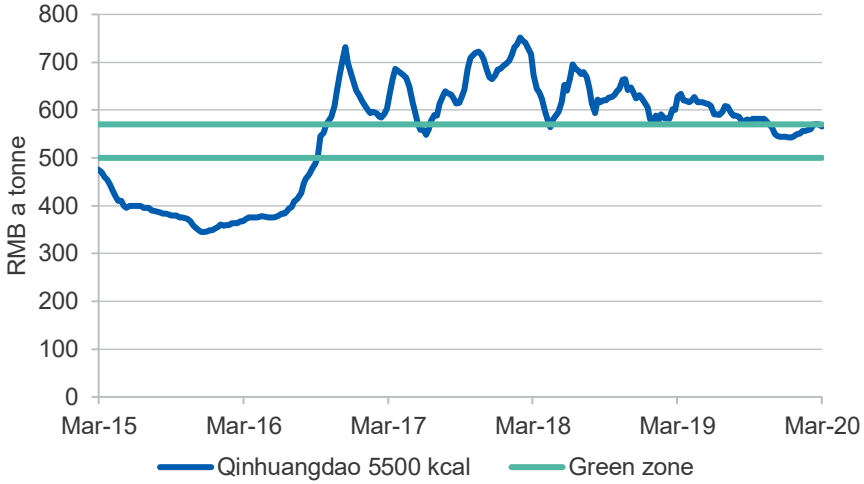
Figure 6.6: China's thermal coal production and imports



Source: IEA (2019) Coal Information; IEA (2019) Coal 2019; Bloomberg (2020) National Bureau of Statistics of China; Department of Industry, Science, Energy and Resources (2020)

Chinese policymakers have also sought to use policy measures to keep domestic thermal coal prices within the 'green zone' — a price band of 500 to 570 Renminbi (RMB) (Figure 6.7). Prices in this range are understood to be broadly acceptable to China's power generators and industrial consumers, while also providing high enough margins for domestic coal producers. Thermal coal import policy has been a key tool for stabilising domestic prices in the green zone: China's government has tended to ease import restrictions when domestic prices are high, and tighten restrictions when domestic prices are at more acceptable levels.

Figure 6.7: China's domestic thermal coal price



Notes: Qinhuangdao (QHD) is the largest coal port in China and QHD prices are a key benchmark for coal prices in northeastern China.

Source: Bloomberg (2020)

The outlook for China's thermal coal imports remain highly uncertain, with small swings in domestic production and consumption having a large impact on imports. Policy uncertainty has been — and will continue to be — a key risk. China's coal policies will continue to be driven by the sometimes competing priorities of economic growth and supporting domestic production, reducing air pollution and minimising electricity prices, against the backdrop of international climate commitments.

India's imports to fall back from highs as production growth resumes

India is the world's second largest thermal coal importer and consumer. After declining in 2015 and 2016, India's thermal coal imports recorded their third consecutive annual increase in 2019, rising by 12 per cent to reach an estimated 211 million tonnes — a record high. Higher imports were the result of increasing consumption coupled with a decline in domestic production, on the back of heavy rain in an extended monsoon season.

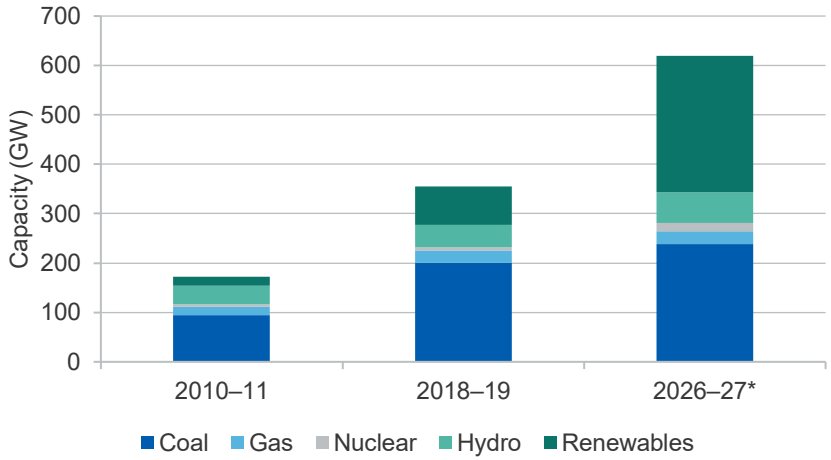
In February 2020, India's Minister for Coal and Mines announced India would aim to stop importing thermal coal from Indian fiscal year 2023–24. India faces considerable barriers to achieving this goal. In 2014, Indian government officials indicated that India would become self-sufficient in thermal coal within 2-3 years, but imports have since climbed. However, the announcement signals a renewed intent to cut thermal coal imports.

India's thermal coal imports are expected to fall from current highs, as production growth resumes — driven by government targets and policy. Annual imports should level out in the 185-190 million tonne range over the next five years.

India's coal consumption is expected to grow rapidly over the next five years, as the country's electricity demand grows. Under India's 2018 national electricity plan, renewable generation and hydro account for the majority of new capacity, but coal-fired power generation is expected to grow from 204 GW in November 2019, reaching 217 GW in 2021–22 and 238 GW in 2026–27 (Figure 6.8). Increasing utilisation of existing coal-fired stations will also drive thermal coal demand. India has built a large amount of coal generation capacity in recent years and coal-fired power plants in India are running well below capacity.

To meet rising coal demand, India is aiming to increase coal production. The Indian government's strategy has several elements. The first is to boost production by state-owned companies, particularly Coal India — which currently accounts for 85 per cent of production. Coal India has a production target of 1 billion tonnes by Indian fiscal year (April-March) 2023–24, up from 607 million tonnes in 2018–19.

Figure 6.8: India's installed electricity generation capacity and national electricity plan targets



Notes: *Target as given in India's 2018 national electricity plan. Installed capacity is at March each year. Hydro refers to large-scale hydro. Renewables include wind, solar, biomass and mini-hydro. Excludes diesel.

Source: Central Electricity Authority (2020)

Second, the Indian government is looking to increase production by the private sector, and has introduced a number of reforms to encourage private investment. In February 2018, the Indian government changed the rules governing coal mine auctions to allow private producers to develop new mines. In August 2019, the Indian government opened up the country's coal sector to 100 per cent foreign direct investment. Then, in January 2020, the Indian government introduced a raft of reforms that included removing end-use restrictions on coal blocks, allowing captive producers — private end users such as electricity generators, who produce their own coal — to sell coal on the open market. India faces substantial barriers to achieving its production targets, especially around approvals and land acquisition for new coal projects. While India will likely

fall short of its production targets, government policy is nevertheless expected to propel Indian coal production higher over the next five years.

Overall, the outlook for India's imports remains finely balanced. With India's coal consumption and production both dwarfing import requirements, small swings in either would exert a huge influence over the trajectory of India's thermal coal imports. The long-term outlook for India's thermal coal imports is discussed in the Office of the Chief Economist's *Coal in India 2019* publication.

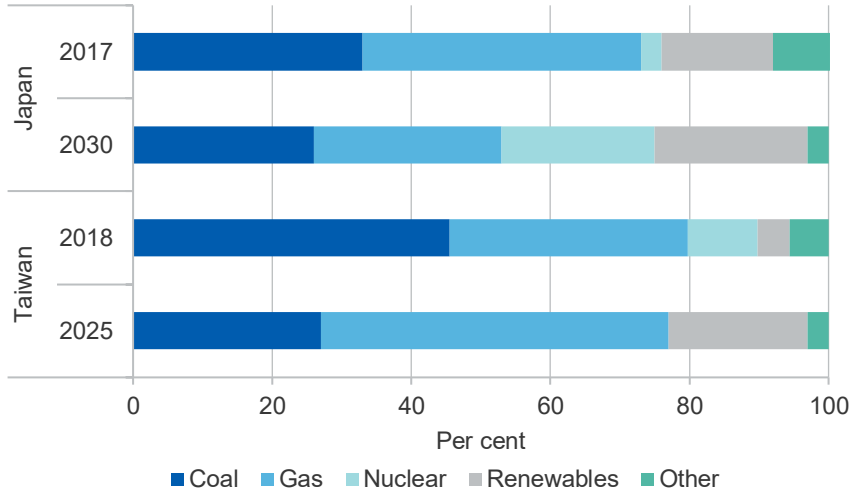
Competing trends to leave Japan's imports broadly unchanged

Japan is the world's third largest thermal coal importer, importing an estimated 135 million tonnes of thermal coal in 2019. Japan's thermal coal imports are projected to be broadly unchanged over the next five years.

Competing trends are at work in Japan. There is around 6 GW of new coal-fired coal capacity under construction, and few coal-fired power station retirements are expected before 2025. However, energy demand in Japan is expected to decline slightly over the next five years, and Japan is planning to shift its power generation mix towards nuclear and renewable energy, and away from natural gas and coal. The 2011 Fukushima disaster resulted in the closure of Japan's nuclear fleet. At the time of writing, nine of Japan's 42 nuclear reactors had gained approval to restart. More reactors are likely to come back online over the next five years, with 18 reactors having submitted applications to Japan's Nuclear Regulation Authority to restart. If realised, Japan's energy plan would see coal's share of power generation fall from 33 per cent in Japanese Fiscal Year (April-March) 2017–18 to 26 per cent in 2030–31 (see Figure 6.9).

The pace of nuclear restarts is the main uncertainty affecting the outlook for Japan's thermal coal imports. Nuclear energy in Japan continues to face public opposition and legal challenges. There remain significant risks of delays and slippages in nuclear restarts. The outlook for nuclear generation is further complicated by new counterterrorism measures that require nuclear reactors to complete additional upgrades to meet the new security requirements.

Figure 6.9: Japan and Taiwan's power generation mix targets



Notes: Japanese fiscal years (April-March) 2017-18 and 2030-31.
Source: Taiwan Bureau of Energy (2019); Ministry of Economy, Trade and Industry (2018)

South Korea's coal imports to decline as energy transition accelerates

South Korea is the world's fourth largest thermal coal importer, purchasing an estimated 99 million tonnes of thermal coal in 2019. South Korea's thermal coal imports are projected to fall steadily over the next five years, reaching 87 million tonnes in 2025.

South Korea's long-term plan is to shift its energy mix towards renewables and gas, and away from nuclear and coal. Under South Korea's energy plan, no new coal-fired power or nuclear capacity will be added, aside from that already under construction.

The South Korean government has introduced strong environmental regulations to improve air quality and reduce emissions. Sixty coal-fired power stations across the country are limited to operating at 80 per cent capacity when air pollution reaches a certain threshold. Since 2018, older coal-fired power stations have been closed between March and June each year. In late 2019, South Korea stepped up this approach, announcing that

operations would be suspended at between 8 and 15 plants in the December 2019 to February 2020 period. A number of coal-fired power plants will close over the outlook period, although this will be offset by the commissioning of new coal generation capacity.

South Korea's government also introduced new tax arrangements in May 2019 aimed at encouraging gas use over coal: it lowered consumption and import taxes on LNG, and raised consumption taxes on coal.

Taiwan's imports projected to decline under national energy plan

Taiwan's thermal coal imports remained broadly steady in 2019, at an estimated 58 million tonnes. Taiwan's thermal coal imports are projected to decline over the outlook period to around 52 million tonnes. Taiwan is aiming to shift its power generation mix towards gas and renewables, and away from nuclear and coal (Figure 6.9). Under Taiwan's energy plan, coal's share of power generation would fall from 46 per cent at present to 27 per cent in 2025. At a referendum held in November 2018, Taiwanese voters endorsed the government's stance that no more coal-fired power plants should be built.

However, Taiwan faces challenges in achieving such a rapid energy transition. Taiwan will need to quickly bring on LNG regasification capacity in order to ramp up LNG imports, and project slippage will remain a risk. Taiwan's energy plan also envisages a 10-fold expansion in solar photovoltaic capacity, but Taiwan is densely populated, and access to land to support the ramp up remains a major challenge. To date, Taiwan's expansion of offshore wind generation has gone relatively smoothly, with greater government control over offshore development rights.

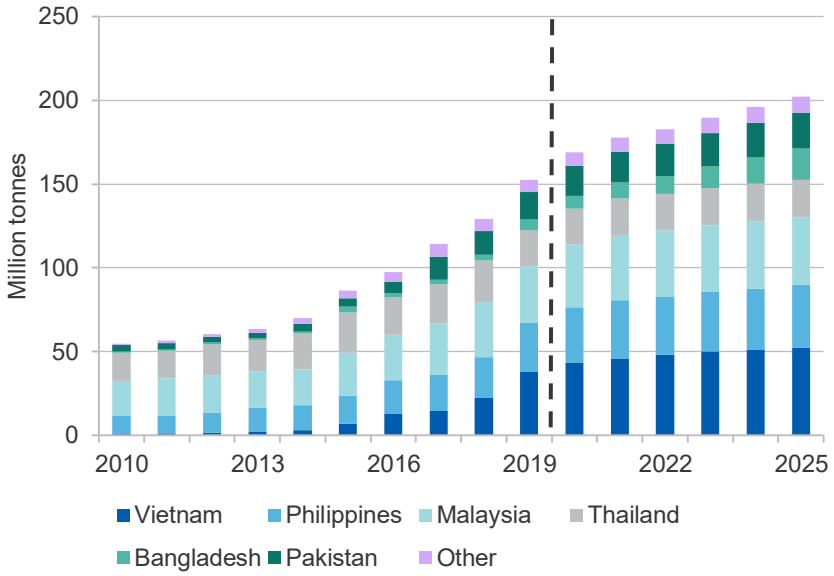
Southeast and South Asia to be a key source of import growth

In 2018, Southeast and South Asia imported a combined 129 million tonnes of thermal coal. The largest importers of thermal coal in Southeast Asia were Malaysia (33 million tonnes), Thailand (25 million tonnes), the Philippines (24 million tonnes) and Vietnam (22 million tonnes). In South Asia, Pakistan was the largest thermal coal buyer (14 million tonnes), followed by Bangladesh (3 million tonnes).

While countries in Southeast and South Asia are relatively small importers individually, collectively, the region is expected to play a substantial role in thermal coal markets going forward. The thermal coal imports of Southeast and South Asia are expected to increase by 70 million tonnes over the next five years, reaching over 200 million tonnes in 2025 (Figure 6.10). Strong economic and population growth is driving robust growth in demand for electricity, and coal-fired power generation is expected to play a key role in meeting growing usage. Southeast and South Asia's share of world imports is expected to increase from 12 per cent in 2018 to 19 per cent in 2025.

In South Asia, Pakistan has recently commissioned a number of new coal-fired power stations and has around 2 gigawatts (GW) under construction and a further 7 GW planned. Bangladesh has around 5 GW under construction and a further 15 GW at the planning stage.

Figure 6.10: South and South East Asia thermal coal imports



Source: IEA (2019) Coal Market Report; IEA (2019) Coal Information; Department of Industry, Science, Energy and Resources (2020)

In Southeast Asia, around 12 GW of new coal-based generation capacity is under construction in key importing countries, with another 46 GW at the planning stage. Vietnam is expected to be a key driver of import demand growth. Under Vietnam's Power Development Plan, coal-fired power would account for 49 per cent of the country's generation capacity by 2025. Around 7 GW of coal-fired power capacity is under construction, with 34 GW at the planning stage. However, there are downside risks to the outlook, with the country's National Steering Committee for Power Developing reportedly recommending that the Vietnamese government scale back the target for coal-fired power to 37 per cent in 2025.

Overall, while project cancellations appear to have been rising in recent years, the completion of coal-fired power stations currently under construction is expected to drive the region's demand for thermal coal imports higher over the next five years (Figure 6.10).

6.5 World exports

Indonesia's exports to decline as coal is directed to the domestic market

Indonesia is the world's largest thermal coal exporter. In 2019, Indonesia's exports grew by 7 per cent to an estimated 466 million tonnes — a record high. Coal production reached around 610 million tonnes, exceeding the government's coal production target of 550 million tonnes. The Indonesian government is targeting an output cap of 550 million tonnes for 2020. Whether this target can be achieved remains to be seen, with output having exceeded the target for the past few years. Indonesian producers tend to be responsive to price rises, and the government has sometimes relaxed output restrictions at times of high prices to help ease the current account deficit.

Even if targets are not fully achieved, however, government policy should drive Indonesia's thermal coal exports lower over the next five years. The Indonesian government is expected to limit annual production at lower levels over the outlook period, in order to safeguard coal reserves for future use. The government is also expected to continue to increase the Domestic Market Obligation (DMO), under which Indonesian producers are obliged to sell at least 25 per cent of production into the domestic market at capped prices. With constrained production and supply being increasingly diverted to the domestic market, Indonesia's thermal coal exports are projected to fall to about 394 million tonnes by 2025.

South Africa to seek out new markets and increase exports

South Africa exported an estimated 77 million tonnes of thermal coal in 2019. South Africa's thermal coal exports are projected to rise over the next five years, reaching 92 million tonnes in 2025, as several new mines commence operations. South Africa is expected to increase its exports to India, and increasingly target other Asian markets — such as Pakistan and South Korea — as European coal consumption declines. A modest decline in domestic consumption should also help free up thermal coal for export. In October 2019, the South African government approved the National Development Plan, which foresees coal-fired power generation capacity falling from 37 GW at present to 33 GW by 2030.

Russia's exports forecast to grow on the back of recent investment

Russia's thermal coal exports increased for the fourth consecutive year in 2019, up by around 5 per cent to a record high of an estimated 181 million tonnes. Russia has been investing heavily in transportation infrastructure to the country's eastern ports — targeting the Asian premium market, where Japan's utilities are diversifying their sources of supply, and South Korea's new regulations are increasing demand for Russia's low sulphur coal. The low Russian ruble has also helped Russian coal miners.

Russia's thermal coal exports are expected to reach 192 million tonnes by 2025. Export growth will be supported by ongoing government plans to invest in the coal industry and in rail and port infrastructure. Russia's Ministry of Energy has announced plans to expand its total coal production (metallurgical and thermal) from around 420 mtpa to 480 mtpa by 2030.

US exports to decline due to cost and infrastructure challenges

Falling prices saw US thermal coal exports fall sharply in 2019, to an estimated 34 million tonnes — down around 30 per cent on the previous

year. The US is a price-sensitive swing supplier in the seaborne thermal coal market, with most US producers considered high cost. A strong US dollar, falling demand in Europe (traditionally the destination for US coal), and a lack of infrastructure on the US west coast (near Asian markets) have added to the difficulties facing US producers. These challenges are expected to result in US thermal coal exports declining from current levels to reach 20 million tonnes in 2025.

Colombia's thermal coal exports to remain stable

Colombia's thermal coal exports declined from 80 million tonnes in 2018 to 75 million tonnes in 2019. Exports are projected to rebound slightly and then remain stable at around 80 million tonnes. A lack of investment in Colombia's coal sector in recent years and falling coal consumption in Europe — where Colombian producers have historically sold their coal — are expected to limit the export growth. Most of Colombia's coal mines are on the Caribbean coast, and its producers face high shipping costs to growing demand centres in Asia.

6.6 Australia

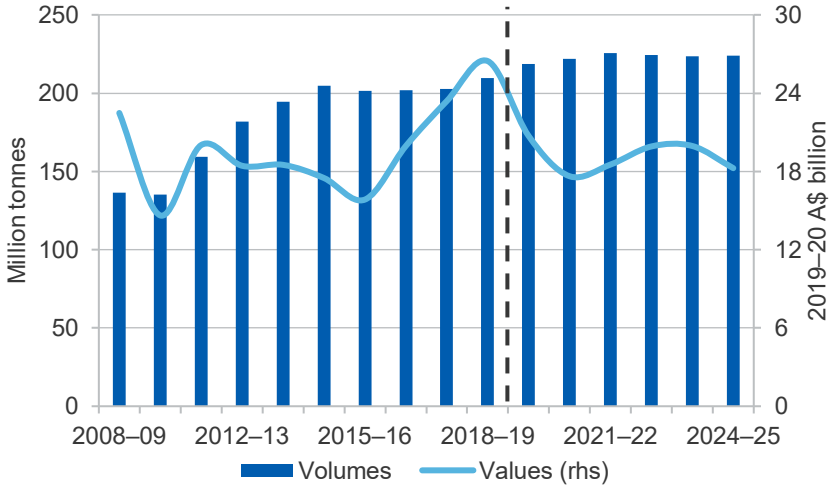
Thermal coal exports earnings are expected to decline

The value of Australia's thermal coal exports is projected to decline from $26 billion in 2018–19 to $21 billion (in real terms) in 2019–20, as a result of price falls over the past year. Export earnings are then forecast to edge down and stabilise in the $17-20 billion range in 2020–21 and over the remainder of the outlook period (Figure 6.11). Australia's thermal coal export volumes are forecast to grow from 210 million tonnes in 2018–19 to 224 million tonnes in 2024–25. The continued shift in coal trade towards the Asia-Pacific should favour Australian producers, as well as exporters that can pivot eastward such as South Africa and Russia.

Increased Australian exports are expected to be driven by the ramp up of production at both new and existing thermal coal mines. Adani Group's 10–15 mtpa Carmichael coal mine is expected to produce first coal in 2021. BHP's Mount Arthur mine in the Hunter Valley in New South Wales — which produced 18 million tonnes in 2018–19 — has approval to increase production to 27 mtpa. Glencore's Rolleston mine in the Bowen Basin in Queensland — which produced around 16 million tonnes in 2018–19 — has approval to scale up production to 19 mtpa. New Hope's New Acland mine in the Darling Downs region in Queensland has applied for approval for an expansion that would see the mine's capacity increased to 7.5 mtpa. MACH Energy's Mount Pleasant mine in New South Wales appears to be rapidly ramping up to full capacity of 7.5 mtpa. Overall, while some Australian mines may not reach their full approved capacity, at least within the outlook period, increased output from a number of established mines with relatively low production costs does appear likely.

Increases in output from new and established mines are expected to be partly offset by the closure of several mines over the outlook period due to resource depletion. The forecast for relatively low thermal coal prices presents a downside risk for higher cost mines. Yancoal has announced it will place its Austar underground mine in New South Wales on care and maintenance from 31 March 2020 as the current mining area reaches completion.

Figure 6.11: Australia's thermal coal exports



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

Table 6.1: World trade in thermal coal

	Unit	2019[s]	2020[f]	2021[f]	2022[f]	2023[z]	2024[z]	2025[z]	CAGR[r]
World trade	Mt	1,143	1,124	1,117	1,124	1,123	1,108	1,092	-0.8
Thermal coal imports									
Asia	Mt	908	909	898	906	910	899	888	-0.4
China	Mt	241	240	240	239	238	230	218	-1.7
India	Mt	211	202	185	188	190	186	185	-2.2
Japan	Mt	135	128	131	134	135	134	133	-0.2
South Korea	Mt	99	98	97	95	92	89	87	-2.2
Thermal coal exports									
Indonesia	Mt	466	438	422	423	418	407	394	-2.8
Australia	Mt	212	218	224	225	223	224	224	0.9
Russia	Mt	181	184	191	190	190	190	192	1.0
Colombia	Mt	75	80	80	80	80	80	80	1.1
South Africa	Mt	77	80	82	85	91	92	92	2.9
United States	Mt	34	30	25	24	24	20	20	-8.6

Notes: **s** Estimate; **f** Forecast; **z** Projection; **r** Compound average annual growth rate between 2019 and 2025.
Source: IEA (2019) Coal Information 2019; IEA (2019) Coal 2019; IHS (2020); Department of Industry, Science, Energy and Resources (2020)

Table 6.2: Thermal coal outlook

World	Unit	2019	2020[f]	2021[f]	2022[f]	2023[z]	2024[z]	2025[z]	CAGR[r]
Contract prices[b]									
– nominal	US$/t	95	70	71	78	84	81	76	-3.6
– real[c]	US$/t	95	69	68	73	77	72	67	-5.7
Spot prices[d]									
– nominal	US$/t	74	65	66	72	77	75	70	-0.9
– real[e]	US$/t	76	65	64	69	72	68	63	-3.1
Australia	**Unit**	**2018–19**	**2019–20[f]**	**2020–21[f]**	**2021–22[f]**	**2022–23[z]**	**2023–24[z]**	**2024–25[z]**	**CAGR[r]**
Production	Mt	272	274	284	288	287	286	286	0.8
Export volume	Mt	210	218	222	225	224	224	224	1.1
– nominal value	A$m	25,958	20,713	17,986	19,306	21,250	21,811	20,453	-3.9
– real value[h]	A$m	26,446	20,713	17,637	18,534	19,921	19,948	18,241	-6.0

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 6,700 kcal/kg gross air dried; **c** In current JFY US dollars; **d** fob Newcastle 6,000 kcal net as received; **e** In 2020 US dollars; **f** Forecast; **h** In 2019–20 Australian dollars; **r** Compound annual growth rate from 2019 to 2025, and 2018–19 to 2024–25.

Source: ABS (2020) International Trade in Goods and Services, Australia, Cat. No. 5368.0; IHS (2020); NSW Coal Services (2020); Queensland Department of Natural Resources and Mines (2020); Company Reports; Department of Industry, Science, Energy and Resources (2020)