Hume Coal Market Report

Prepared for Hume Coal

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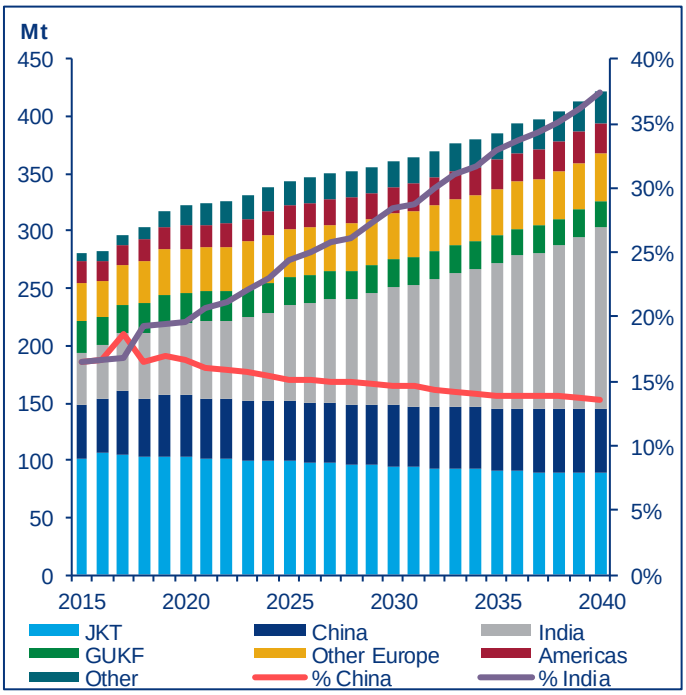
1. Metallurgical coal market

1.1. Demand

1.1.1. Global seaborne metallurgical coal demand

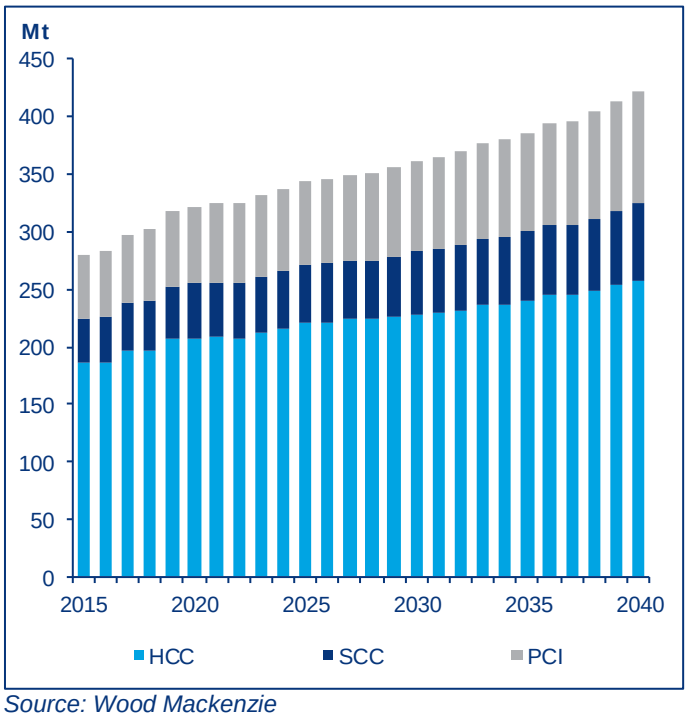
The underlying factors supporting metallurgical coal demand – urbanisation in South and Southeast Asian countries – are expected to continue to drive development of steel-making capacity. We expect that blast oxygen furnace (BOF) will continue to be the preferred steel-making route in these countries, due the requirement for primary steel production and limited access to scrap, ultimately allowing for new coal exports to those areas.

Figure 1 Global seaborne metallurgical coal import demand by region



Source: Wood Mackenzie
JKT – Japan, South Korea & Taiwan; GUKF – Germany, the United Kingdom & France

Figure 2 Global seaborne metallurgical coal import demand by subtype



Source: Wood Mackenzie
HCC – hard coking coal; SCC – soft coking coal; PCI – pulverised coal injection

Globally, steel production is expected to grow from 1,879 Mt in 2019 to 2,100 Mt in 2040 (0.5% CAGR), however the proportion of BOF is expected to fall from 71% to 67%, meaning metallurgical coal demand growth is expected to be more limited. While APAC steel production growth is expected to only be at 0.3% CAGR due to declining production in China, the proportion of BOF is expected to remain above 75%.

Table 1 Global seaborne metallurgical coal import demand by region

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2035	2040
JKT	102	106	105	103	104	103	102	101	100	99	99	98	97	96	96	95	92	88
China	46	47	56	50	54	54	52	52	52	52	52	52	52	52	53	53	54	57
India	46	47	50	58	62	63	67	69	73	78	84	87	91	92	97	103	127	157
GUKF	27	24	25	25	25	26	26	25	25	25	25	25	25	25	25	25	24	24
Other Europe	33	33	34	38	40	40	38	39	41	41	41	41	41	41	40	40	40	41
Americas	20	17	19	18	18	19	20	20	20	21	21	22	22	22	23	23	25	27
Other	7	9	9	10	15	18	20	19	20	21	21	22	22	23	23	23	24	27
Total	**281**	**283**	**297**	**303**	**318**	**322**	**325**	**326**	**331**	**338**	**344**	**346**	**350**	**352**	**356**	**361**	**386**	**421**
% China	17%	17%	19%	17%	17%	17%	16%	16%	16%	15%	15%	15%	15%	15%	15%	15%	14%	14%
% India	16%	17%	17%	19%	19%	20%	21%	21%	22%	23%	24%	25%	26%	26%	27%	28%	33%	37%

Source: Wood Mackenzie

As shown in Figure 1, overall demand for seaborne metallurgical coal is expected to rise from 318 Mt in 2019 to 421 Mt by 2040 (1.3% CAGR). Although there is expected to be a 103 Mt rise in demand by 2040, only 13 Mt of this is expected by 2023, with Asian demand remaining flat over this period. From 2023 to 2040, seaborne demand is expected to rise by 90 Mt, almost completely driven by India's increased demand for coal imports.

Table 2 Global seaborne metallurgical coal import demand by subtype

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2035	2040
HCC	187	187	197	197	206	207	208	208	212	216	221	222	224	224	226	228	240	258
SCC	37	38	41	43	46	47	47	48	49	50	50	51	52	51	52	54	60	67
PCI	56	58	59	63	65	67	70	70	71	72	73	74	75	77	77	79	86	97
Total	**281**	**283**	**297**	**303**	**318**	**322**	**325**	**326**	**331**	**338**	**344**	**346**	**350**	**352**	**356**	**361**	**386**	**421**

Source: Wood Mackenzie

HCC demand will grow from 206 Mt in 2019 to 258 Mt in 2040 (1.5% CAGR), as shown in Figure 2. The majority of this growth will come from India, however China will also see some incremental tonnages as domestic reserves of high quality HCC are depleted and steelmakers are forced to turn to the seaborne market.

SCC import demand is expected to grow at a higher rate than HCC, from 46 Mt in 2019 to 67 Mt in 2040 (1.8% CAGR). The main driver of this increase is expected to be India, where demand growth is expected to nearly equal total global growth. India is expected to surpass Japan as the largest importer of SCC in 2033 as Indian steel mills look to reduce costs by increasing the use of SCC in blends.

Japan, South Korea and Taiwan

Demand across the developed economics of Japan, South Korea and Taiwan will fall throughout the forecast, as the region is challenged by demographics and competition from other countries in the export steel market.

As a result of falling steel production, Japanese import demand for metallurgical coal is expected to fall through the forecast period – from 59 Mt in 2019 to 45 Mt in 2040 – as low economic growth and a declining share of the steel export trade impacts production. Over the long term, Japan's exports are expected to see growing competition from Southeast Asia. The majority of the fall in metallurgical coal demand is expected to be HCC, with only a 2 Mt decrease in SCC imports occurring over the forecast period and a 1.5 Mt fall in PCI. Japan has spearheaded technology to include large volumes of SCC in coke blends, and the proportion used is expected to continue growing at some plants.

South Korea saw growth in domestic steel demand in 2019 off the back of strong orders for shipbuilding, however exports dropped due to trade disputes, muting the impact of this growth on overall production. Domestic demand in South Korea is expected to decline post-2024, although this will be balanced by an increase in exports as the high-grade steel produced in Korea maintains its competitiveness in export markets. Overall, steel production is expected to remain flat over the forecast, resulting in metallurgical coal imports also remaining flat at 33-34 Mtpa between 2019 and 2040. South Korea has high rates of SCC use, with blends at POSCO's plants currently at around 52% and expected to remain at this level throughout the forecast.

Self-sufficiency in the Chinese steel industry means Taiwan's exports are forecast to decline marginally over the long term. However, domestic demand is expected to rise due to the expanding property sector while imports decline, resulting in net growth in steel production during this period. The bulk of this growth will come from EAF production, however, muting the effect on metallurgical coal demand. We expect Taiwan's seaborne metallurgical coal demand to remain flat at around 10 Mtpa until 2040.

China

China's crude steel production is expected to peak at 999 Mt in 2020 as a result of short-term government stimulus, before declining to 880 Mt by 2040. Steel exports are expected to fall to a low of 63 Mt by 2020 as a result of anti-dumping policies but increase beyond then due to a decrease in global supply, reaching 90 Mt by 2040. BOF is expected to continue to dominate steel production in China with limited scrap availability due to supply chain issues.

The shifting of inland steel mills towards the coast and an increase in blast furnace size will support growth in demand for seaborne metallurgical coal, but this will be limited by market dynamics and government limits on imports, particularly in the near-term. Over the long term, depletion of China's high-quality HCC reserves will result in an increase in HCC imports, which will grow from 38 Mt in 2019 to 47 Mt in 2040. China has more extensive SCC reserves, and as a result demand for SCC will fall from 5 Mt to 4 Mt over the forecast.

Supply from Australia has suffered due to political tensions during 2019, however the importance of this high-quality HCC supply to China means this is not expected to have a long-term impact, with Australia continuing to supply the majority of China's metallurgical coal import requirements into the future.

India

India is expected to be the primary source of global growth of metallurgical coal throughout the forecast period. India continues to have enormous potential for steel demand growth due to a large and expanding population, relatively low steel intensity and

urbanisation rates, and a burgeoning middle class. Steel consumption is expected to rise to 279 Mt by 2040, an increase of 181 Mt from 2019. This increase is supported in the short term by the government's new US$3.5B infrastructure fund which aims to increase access to affordable housing by funding stalled projects in the sector.

The bulk of the increase in steel demand is expected to be met from domestic steel production which is forecast to grow from 111 Mt in 2019 to 286 Mt in 2040, an increase of 175 Mt. Our forecast additional production is lower than the production levels targeted by the Indian government, which has expressed a wish to hit 300 Mt of production by 2025. Given the difficulties surrounding land acquisition and obtaining mining leases, as well as the problems attracting sufficient investment, this outcome is considered highly unlikely, and as a result India is likely to continue to require steel imports.

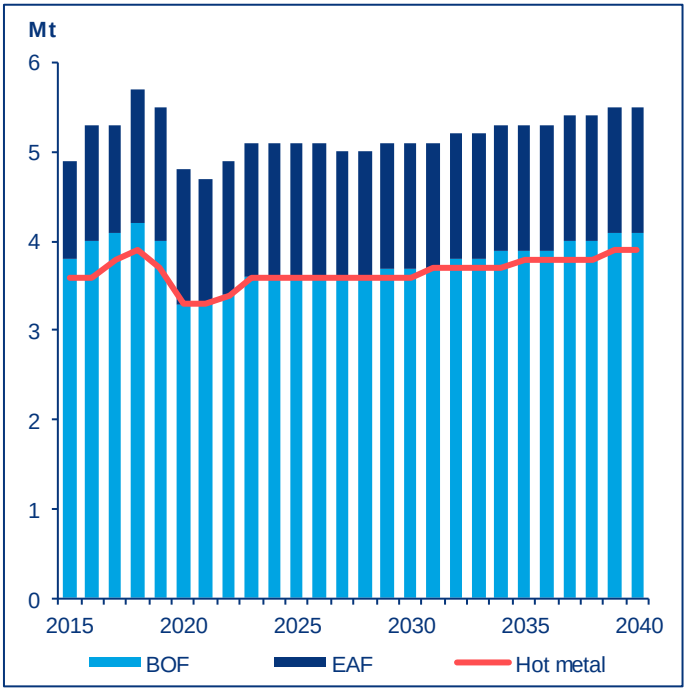
BOF is expected to be the technology of choice in India for steel production. EAF capacity has historically prospered in India due to the abundance of cheap electricity, comparatively low capital expenditure requirements, and availability of competitive iron units from the direct reduction iron (DRI) sector. In recent years, however, the DRI sector has been adversely impacted due to poor iron ore availability, and the inefficiency of scrap delivery makes substitution difficult. The use of BOF is expected to dominate steel making in the future due to its larger scale and overall lower long-term cost with India's significant iron ore deposits. Small-scale non-BOF steel – such as some electric and induction furnaces – have been poorly regulated in the past but are now under scrutiny due to their high pollution levels and inefficiency, so capacity from these is expected to decline.

Metallurgical coal import demand in India is forecast to grow only 11 Mt from 62 Mt in 2019 to 73 Mt in 2024 due to slow delivery of infrastructure development, but beyond that, as investment and project delivery accelerates, demand is expected to grow rapidly. HCC imports are expected to increase from 45 Mt in 2019 to 93 Mt in 2040. The use of SCC and PCI rises at a faster rate than HCC, as mills seek to minimise hot metal costs. By 2040, total metallurgical coal imports are expected to reach 157 Mtpa, with SCC reaching 25 Mtpa, from 7 Mtpa in 2019.

1.1.2. Australian domestic metallurgical coal demand

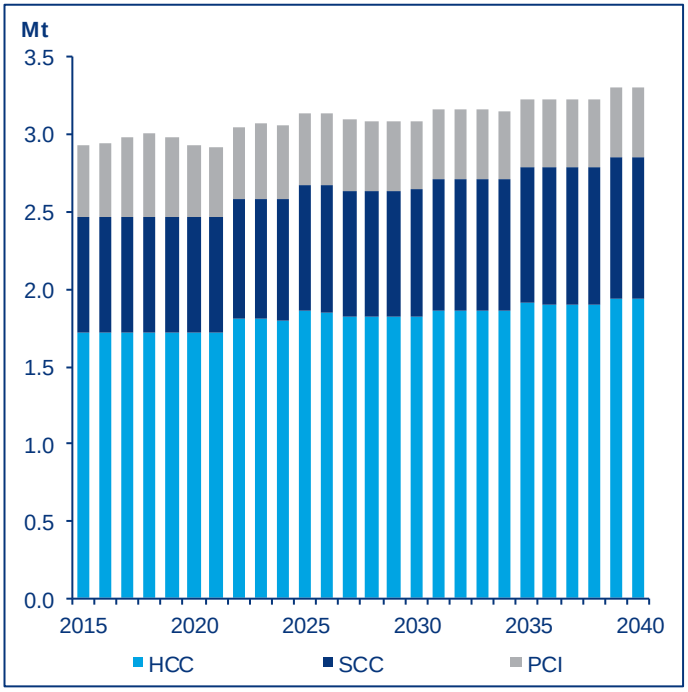
Australia's domestic steel market has declined through the 2000s as imports increasingly displaced domestic supply. Australia currently has two BOF steel producers – BlueScope Steel, which operates the 3 Mtpa Port Kembla Steelworks and various downstream operations, and Liberty, which acquired Arrium's 1.25 Mtpa Whyalla Steelworks following its bankruptcy in 2017. Both Arrium and BlueScope were spun off from BHP, in 2000 and 2002, respectively. There are also a number of smaller EAFs around the country.

Figure 3 Australian steel production by process



Source: Wood Mackenzie

Figure 4 Australian metallurgical coal demand by subtype



Source: Wood Mackenzie

Australian steel production is expected to fall in 2020, as seen in Figure 3, with a reduction in utilisation at Whyalla as investment in the mill is undertaken to return it to profit. Production is expected to grow from 4.8 Mt in 2020 to 5.5 Mt in 2040 as Whyalla increases output and efficiency improvements are made.

A shown in Figure 4, domestic demand for metallurgical coal will follow a similar trajectory to BOF and hot metal production, growing from 3.0 Mt in 2019 to 3.3 Mt in 2040. This growth will come from increases in HCC and SCC demand, with PCI demand remaining flat throughout the forecast.

Table 3 Australian steel production by process

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2035	2040
BOF	3.8	4.0	4.1	4.2	4.0	3.3	3.3	3.4	3.6	3.6	3.6	3.6	3.6	3.6	3.7	3.7	3.9	4.1
EAF	1.1	1.3	1.2	1.5	1.5	1.5	1.4	1.5	1.5	1.5	1.5	1.5	1.4	1.4	1.4	1.4	1.4	1.4
Total	**4.9**	**5.3**	**5.3**	**5.7**	**5.5**	**4.8**	**4.7**	**4.9**	**5.1**	**5.1**	**5.1**	**5.1**	**5.0**	**5.0**	**5.1**	**5.1**	**5.3**	**5.5**
Hot Metal	3.6	3.6	3.8	3.9	3.7	3.3	3.3	3.4	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.8	3.9

Source: Wood Mackenzie

Table 4 Australian metallurgical coal demand by subtype

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2035	2040
HCC	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.9	1.9	1.8	1.8	1.8	1.8	1.9	1.9
SCC	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9
PCI	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5
Total	**2.9**	**2.9**	**3.0**	**3.0**	**3.0**	**2.9**	**2.9**	**3.1**	**3.1**	**3.1**	**3.1**	**3.1**	**3.1**	**3.1**	**3.1**	**3.1**	**3.2**	**3.3**

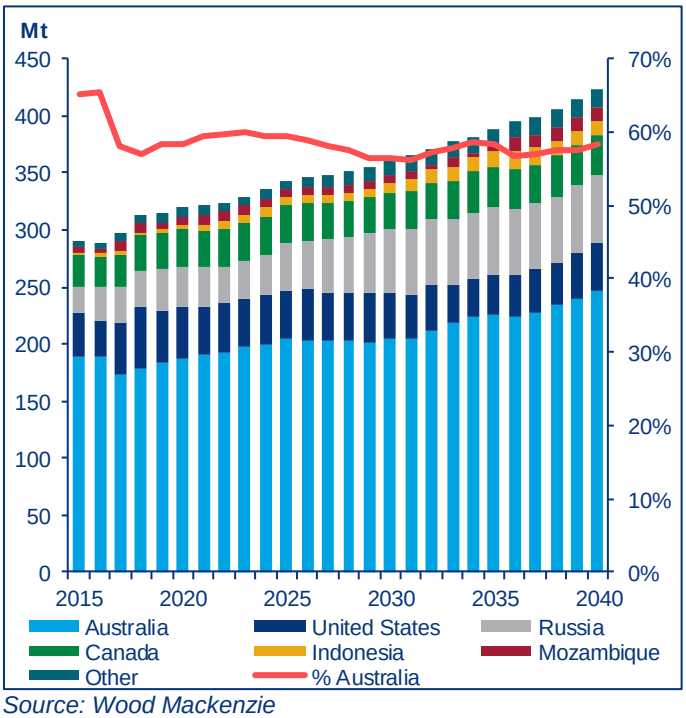
Source: Wood Mackenzie

1.2. Supply

1.2.1. Global seaborne metallurgical coal supply

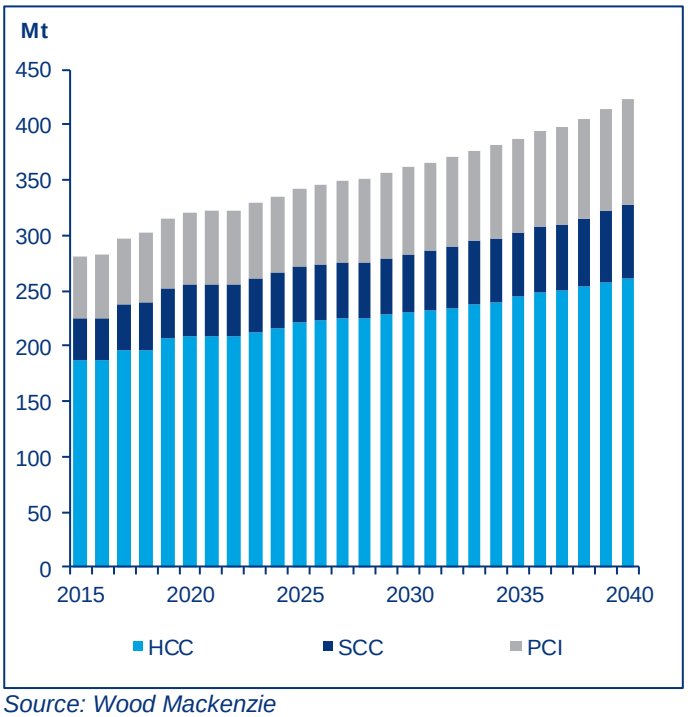
Global supply of seaborne metallurgical coal is expected to increase by 108 Mt between 2019 and 2040 to meet demand, as shown in Figure 5. In 2019, more than half of global metallurgical coal demand was met by supply from Australia. Wood Mackenzie forecasts that Australia will maintain its market share over the longer term, continuing to dominate seaborne metallurgical supply and accounting for around 60% of the seaborne total over the forecast period.

Figure 5 Global seaborne metallurgical coal export supply by country



Source: Wood Mackenzie

Figure 6 Global seaborne metallurgical coal export supply by subtype



Source: Wood Mackenzie

Australia is expected to capture 57% of the increase in supply, or 62 Mt, but new global supply from projects is not required until about 2023 to replace depleting operations as demand starts to accelerate. Most of the expanded exports are expected to serve demand growth in India. Following the demand trajectory, PCI is expected to have the highest growth rate, at 1.9%, while SCC will grow at 1.8% and HCC will have the lowest growth at 1.1% between 2019 and 2040.

Table 5 Global seaborne metallurgical coal export supply by country

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2035	2040
Australia	189	189	173	179	184	187	191	193	198	199	204	203	203	202	201	204	226	246
USA	38	31	46	53	45	46	42	43	42	43	43	44	43	42	43	40	35	42
Russia	23	30	32	33	36	35	34	32	33	36	41	43	46	49	53	56	59	60
Canada	27	27	28	31	32	33	32	33	33	34	33	32	32	32	32	32	36	36
Indonesia	3	2	3	3	3	5	6	7	8	8	8	8	7	7	8	9	14	12
Mozambique	4	5	8	8	6	7	8	8	8	7	7	7	7	7	7	6	5	13
Other	5	5	6	7	8	8	9	7	8	9	7	8	11	12	12	14	13	14
Total	**290**	**289**	**297**	**313**	**315**	**320**	**322**	**323**	**329**	**336**	**343**	**346**	**349**	**351**	**356**	**361**	**388**	**423**
% Australia	65%	66%	58%	57%	58%	58%	59%	60%	60%	59%	59%	59%	58%	58%	57%	57%	58%	58%

Source: Wood Mackenzie

Table 6 Global seaborne metallurgical coal export supply by subtype

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2035	2040
HCC	187	187	197	197	206	208	210	209	212	217	221	222	224	225	228	230	244	262
SCC	37	38	41	43	45	47	46	47	48	49	50	51	51	51	51	53	59	66
PCI	56	58	59	63	63	64	66	67	69	70	71	73	73	75	76	78	85	94
Total	**290**	**289**	**297**	**313**	**315**	**320**	**322**	**323**	**329**	**336**	**343**	**346**	**349**	**351**	**356**	**361**	**388**	**423**

Source: Wood Mackenzie

Australia

Most long-term demand growth in the metallurgical coal market is expected to be driven by India and Australian mines have a transportation advantage to capture a large share of that new business compared to Russia, the United States and Canada. Australia's total metallurgical coal exports are expected to rise from 184 Mt currently to 246 Mt by 2040.

Key expansions in 2020 are expected to be offset by some disruptions. We expect that Byerwen Phase 1 will continue to ramp up, Gregory/Crinum will restart and there will be growth at Appin and some of BMA's mines, while production from Anglo American will ease due to a longwall move, and Peabody has delayed the North Goonyella Restart.

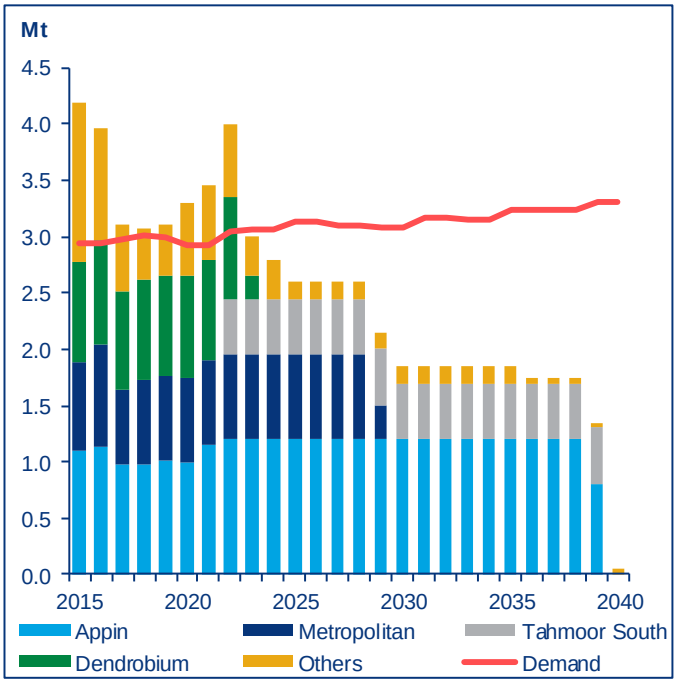
1.2.2. Supply to the Australian domestic market

There is currently about 3 Mtpa of metallurgical coal contracted to the domestic market, which will rise slightly as Tahmoor South is commissioned, before dropping off as Dendrobium and then Metropolitan cease production with reserve depletion.

As a result of this declining supply outlook, Australia's steelmakers are likely to start contracting new production in the coming years to shore up supply for their mills. This can either come from the redirection of coal from currently operating mines that was otherwise destined for the export market, or from new projects.

Given its location, Hume coal is well placed to service the Port Kembla steel works when it looks to source new coal supply due to its freight advantage.

Figure 7 Contracted Australian domestic metallurgical coal supply by mine



Source: Wood Mackenzie

Table 7 Contracted Australian domestic metallurgical coal supply by mine

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2035	2040
Appin	1.1	1.1	1.0	1.0	1.0	1.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	
Metropolitan	0.8	0.9	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.3			
Tahmoor South								0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
Dendrobium	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.2									
Others	1.4	1.0	0.6	0.5	0.5	0.7	0.7	0.7	0.4	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
Total	**4.2**	**4.0**	**3.1**	**3.1**	**3.1**	**3.3**	**3.5**	**4.0**	**3.0**	**2.8**	**2.6**	**2.6**	**2.6**	**2.6**	**2.2**	**1.9**	**1.9**	**0.1**
Demand	2.9	2.9	3.0	3.0	3.0	2.9	2.9	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.2	3.3

Source: Wood Mackenzie

2. Metallurgical coal pricing

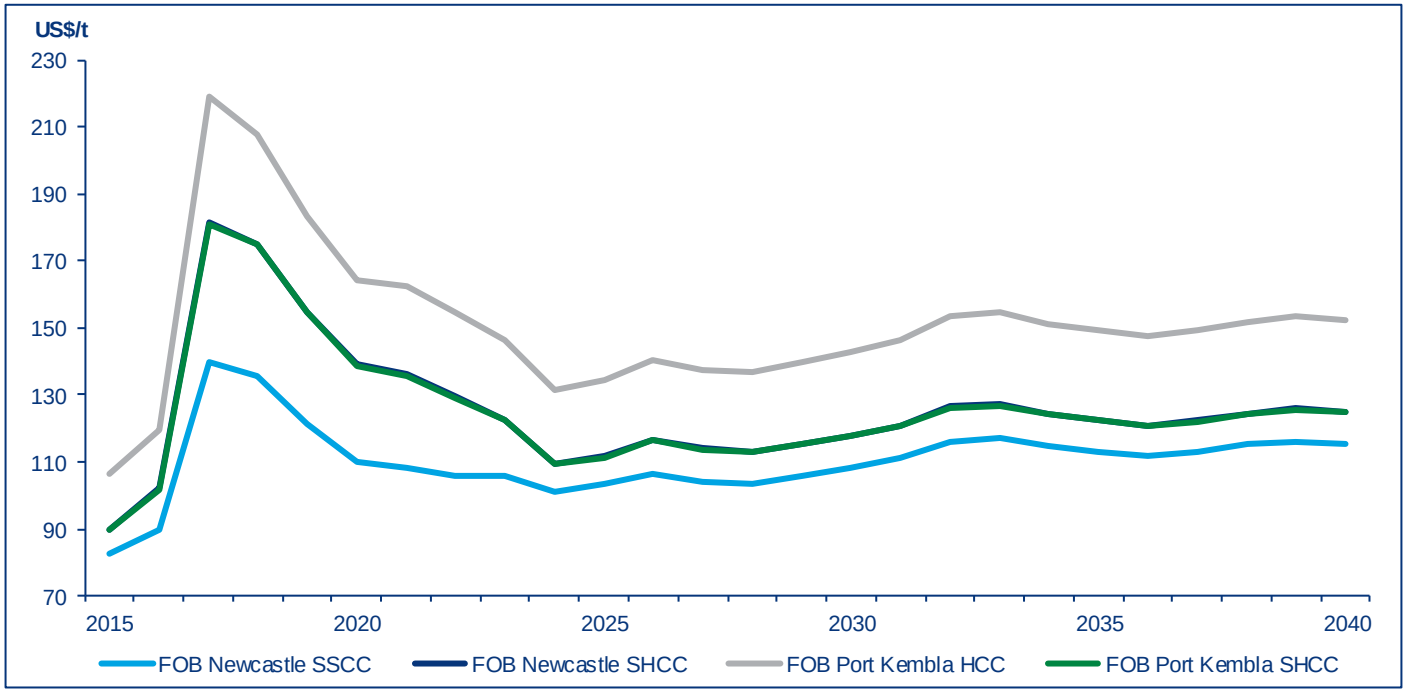
Seaborne metallurgical coal prices spiked in 2017 as a result of disruption to supply from Queensland following Cyclone Debbie, which damaged export infrastructure. Since then, seaborne metallurgical coal prices have fallen back to lower levels, with no further disruption to elevate prices.

Going forward, as seen in Figure 8, we expect that Chinese coal supply and demand dynamics will shift and see prices settle to a lower, more sustainable long-term level in China. This change will be driven by Chinese hot metal production peaking in 2021, and falling thereafter, as well as growing supply on the seaborne market. These factors combined will lead to seaborne prices continuing to slide until the mid-2020s, falling back to the marginal cost of supply.

From the mid-2020s the growth in demand for metallurgical coal is expected to reverse the decline in prices, with new supply starting to be required to fill the market. This will result in prices rising in order to incentivise new, higher cost projects, to enter the market and elevating prices through the remainder of the forecast.

While the discount for SHCC will remain flat throughout the forecast, the discount for SSCC is expected to decline through to 2025, with prices seeing much less of a decline than SHCC or HCC. From 2025 to 2040, the discount is expected to remain consistent, with the price of SSCC growing along with HCC and SHCC.

Figure 8 Metallurgical coal price indices (real)



Source: Wood Mackenzie

Table 8 Metallurgical coal price indices (real)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2035	2040
FOB Newcastle SSCC	83	90	140	136	121	110	108	106	106	101	103	107	104	104	106	108	113	116
FOB Newcastle SHCC*	90	102	181	175	155	139	136	129	123	110	112	117	114	113	115	118	123	125
FOB Pt Kembla HCC*	107	120	219	208	183	164	163	155	147	132	135	141	138	137	140	143	149	152
FOB Pt Kembla SHCC*	90	102	181	175	155	139	136	129	122	109	111	116	114	113	115	118	123	125

Source: Wood Mackenzie
**Price has been calculated on a freight differential to the relevant benchmark index.*

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