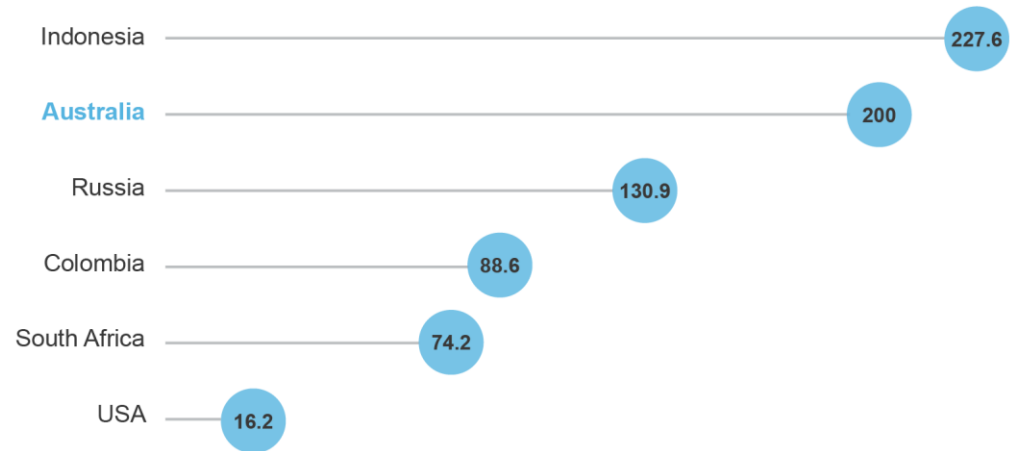


# Thermal coal

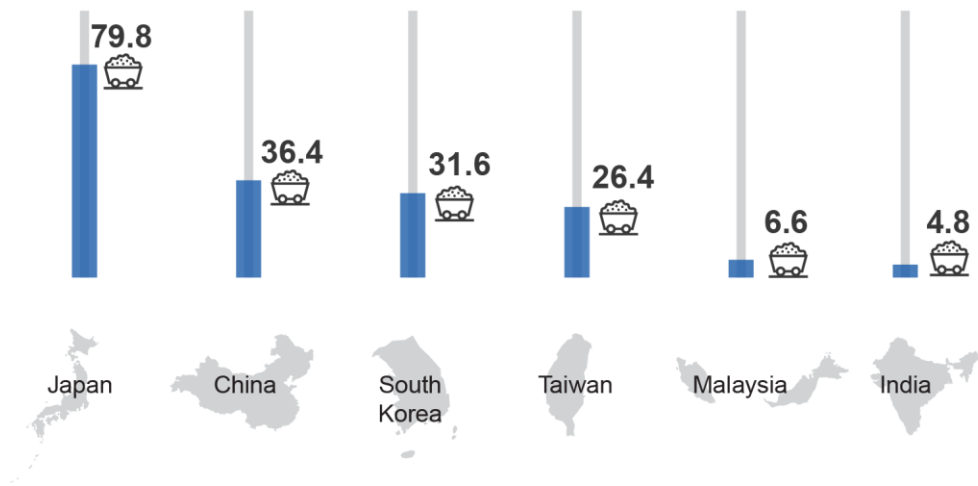
Resources and Energy Quarterly December 2017



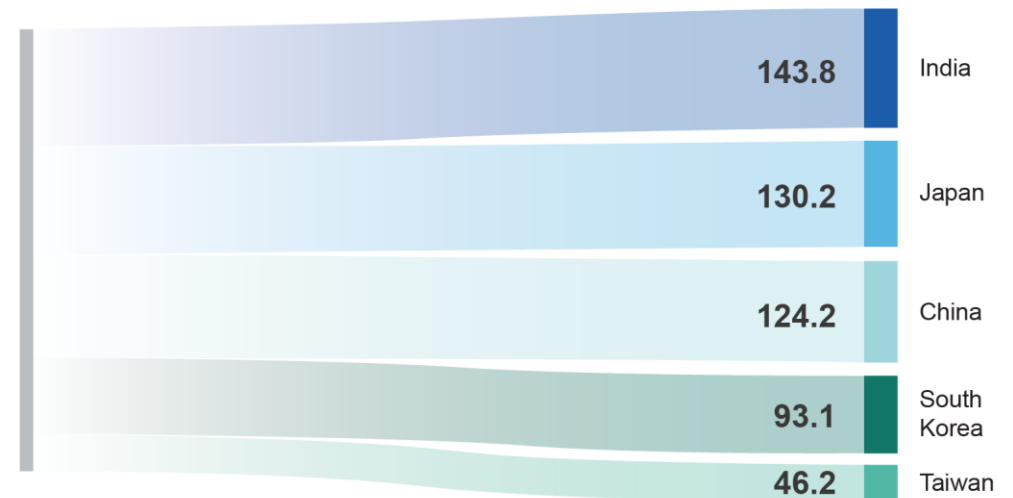
## Major thermal coal exporters (million tonnes), 2016



## Key importers of Australian thermal coal (million tonnes), 2016



## Asian thermal coal imports (million tonnes), 2016



## 6.1 Summary

- Thermal coal prices have remained at the relatively high levels reached late in the September quarter, at over US\$90 per tonne.
- Stronger world demand remains a feature of the market, as the world economic recovery consolidates.
- Supply remains constrained, as China conducts safety inspections and industrial action impacts on Australian output.
- In 2017–18, Australia’s exports are forecast to rise marginally from 2016-17, and see further minor gains to 203 million tonnes in 2018–19.

## 6.2 Prices

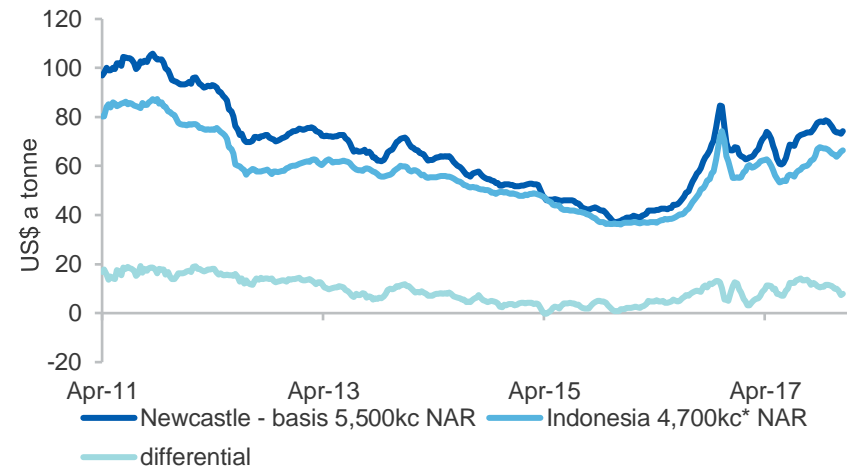
### Prices remained high, as strong demand added to supply worries

The October 2017 to September 2018 Japanese contract price settled at US\$94.75 a tonne FOB Newcastle, the same as the previous year.

During the December quarter, Newcastle spot prices held at levels reached in late September 2017, at US\$95–100 a tonne. Price strength derived from both firm restocking demand and supply concerns. The Newcastle FOB spot price is estimated to have averaged US\$87 a tonne in 2017, one third above 2016. The premium of Australian thermal coal to Indonesian coal has stayed relatively wide, encouraging higher purchases of Indonesian coal (often to blend with Australian coal).

Prices are expected to ease through 2018 and early 2019, as supply rebounds and demand moderates. The Newcastle FOB spot price is forecast to drop by 12 per cent to average US\$77 a tonne in 2018, and by a further 6 per cent to USD70 a tonne in 2019. The JFY 2018 (April 2018 to March 2019) benchmark contract price is now projected to settle at US\$79 a tonne, lower than the JFY 2017 price of US\$84 a tonne. This represents an upward revision of US\$5 a tonne from the September 2017 *Resources and Energy Quarterly* forecast. The contract price is forecast to be US\$74 a tonne in 2019.

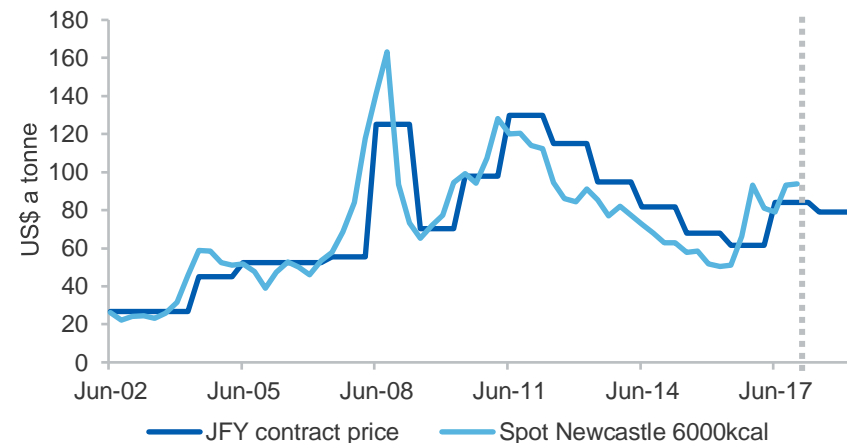
Figure 6.1: Thermal coal prices — Australian versus Indonesian



Notes: Indonesia calorific value basis lowered to 4,700 kc NAR from 4,900 kc NAR, effective week ending 6 May 2016. History is based on pro rata calculation of the previous series

Source: IHS Markit (2017)

Figure 6.2: Australian thermal coal price — spot versus contract



Notes: Spot price is quarterly average of weekly data, contract price is for Japanese Fiscal Year commencing 1 April

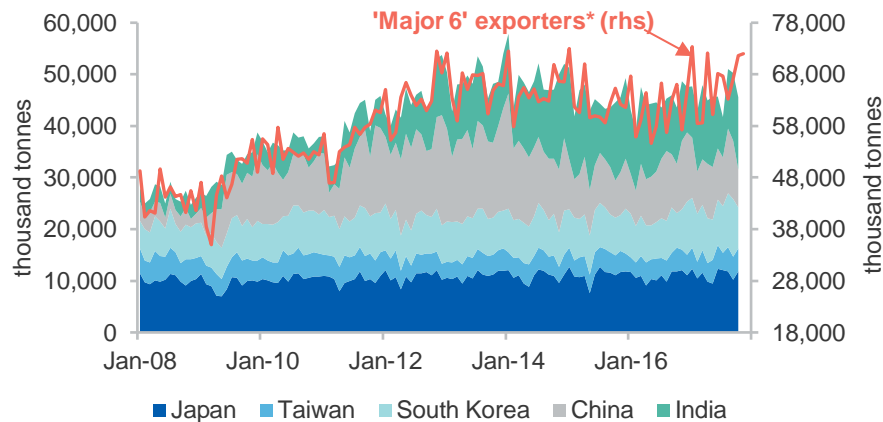
Source: IHS Markit (2017)

### 6.3 World trade

Following an estimated gain of 1.3 per cent in 2017, world thermal coal trade in 2018 is forecast to increase by 1 per cent to 1.1 billion tonnes. A feature of world trade in 2017 has been the significant rise in imports outside of the major five Asian importing nations. For the past nine years, swings in imports by the major five Asian importers have closely dictated swings in total exports by the major six exporters (Indonesia, Australia, Russia, Colombia, South Africa and the US). However, in 2017 exports by the major six exporters were stronger than imports by the Asian five would have suggested, indicating stronger 'rest of world' demand. The strength in the 'rest of the world' could have contributed to unexpected price strength.

Among the major five Asian importers, there have been signs of a tentative stabilisation in Indian import demand, and a major surge in South Korean imports. On the export side, the recovery in United States exports in late 2016 has held, and Indonesian exports have strengthened noticeably.

**Figure 6.3: Major five Asian importers vs major six world exporters**



Notes: Major six exporters are Australia, Russia, Indonesia, Colombia, US, South Africa.  
Data is previous month's exports.  
Source: IHS Markit (2017)

### 6.4 Imports

#### Strong Asian import demand appears set to continue

Thermal coal import demand has recently been driven by China, India, South Korea, and to a lesser extent Vietnam, Pakistan and the Philippines. Inventories in China and India have been low in seasonal terms, which has seen firm import demand from those nations as winter peaks.

#### Chinese imports rose modestly in 2017, as safety checks impacted

After Government-induced production cutbacks in the middle of 2016, Chinese thermal coal production in 2017 was adversely impacted by rolling mine safety inspections. The resultant low coal output helped raise imports, though buying has recently become much more sporadic — as it has in India — as prices hit levels that importers deem too high. Strong hydro power output in the latter half of 2017 allowed power generators to pare coal-fired output. Imports suffered, as customs conducted more stringent checks in ports in south China, delaying cargoes.

The Chinese authorities remain committed to reducing losses by state-owned coal miners. To that end, there remains a commitment at varying domestic output in order to try to keep prices at levels where Chinese power utilities have “acceptable” profit margins.

The Chinese authorities appear intent on limiting thermal coal burn, particularly in the regions where air pollution is at its worst. However, more than half of China's massive coal-fired fleet is less than 10 years old and can/will not be quickly replaced. Accordingly, over the forecast period (to end 2018–19) and beyond, the emphasis will be on importing high energy/low ash coal. This trend will favour Australian miners at the expense of Indonesian miners, though any major move in the price differential will see changes in Chinese blending, in order to optimise the price/energy trade off.

### Japanese imports rose modestly in 2017

Japanese imports are estimated to have risen modestly in 2017, as a steady economic recovery helped boost power demand. With the vast majority of the nuclear power industry remaining 'grounded', utilities continue to rely on coal to help fill the gap. Thermal coal imports are unlikely to show substantial growth in the next two years: Japan will continue to bring its nuclear power fleet back on line very slowly, and renewables are expected to provide a rising source of energy for Japan's power needs.

### Indian imports fell as production improved and stocks were run down

Indian imports declined in 2017 compared to 2016, as domestic output rose and inventories were run down after the end of the winter. Coal India has been successful in raising output modestly, though it looks unlikely to go close to meeting its 600 million tonne target for Indian financial year 2017-18. Production by Central Coalfields, a Coal India unit, was disrupted by unprecedented rains, and the closure of the Dhanbad-Chandrapura railway line (because of safety concerns) also disrupted supply.

For 2017 as a whole, Indian imports from Indonesia are estimated to have been little changed from 2016, but there were significant falls in imports from South Africa and Australia. In the latter half of 2017, inventories at power plants were run down to reach their lowest level (in absolute terms) this decade, suggesting that inventories are extremely low relative to consumption. In the next year or so, imports will likely rebound modestly: with inventories very low, domestic coal output is unlikely to keep pace with rising power demand. A ban on petcoke in the National Capital Region in November 2017 will also act to boost thermal coal imports.

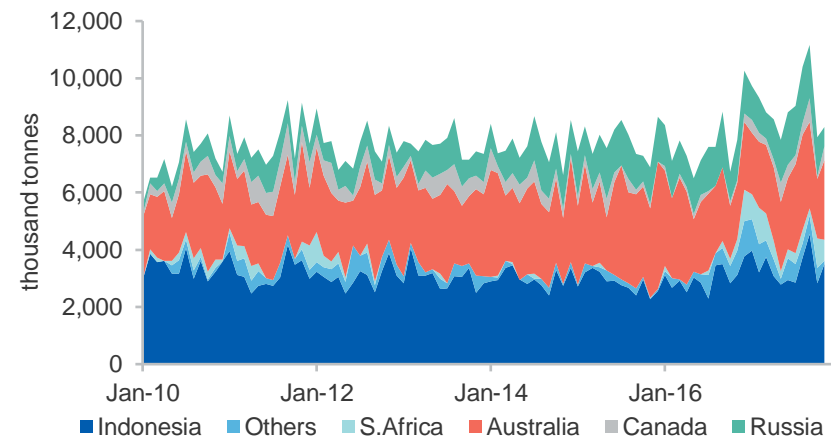
The Indian Government remains intent on increasing the portion of renewable energy in the country's power mix. However, it seems that the demand for power will rise at a faster pace than the rate at which renewable capacity can be built — see Box 6.1 on the next page. The Indian government is left relying on increased domestic production (of low energy, high ash thermal coal) and or/higher imports.

### South Korean imports jumped in 2017

South Korea's thermal coal imports have shown high volatility in recent months, but have averaged levels noticeably higher than in 2016. Driving the gains has been buying by coal-fired power generators, as nuclear reactor outages bite into the country's energy supply. In 2017, imports are estimated to have risen by around 20 per cent on 2016.

South Korean demand should remain solid in 2018 and 2019, as the introduction of new coal-fired power capacity outpaces capacity being retired or temporarily closed. Imports will move towards higher quality (high energy, low ash) coal, as the government uses (further hikes in) the coal consumption tax and moral suasion to push generating companies to limit air pollution. Australia, Colombia and Russia should benefit at Indonesia's expense.

Figure 6.4: South Korean thermal coal imports



Source: IHS Markit

### Box 6.1: World Energy Outlook 2017: Coal

The World Energy Outlook 2017 released in November 2017 constructed three scenarios to help frame forecasts of world energy usage to 2040. In the 'New Policies Scenario' incorporating policies adopted or promised, while global GDP grows by 3.4 per cent a year on average over the next 25 years, coal demand growth levels off. However, the global trend masks some stark regional differences. Many high-income nations, often with flat energy demand and an economic growth model that relies to a large degree on services, choose to phase out coal use for environmental reasons. However, lower income nations at an earlier stage of their economic development typically need to satisfy fast growing energy demand, fueled in part by rapid population growth.

The International Energy Agency projections suggest that as China's policy efforts to foster the economic contribution of the service sector and decrease reliance on the heavy industries bear fruit, the country will gradually join the group of countries that see their coal demand decline over the projection period. Although China's coal demand peaked in 2013, it takes time to achieve deep cuts in coal consumption. Only in the latter half of the Outlook period does China's coal demand drop markedly, resulting in an overall decrease in coal use of some 13 per cent over the next 25 years. Coal demand in India more than doubles over the period to 2040, while in Southeast Asia it grows almost two-and-a-half times. This contrasts with a drop in coal usage by 2040 of over 60 per cent in the EU, more than 30 per cent in Japan, and around 10 per cent in the US.

Coal's share of world power output falls from 37 per cent today to about a quarter in 2040, as renewables continue their ascent and become the number one source of power generation in the mid-2020s. Electricity generation from coal rises by some 10 per cent through 2040, but coal burn in the power sector hardly gains, a clear sign that the world's coal fleet becomes more efficient. 75 per cent of the 880 GW of new coal plant entering into service over the next 25 years uses either supercritical (440 GW) or ultra-supercritical technology (235 GW), bringing down the share

of the less efficient subcritical plants in the global coal fleet from over 60 per cent in 2016 to less than 40 per cent in 2040.

China remains the world's largest coal producer throughout the projection period while India, currently the 4<sup>th</sup> largest producer, overtakes the US (and Australia) in the early 2020s to become the 2<sup>nd</sup> coal producer. The share of steam coal rises from around 75 per cent now to over 80 per cent in 2040, as coking coal output declines from 967 Mtce in 2016 to 805 Mtce in 2040 (and lignite output drops from 255 Mtce to 230 Mtce). The drop in coking coal production is mostly due to China moving away from the basic-oxygen furnace in steel production. Export-oriented coal producers like Australia, Russia or Mozambique manage to expand their coking coal production over the next 25 years, primarily targeting rapidly growing steel producers like India.

In the past two years, coal trade has declined slightly after tripling in the previous 25 years. In the New Policies Scenario, coal trade does not grow: in 2040, trade volumes are still below 2015 levels. However, the global trend masks stark regional variations and some differences between types of coal. Coal imports decline in advanced economies like the European Union, Japan and Korea. They also decline in China, which in 2016 was the biggest coal importer in the world. Imports continue to play an important balancing role during China's coal industry restructuring process, but this process is assumed to be largely accomplished by the mid-2020, and China's need for coal imports therefore declines. By 2040, Chinese coal imports have dropped to 70 Mtce, down from almost 200 Mtce in 2016. The declines are offset by rises in other parts of the world, notably India and Southeast Asia. In India, imports are forecast to resume growing from the early 2020s, and increase through to 2040. India thus becomes the world's largest importer, buying over 235 Mtce in 2040 – a 45 per cent rise on 2016 import levels. Three-quarters of the increase in imports comes from coking coal. Similarly, fast growing and price sensitive economies like Vietnam, Pakistan, Malaysia, Thailand the Philippines and Pakistan increasingly turn to coal imports to meet their energy needs.

*Source: International Energy Agency (2017), World Energy Outlook 2017, OECD/IEA, Paris*

## 6.5 Exports

### Indonesian exports bounced back in 2017

Indonesian thermal coal exports rose noticeably right through 2017, as the higher prices of the past year encouraged increased production, reaching over 450 million tonnes. Going forward, Indonesian government officials have indicated that local miners will have to meet stricter environmental and safety requirements before the government approves requests to increase future production. The government also wants to limit total coal output at 400 million tonnes a year from 2019 onwards, in order to support Indonesia's future energy security. National output however, has historically exceeded the government's targets.

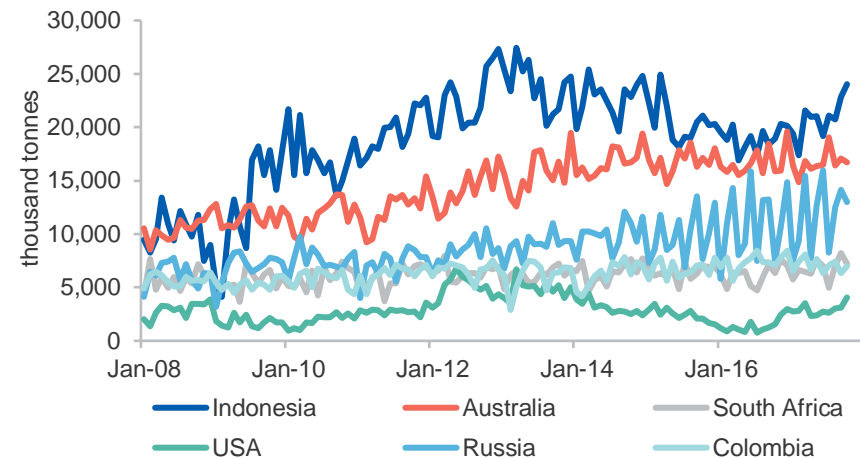
### Russian exports hurt by falling European coal consumption

In trend terms, Russian exports increased modestly in the last part of 2017, as a surge in exports to Ukraine was largely offset by lower demand from the United Kingdom and Germany. With Western European nations looking to reduce thermal coal consumption, Russian miners are increasingly looking to supply India and South East Asian countries, by tapping coal deposits in the country's east. A few projects are already under development, such as the Amaam and Elga projects. As low-cost producers, Russian miners are expected to continue to compete strongly for increased market share in the outlook period.

### US exports maintained their recovery of late 2016

US exports held at relatively high levels in the last part of 2017. US seaborne exports of thermal coal in 2017 are likely to have been around 34 million tonnes, roughly double 2016 exports of 16.2 million tonnes. Increased Asian and European demand helped US miners, a large portion of whom were still recovering from the impacts of major financial restructurings that occurred in 2016.

Figure 6.5: Thermal coal exports by major exporters



Source: IHS Markit

The global appetite for US (high-sulphur) coal exports has been growing, with buyers blending it with Russian low sulphur coal. Some buyers have fewer concerns about sulphur content, such as cement and brick makers.

In 2018, US exports are likely to hold at relatively high levels compared to 2016. US exports are likely to gradually drop back from around the end of 2018, in response to a steady decline in global thermal coal prices in 2018.

### South African labour unrest less of a threat in 2018 and 2019

South African exports have been firm in recent months, helped by strong demand from India and, to a lesser extent, South Korea. The threat of widespread industrial action in the South African coal industry has also seen Indian importers snapping up South African cargoes as a precautionary measure. With better quality coal than Indonesia, South Africa can benefit from India's gradual push towards using cleaner coal. Major mining companies remain reluctant investors in the South African industry, and transportation in that nation remains a major problem.

### Colombian exports have been impacted by bad weather

Exports are estimated to have decreased by 1–2 per cent in 2017. Glencore's and Cerrejón's operations were affected by heavy rain (in the middle of the year) and lower mining equipment availability. Colombia remains one of the world's lowest-cost producers, however, the distance to Asia remains a major problem for Colombian exporters, as demand wanes in both Europe and the Americas.

### Australia's exploration, production and trade

#### Australian coal exploration remains low, though with growth in Queensland

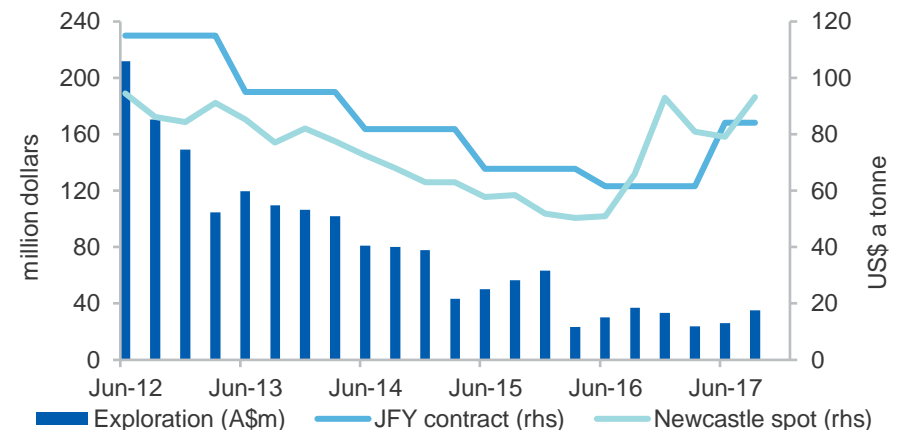
Australia's coal exploration expenditure remains relatively modest, with \$35.1 million invested in the September quarter. This is about one third higher than in the June quarter, but virtually unchanged through the year. The quarterly rise was driven by higher exploration in Queensland, which now accounts for more than 80 per cent of all coal exploration. Coal exploration spending peaked in the September quarter of 2011 (when \$227 million was spent), but has been progressively pegged back amidst falling coal prices and oversupply in low grade thermal coal markets.

#### Australian production has been impacted by industrial action

Australian production has been slightly impacted by industrial action in 2017–18. With prices hitting multi-year highs, and a firm demand outlook, Australian producers are attempting to raise production. Provided industrial disputes do not escalate, it is likely that production will show significant growth in 2018 and early 2019, before flattening out. Production is forecast to be around 249 million tonnes in 2017–18, down fractionally from 250 million tonnes in 2016–17.

In 2018–19, production is forecast to increase by 2 per cent to 254 million tonnes. Output is expected to be boosted by the ongoing expansions at Rolleston and at a significant number of mines in the NSW Hunter Valley region, including Ravensworth.

Figure 6.6: Australia's coal exploration expenditure



Source: ABS (2017) Mineral and Petroleum Exploration, cat. no. 8412.0; Department of Industry, Innovation & Science (2017)

#### Australian exports impacted by transport problems and industrial action

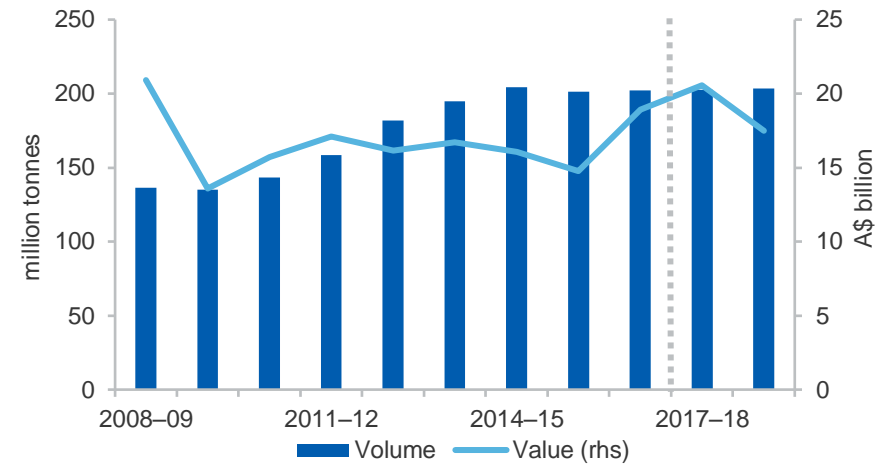
Australian exports in 2017 are estimated to have been little changed from 2016, as industrial action, transport disruptions and bad weather impacted on producers who were urgently attempting to respond to the price surge of 2016 and early 2017.

Union workers at Australian freight provider Pacific National's New South Wales unit held two 48-hour strikes at consecutive weekends from 21st October, escalating their industrial dispute over negotiations surrounding a new collective workplace agreement. The industrial action resulted in the cancellation of 180 trains from Hunter Valley to Newcastle Port, and impacted roughly 1.5 million tonnes of coal deliveries. Ongoing industrial unrest at Glencore's operations also had an impact on production and exports in the last few months of 2017.

Australian producers with high energy and low ash coal will tend to take share from local/overseas producers of lower quality coal, as countries such as China, South Korea and Taiwan look to reduce air pollution, particularly during their winter months.

Australian's thermal coal export earnings are forecast to rise by 7.7 per cent in 2017–18, to \$20.4 billion. In 2018–19, thermal coal export revenues are expected to be \$17.5 billion: lower prices achieved for Australia's thermal coal exports will more than offset the impact on earnings of modestly higher export volumes.

**Figure 6.7: Australia's thermal coal export volumes and values**



Source: Australian Bureau of Statistics, Department of Industry, Innovation and Science (2017)



**Table 6.1: Thermal coal outlook**

World	Unit	2016	2017 s	2018 f	2019 f	Annual percentage change		
						2017 f	2018 f	2019 f
<b>Contract prices b</b>								
– nominal	US\$/t	62	84	79	74	36.4	-6.0	-6.3
– real c	US\$/t	63	84	77	71	33.5	-8.1	-8.6
<b>Spot prices d</b>								
– nominal	US\$/t	65	87	77	70	33.2	-11.6	-9.4
– real e	US\$/t	67	87	75	67	30.4	-13.4	-11.4
Coal trade	Mt	1,045	1,058	1,038	1,014	1.3	-1.9	-2.3
<b>Imports</b>								
Asia	Mt	759	759	760	751	-0.1	0.1	-1.1
China	Mt	196	200	198	184	2.0	-1.0	-7.0
Chinese Taipei	Mt	59	63	66	67	7.0	4.0	2.5
India	Mt	166	141	137	135	-15.0	-3.0	-1.0
Japan	Mt	138	141	142	143	2.0	1.0	0.5
South Korea	Mt	100	106	104	104	6.5	-2.0	-0.5
Europe	Mt	214	204	189	176	-5.0	-7.0	-7.0
European Union 27	Mt	163	155	144	134	-5.0	-7.0	-7.0
other Europe	Mt	51	49	45	42	-5.0	-7.0	-7.0
<b>Exports</b>								
Australia	Mt	202	201	203	202	-0.6	0.9	-0.5
Colombia	Mt	82	82	84	88	-0.1	2.0	5.0
Indonesia	Mt	369	374	367	354	1.5	-2.0	-3.5
Russia	Mt	144	151	153	155	5.0	1.1	1.3
South Africa	Mt	75	76	76	78	1.0	-0.2	2.6
United States	Mt	18	33	27	25	90.0	-20.0	-5.0
<b>Australia</b>	<b>Unit</b>	<b>2015–16</b>	<b>2016–17</b>	<b>2017–18 f</b>	<b>2018–19 f</b>	<b>2016–17</b>	<b>2017–18 f</b>	<b>2018–19 f</b>
Production	Mt	250.4	250.0	248.8	254.1	-0.2	-0.5	2.1
Export volume	Mt	201.3	201.7	204.3	203.3	0.2	1.3	-0.5
– nominal value	A\$m	14,751	18,903	20,360	17,492	28.1	7.7	-14.1
– real value h	A\$m	15,312	19,292	20,360	17,084	26.0	5.5	-16.1

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 6000Kcal; **e** In 2017 US dollars; **f** Forecast; **g** Includes lignite; **h** In 2017–18 Australian dollars

Source: ABS (2017) International Trade in Goods and Services, Australia, Cat. No. 5368.0; IHS Inc; IEA 2015 Coal Information; Coal Services Pty Ltd; Queensland Department of Natural Resources and Mines; Company Reports; Department of Industry, Innovation and Science.