Resources and Energy Quarterly

December 2016

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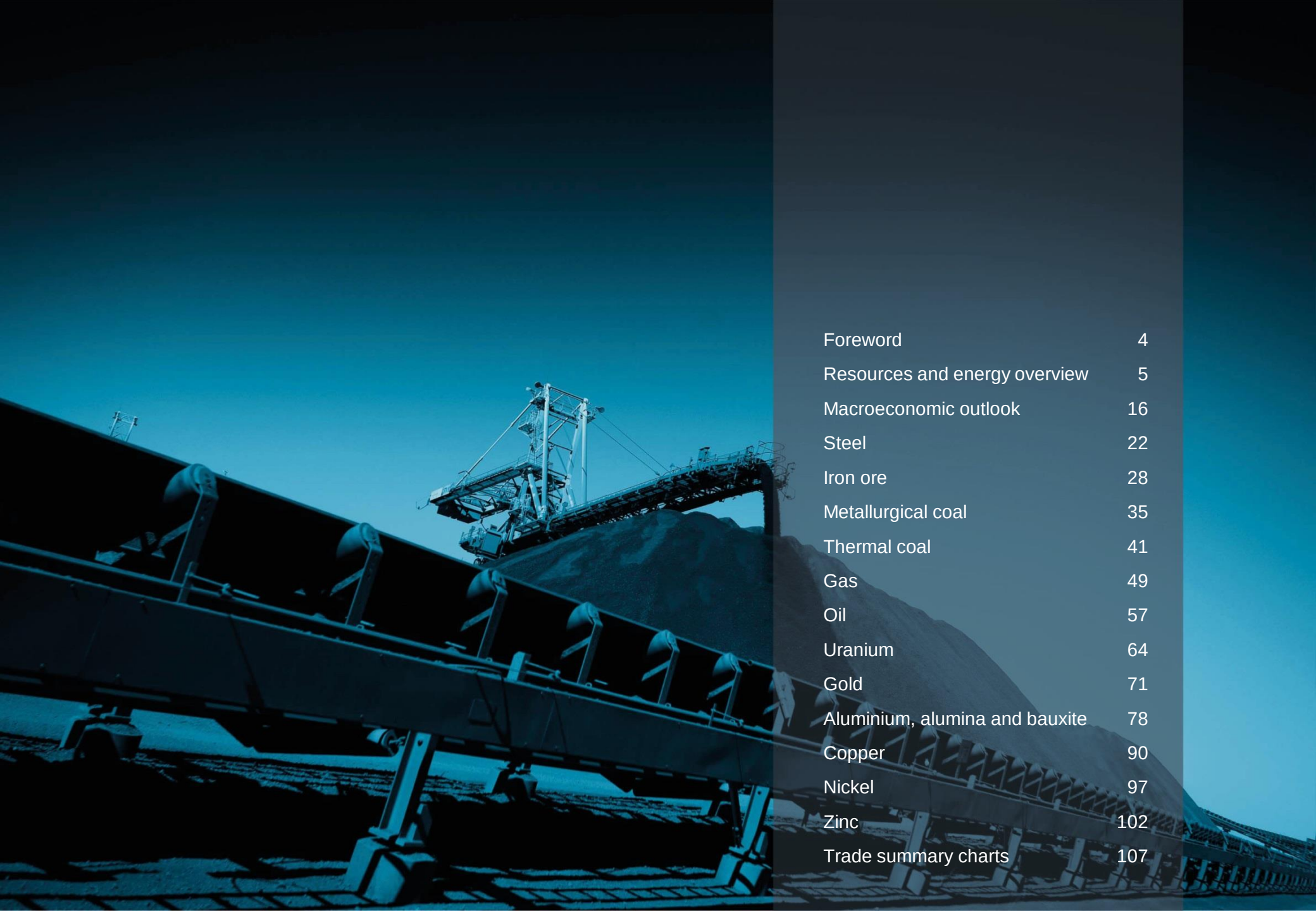

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Foreword

Higher prices for steel-making raw materials and thermal coal, and increased LNG export volumes, are expected to see Australia's resource and energy export earnings increase by 30 per cent in 2016–17, to a record $204 billion.

Continued growth in demand from China's steel sector, as well as disruptions to the supply of a number of resource commodities, have boosted prices. The world economy appears to be picking up speed. At the same time, significant investment in Australia's productive capacity has supported strong growth in LNG export volumes.

Unfortunately, the high prices that are expected to bolster Australia's resources and energy export earnings in 2016–17 are not expected to last. The combination of slowing demand growth from China's steel sector and increased global supplies, are expected to lower export unit values in 2017–18.

However, the production phase of the mining boom will continue, with export volumes forecast to increase in each of Australia's top five resource and energy commodities in 2017–18. Most significantly, LNG export volumes are forecast to grow a further 28 per cent in 2017–18.

Overall, the value Australia's resource and energy exports are forecast to be steady in 2017–18 at around $202 billion.

The annual *Resources and Energy Major Projects* publication — published as an appendix to this report — highlights the ongoing transition from the investment phase to the production phase of the mining boom.

The value of committed projects fell by 12 per cent over twelve months to October 2016, and the outlook for resources and energy investment remains subdued over the short to medium term. The mega projects that have been a key driving force of the investment boom have reached, or are close to reaching, completion.

Despite recent high prices, expectations of challenging operating and market conditions have resulted in delays to final investment decisions for many projects, as producers divert their focus to reducing costs and ensuring the commercial viability of existing assets.

Nevertheless, the overall prospects and opportunities for further investment in Australia's resources and energy sector remain broadly positive. Australia has many high quality mineral and petroleum deposits, which can be developed when the price cycle rebounds.

Mark Cully
Chief Economist
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Resources and energy overview

Revisions to the outlook

The value of Australia's resources and energy exports is forecast to increase by 30 per cent in 2016–17, to a record $204 billion, before declining marginally (by 0.9 per cent to $202 billion) in 2017–18.

Figure 1.1 shows that the new 2016–17 forecast represents a 16 per cent upward revision from the previous estimate made in September. The 2017–18 forecast represents an upward revision of 3 per cent from the previous forecast for that year — which was made in March.

The change to the 2016–17 forecast primarily reflects — in order of significance — increased metallurgical coal, iron ore and thermal coal export earnings, which combined account for 92 per cent of the revision.

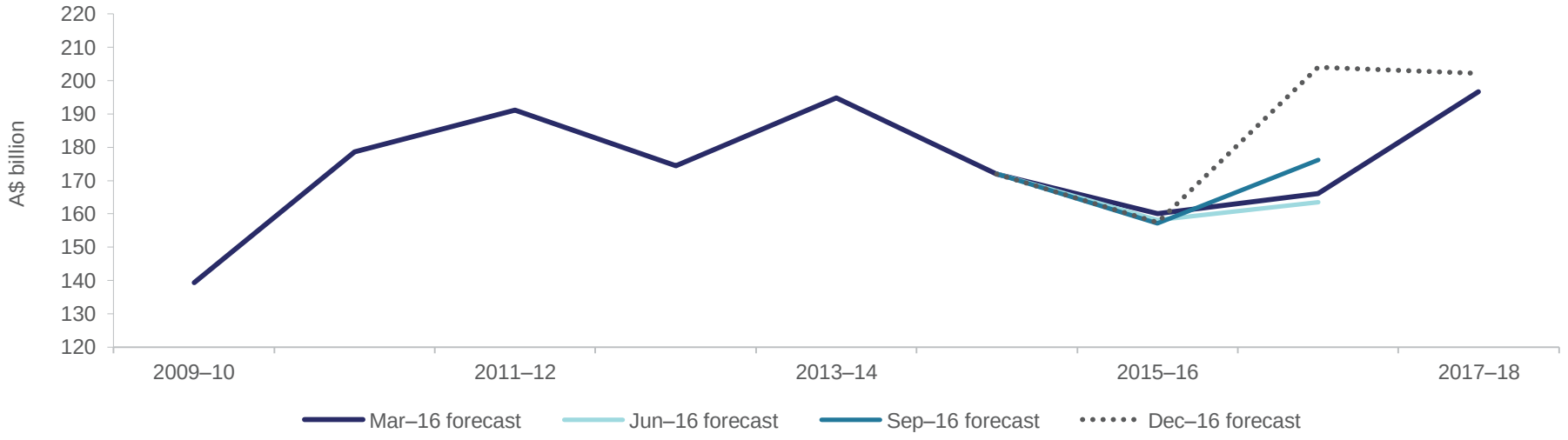
The effect of supply disruptions on benchmark metallurgical coal prices and thermal coal spot prices was much sharper than previously expected, and will flow into Australia's export revenues in the coming few quarters.

The supply disruptions, which include the now largely reversed government-mandated output restrictions in China, are temporary. Prices are expected to decline over the outlook period as supply returns to the market.

Higher-than-expected steel production in China (a major source of demand) also affected metallurgical coal and iron ore prices. As steel production in China slows, metallurgical coal and iron ore prices are expected to decline over the next one to two years.

The decline in the price of steel-making materials are forecast to be offset by a 56 per cent increase in LNG export values. The sharp rise in export values follows the large investment in Australia's LNG production capacity over the past decade.

Figure 1.1: Export earnings



Source: ABS (2016) International Trade in Goods and Services, 5368.0; Department of Industry, Innovation and Science (2016)

Global resource and energy market summary

Over the past year, Australia has generally gained market share of global resource commodities supply. The gains have come as a result of a large investment in new capacity over the past decade, low production costs and the relatively high quality of Australia's resources. Global consumption grew in 2016 for most of the resource and energy commodities that Australia produces. However, the rate of growth was slow compared to the boom times of just a few years ago.

Benchmark prices for Australia's largest export commodities have increased noticeably in recent months — particularly the steel-making commodities, metallurgical coal and iron ore. Crude oil prices — to which LNG contract prices are linked — also increased in the December quarter, as did the prices of copper and zinc.

In broad terms, benchmark steel-making commodity prices are forecast to lose most of their 2016 gains in 2017, while prices for heating, power and transport fuels and other metals are expected to increase slightly over the next two years. Gold prices are forecast to be stable.

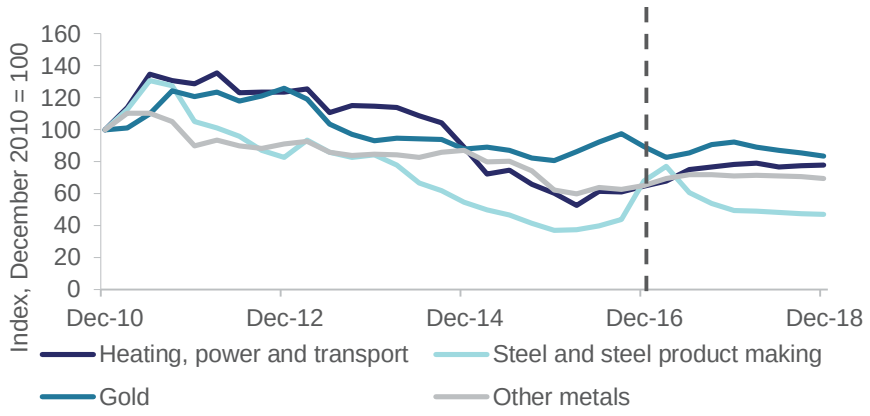
A temporary resurgence in Chinese steel production and supply disruptions in key producing countries, contributed to strong price increases for steel-making and construction raw materials in 2016. However, prices are forecast to decline in 2017, as the demand for steel from China's residential construction sector falls and as supply rises.

The value of the US dollar and global commodity prices (denominated in US dollars) typically move in opposite directions, as shown in Figure 1.3. However, in the month or so after the 9 November US election, while the US dollar (trade weighted) index rose sharply, commodity prices were largely stable in US dollar terms. The break in the correlation appears partly due to President-elect Trump's infrastructure spending and tax cut proposals, viewed as likely to raise world resource consumption.

The effect of the US election outcome on Australia's resource and export earnings is uncertain

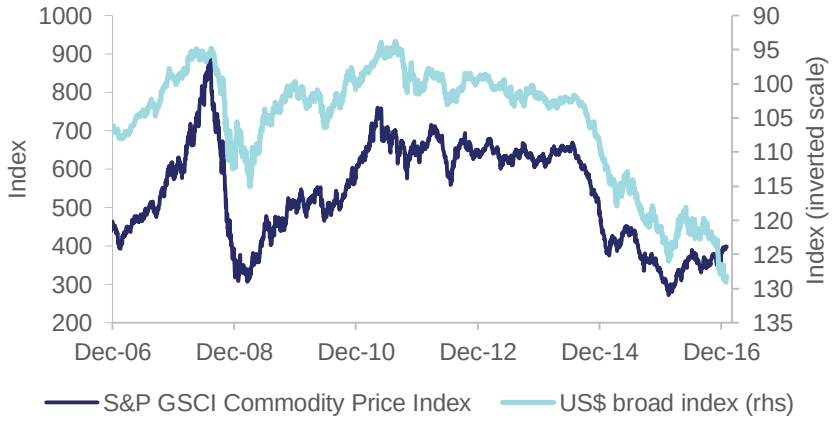
The effect of a Donald Trump Presidency on Australia's resources and energy export earnings is highly uncertain. In his campaign, President-elect Trump pledged to cut taxes and raise spending on infrastructure, which should raise the United States' demand for goods and services.

Figure 1.2: Commodity prices



Note: Heating, power and transport fuels includes Brent oil, thermal coal and uranium. Steel and steel product making includes iron ore, metallurgical coal, nickel and zinc. Other metals includes copper, alumina and alumina. The components are 2016–17 export share weighted.
Source: Bloomberg (2016); Department of Industry, Innovation and Science (2016)

Figure 1.3: Global commodity prices and the US dollar



Note: S&P GSCI Commodity Price Index is based on a global basket of commodity prices. Therefore, movements in this index may differ from an index based on the price of Australia's commodity exports.
Source: Bloomberg (2016) Federal Reserve, Standard and Poors

Some of these goods may be sourced from raw materials produced in Australia — if the US does not increase its own mine output to meet demand.

Mr Trump has also voiced support for the US coal industry, which has been squeezed by the impact of both policy change under the Obama Administration and low natural gas prices. It is unlikely that increased US coal production would pose much of a threat to Australian exports.

Base metal price moves point to a rise in industrial production growth

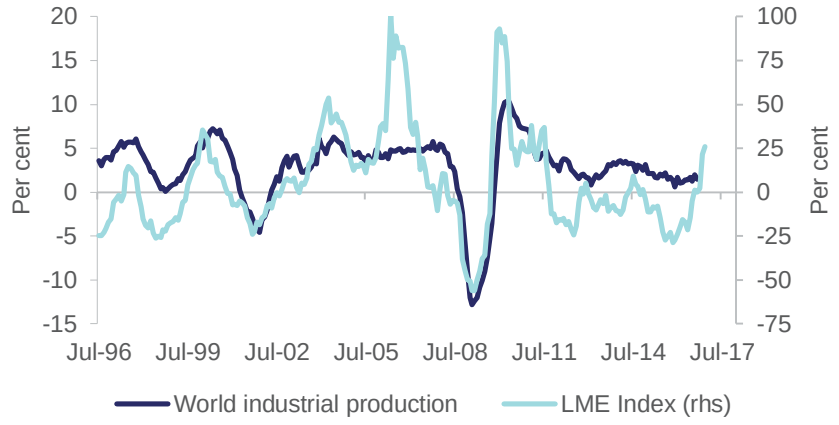
Reflecting the sluggish pace of growth in the world economy, global industrial production grew by 1.5 per cent year-on-year in September. However, as shown by Figure 1.4, recent moves in base metals prices and some leading indicators (see Macroeconomic Outlook) point to stronger growth in world industrial production over the first half of 2017. Monetary conditions in the major world economies remain loose in historical terms.

Speculation in futures markets has increased again

Futures trading activity and spot price volatility has increased again in the last four months of 2016, particularly in the markets for iron ore, thermal and coking coal, zinc, steel, nickel and tin. This follows a large spike in the number of trades in the March and June quarters of 2016; the volume of iron ore futures trades on the Dalian Commodity Exchange averaged nearly 600 million tonnes a day in March and April 2016 — equivalent to a third of the world's production of iron ore in an entire year.

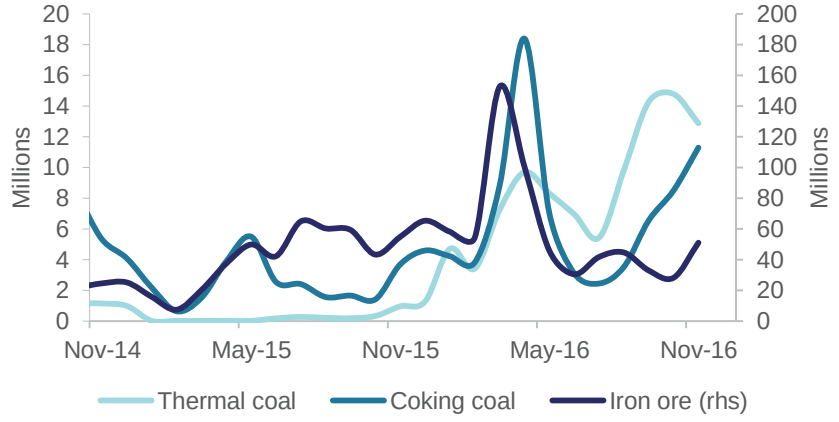
While fundamentals of supply and demand in these markets may partly explain price movements, the heightened amount of money used in speculation may also be to blame. Such volatility adds to the difficulty of forecasting short term movements in commodity prices.

Figure 1.4: World industrial production vs LME Index growth



Source: Bloomberg (2016) CPB Netherlands Bureau for Economic Policy Analysis, London Metals Exchange

Figure 1.5: Monthly number of futures contracts traded



Source: Bloomberg (2016) Dalian Commodity Exchange and Zhengzhou Commodity Exchange

Industrial commodities and precious metals overview

The bulk of Australia's resource commodity exports will continue to be highly dependent on global steel making and, in particular, China's residential construction sector out to 2018.

53 per cent of Australia's resources and energy exports in 2016–17 will be used to make steel and steel-containing products (that is, iron ore, metallurgical coal, nickel and zinc). It is estimated that 43 per cent of China's steel production, and around 21 per cent of global steel production, is consumed by China's real estate construction sector.

Chinese Government-mandated coal mine closures and operating restrictions have aided a significant price rally in metallurgical and thermal coal in 2016. The Chinese Government has recently partly reversed these measures, which is expected to result in price declines in 2017.

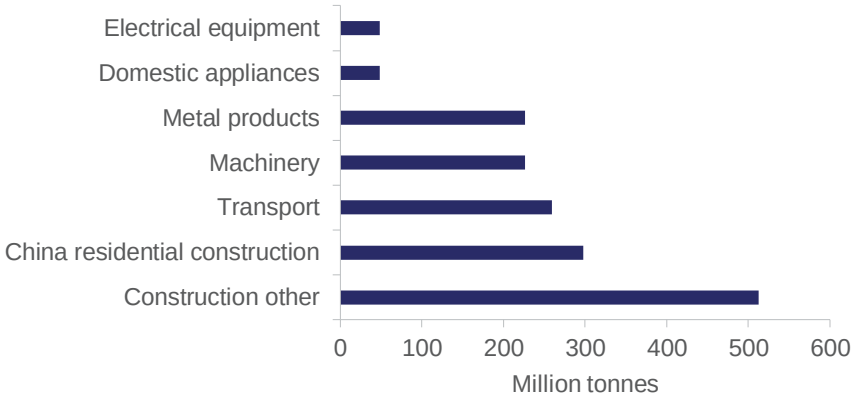
Monetary stimulus and some loosening in buying restrictions has seen a resurgence in Chinese residential construction activity in 2016 — putting upward pressure on the price of steel-making raw materials. However, demand growth has slowed markedly in recent months. Chinese steel demand is forecast to decline marginally in 2017, though the outlook remains highly dependent on government intervention in the sector.

Loss making and excess capacity is high among China's steel makers and in its coal industry, and the Central Government has made moves to cut production. However, rising prices have resulted in the Government largely reversing its stance on coal. Additionally, it is not clear to what extent steel capacity cuts will translate to production cuts. The play-out of these forces will have significant consequences for Australia's resource and energy export earnings in 2017 and 2018.

The gold price is forecast to be relatively subdued into 2017 and 2018, as rising US interest rates — and likely a stronger US dollar — weigh on investor demand. Gold is expected to account for 8.6 per cent of Australia's resource and energy export earnings in 2016–17.

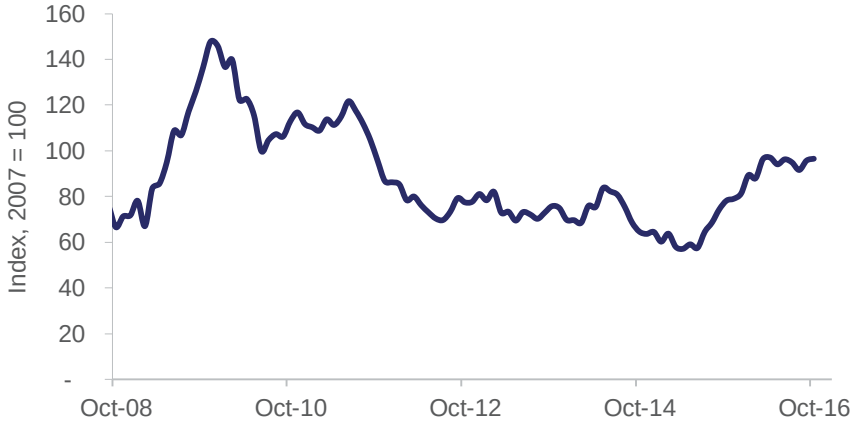
The prospects for Australia's aluminium, alumina and bauxite exports are broadly positive, thanks to increased demand from the US, Europe and China, where vehicle sales and production are forecast to increase. Aluminium, alumina and bauxite are expected to account for 5.2 per cent of Australia's resource and energy export earnings in 2016–17.

Figure 1.6: Global steel consumption by sector in 2016–17



Source: Department of Industry, Innovation and Science (2016); Bloomberg Intelligence (2016)

Figure 1.7: China monetary conditions index



Note: A higher / lower reading of the index may reflect looser / tighter monetary conditions. The index represents a composite of China's real interest rates, total loan growth and the real effective exchange rate.

Source: Bloomberg Intelligence (2016)

Heating, power and transport fuel commodities overview

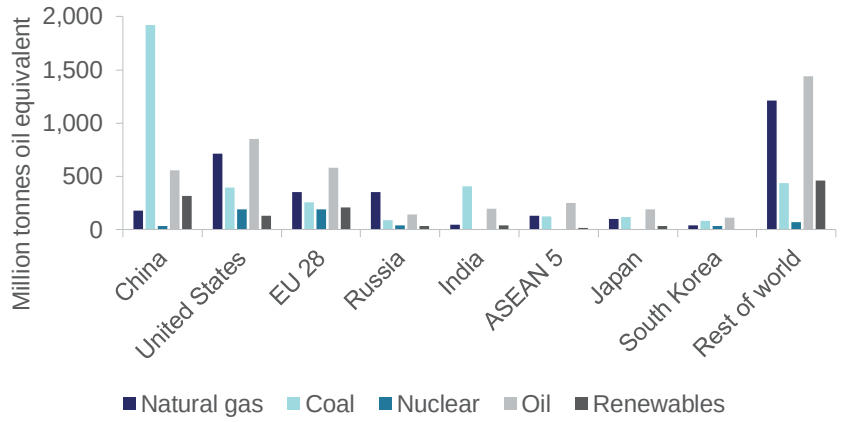
Approximately 24 per cent of Australia's resources and energy exports will be used to generate heating and power and fuel transport vehicles (that is LNG, thermal coal, crude oil and uranium) in 2016–17. Growth in the value of Australia's energy exports is sensitive to both overall energy demand and changes in the energy consumption mix.

It is estimated that in 2015, coal represented 29 per cent of global energy consumption and natural gas represented 24 per cent. However, slower primary energy demand growth, and the decline in energy intensity in the world economy, are now lessening demand growth for all fossil fuels, including gas and thermal coal. The energy transformation in China, and subdued economic growth in advanced economies, is creating headwinds for energy demand in general. Low fossil fuel prices have, so far, failed to stimulate increased demand for these sources of energy.

In the five years to 2014, global imports of thermal coal grew by an average annual rate of 9 per cent, with 36 per cent of that growth coming from China, and a further 32 per cent from India. Global thermal coal demand declined in 2015, owing to weaker Chinese/Indian demand and the adoption of stricter carbon emission policies around the world. As a result, global thermal imports declined by 7.0 per cent in 2015. However, mandated mine output cuts in China have slowed the decline in global thermal coal seaborne trade, with imports estimated to have declined by 1.4 per cent in 2016. Into 2017 and 2018, increased thermal coal imports in India are forecast to offset declines in demand elsewhere.

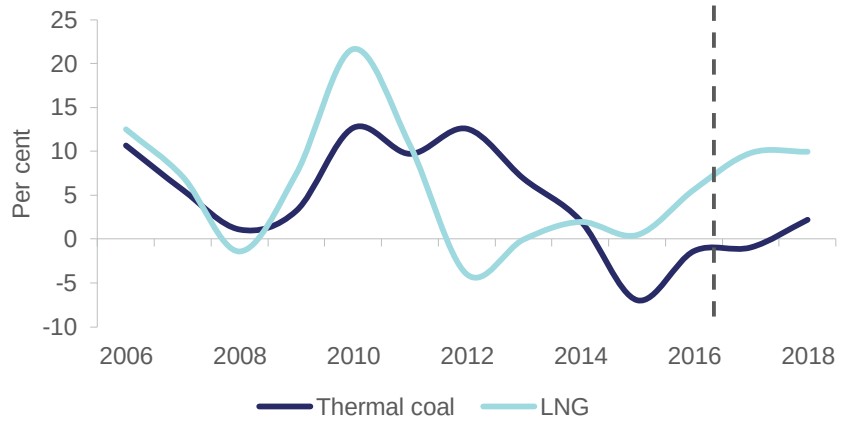
Global gas consumption growth is expected to remain slow in the next two years, growing by 0.8 per cent in 2017 and 2.5 per cent in 2018. However, LNG supplies are growing rapidly, underpinned by expansions in export capacity in both Australia and the United States. Australia's share of global LNG exports is forecast to increase from 12 per cent in 2015, to 24 per cent in 2018.

Figure 1.8: Global energy demand in 2015



Source: BP Statistical Review of World Energy (2016)

Figure 1.9: Global imports of thermal coal and LNG, annual growth



Source: Department of Industry, Innovation and Science (2016); Nexant (2016); IEA (2016) Coal Information 2016

Australia overview

Export earnings forecast to reach record high before steadying

Growth in the volume of Australia's exports of resource and energy commodities was mixed in the September quarter 2016 (year-on-year). LNG, gold, alumina and iron ore exports grew, while exports of coal and base metals exports generally declined.

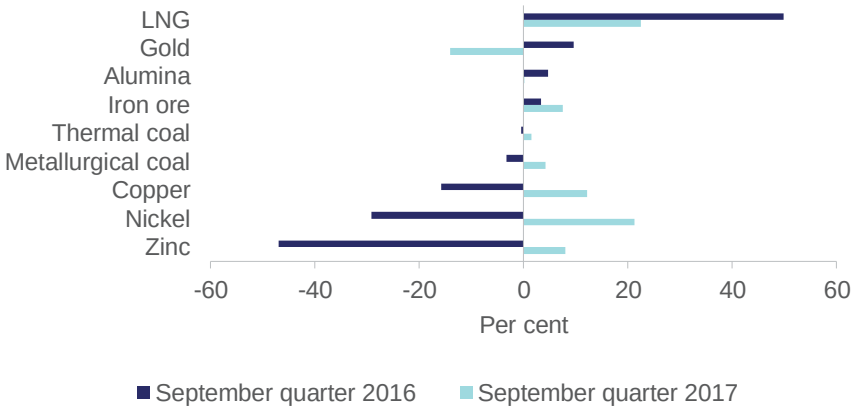
Export volumes of LNG increased by 50 per cent year-on-year, due to the commencement of Australia Pacific LNG, Gladstone LNG and Gorgon LNG projects. Bauxite export volumes increased by 23 per cent, due to increased alumina production in China and supply reductions in Malaysia and Indonesia. Gold export volumes increased by 9.6 per cent, partly driven by the ramp up in production at Newmont Mining's Boddington mine. Iron ore exports increased by 3.3 per cent, supported by production ramping up at Hancock Prospecting's Roy Hill Mine, as well as production increases at Fortescue Metals and Rio Tinto.

By contrast, zinc exports fell by 47 per cent year-on-year in September quarter 2016, because of mine cutbacks by Glencore and the closure of MMG Limited's Century Zinc mine. Nickel ore exports (metal content) declined by 29 per cent, as several mines were placed under 'care and maintenance'. Copper exports also declined, down by 16 per cent. Coking coal exports declined by 3.3 per cent, because of weather and infrastructure disruptions in Queensland, while thermal coal exports declined by 0.4 per cent.

The outlook for Australia's resources and energy exports is positive, with export earnings forecast to increase 30 per cent in 2016–17, to a nominal record of $204 billion, before steadying in 2017–18. The strongest growth in export earnings over the two years to 2017–18 will come from LNG, which is forecast to increase by 124 per cent, from $17 billion in 2015–16 to $37 billion in 2017–18, as recently completed projects ramp up output and projects under construction come online.

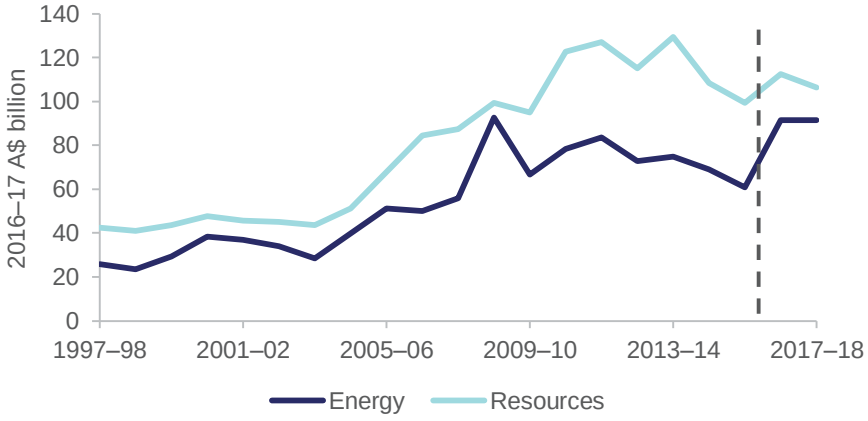
Growth in bulk commodities volumes are also expected to contribute to higher export earnings over the outlook period — despite the expected unwinding of most of 2016's price gains. Export earnings from iron ore, metallurgical coal, and thermal coal exports, are forecast to increase a combined 23 per cent, to $101 billion, in the two years to 2017–18.

Figure 1.10: Year-on-year growth in export volumes by commodity



Source: ABS (2016) International Trade in Goods and Services, 5368.0; Department of Industry, Innovation and Science (2016)

Figure 1.11: Australia's resources and energy export earnings



Source: ABS (2016) International Trade in Goods and Services, 5368.0; Department of Industry, Innovation and Science (2016)

Resource and energy exports to support nominal GDP growth

In recent years, Australia's nominal GDP has been increasingly affected by resource and energy export earnings — reflecting the increased share of mining in Australia's economy.

However, declining commodity prices saw the Australian mining sector's share of Australia's gross domestic product (GDP) fall to 6.0 per cent in 2015–16, its lowest share since 2004–05. This should turn around in the next few quarters — higher commodity prices and further increases in export volumes of Australia's largest export commodities, are expected to see the mining sector make a larger contribution to Australia's economy in 2016–17.

Capital expenditure declines and the investment pipeline thins

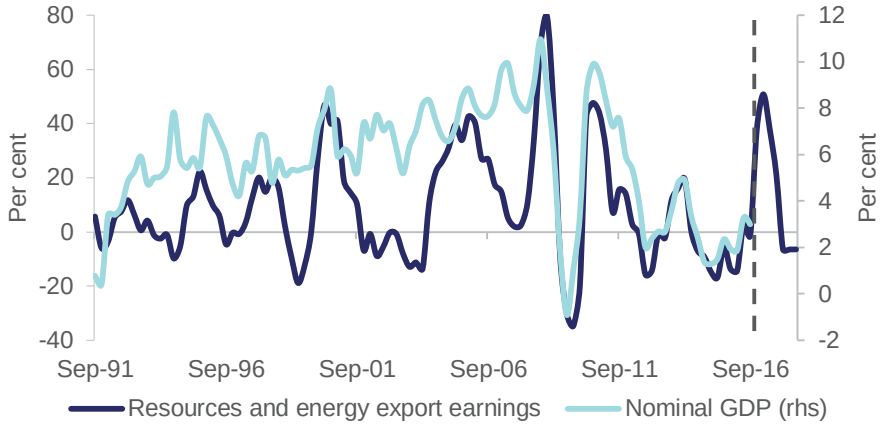
The mining boom continues to transition from the 'investment phase' to the 'production phase', with the commodity price outlook too low to incentivise a strong rebound in capital expenditure. Despite the improvement in commodity prices in 2016, they remain well below levels reached in the investment phase. Additionally, the price gains of 2016 are expected to be largely unwound over the next 18-24 months.

Private capital expenditure in the mining sector declined by 35 per cent year-on-year in the September quarter 2016, to $9.7 billion. This was the lowest level in six years, although it remains well above levels observed prior to the onset of the mining boom.

The *Resources and Energy Major Projects* publication — an appendix to this report — reflects the decline in capital investment. The total value of committed resource and energy projects in the investment pipeline — those where a final investment decision has been taken and construction activity is likely underway — has fallen by 12 per cent over the 12 months to October 2016, to $195 billion.

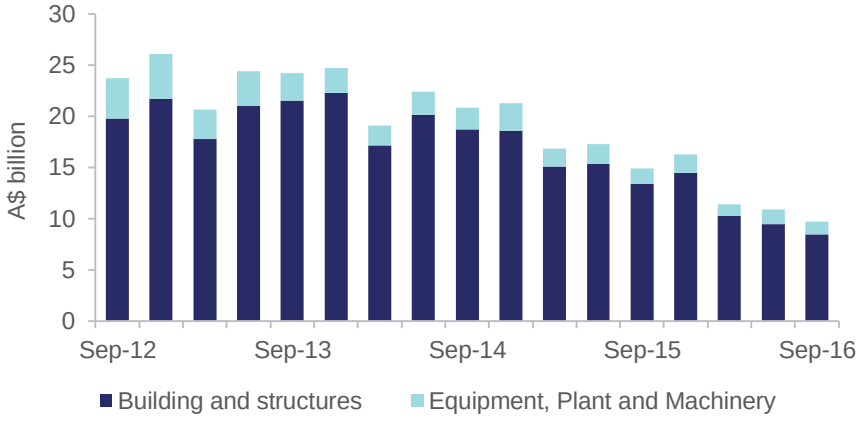
Moreover, the progression of projects to the committed stage is slowing, as producers divert focus from developing new projects to reducing costs, and to ensuring the commercial viability of existing assets. Final investment decisions for many projects have been delayed to 2017 or later, with project owners weighing up factors such as the price cycle, access to infrastructure and cost competitiveness in Australia. As a result, the outlook for resources and energy investment remains subdued over the short to medium term.

Figure 1.12: Australia's nominal GDP vs resource and energy export earnings, year-on-year change



Source: ABS (2016) National Accounts, 5206.0; ABS (2016) International Trade in Goods and Services, 5368.0; Department of Industry, Innovation and Science (2016)

Figure 1.13: Private mining capital expenditure



Source: ABS (2016) Private New Capital Expenditure and Expected Expenditure, 5625.0

Exploration expenditure continues to fall

The pace of decline in mineral exploration expenditure — which has usually declined by over ten per cent year-on-year since late 2012 — has slowed considerably in recent quarters. Mineral exploration fell by only 3.7 per cent in the September quarter 2016, to $380 million. By contrast, petroleum exploration expenditure continued to decline rapidly, falling by 39 per cent year-on-year, to $355 million.

Gold and copper were the only minerals to record increased exploration expenditure in the September quarter 2016. Gold exploration expenditure increased by 19 per cent year-on-year, to $159 million, while copper exploration expenditure increased by 15 per cent to $35 million. Coal exploration expenditure was the largest contributor to the overall decline, falling 34 per cent year-on-year to $37 million. The decline in iron ore exploration expenditure has slowed considerably in recent quarters, falling by only 2.9 per cent to $80 million in the September quarter 2016.

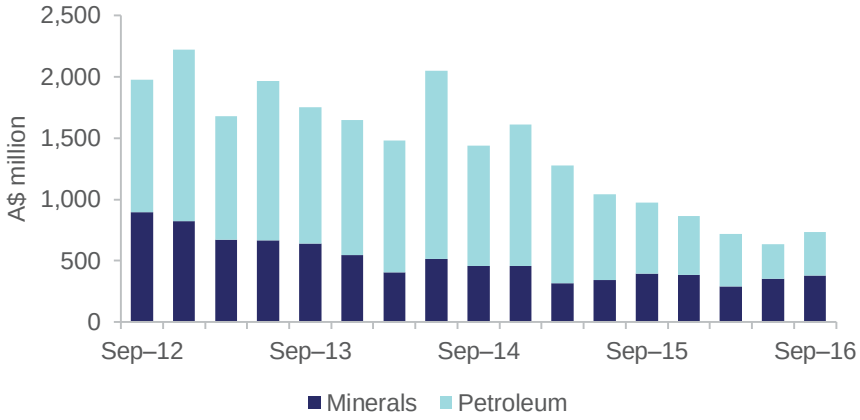
Minerals exploration expenditure increased year-on-year in Victoria (up 23 per cent to $7.9 million), New South Wales (up 8.5 per cent to $32 million) and Western Australia (up 6.7 per cent to $249 million) in the September quarter 2016. This was offset by declines in Northern Territory (down 34 per cent to $22 million), Queensland (down 28 per cent to 55 million), Tasmania (down 18 per cent to $3.2 million) and South Australia (down 5.5 per cent to $10 million).

The generally subdued long term outlook for growth in commodity prices makes substantive increases in exploration expenditure over the outlook period unlikely.

Mining employment is at its lowest level in over five years

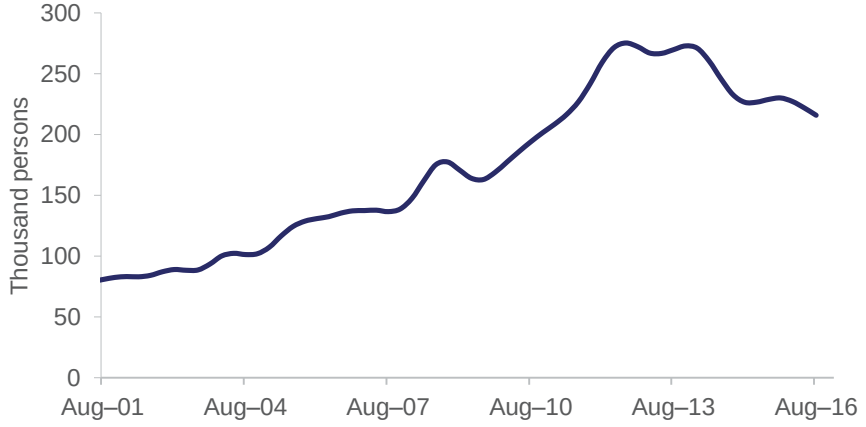
Trend employment in the mining sector declined by 2.7 per cent in August 2016, to 216,000 — the lowest level since February 2011. In the year to August 2016, the largest fall in mining industry employment occurred in Queensland, where employment declined by 9 per cent to 61,100 persons. Employment is likely to decline further over the outlook period, as major projects move into the less labour-intensive production phase of the mining boom.

Figure 1.14: Australia's exploration expenditure



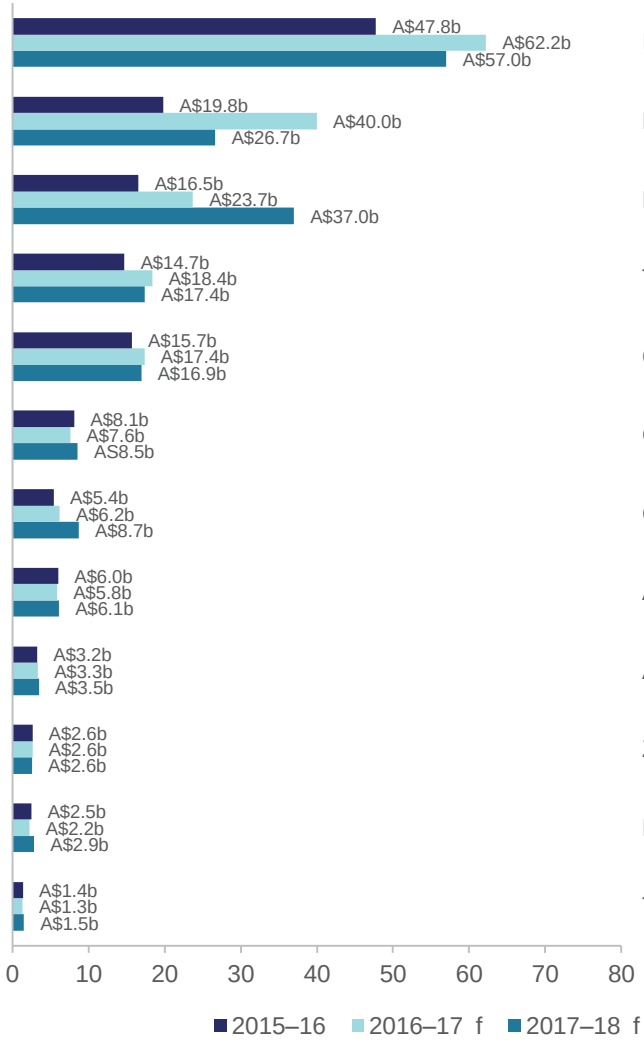
Source: ABS (2016) Actual and Expected Private Mineral Exploration, 8412.0

Figure 1.15: Mining sector employment



Source: ABS (2016) Labour Force Australia, 6291.0.55.003

Figure 1.16: Australia's major resources and energy commodity exports



Per cent

	2016–17 f			2017–18 f		
	volume	EUV	value	volume	EUV	value
Iron ore	▲ 6	▲ 23	▲ 30	▲ 6	▼ -13	▼ -8
Metallurgical coal	▲ 2	▲ 99	▲ 102	→ 0	▼ -33	▼ -33
LNG	▲ 42	▲ 1	▲ 43	▲ 28	▲ 21	▲ 56
Thermal coal	▲ 4	▲ 21	▲ 25	→ 0	▼ -5	▼ -5
Gold	▲ 5	▲ 5	▲ 11	▼ -2	▼ -1	▼ -2
Copper	▼ -9	▲ 2	▼ -6	→ 0	▲ 13	▲ 13
Crude oil	▲ 2	▲ 12	▲ 14	▲ 21	▲ 16	▲ 40
Alumina	▲ 3	▼ -5	▼ -3	→ 0	▲ 4	▲ 4
Aluminium	▲ 3	→ 0	▲ 3	▲ 3	▲ 1	▲ 3
Zinc	▼ -38	▲ 61	→ 0	▲ 5	▼ -7	▼ -3
Nickel	▼ -14	▲ 5	▼ -9	▲ 18	▲ 8	▲ 27
Titanium and zircon	▲ 5	▼ -7	▼ -3	▲ 18	▼ -4	▲ 13

Source: ABS (2016) International Trade in Goods and Services, 5368.0; Department of Industry, Innovation and Science (2016)

Notes: f Forecast; EUV is export Unit Value

Table 1.1: Outlook for Australia's resources and energy commodities

	unit	2015–16	2016–17 [f]	Per cent change	2017–18 [f]	Per cent change
Value of exports						
Resources and energy	A$m	157,374	203,946	29.6	202,155	–0.9
– real [b]	A$m	159,971	203,946	27.5	197,899	–3.0
Energy	A$m	59,741	91,544	53.2	93,391	2.0
– real [b]	A$m	60,727	91,544	50.7	91,425	–0.1
Resources	A$m	97,633	112,402	15.1	108,764	–3.2
– real [b]	A$m	99,244	112,402	13.3	106,474	–5.3

Notes: ***b*** *In current financial year Australian dollars;* ***f*** *Forecast*

Source: ABS (2016) International Trade in Goods and Services, 5368.0; Department of Industry, Innovation and Science (2016)

Table 1.2: Australia's resources and energy commodity exports, selected commodities

		Volume			Value		
	unit	2016–17 [f]	2017–18 [f]	Per cent change	2016–17 [f]	2017–18 [f]	Per cent change
Alumina	kt	18,211	18,211	0.0	5,843	6,106	4.5
Aluminium	kt	1,490	1,532	2.8	3,350	3,463	3.4
Copper	kt	981	1,024	4.4	7,579	8,549	12.8
Gold	t	323	317	-1.6	17,353	16,929	–2.4
Iron ore	Mt	832	879	5.6	62,230	57,021	–8.4
Nickel	kt	186	219	18.1	2,245	2,855	27.2
Zinc	kt	941	985	4.7	2,634	2,552	–3.1
LNG	Mt	52	67	28.5	23,713	37,000	56.0
Metallurgical coal	Mt	191	191	-0.3	39,988	26,661	–33.3
Thermal coal	Mt	208	208	0.2	18,370	17,395	–5.3
Oil	kbd	244	295	20.8	6,221	8,723	40.2
Uranium	t	7,141	7,850	9.9	907	995	9.8

Notes: ***f*** *Forecast*

Source: ABS (2016) International Trade in Goods and Services, 5368.0; Department of Industry, Innovation and Science (2016)

Macroeconomic outlook

Overview

Recent months have seen signs of a recovery in the world industrial production cycle — the major driver of resource commodity demand growth and prices. The prospect of a more stimulatory US fiscal policy is adding to the chance of an even stronger recovery in 2017. Forthcoming elections in several large European countries, and scheduled leadership change in China through 2017, pose uncertainties to the forecast outlook. Further out, a withdrawal of extremely loose monetary policy in the United States and the prospect of increasing foreign trade protectionism, could largely offset the ongoing benefits of any US fiscal stimulus.

United States

From likely growth of around 1.75 per cent in 2016, US GDP growth is forecast to improve to 2.3 per cent in 2017 and 3.0 per cent in 2018. These forecasts are based on assumed increased infrastructure spending and significant tax cuts for households and corporations.

A sharp rebound in US year bond yields has been the most notable trend on global financial markets in recent months. Along with the prospective fiscal stimulus, rising commodity prices and signs of stronger growth have helped raise US inflation expectations. September quarter US GDP was revised up to 3.2 per cent (seasonally-adjusted annualised rate), driven by a rebound in consumption. The prospect of this growth continuing is supported by US consumer confidence readings, which rose sharply in November. The manufacturing sector also showed signs of growth in November, with both the ISM and Markit PMI rising to 53.2 and 54.1 index points, respectively. Growth in the sector has been driven by rising demand for goods from both consumers and businesses. Although the higher US dollar has hurt exports, it has also reduced import costs, at a time when inflation pressures are rising.

Construction spending has also shown strong gains, rising to a 7-month high of US$1.2 trillion (annualised rate) in October, due to increases in public construction spending and in private residential spending. Housing starts also jumped 25.5 per cent in October (seasonally adjusted, annualised rate), the highest pace since August 2007.

Figure 2.1: World PMI vs growth in world industrial production

Source: Netherland CPB (2016) World Trade Monitor September; Markit (2016) JP Morgan Global Manufacturing PMI

Figure 2.2: Growth in world steel production vs industrial production

Source: Netherlands CPB(2016) World Trade Monitor September ; International Iron and Steel Institute (2016) World Total Steel Production Data

China

Chinese GDP growth is expected to continue to ease modestly, to 6.4 per cent in 2017 and 6.1 per cent in 2018. The Chinese government continues to use various policy levers to keep growth firm, as the economy transitions away from export and investment-led growth to consumption-led growth. However, with a leadership change expected at the 19th National People's Congress — to be held in late 2017 — there may be a renewed focus on strong growth at the expense of structural reform. A further significant decline in the Yuan over the past few months will help to sustain economic growth of the Chinese economy in 2017.

Recent data for the manufacturing sector supports signs of continuing stabilisation in the economy. Both leading manufacturing leading indices (the official PMI and Caixin PMI) suggest a significant strengthening in the manufacturing sector in the coming few months. The manufacturing sector appears to be benefiting from the government's stimulus measures earlier this year, and from an emerging economic recovery in China's main trading partners.

The (stop-start nature of the) Chinese housing market continues to be a concern, as house prices surge in China's 70 major cities. Despite some tightening of regulations on house purchases in a range of tier 2 and tier 3 cities, and instructions from the Chinese central bank to reduce bank credit, investment in real estate grew strongly in the year to October. Construction is likely to slow over the next few months, as policy measures bite, providing less support for economic growth.

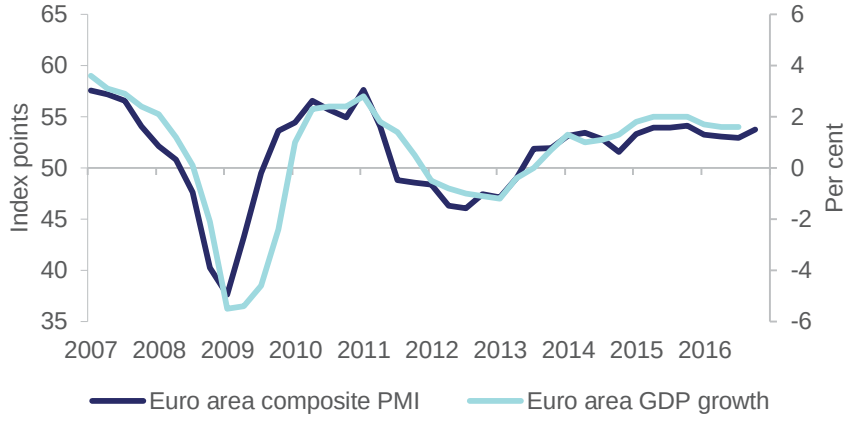
Europe

Following an initial sell-off on the back of the Brexit referendum, European markets have settled. Industrial production in the Euro area showed steady growth in September, increasing 1.2 per cent year-on-year. Recent readings of the Euro area composite PMI point to GDP growth continuing at current levels over the next few months.

Figure 2.3: Growth in Chinese industrial production vs OECD leading indicator for China

Source: OECD (2016) China Composite Leading Index Total Trend Restored Stock; National Bureau of Statistics, China (2016) China Leading Index

Figure 2.4: Euro area GDP growth vs composite PMI



Source: Eurostat (2016) Euro Area Gross Domestic Product; Markit (2016) Eurozone Composite PMI

GDP growth for the Euro area is expected to be 1.6 per cent in 2017 and 1.7 per cent in 2018, little changed from recent years. However, there remain some risks to future growth. Once Article 50 is triggered and the two-year UK-EU exit negotiation process begins, uncertainty may weigh on consumer and business confidence. Moreover, oil prices appear to have bottomed, and the European Central Bank appears unlikely to loosen monetary policy substantially further.

Results of the recent referendum in Italy have created additional uncertainty, with the Italian Prime Minister to resign following the outcome. However, markets remained stable, with minimal disruption aside from a short-lived drop in value for the Euro.

Japan

Japanese industrial production has resumed positive growth, after a year of contraction. A pick-up in global demand for motor vehicles and consumer electronics is helping Japanese exports and production, while macroeconomic policy remains stimulatory.

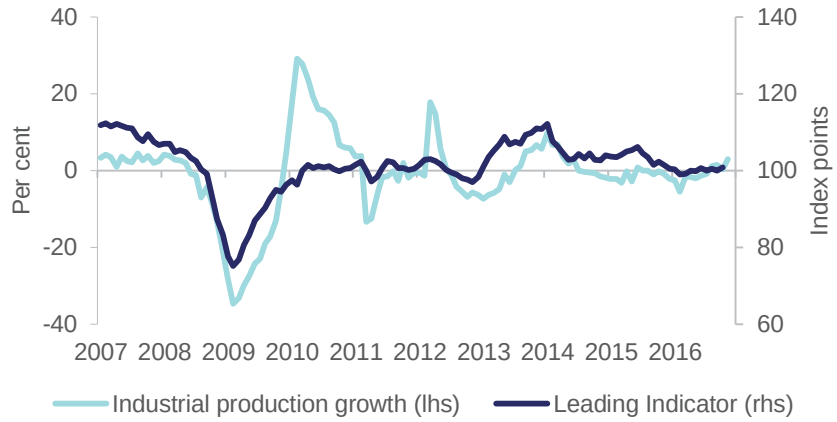
Japanese GDP growth is forecast to be 1.0 per cent in 2017 and 0.8 per cent in 2018. A depreciation in the yen following the result of the US election has been beneficial for exports, helping to alleviate the impact of weak domestic spending.

South Korea

Industrial production has contracted, as foreign demand wanes for South Korean manufactured products. The South Korean economy has also been impacted by political unrest in recent months.

A resolution of the domestic political crisis situation would appear to be necessary for a strong recovery in business and consumer confidence. GDP growth for South Korea is forecast to reach 2.6 per cent in 2017 and 3.0 per cent in 2018.

Figure 2.5: Japanese industrial production index vs leading index



Source: Ministry of Economy, Trade and Industry, Japan (2016) Japan Indices of Industrial Production; Economic and Social Research Institute, Japan (2016) Japan New Composite Index of Business Cycle Indicators Leading Index

India

Industrial production growth has been weaker than the expected. November's PMI shows India's manufacturing sector continued to expand, but at a slower pace. The weaker than expected growth is partially due to the withdrawal of high-value banknotes by the Government, as it cracks down on corruption. Manufacturers have noted that resulting cash shortages have impacted the growth of new work, buying activity and production. Other sectors have been even more deeply affected.

Indian GDP growth is forecast to remain strong, at 7.6 per cent in 2017 and 7.7 per cent in 2018.

Table 2.1: Key world macroeconomic assumptions

Per cent	2014	2015	2016 [a]	2017 [a]	2018 [a]
Economic growth [b]					
Advanced economies	1.9	2.1	1.6	1.8	1.8
United States	2.4	2.6	1.5	2.3	3.0
Japan	0.0	0.5	0.8	1.0	0.8
European Union 28	1.6	2.3	1.9	1.7	1.8
Germany	1.6	1.5	1.7	1.4	1.4
France	0.6	1.3	1.3	1.3	1.6
United Kingdom	3.1	2.2	1.8	1.1	1.7
South Korea	3.3	2.6	2.7	2.6	3.0
Chinese Taipei	3.9	0.6	1.0	1.7	1.9
Emerging economies	4.6	4.0	4.2	4.6	4.8
Non-OECD Asia	6.8	6.6	6.5	6.3	6.3
South East Asia [d]	4.6	4.8	4.8	5.1	5.2
China [e]	7.3	6.9	6.7	6.4	6.1
India	7.2	7.6	7.4	7.6	7.7
Latin America & Caribbean	1.0	–0.0	–0.6	1.6	2.1
Middle East	2.6	2.2	3.2	3.2	3.4
World [c]	3.4	3.2	3.1	3.4	3.6
Inflation rate [b]					
United States	2.2	0.1	1.1	1.8	2.2

*Notes: **a** Assumption; **b** Change from previous period; **c** Weighted using 2012 purchasing power parity (PPP) valuation of country gross domestic product by IMF; **d** Indonesia, Malaysia, Philippines, Thailand and Vietnam; **e** Excludes Hong Kong*

Source: IMF (2016) World Economic Outlook; OECD (2016) Economic Outlook

Australian macroeconomic assumptions

The forecast export values presented in this report are dependent on assumptions about the Australian dollar-US dollar exchange rate, the Reserve Bank of Australia (RBA) cash rate and the inflation rate over the outlook period.

Australian dollar-US dollar exchange rate

The Australian dollar averaged around US73 cents in 2015–16, down from US84 cents in 2014–15. The Australian dollar is assumed to remain relatively stable, at around US74 cents in 2016–17 and 2017–18.

RBA cash rate

The RBA cash rate has declined over the past few years because of weak domestic economic conditions. The RBA cash rate is assumed to remain at current levels in 2016–17.

Inflation

The RBA targets an inflation band of between 2–3 per cent on average over the economic cycle. The inflation rate is assumed to increase to 2.3 per cent in 2016–17.

Figure 2.6: Australia's exchange rate

Source: RBA (2016) Reserve Bank of Australia Bulletin; Department of Industry, Innovation and Science (2016)


Steel

Market summary

Global steel production is forecast to grow by 0.1 per cent in 2017, and by 1.0 per cent in 2018, to reach 1.6 billion tonnes. Steel production in China is forecast to decline, as residential construction slows, representing a significant risk to suppliers of raw materials to the steel sector in China. In contrast, India's steel production is forecast to continue to grow strongly, with India set to become the second largest producer in the world by the end of 2018. Steel production in the United States and European Union is also expected to grow over the outlook period, supported by rising domestic demand and by anti-dumping measures against low price steel imports from China.

Steel production and consumption

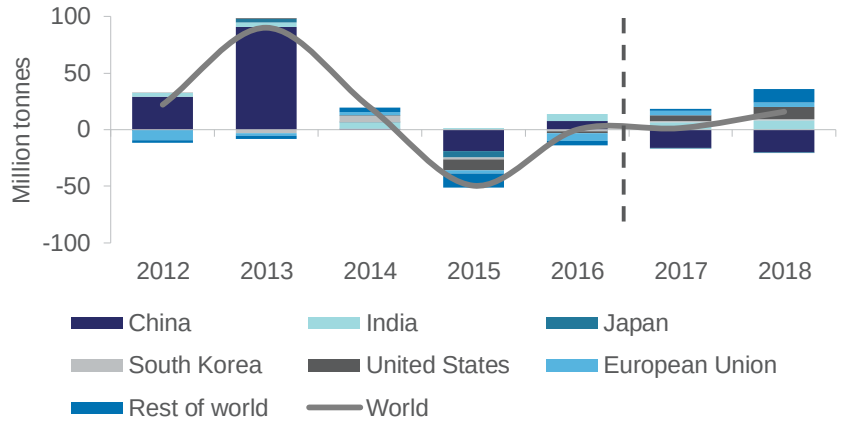
China's steel production forecast to decline in 2017 and 2018

In the four months to October, steel production increased 3.5 per cent year-on-year, supported by increased steel consumption, up 5.8 per cent over the same period. In contrast to previous expectations that China's steel production would decline in 2016, annual production is now estimated to have grown slightly (by 0.9 per cent), to reach 811 million tonnes. Production is forecast to decline by 2.0 per cent and 2.5 per cent in 2017 and 2018, respectively.

The recent increase in China's steel production has occurred despite accelerating capacity cuts in recent months. These cuts have totalled 88 million tonnes in the year to date, almost double the target of 45 million tonnes. However, a large share of the capacity cuts were to plants that had already been idled, while production growth at remaining plants has been incentivised by higher steel prices, improved margins and strong demand.

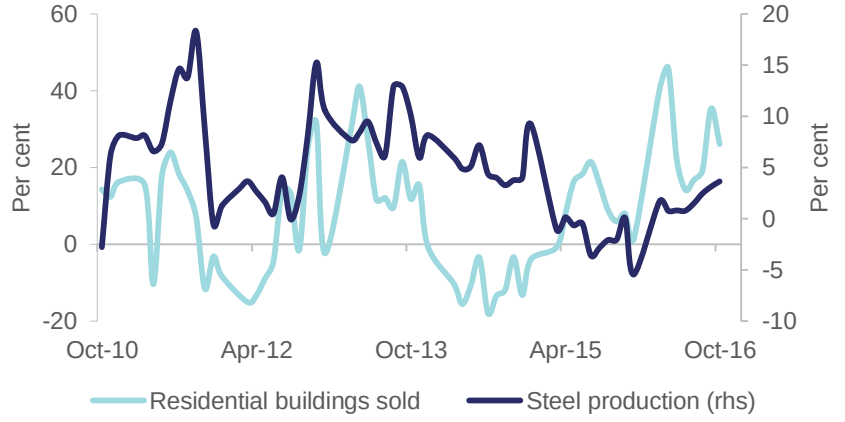
Recent steel consumption growth has been driven by the construction sector and investment in infrastructure. Residential property sales were up 28 per cent year-on-year in the three months to October, while infrastructure fixed asset investment increased 19 per cent. A 24 per cent increase in automobile production — supported by a cut in the sales tax on small passenger cars — also drove higher steel demand.

Figure 3.1: World steel production, annual change



Source: Bloomberg (2016) World Steel Association; Department of Industry, Innovation and Science (2016)

Figure 3.2: China's property sales and steel production, year-on-year change



Source: Bloomberg (2016) National Bureau of Statistics China

Steel exports decreased 15 per cent year-on-year in the three months to October, the largest decline since mid-2011. An increasing number of antidumping duties against China's steel products have been imposed by the European Union, United States and India.

The forecast decline in Chinese steel production over the outlook period is underpinned by an expected slowdown in residential construction, and to a lesser extent, ongoing capacity cuts, industry consolidation and increasingly stringent environmental regulations.

Government measures to cool the housing market in Tier 1 and 2 cities have already had a noticeable effect on house prices. There is also a persistent large oversupply of housing stock in smaller cities. A slowdown in construction — which accounts for around 72 per cent of domestic steel use — will weigh on steel prices and production, and as a result, the demand for raw materials. The pace and extent of the slowdown in residential construction, and potential for further government stimulus measures, represent the key risks to the outlook.

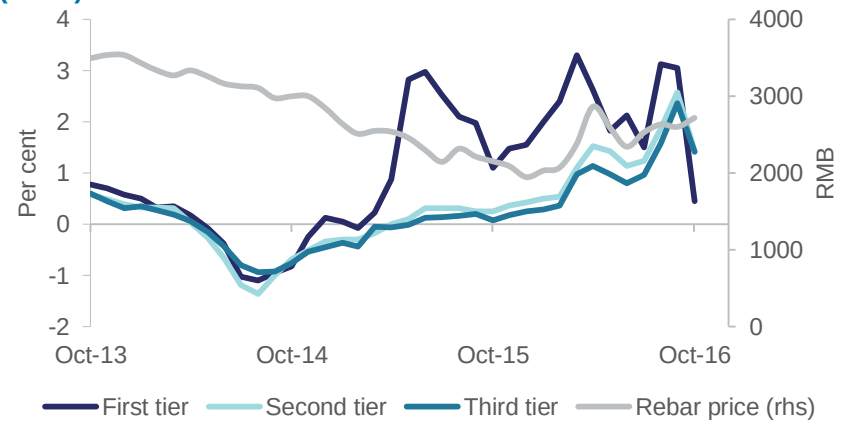
Falling steel demand from the residential construction sector will only be partially offset by increased demand from other sectors, including in the machinery, automobile and appliances sectors. Infrastructure investment will be a key source of demand growth, with the National Development and Reform Commission and the Ministry of Transport planning to spend RMB4.7 trillion on 303 infrastructure projects in the period to end 2018.

India to become world's second largest steel producer

Steel production in India increased 8.7 per cent year-on-year in the September quarter 2016, as producers continued to ramp up output in anticipation of growing demand from the government's infrastructure development plans and the 'Make in India' campaign. In 2016, steel output is estimated to have risen by 6.8 per cent to 95 million tonnes. India is forecast to become the world's second largest steel maker by the end of 2018, with output forecast to grow by 7.0 per cent in 2017 and 8.3 per cent in 2018 to 110 million tonnes.

Domestic steel output will continued to be supported by a range of policies (such as safeguard duties, minimum import price mechanisms and anti-dumping duties imposed on a range of steel products) that have already resulted in substantially reduced imports. Iron and steel imports declined by 28 per cent year-on-year in the four months to October.

Figure 3.3: China property prices (month-on-month ch.) and steel price (rebar)



Source: Bloomberg (2016) National Bureau of Statistics China; Bloomberg (2016) Antaike

Figure 3.4: India's steel production and imports, year-on-year ch.

Source: Bloomberg (2016) World Steel Association; Bloomberg (2016) Reserve Bank of India

Japan's steel production to remain stable over 2017 and 2018

Steel production in Japan increased 0.6 per cent year-on-year in the four months to October. Demand for steel was supported by a strong recovery in housing starts, up 9.2 and 11 per cent year-on-year in August and September, respectively. After a sluggish year of growth, there were also signs of a recovery in industrial production and manufacturing, both up 1.4 per cent year-on-year in September.

However, steel production in Japan is expected to continue to be adversely effected by sluggish domestic economic growth and export demand in the next two years. Production in 2016 as a whole is estimated to have declined by 0.4 per cent, and is forecast to remain largely unchanged over 2017 and 2018, at around 104 million tonnes.

South Korea's steel industry undergoing restructuring

South Korea's steel production increased 0.6 per cent year-on-year in the four months to October, but is estimated to have decreased by 1.6 per cent in 2016 as a whole. The domestic steel industry has been adversely affected by a downturn in its shipbuilding and automobile industries.

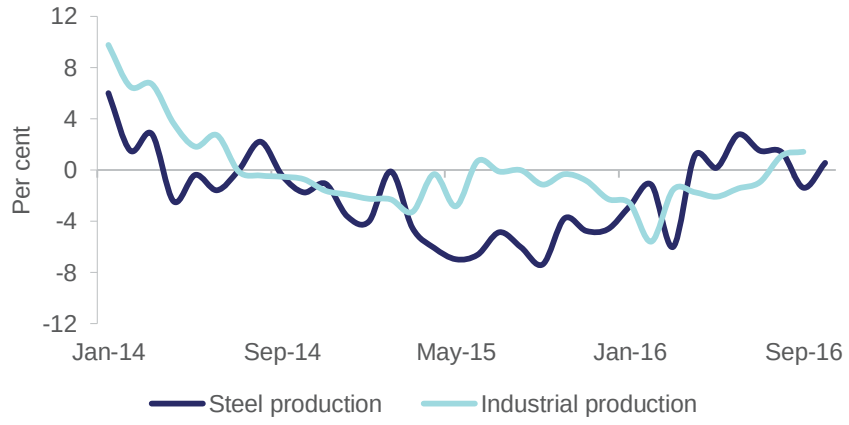
Steel production is forecast to increase marginally, in 2017 and 2018, by 1.2 and 1.3 per cent, respectively, to reach 70 million tonnes. South Korea's two largest steel producers will benefit from a range of government policies aimed at facilitating restructuring in the sector. These policies include fast-tracked merger and acquisitions procedures, tax benefits and financial assistance for research and development.

United States steel production forecast to grow over 2017 and 2018

Steel production in the United States declined by 4.3 per cent in the four months to October, and is estimated to have declined by 1.6 per cent for 2016 as a whole.

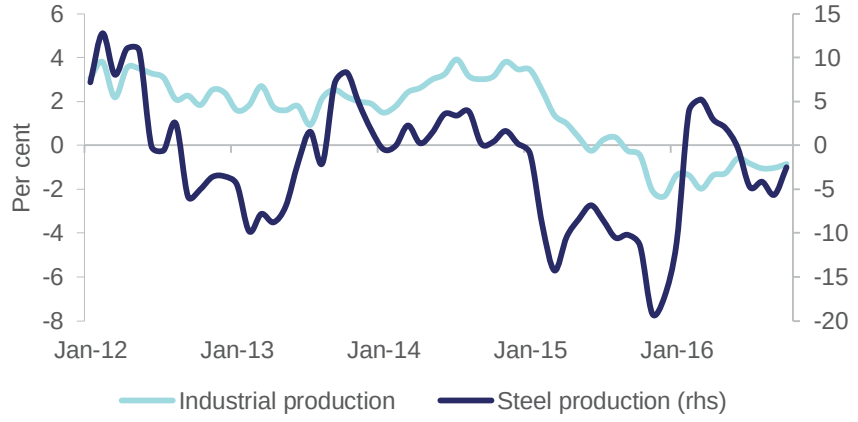
Despite high anti-dumping duties on a range of steel products, and a strong recovery in the Dodge construction index (up 32 per cent year-on-year in August and September), steel production has been affected by subdued domestic demand conditions in the manufacturing and automobile sectors.

Figure 3.5: Japan's steel production and industrial production, y/y ch.



Source: Bloomberg (2016) World Steel Association; Bloomberg (2016) Ministry of Economy, Trade and Industry, Japan

Figure 3.6: US steel production and industrial production, y/y ch.



Source: Bloomberg (2016) World Steel Association; Bloomberg (2016) US Federal Reserve

Steel production in the United States is forecast to grow by 7 per cent and 13 per cent in 2017 and 2018, respectively. The large upward revision from the previous quarter is underpinned by the President-elect Trump's plans for higher infrastructure spending and more protectionist trade policies, which will boost domestic steel demand and production. However, there is a some uncertainty surrounding the delivery of all the pledges made during the election campaign.

Steel production in the European Union forecast to grow in 2017-18

Steel production in the European Union declined by 1.0 per cent in the four months to October, and is estimated to have declined by 4.2 per cent for 2016 as a whole. Demand conditions remained soft, with subdued growth in construction (up 0.7 per cent year-on-year in the three months to October) and industrial production (up 1.1 per cent over the same period).

Production is forecast to grow by 2.5 per cent per annum over the outlook period, to reach 167 million tonnes in 2018, close to the historical average. Steel production is expected to be supported by the imposition of anti-dumping duties on steel imports. Following the Brexit result, there is a higher potential for the EU to pursue policies that protect the domestic industry — the United Kingdom has historically led a small group of countries opposed to trade restrictions.

Australia's steel exports increased while imports decreased in the September quarter

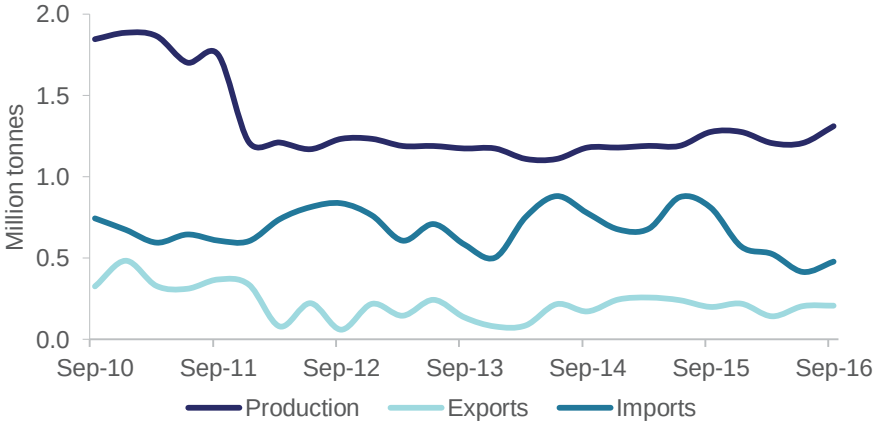
Australia's steel production is estimated to have increased by 2.8 per cent year-on-year in the September quarter 2016, to 1.3 million tonnes. This represents just 0.3 per cent of total global production. At the same time, apparent steel consumption (production plus imports less exports) is estimated to have fallen by 16 per cent to 1.6 million tonnes, as a result of further contraction in the construction industry.

Australia's imports of steel declined 41 per cent year-on-year to 479,000 tonnes in the September quarter, while import unit values declined by 29 per cent over the same period. Despite concern over low-cost imports of steel products from China, imports from China decreased by 4.6 per cent in the September quarter to 76,000 tonnes. Imports from Japan decreased by 9.2 per cent to 28,000 tonnes over the same period.

The volume of Australia's steel exports increased by 3.8 per cent year-on-year in the September quarter to 207,000 tonnes. Despite adverse rulings on Australian steel imports to the US, exports to the US increased by 17 per cent year-on-year in the September quarter, to 48,000 tonnes. Total export unit values decreased by 1.2 per cent over the same period, as a result of lower global steel prices.

Australia has two major steel producers, Arrium Steel and BlueScope Steel. Steel production at Arrium's Whyalla plant was affected by the power outage in South Australia at the start of the December quarter, with an estimated $10 million in losses. Arrium Steel is currently under voluntary administration, with final bids for its sale due in December 2016. Recent cost-cutting activities at BlueScope Steel have resulted in higher margins — even amid high metallurgical coal and iron ore prices — providing some stability to Australia's steel production.

Figure 3.7: Australia's steel production, exports and imports



Source: ABS (2016) International Trade, Australia, cat. no. 5465.0; Department of Industry, Innovation and Science (2016); Company reports and presentations

Table 3.1: World steel consumption

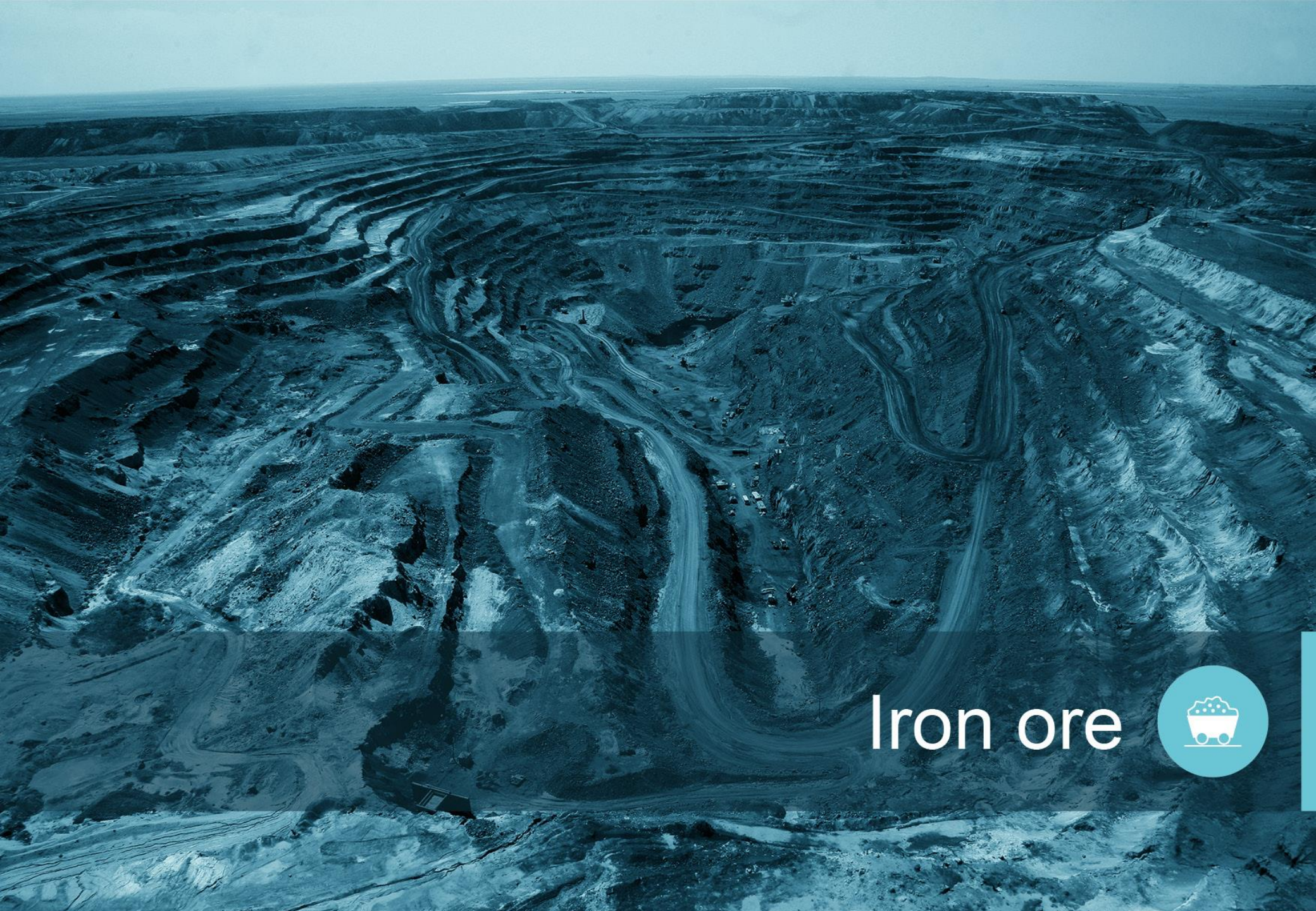
Million tonnes	2015	2016 s	2017 f	2018 f	Per cent change
European Union 28	167	168	170	174	1.2
United States	108	107	112	118	5.0
Brazil	24	16	14	13	–11.7
Russia	45	41	40	39	–2.6
China	700	707	692	683	–2.0
Japan	68	67	66	66	–1.5
South Korea	58	57	56	56	–0.9
India	89	94	102	110	8.2
World steel consumption	**1,617**	**1,617**	**1,620**	**1,636**	**0.2**

Notes: ***e*** *Estimate* ***f*** *Forecast*
Source: Bloomberg (2016) World Steel Association; Department of Industry, Innovation and Science (2016)

Table 3.2: World steel production

Million tonnes	2015	2016 s	2017 f	2018 f	Per cent change
European Union 28	166	159	163	167	2.5
United States	79	78	83	94	12.8
Brazil	33	30	28	27	–3.5
Russia	71	70	69	69	–0.5
China	804	811	795	775	–2.5
Japan	105	105	104	104	–0.0
South Korea	70	69	69	70	1.3
India	89	95	102	110	8.3
World steel production	**1,620**	**1,620**	**1,622**	**1,638**	**1.0**

Notes: ***f*** *Forecast* ***s*** *Estimate*
Source: Bloomberg (2016) World Steel Association; Department of Industry, Innovation and Science (2016)



Iron ore

Market summary

Australia's iron ore export values are forecast to increase by 30 per cent in 2016–17, to reach $62 billion. This represents an upward revision from the previous forecast of $54 billion, due to the recent unexpected strength in the iron ore price. The iron ore price (FOB Australia) is forecast to average US$58 a tonne in 2016–17, supported by a resurgence in China's steel production and speculative trading. The iron ore price is forecast to decline to average US$49 a tonne in 2017–18, as demand cools and supply grows. As a result, export values are forecast to decline by 8.4 per cent in 2017–18, to $57 billion.

Prices

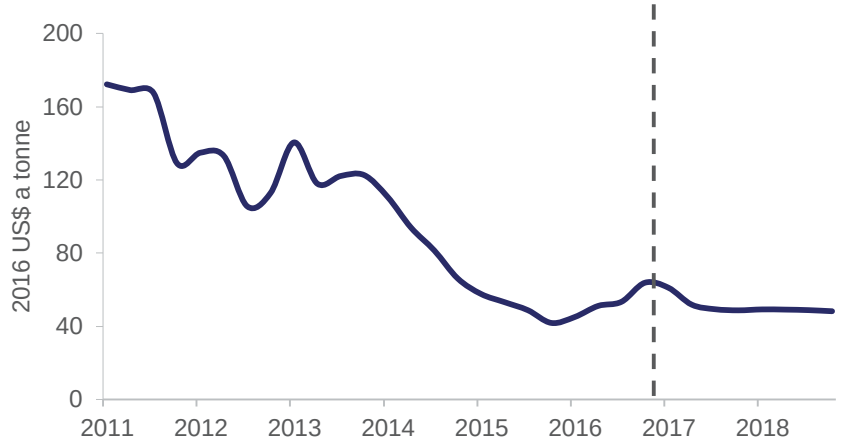
Iron ore spot price forecast to decline from two year highs to reflect weaker fundamentals

The rally in the iron ore spot price (FOB Australia) has continued since the last *Resources and Energy Quarterly*, averaging US$66 a tonne in November and exceeding US$75 a tonne in mid-December. This gain took the price to a 26-month high. The rally reflects a combination of fundamental drivers and speculative trading. However, with the likely moderation of these factors over the outlook period, the iron ore price is still forecast to decline, to average US$53 in 2017 and US$49 in 2018.

The iron ore price has been supported by the resurgence of China's steel sector, where improved demand conditions have boosted margins and production. A sharp increase in metallurgical coal prices has also supported the demand for imports of high quality iron ore, which requires the use of less metallurgical coal in the steel-making process. The growing premium for high quality iron ore is reflected in the widening gap between the 58 per cent and 62 per cent iron ore price indices.

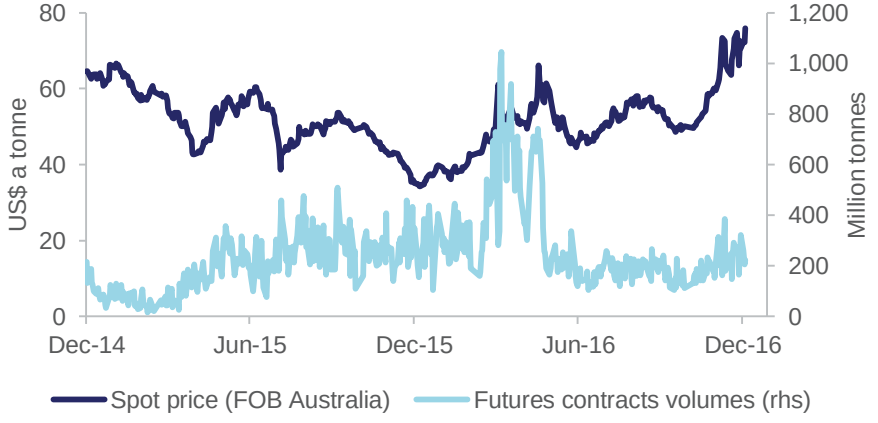
The rally has occurred despite a steady increase in China's port stocks through the year. Stocks exceeded 100 million tonnes in December, a two-year high and up 23 per cent year-on-year. The magnitude of the price rise also reflected heightened speculative activity, with a sharp increase in iron ore futures traded on the Dalian Commodity Exchange. The increased speculation came on the back of the US election outcome and an NDRC announcement that capacity cuts in the steel sector had been exceeded. Investor demand for US dollar-denominated assets has also rose, due to the decline in the Chinese Yuan.

Figure 4.1: Quarterly iron ore price, FOB Australia



Source: Bloomberg (2016) Metal Bulletin; Department of Industry, Innovation and Science (2016)

Figure 4.2: Daily volume of iron ore futures contracts traded and the iron ore spot price, FOB Australia



Source: Bloomberg (2016) Dalian Commodity Exchange; Bloomberg (2016) Metal Bulletin

The forecast price of US$53 a tonne in 2017 has been revised up from the previous forecast of US$45 a tonne. Some short term support is expected at the start of 2017: increased profitability in the Chinese steel sector will combine with likely seasonal disruption to supply from Australia, where a more active cyclone season is forecast.

However, the forecast decline in the price — to an average of US$49 a tonne in 2018 — will ultimately be driven by growing low-cost supply on the seaborne market and more subdued growth in global demand.

World trade

World trade in iron ore is forecast to grow by 5.5 per cent and 2.5 per cent in 2017 and 2018, respectively. The seaborne market is forecast to remain well supplied, with rising low-cost output from Australia and Brazil. China's iron ore imports are forecast to grow, displacing lower-grade domestic production.

China's iron ore imports forecast to grow to displace domestic production

China's iron ore imports increased in November to a record 92 million tonnes, up 12 per cent year-on-year, and are estimated to have increased by 9 per cent in 2016 as a whole to reach 1.0 billion tonnes. Growth has been stronger than expected, as a result of the resurgence in the steel sector and a faster pace of decline in domestic iron ore production. China's iron ore imports are forecast to grow by 0.8 per cent and 0.2 per cent in 2017 and 2018, respectively, to reach 1.05 billion tonnes. The gains come despite a forecast decline in China's steel production over the outlook period.

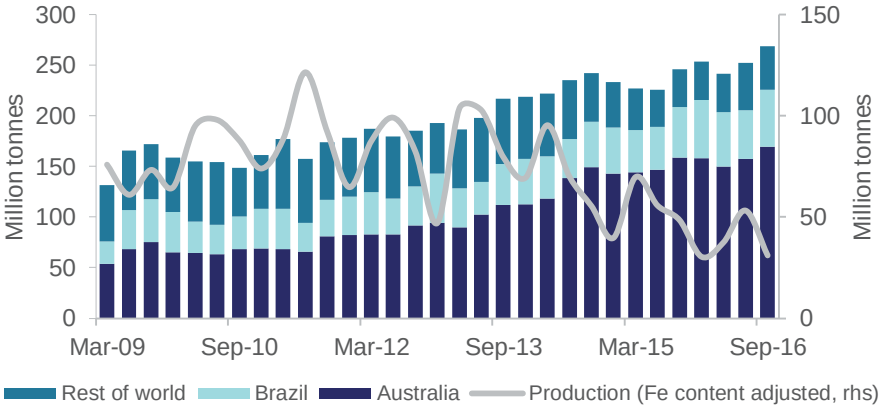
Import growth will be driven by an ongoing decline in domestic iron ore production: many of China's iron ore mines have declining ore grades, making them even more uncompetitive against (higher-grade) low-cost imports. Ongoing capacity cuts in the Chinese steel industry will accelerate the closure of vertically-integrated domestic iron ore mines, many of them state-owned. A growing preference for higher quality iron ore will also drive import growth, as steel mills come under increasing pressure to reduce emissions and pollution.

China's run-of-mine iron ore production (unadjusted for ore quality) fell 7.5 per cent year-on-year in the four months to October. Quality-adjusted iron ore production is estimated to fall by 20 per cent in 2016, and is forecast to fall by a further 20 and 24 per cent in 2017 and 2018, respectively, to reach 99 million tonnes. The pace of decline presents a risk to the outlook, with government policy playing a key role in determining the pace of closures.

India forecast to become world's third largest iron ore producer

Production growth has continued through 2016, following the relaxation of restrictions on mining in the States of Goa, Karnataka and Odisha. India's domestic iron ore production has increased 8.3 per cent year-on-year in the September quarter, and is estimated to grow by 25 per cent in 2016 as a whole.

Figure 4.3: China's iron ore imports and domestic production



Source: Bloomberg (2016) National Bureau of Statistics China; Department of Industry, Innovation and Science (2016)

In the eight months to August 2016, Indian iron ore imports have declined by 66 per cent to 2.6 million tonnes, while Indian iron ore exports — primarily to China — have increased 311 per cent over the same period, to 7.4 million tonnes. However, with growing domestic consumption and relatively small, high-cost mines, India's iron ore exports are not expected to account for a larger share of the seaborne iron ore market over the outlook period.

While India's demand for iron ore is expected to grow over the outlook period — to supply its expanding domestic steel industry — this growth will almost entirely be met by growth in domestic iron ore production.

The potential for increased levels of production depends largely on government policy, including production and export caps in some States. Nevertheless, India's production growth is forecast to grow at 7 per cent annually in 2017 and 2018, to reach 182 million tonnes, making it the world's third largest producer.

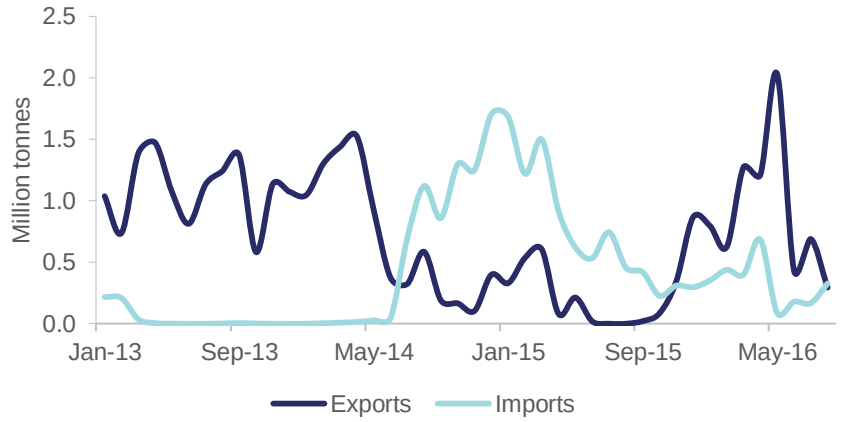
Low-cost supply to the seaborne market forecast to grow, led by Brazil and Australia

Brazil's iron ore exports are forecast to grow by 5.0 per cent and 4.9 per cent in 2017 and 2018, respectively, to reach 433 million tonnes. Brazil will account for 27 per cent of seaborne trade by the end of the outlook period. Export growth is underpinned by the ramp up of production at new, low-cost mines, in particular, Vale's S11D expansion.

S11D is currently in the final stages of development, and is likely to start production in early 2017. Vale has indicated that production will ramp up more slowly than previously expected — over four years instead of two — with a focus on margins over volumes. Nevertheless, S11D will have a nominal capacity of 75 million tonnes of high quality iron ore, and C1 cash costs that will likely go below US$10 a tonne, increasing the volume of low-cost supply entering the seaborne market.

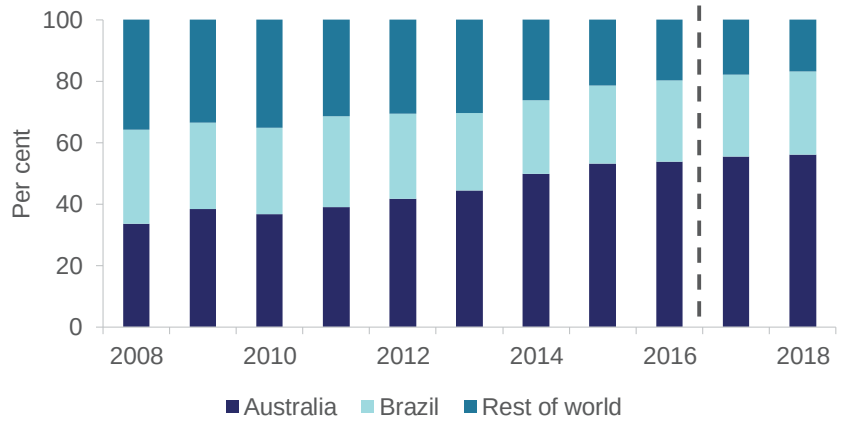
Australia's share of the seaborne market is forecast grow from 54 per cent in 2015, to 56 per cent in 2018. As Australia's iron ore production is dominated by low-cost producers, the risk to the outlook for Australia's export growth is relatively low. Rio Tinto, BHP Billiton, Fortescue Metals Group and Roy Hill are forecast to represent a combined 92 per cent of Australian production in 2018, and are expected to remain profitable at prices below US$50 a tonne.

Figure 4.4: India's iron ore production, exports and imports



Source: Bloomberg (2016) ISSB Limited

Figure 4.5: Australia and Brazil's share of total iron ore exports



Source: Bloomberg (2016) World Steel Association; Department of Industry, Innovation and Science (2016)

Australia's production, exports and exploration

Exploration activity remains subdued

Australia's iron ore exploration expenditure decreased by 2.9 per cent year-on-year and increased 3.9 per cent quarter-on-quarter in the September quarter, to $80 million. Exploration expenditure for iron ore remains at historical lows, as companies focus on cutting costs and maintaining existing assets.

Australia's iron ore export values grew by 5.4 per cent in the September quarter

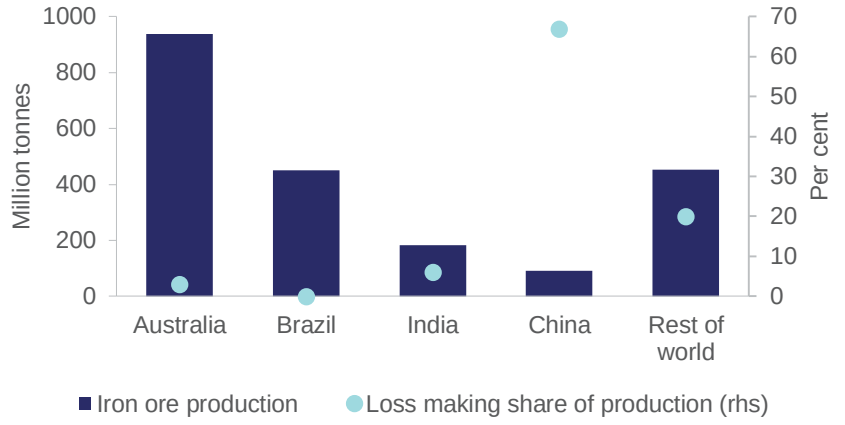
In the September quarter, Australia's iron ore production grew by 2.5 per cent year-on-year, to 220 million tonnes. Exports volumes grew by 3.5 per cent to 206 million tonnes over the same period, while export values grew 5.4 per cent to $14 billion, supported by higher prices. There was strong growth in exports at the start of the December quarter, with iron ore shipments from Port Hedland up 10 per cent year-on-year in November at 41 million tonnes.

Australia's exports values are forecast to grow strongly in 2016–17 but decline in 2017–18

Australia's iron ore production is forecast to increase by 3.7 per cent to 880 million tonnes in 2016–17 and by 4.9 per cent in 2017–18 to reach 923 million tonnes, supported by productivity improvements and the continued ramp up of expansions. Roy Hill, the final new major iron ore development, is expected to reach nameplate capacity of 55 million tonnes in early 2017.

Australia's iron ore exports volumes are forecast to increase 5.9 per cent to 832 million tonnes in 2016–17 and 5.6 per cent to 879 million tonnes in 2017–18. Export values are forecast to increase by 30 per cent in 2016–17 to reach $62 billion, revised up from the previous forecast of $54 billion, due to the recent and unexpected strength in the iron ore price. However, as the iron ore price is forecast to decline over the outlook period, export values are forecast to decrease by 8.4 per cent in 2017–18 to $57 billion.

Figure 4.6: Forecast iron ore production and cash losses in 2018



Source: AME Group (2016); Department of Industry, Innovation and Science (2016)

Figure 4.7: Australia's iron ore exports volumes and values

Source: ABS (2016) International Trade, Australia, cat. no. 5465.0; Department of Industry, Innovation and Science (2016)

Table 4.1: World iron ore imports

Million tonnes	2015	2016 s	2017 f	2018 f	Per cent change
European Union 28	153	138	133	135	1.5
Japan	131	131	127	127	0.0
China	953	1,039	1,047	1,049	0.2
South Korea	73	73	67	68	1.3

*Notes: **f** Forecast **s** Estimate*
Source: Bloomberg (2016) World Steel Association; Department of Industry, Innovation and Science (2016)

Table 4.2: World iron ore exports

Million tonnes	2015	2016 s	2017 f	2018 f	Per cent change
Australia	767	802	862	901	4.6
Brazil	366	393	412	433	4.9
India (net exports)	4	6	15	12	–15.9
Canada	37	40	42	42	1.1
South Africa	65	57	58	58	–0.3

*Notes: **f** Forecast **s** Estimate*
Source: Bloomberg (2016) World Steel Association; Department of Industry, Innovation and Science (2016)

Table 4.3: Iron ore outlook

	unit	2015	2016 s	2017 f	2018 f	Per cent change
World						
Iron ore prices bc						
– nominal	US$/t	50.3	52.7	52.7	48.8	–7.4
– real d	US$/t	50.9	52.7	51.6	46.7	–9.4
		2014–15	**2015–16**	**2016–17 f**	**2017–18 f**	**Per cent change**
Australia						
Production						
Iron and steel gs	Mt	4.74	4.97	5.04	4.79	–5.0
Iron ore	Mt	786.7	848.6	879.8	923.0	4.9
Exports						
Iron and steel gs	Mt	0.92	0.77	0.90	0.89	–1.1
– nominal value	A$m	719	598	696	674	–3.2
– real value h	A$m	741	608	696	660	–5.2
Iron ore	Mt	747.7	786.0	832.2	878.7	5.6
– nominal value	A$m	54,519	47,768	62,230	57,021	–8.4
– real value h	A$m	56,184	48,556	62,230	55,820	–10.3

*Notes: **b** FOB Australian basis **c** Spot price, 62 per cent iron content basis **d** In current calendar year US dollars **g** Crude steel equivalent. Crude steel is defined as the first solid state of production after melting. In ABS Australian Harmonized Export Commodity Classification, crude steel equivalent includes most items from 7206 to 7307, excluding ferrous waste and scrap and ferroalloys **h** In current Australian financial year dollars **f** Forecast **s** Estimate*

Source: ABS (2016) International Trade in Goods and Services, 5368.0; World Steel Association (2016); AME Group (2016); Company Reports; Department of Industry, Innovation and Science (2016)

Metallurgical coal

Market Summary

Global metallurgical coal prices achieved highs not seen in more than five years in the December quarter, driven by increased import demand from China. Higher prices seen in late 2016 and expected in early 2017 are forecast to add $20 billion to Australia's forecast export earnings in 2016–17. However, prices are forecast to decline over the outlook period, as China's metallurgical coal import demand stabilizes. Global metallurgical coal producers have been increasing production in response to higher prices, and China has now eased domestic supply-side policy measures in order to bring prices down.

Prices

Spot prices move from strength to strength

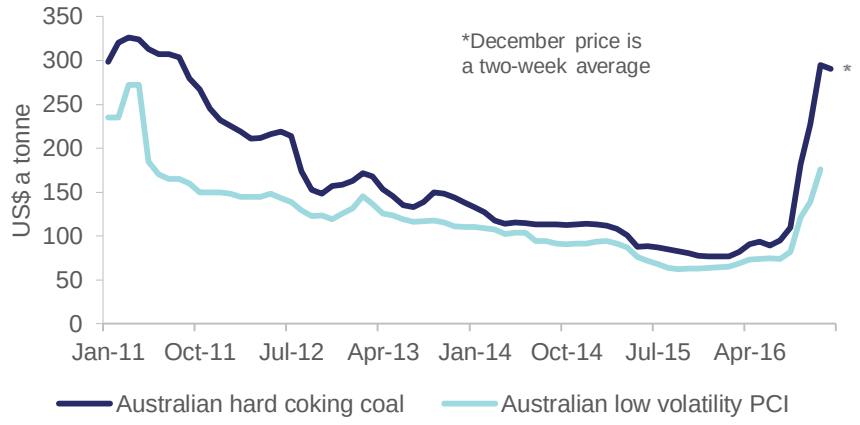
The rally that began in the June quarter saw Australian hard prime coking coal spot prices reach US$311.25 a tonne in mid-November, a 5-year high. It is estimated that spot prices in the December quarter averaged more than triple the previous year, to around US$270 a tonne.

Government-mandated coal mine closures and restricted days of coal mine operation in China, along with production disruptions in Australia, aided the huge price rally in the second half of 2016. These supply constraints coincided with increased demand from China's steel sector, multiplying the price effects.

In early December, benchmark contract prices for the March quarter 2017 were settled between Australian metallurgical coal producers and Japanese steel producers, at US$285 a tonne. This marked the highest negotiated quarterly contract price in five years. The benchmark contract price averaged US$114 a tonne in 2016.

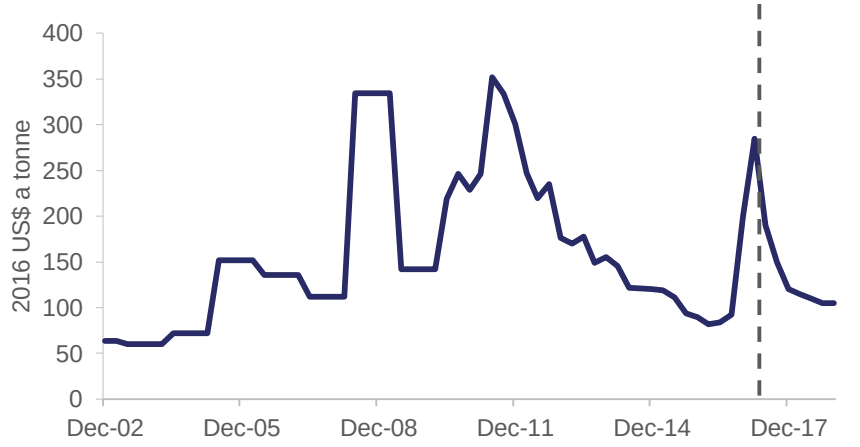
In a bid to raise domestic coal output and help ease upward pressure on prices, the Chinese Government started to ease restrictive coal production measures in September, and then took further measures in November. Since the November measures and the expectation of a return to normal production in Australia, prices have started to decline. This trend is expected to continue in 2017. The Australian benchmark metallurgical coal contract price is forecast to average US$186 a tonne in 2017, a 63 per cent increase from 2016.

Figure 5.1: Surge in spot prices to more than five year highs



Source: IHS (2016) Prices: Coal and Petcoke

Figure 5.2: Benchmark contract prices for Australian metallurgical coal



Source: Department of Industry, Innovation and Science (2016)

In 2018, Australian benchmark metallurgical coal contract prices are forecast to decline 42 per cent to US$109 a tonne. The forecast for declining prices is partly attributable to a rise in production in China and other major exporting countries, and softer Chinese import demand.

World trade

In 2017, world metallurgical coal trade is forecast to be little changed from 2016, at 314 million tonnes. A decline in metallurgical coal demand for steel production in China will be offset by increased import demand from India and ASEAN economies. In 2018, world metallurgical coal trade is forecast to stay similar.

China's metallurgical coal imports continue to grow

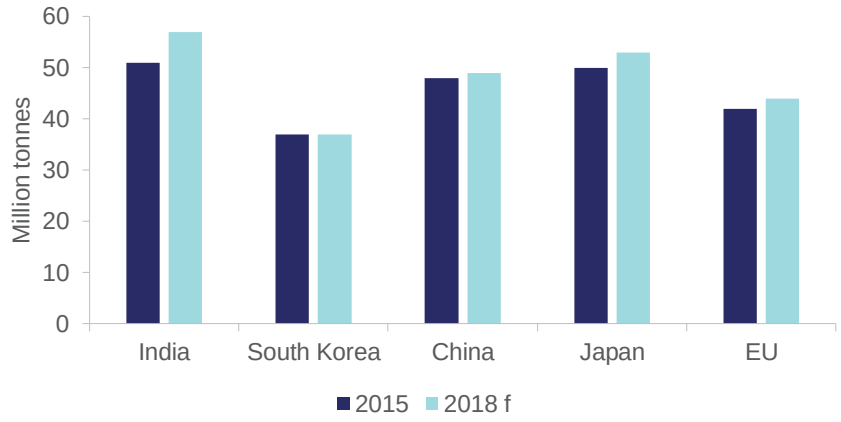
China's metallurgical coal imports increased 54 per cent year-on-year in the three months to October 2016. The increase in imports was driven by China's mandated coal mine capacity closures. Capacity closures seem to have affected metallurgical coal output more than thermal coal, as the enforcement of cutbacks appear to have been largely enforced in the Shanxi region — where metallurgical coal production is high. Output in the Shanxi province was also adversely affected by bad weather in the September quarter, exacerbating the supply squeeze on Chinese steel mills.

In 2017, China's metallurgical coal imports are forecast to decline by 11 per cent, to 51 million tonnes. This decline reflects expectations of a less heavy-handed approach to capacity closures by the Chinese Government, and lower demand from China's steel sector — as China's construction sector begins to cool. China's metallurgical coal imports are expected to decline by 3.9 per cent in 2018, to 49 million tonnes. However, there is upside risk to this import forecast, with China's property market possibly holding up better than expected.

India's metallurgical coal imports forecast to increase

Relative to the previous year, India's metallurgical coal imports declined by 15 per cent, in the September quarter, as high prices started to bite home. The decline follows a 1.8 per cent year-on-year increase in the first half of 2016. After declining in 2016 — due to high metallurgical coal prices — India's metallurgical coal imports are forecast to increase by 12 per cent in 2017, to 55 million tonnes, and by a further 3.6 per cent in 2018, to 57 million tonnes.

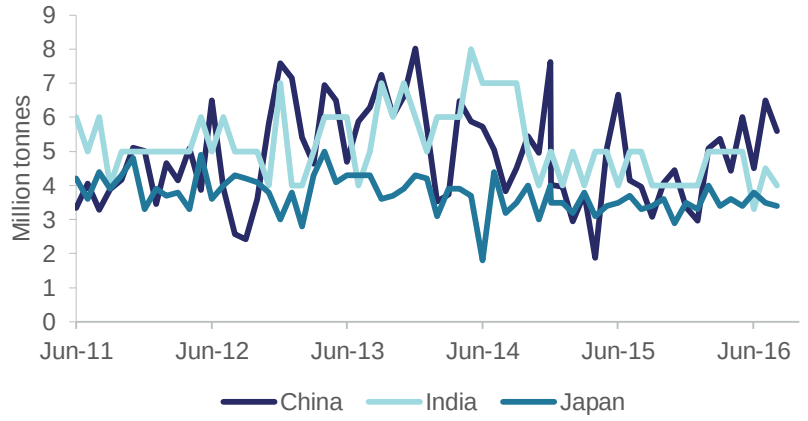
Figure 5.3: Major metallurgical coal importers



Notes: ***f*** *Forecast*

Source: IEA (2016) Coal information 2016; Department of Industry, Innovation and Science (2016)

Figure 5.4: China, India and Japan's metallurgical coal imports



Source: IHS (2016) Coal imports by country and type

Growth in imports is expected to be underpinned by the increased need for more metallurgical coal to support local steel production, given India's very small domestic coking coal reserves. The Indian Government's plans to attract more investment in the country and improve the domestic manufacturing industry, will require better domestic infrastructure and hence higher steel consumption.

Japan's metallurgical coal imports are likely to be steady over 2017–18

Higher metallurgical coal prices did not deter Japanese steel producers, as metallurgical coal imports increased 8.3 per cent year-on-year in the three months ending October 2016. The increase in imports came despite flat steel production and exports over the same time period, and could be attributed to re-stocking and increased precautionary buying(as insurance against potentially higher metallurgical coal prices in the future).

In 2017 and 2018, Japan's metallurgical coal imports are forecast to be little changed from 2016, at 53 million tonnes. This is expected to be supported by flat steel production over the same time period.

World exports

Canada and Russia's metallurgical coal exports increase

Higher metallurgical coal prices and increased global import demand drove Canada's exports up 14 per cent, year-on-year, in the September quarter. This was the first quarterly year-on-year rise for a year.

In 2017, Canada's metallurgical coal exports are forecast to increase 3.6 per cent to 29 million tonnes, and remain at that level in 2018. Record high metallurgical coal prices and increased demand from China, encouraged the potential restart of mines in Canada. Grande Cache Coal announced in November that it plans to open its surface-mine operations (shut down in 2015) on the west coast of Canada at the end of March 2017. Output from operations primarily service Asian markets, and total operations have estimated saleable coal reserves of 148 million tonnes.

Russian metallurgical coal production is forecast to keep rising steadily, assisted by the impact of the sharp decline in the Russian Ruble in recent years.

Table 5.1: World metallurgical coal trade

	2015	2016[s]	2017 [f]	2018 [f]	Per cent change
Metallurgical coal imports					
European Union 28	42	42	43	44	1.5
Japan	50	53	53	53	0.0
China	48	57	51	49	–3.9
South Korea	37	36	37	37	0.0
India	51	49	55	57	3.6
Metallurgical coal exports					
Australia	186	184	197	191	–3.0
Canada	28	28	29	29	0.0
United States	42	34	32	31	–2.4
Russia	18	22	24	26	8.3
World trade	299	314	314	313	–0.3

*Notes: **f** Forecast; **s** Estimate*

Source: IEA (2015) Coal Information 2015; Department of Industry, Innovation and Science (2016)

Australia's production and exports

Australia's production forecast to increase, as mines restart

Australia's metallurgical coal output was an estimated 41 million tonnes in the September quarter, down 11 per cent from the June quarter, and down 20 per cent year-on-year. Output in the September quarter was hampered by weather-induced production and infrastructure problems in Queensland, as well as industrial action and geological instability at some mines.

Production in the December quarter was marred by challenging operational conditions at South 32's Appin mine. Operational and industrial issues have also been curtailing Anglo America's Capcoal operations since the September quarter. Output is expected to return to normal over the remainder of the year, and rise from 2015–16 levels.

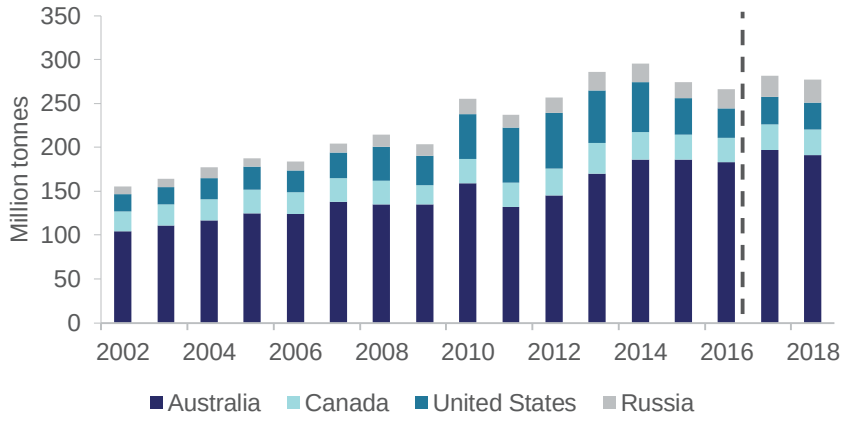
Australia's metallurgical coal output in 2016–17 is forecast to rise by 1.5 per cent, to 192 million tonnes. Growth in output is expected to be driven by a ramp up in production at some mines, including Whitehaven's Maules creek mine and the reopening of other mines — encouraged by high metallurgical coal prices. Glencore announced the restart/reopening of its Collinsville and Integra mines in 2016-17. The Integra mine has been on 'care and maintenance' since late 2015, and Glencore believes it can restart the mine in early 2017, with little delay and minimal investment. In 2017–18, Australia's metallurgical coal output is forecast to increase 0.7 per cent to 194 million tonnes, as more production from restarted mines comes online.

Australia's export volumes and export earnings are forecast to increase

Australia's metallurgical coal export volumes in 2016–17 are forecast to increase 1.6 per cent to 191 million tonnes, underpinned by increased import demand from China and India. Export values are forecast to double to $40 billion, supported by higher volumes and prices. The upward revision in export volumes and values in 2016–17, relative to the previous quarter's forecast, reflects both higher than expected metallurgical coal prices and recently announced mine restarts.

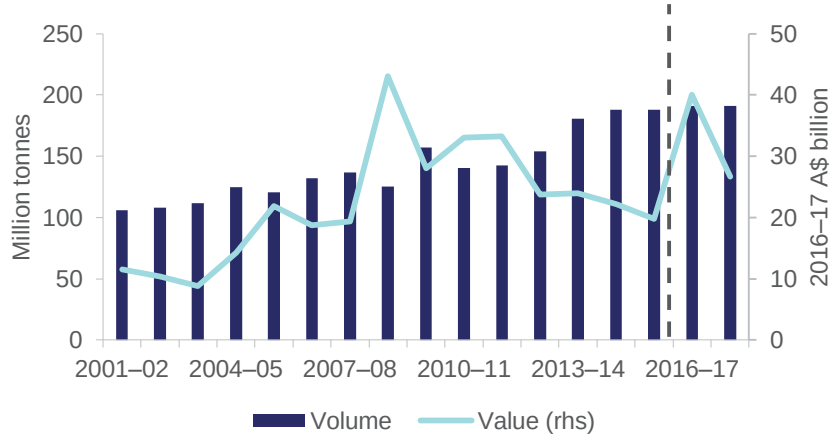
The volume of metallurgical coal exports in 2017–18 are forecast to stay similar to 2016–17, as increased import demand from India's steel industry offsets declining demand in China. Export earnings are forecast to decline by 33 per cent to around $27 billion, as prices decline from current highs — but earnings will still be 35 per cent higher than 2015–16 levels.

Figure 5.5: Major metallurgical coal exporters



Source: IEA (2016) Coal information 2016; Department of Industry, Innovation and Science (2016)

Figure 5.6: Australia's metallurgical coal exports



Source: ABS (2016) International Trade in Goods and Services, 5368.0; Department of Industry, Innovation and Science (2016)

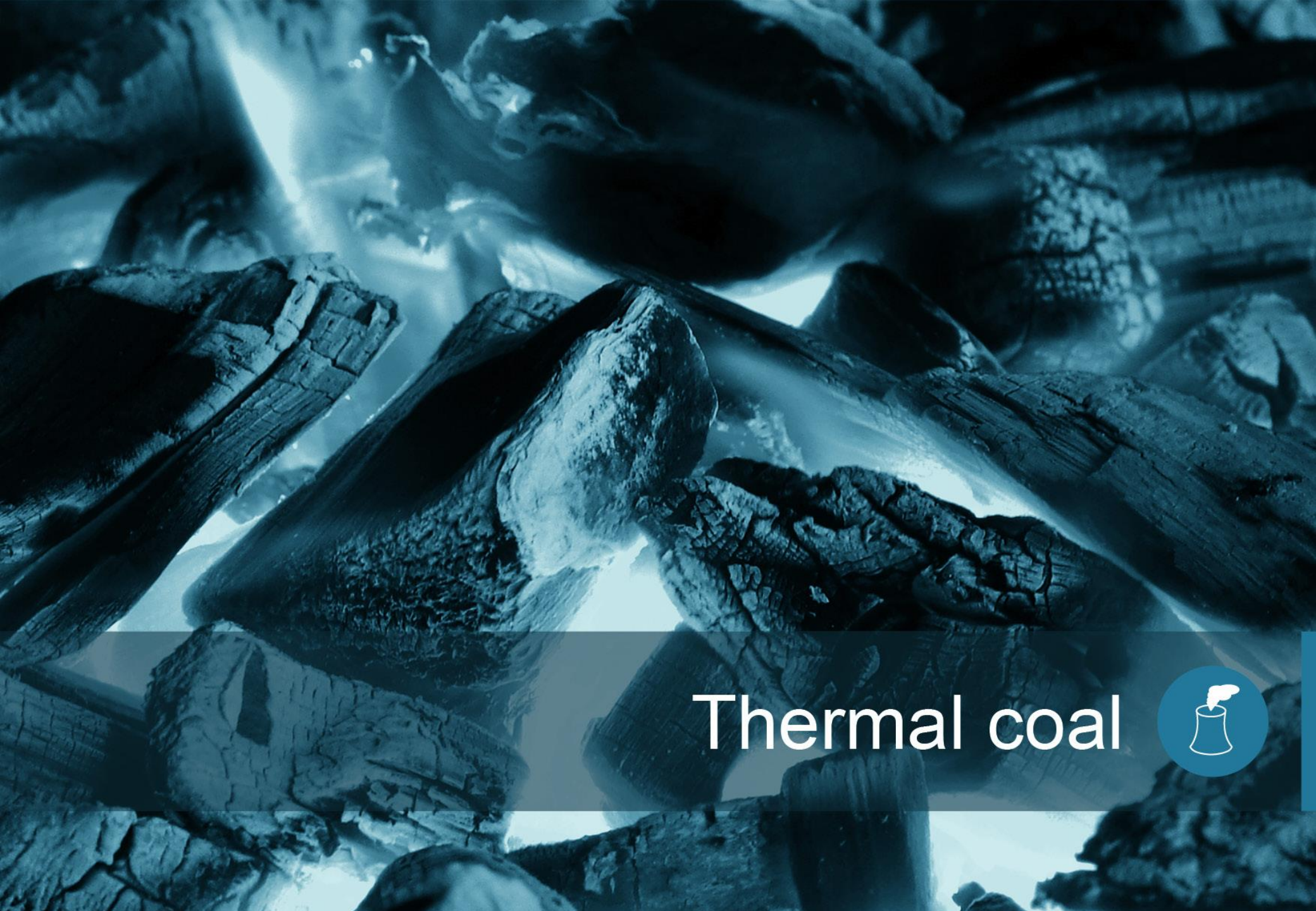
Table 5.2: Australia's metallurgical coal outlook

	Units	2015	2016 [s]	2017 [f]	2018 [f]	Per cent change
Contract prices [d]						
– nominal	US$/t	102.1	114.4	186.3	108.8	–41.6
– real [e]	US$/t	103.3	114.4	182.2	104.1	–42.9
	Units	**2014–15**	**2015–16**	**2016–17 [f]**	**2017–18 [f]**	**Per cent change**
Australia						
Production	Mt	194.1	189.3	192.1	193.5	0.7
Export volume	Mt	188	188	191	191	–0.3
– nominal value	A$m	21,813	19,803	39,988	26,661	–33.3
– real value [h]	A$m	22,479	20,130	39,988	26,099	–34.7

*Notes: **f** Forecast; **d** Contract price assessment for high-quality hard coking coal; **e** In current calendar year US dollars; **h** In current financial year Australian dollars; **s** Estimate*

Source: ABS (2016) International Trade in Goods and Services, 5368.0; Department of Industry, Innovation and Science (2016)

Thermal coal



Market summary

Thermal coal prices increased further in the first half of the December quarter, driven by China's supply side reform policies and lower output from Indonesia. An easing in China's restrictive domestic coal production policies resulted in a slight decline in prices from mid-November. With likely further easing in Chinese Government coal production policies and increased production from Indonesia, it is expected that seaborne thermal coal prices will pull back over the outlook period. With higher prices and export volumes, Australia's export values are forecast to increase in 2016–17 before stabilising in 2017–18.

Prices

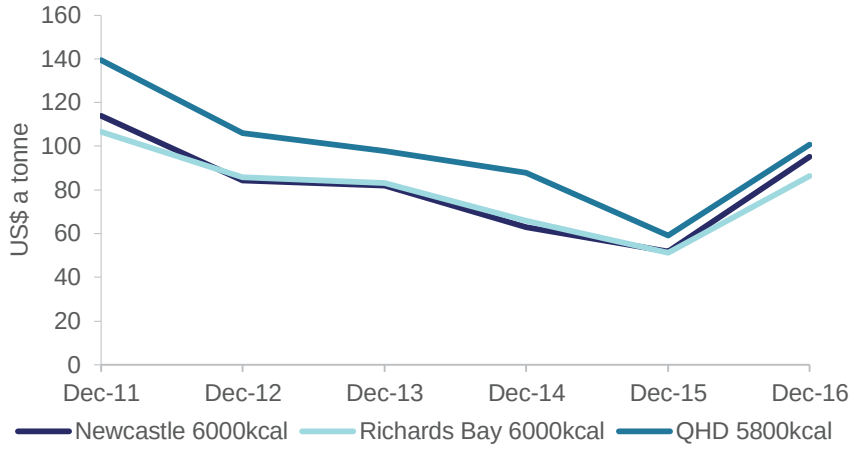
Prices decline from multi-year highs in the second half of the quarter

Benchmark thermal coal prices continued to increase over the first half of the fourth quarter, rising to near five year highs. Australia's benchmark Newcastle free on board (FOB) spot price hit highs not seen since March quarter, 2012, reaching US$110 a tonne before falling back.

The fall back in prices as the quarter progressed can be attributed to the Chinese Government's easing of domestic coal production policies and increased output from Indonesia. The move by Beijing sought to reverse the effects of its previously mandated capacity closures (supply reform), which had contributed to coal shortages in China and large upswings in global thermal coal prices.

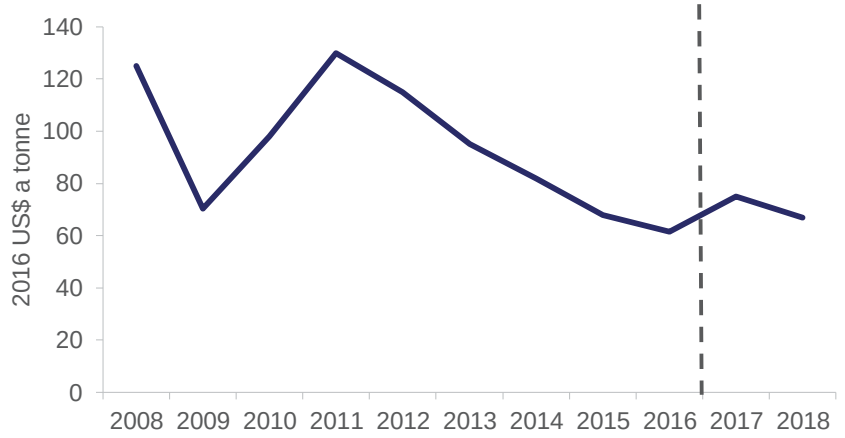
The JFY 2017 (April 2017 to March 2018) benchmark price, to be negotiated early next year, is forecast to increase 22 percent to US$75 a tonne. The increase will reflect the price recovery in spot prices relative to the previous year. With an easing of China's capacity cuts likely to continue, and an expected decline in India's import growth, a gradual decline in spot and contract thermal coal prices is expected over the outlook period. The JFY 2018 benchmark price is forecast to decline by 11 per cent to US$67 a tonne, reflective of the forecast decline in spot prices in 2017–18.

Figure 6.1: Thermal coal spot prices



Source: IHS Inc. (2016) MCR prices-steam coal, metallurgical coal and petcoke

Figure 6.2: JFY thermal coal contract prices



Source: Department of Industry, Innovation and Science (2016)

World trade

World thermal coal trade is forecast to decline 1.4 per cent in 2016 to 1.03 billion tonnes, as lower demand in India offsets the spike in demand from China. Global import demand in 2017 is forecast to decline by 0.9 per cent to 1.02 billion tonnes, due to lower imports from China and India. In 2018, global import demand is expected to increase 0.9 per cent from 2017, to 1.03 billion tonnes. This increase will be driven by growth in demand from India, offsetting import declines in China.

World imports

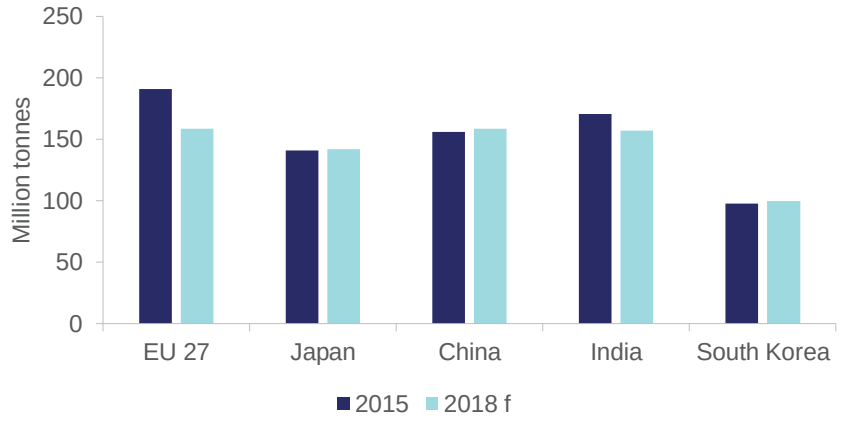
China's thermal coal imports reverse trend in 2016

Until the second half of 2016, China's thermal coal imports had been in trend decline since 2014. This decline owed much to China's slowing economic growth and its ongoing gradual transition from an industrial economy to a less-energy intensive services economy.

China's imports of thermal coal increased by around 29 per cent year-on-year in the three months to October 2016. This was largely driven by cuts in domestic coal mine capacity — part of the government's supply side reforms. The capacity cuts coincided with increased demand over China's warm summer, which saw total industry and residential electricity consumption increase 9.5 per cent year on year in the September quarter.

To reduce upward pressure on thermal coal prices and ensure sufficient supply, China started to ease its restrictive coal supply side measures in September. Stronger measures were subsequently implemented in mid-November, which are now seen as having contributed to the decline in global prices as the calendar year came to an end. In mid-November, China's Government allowed all mines that meet safety standards to produce for 330 working days in a year, an extension from the originally enforced 276 days. At this stage, this production schedule is only permitted until mid-March 2017, which may provide China with sufficient coal stocks at coal power plants as summer approaches. Furthermore, Beijing has sought to facilitate annual contract negotiations and enforce a benchmark price mechanism that is more favourable for generators.

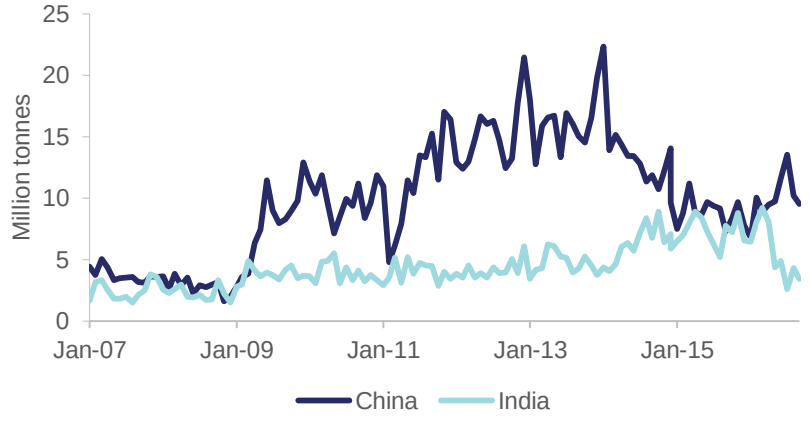
Figure 6.3: Major thermal coal importers



Notes: ***f*** *Forecast*

Source: IEA (2016) Coal Information 2016; Department of Industry, Innovation and Science (2016)

Figure 6.4: China and India's thermal coal imports



Source: IHS (2016) Coal imports by country and type

In 2017, China's thermal coal imports are forecast to decline by 2.4 per cent, to 160 million tonnes. The Chinese Government is expected to continue to cut capacity into 2017, but at a less frenzied pace than seen in 2016. Less restrictive domestic supply side policies in 2017, combined with a possible return to normal weather conditions (requiring less electricity consumption), is expected to reduce China's thermal coal import demand.

In 2018, thermal coal imports are forecast to decline marginally from 2017 levels, to 159 million tonnes. This decline will come on the back of the cessation of further capacity cuts and a minor increase in coal generation capacity.

India continues to seek lower dependence on thermal coal imports

In 2015, India's thermal coal imports declined for the first time since 2003. This decline continued into 2016. Imports in the September quarter declined 37 per cent, year-on-year.

Imports are forecast to decline 3.7 per cent in 2017, to 155 million tonnes. This decline is likely to be driven by the Indian Government's desire to reduce the country's dependence on imports, but limited by India's growing energy needs. The commitment by state-owned Coal India (responsible for more than 80 per cent of the country's coal production) to increase output is expected to support a decline in imports. In November, the company released a medium term strategy (spanning to 2019–20) to Parliament. The plan highlighted the company's intent to increase its project numbers and employ mass production technologies.

In 2018, India's thermal coal imports are forecast to increase 1.3 per cent to 157 million tonnes. This increase will be underpinned by nearly 100 new coal fired power plants currently under construction and scheduled to come online by the end of 2018. However, growth in imports in 2018 could be restricted by continued strong production from Coal India and delays in power sector reform.

Higher thermal coal prices reduce import attractiveness in Japan

Japan's thermal coal imports declined 1.8 per cent year-on-year in the three months ending October 2016, due to higher thermal coal prices. This decline follows a steady year-on-year pace in the first half of 2016.

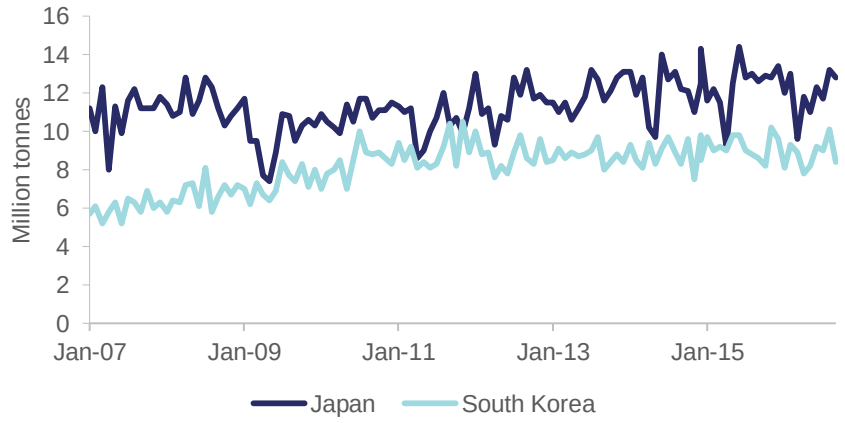
Currently, there are three nuclear power reactors operating in Japan. Around 17 reactors are awaiting approval for restart. There is a possibility that at least three more nuclear power plants could restart by the end of 2018. However, any adverse effect nuclear restarts may have on coal imports is likely to be outweighed by the Japanese Government's focus on increasing the share of coal in the power generation mix.

Coal imports are forecast to increase by 0.7 per cent in 2017, to 141 million tonnes, and by 0.7 per cent in 2018, to 142 million tonnes. These increases are supported by the stabilisation of thermal coal prices, and the Japanese Government's plan to gradually raise coal's share of the power generation mix — to be the largest generator of power by 2019.

South Korea's thermal coal imports increase on the back of nuclear power plant shutdowns

South Korea's thermal coal imports increased 3.9 per cent year-on-year in the three months ending October 2016. The increase can be largely attributed to the precautionary shutdown of four nuclear power plants in September, due to an earthquake. This increase follows a 6.0 per cent year-on-year decline in the seven months ended July 2016.

Figure 6.5: Japan and South Korea's thermal coal imports



Source: IHS (2016) Coal imports by country and type

Imports in 2017 are forecast to increase by 1.0 per cent, to 100 million tonnes, and to be stable in 2018. An increase in imports in 2017 will be supported by increased coal-fired power generation capacity. Around thirteen coal-fired power plants currently under construction are expected to be online by the end of 2017.

World thermal coal exports

Indonesia's producers expected to increase output in 2017

Following a year-on-year decline in thermal coal exports in the first half of the year — due to bad weather and loading delays — Indonesian coal producers were able to respond to higher thermal coal prices in late 2016. Exports registered a 3.3 per cent year-on-year increase in the September quarter, and Indonesian coal producers seem on track to slightly increase output in 2017.

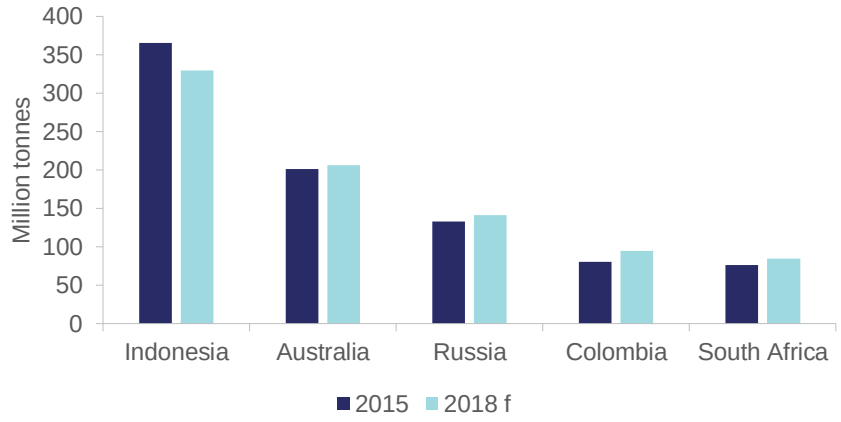
Indonesia's thermal coal exports are forecast to increase modestly in 2017, to 341 million tonnes, in response to higher thermal coal prices. However, exports are likely to decline by 3.2 per cent in 2018, to 330 million tonnes. The decline in 2018 is likely to reflect lower thermal coal prices and the Indonesian Government's mandated domestic coal obligation — requiring domestic coal power plants to fulfil most of the country's coal-fired power-generation needs. However, the country's power program seems behind schedule, due to a lack of investment. Roughly 20 gigawatts of coal-fired generation capacity is now expected to be online by 2020, as opposed to the previously announced target of 35 gigawatts. The lower-than-expected domestic requirement for thermal coal could result in higher Indonesian exports.

Russian thermal coal exports continue to increase

Exports of thermal coal from Russia increased at an annual compound rate of 6.2 per cent from 2012 to 2015. Continuing this trend, exports increased 7.8 per cent year-on-year in the September quarter, supported by higher thermal coal prices and the sharply weaker Russian Ruble.

Russia's thermal coal exports are forecast to continue to increase in 2017, supported by higher thermal coal prices and the competitive nature of Russian supply. Exports are forecast to increase 1.4 per cent in 2017, to 142 million tonnes. Russia's thermal coal export volumes in 2018 are expected to be similar to 2017.

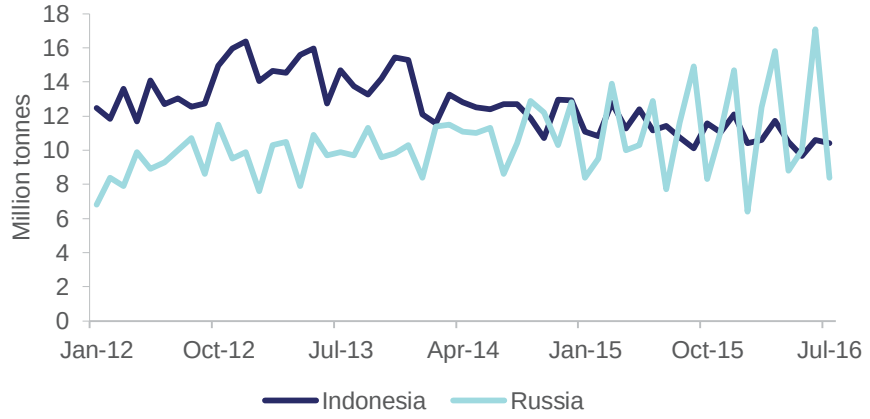
Figure 6.6: Major thermal coal exporters



Notes: ***f*** *Forecast*

Source: IEA (2016) Coal Information 2016; Department of Industry, Innovation and Science (2016)

Figure 6.7: Indonesia and Russia thermal coal exports



Source: IHS (2016) Coal imports by country and type

Australia's exploration, production and trade

Coal exploration declines year-on-year but up from previous quarter

The thermal coal price rally may have encouraged an increase in coal exploration expenditure in the September quarter. Total expenditure for the quarter was up 23 per cent relative to the previous quarter, at $37 million. However expenditure was down by 34 per cent, year-on-year.

Production disruptions affected September quarter production

In the September quarter 2016, Australia's thermal coal output was an estimated 61 million tonnes, down from the June quarter but similar to September quarter 2015. Most mines continued to increase production, buoyed by higher thermal coal prices. Higher productivity also played a part. BHP Billiton's New South Wales thermal coal operations were one of the notable exceptions: production for the quarter was estimated to be down, due to heavy rainfall and the re-scheduling of their mine plan.

Production disruptions in the September quarter are likely to be more than offset by a rebound in production in the subsequent three quarters of 2016-17. The drivers will include the restart of operations and the impact of higher thermal coal prices. In 2016–17, Australia's production is forecast to increase 0.4 per cent, to 252 million tonnes. Higher production across most mines, including the return of operations at Glencore's Collinsville mine, is likely to offset the impact of the shutdown of Yancoal's Donaldson operation and BHP's Gregory mine in 2015–16.

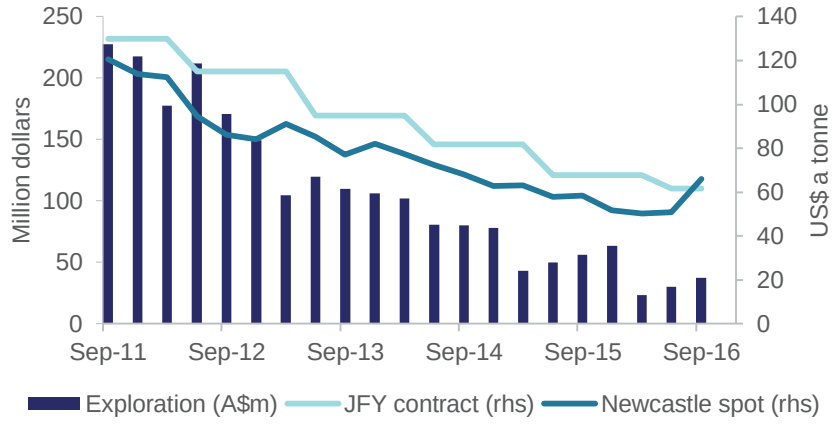
In 2017–18, Australia's output is forecast to be unchanged, at 253 million tonnes. The rise in output will be aided by ramp-ups at Maules Creek and Mount Thorley Warkworth, and increased production at Narrabri.

Australia's export earnings forecast to increase in 2016–17

Export volumes in 2016–17 are forecast to increase by 3.7 per cent year-on-year, to 208 million tonnes. Higher export volumes will be supported by higher production, in turn driven by China's strong demand, notably in the first half of the year. Export earnings are forecast to increase 25 per cent year-on-year to $18.4 billion, largely driven by increased thermal coal prices.

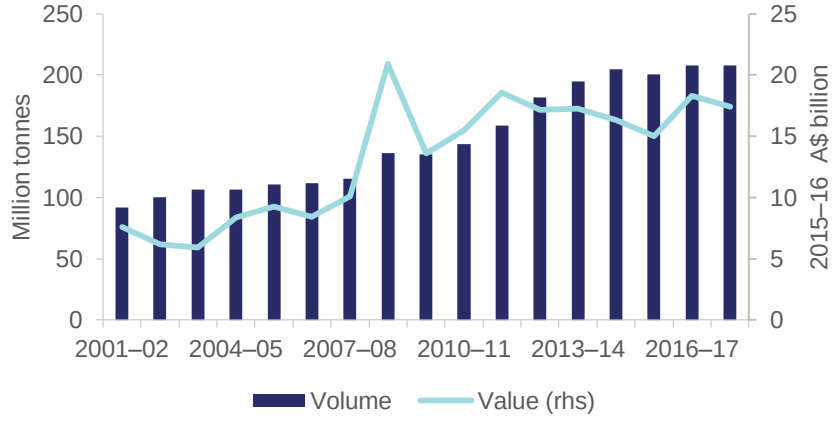
In 2017–18, export volumes are likely to be similar to 2016–17 levels. However, export values are forecast to decline by 5.3 per cent to $17.4 billion, as prices decline from the highs seen in late 2016/early 2017.

Figure 6.8: Australia's coal exploration expenditure



Source: ABS (2016) Mineral and Petroleum Expenditure, 8412.0; IHS Inc (2016); Department of Industry, Innovation and Science (2016)

Figure 6.9: Australia's thermal coal exports



Source: ABS (2016) International Trade in Goods and Services, 5368.0; Department of Industry, Innovation and Science (2016)

Table 6.1: Thermal coal

	unit	2015	2016 s	2017 f	2018 f	Per cent change
World						
Contract prices [b]						
– nominal	US$/t	68	62	75	67	–10.7
– real [c]	US$/t	69	62	74	64	–12.6
Coal trade	Mt	1,047	1,033	1,024	1,033	0.9
Imports						
Asia	Mt	707	712	706	729	3.3
China	Mt	156	164	160	159	–0.6
Chinese Taipei	Mt	57	58	59	61	3.4
India	Mt	171	161	155	157	1.3
Japan	Mt	141	140	141	142	0.7
South Korea	Mt	98	99	100	100	0.0
Europe	Mt	244	224	221	217	–2.0
European Union 27	Mt	191	168	163	159	–2.6
other Europe	Mt	53	57	58	58	–0.0
Exports						
Australia	Mt	202	200	208	208	0.1
Colombia	Mt	81	85	88	95	8.0
Indonesia	Mt	366	340	341	330	–3.2
Russia	Mt	133	140	142	142	0.0
South Africa	Mt	77	82	83	85	2.4
United States	Mt	25	19	19	18	–5.3
		2014–15	**2015–16**	**2016–17 f**	**2017–18 f**	**Per cent change**
Australia						
Production	Mt	251.5	250.8	251.8	252.7	0.3
Export volume	Mt	204.5	200.4	207.8	208.1	0.2
– nominal value	A$m	16,057	14,700	18,370	17,395	–5.3
– real value [d]	A$m	16,548	14,942	18,370	17,029	–7.3

Notes: ***b*** *Japanese Fiscal Year (JFY), starting 1 April, 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 dollars;* ***d*** *In current financial year Australian dollars,* ***f*** *Forecast;* ***s*** *Estimate*

Sources: ABS (2016) International Trade in Goods and Services, 5368.0; IEA (2016) Coal Information 2016; Coal Services Pty Ltd (2016); Queensland Department of Natural Resources and Mines (2016) Quarterly Coal Production; Company Reports; Department of Industry, Innovation and Science (2016)


Gas

Market summary

The value of Australia's LNG exports is forecast to increase by 50 per cent a year to $37 billion in 2017–18, supported by higher LNG prices and export volumes. LNG contract prices, under which most Australian LNG is sold, are forecast to increase in line with oil prices. Export volumes are expected to increase by 35 per cent a year to 2017–18, as the four remaining LNG projects under construction come online. Australian producers are expected to capture an increasing share of imports into major markets in North East Asia, as long-term LNG import contracts commence. The forecast for export earnings has been revised up, reflecting an improved outlook for oil prices.

Prices

Prices for Australian LNG have increased, driven by rising contract prices

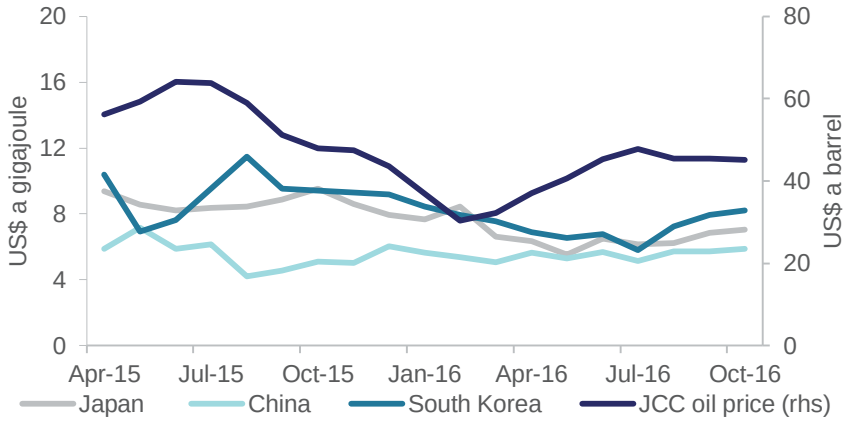
The price of Australian LNG delivered to major markets in North East Asia increased between July and October of 2016. The price of LNG into Japan, Australia's largest market and the world's largest importer, averaged US$7.05 a gigajoule October, up from US$6.13 in July. The uptick in prices reflects the effect of the oil price rally during the first half of 2016. Most Australian LNG delivered into Asia is sold under contracts linked to the Japanese Customs-cleared Crude (JCC) oil price by a time lag of three to four months.

The average price for Australian LNG delivered to North East Asia is expected to have remained largely unchanged over the last few months of 2016. The JCC oil price remained broadly stable in August and September at around US$45 a barrel, and its lagged effect on LNG contract prices is expected to be seen in the coming months. LNG contract prices are then expected to rise over 2017 and 2018, in line with the forecast for a recovery in oil prices to over US$60 a barrel.

Spot prices have also increased, but the rally is expected to be temporary

While the increase in the average price of Australian LNG has primarily been driven by contract prices, spot prices have also increased over the past few months. The North East Asian spot price climbed from lows of

Figure 7.1: Price of Australian LNG delivered to key markets



Source: Argus Media (2016)

Figure 7.2: North East Asian LNG spot price

Source: Argus Media (2016)

US$4.16 a gigajoule in April to average US$6.91 a gigajoule in November — its highest level in a year. Cold weather prompted strong spot market buying from North East Asian economies, while the suspension of operations at nuclear plants in South Korea — following an earthquake — also contributed to increased demand for LNG. The recent rally in spot prices is expected to be temporary, with the entry of new capacity in the US and Australia ensuring that the market remains well supplied.

The implications of a potential divergence between contract and spot LNG prices remain to be seen. One scenario is that buyers reduce LNG purchases to 'take-or-pay' levels, and seek to buy larger volumes on the spot market. A divergence between spot and contract prices would also encourage buyers' efforts to renegotiate pricing mechanisms in LNG contracts. India's Petronet has reportedly renewed efforts to renegotiate the pricing formula for supplies from Australia's Gorgon LNG project.

World trade

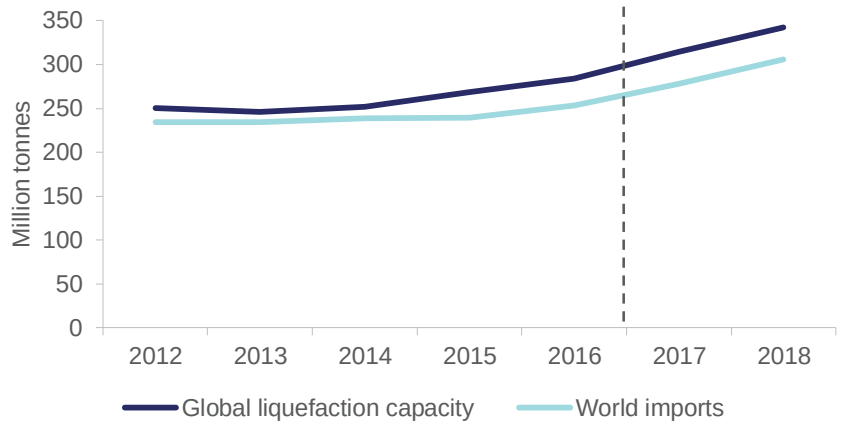
World LNG imports are forecast to increase by 10 per cent a year to reach 306 million tonnes in 2018. Growth will be driven by demand in emerging Asia and Europe, and enabled by a major expansion of LNG export infrastructure in Australia and the US.

World imports

Prospects for import growth in traditional demand centres remain subdued

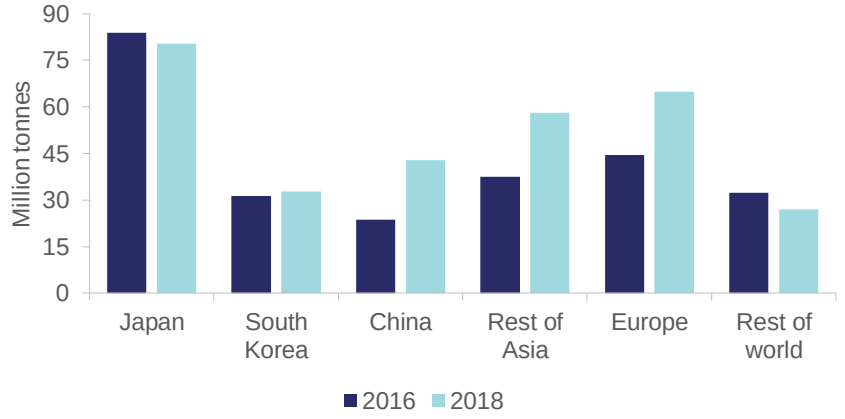
Japan's LNG imports increased 3.2 per cent year-on-year in the three months to October 2016. Imports received support from the uptick in thermal coal prices, with which LNG competes in electricity generation, and the start-up of long-term LNG contracts with Australian producers. Japan's LNG imports are estimated to have declined by 2.5 per cent in 2016 — a more modest decline than forecast in September.

Figure 7.3: Global liquefaction capacity vs LNG imports



Source: Nexant World Gas Model (2016)

Figure 7.4: LNG import forecasts



Source: Nexant World Gas Model (2016); Department of Industry, Innovation and Science (2016)

Japan's LNG imports are forecast to fall by 2.1 per cent a year to 80 million tonnes in 2018. Subdued energy demand, a forecast decline in thermal coal prices, the expansion of renewable capacity, and the restart of nuclear capacity are all expected to weigh on LNG imports. In November, Japan's Nuclear Regulation Authority ruled that Kyushu Electric Power's Genkai's No. 3 and 4 reactors had met post-Fukushima safety rules, one of the main requirements to restart operations. These would be the fourth and fifth reactors out of Japan's fleet of 42 to restart post-Fukushima. In November, there were 17 applications for reactor restarts before the Nuclear Regulation Authority.

The timing and scale of nuclear restarts remains a key uncertainty affecting the outlook. The three reactors currently operating have had to overcome legal challenges to their restart, while two reactors that restarted in early 2016 were forced to shut down in June following a court injunction. The earthquake in November that disrupted the spent fuel pool cooling system in Fukushima Daiichi plant unit 3 has only added to public concern about nuclear power in Japan.

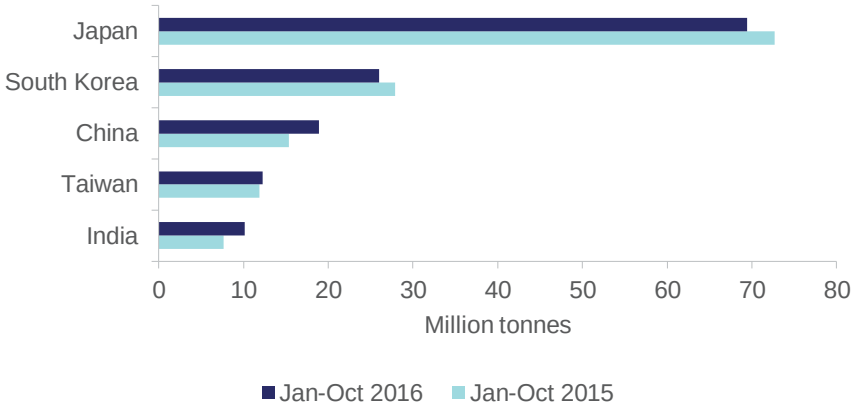
South Korea's LNG imports remained broadly unchanged year-on-year in the three months to October 2016. LNG imports received support from the shut down of nuclear power plants in South Korea following an earthquake in September. South Korea's LNG imports are forecast to decline by 1.7 per cent in 2016.

Growth in South Korea's LNG imports is expected to remain subdued over the outlook period. LNG will continue to face competition from other energy sources, as South Korea expands both its nuclear and coal-fired power capacity.

Emerging Asia will be a key source of growth

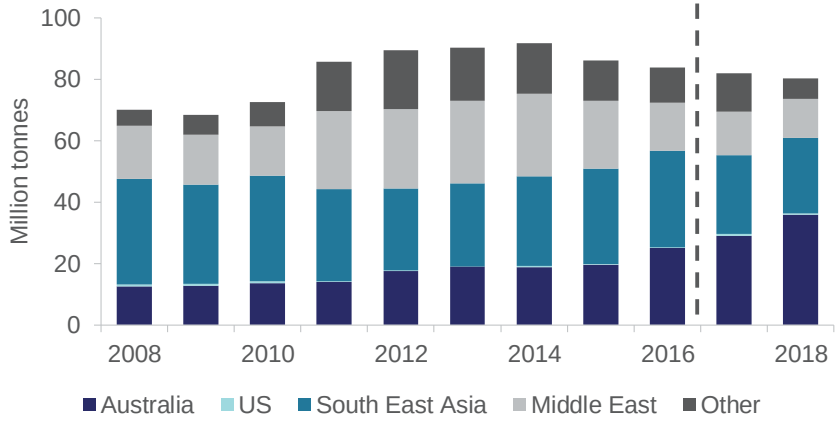
China's LNG imports increased by 59 per cent year-on-year in the three months to October 2016. Domestic production and pipeline imports also rose, suggesting robust growth in gas consumption. LNG imports were driven by the ramp up of purchasing commitments with Australian producers, temporary disruptions to pipeline supplies, and strong pre-winter buying from utilities. China's LNG imports are estimated to have increased by 28 per cent in 2016.

Figure 7.5: Growth in the LNG imports of key markets



Source: Argus Media (2016); Department of Industry, Innovation and Science (2016)
Notes: data for India is for Jan-Aug 2015 and Jan-Aug 2016.

Figure 7.6: Japan's LNG imports



Source: Nexant World Gas Model (2016); Department of Industry, Innovation and Science (2016)

China's LNG imports are forecast to rise by 34 per cent a year, to 43 million tonnes in 2018. China is aiming to raise the share of gas in its energy mix from 5 per cent to 10 per cent by 2020, with policy efforts directed at the electricity generation and transport sectors. LNG will play an important role in servicing rising gas demand, with China having agreed to contracts requiring large LNG imports over the next few years.

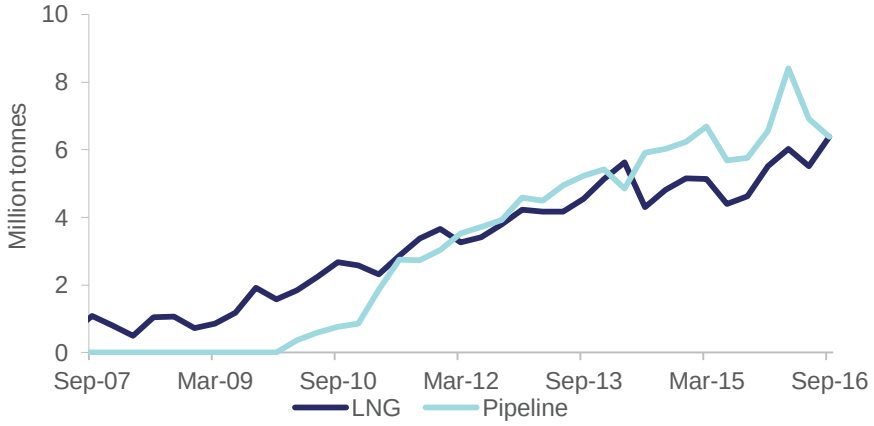
The deferral of Line D, the fourth and final pipeline in the China-Central Asia gas pipeline network, should support LNG imports. The pipeline was expected to have a capacity of 30 billion cubic metres a year — equivalent to around half of China's total gas imports in 2015. Both domestic output and pipeline imports are expected to grow alongside LNG imports.

Import growth in other emerging Asian economies is also expected to support demand. Expectations of persistent low spot prices continue to encourage countries in Asia to expand LNG import infrastructure. Import growth will be facilitated by floating storage regasification unit (FSRU) technology, which allows small volumes of LNG to be received economically by less mature import markets.

Europe's LNG imports are set to increase

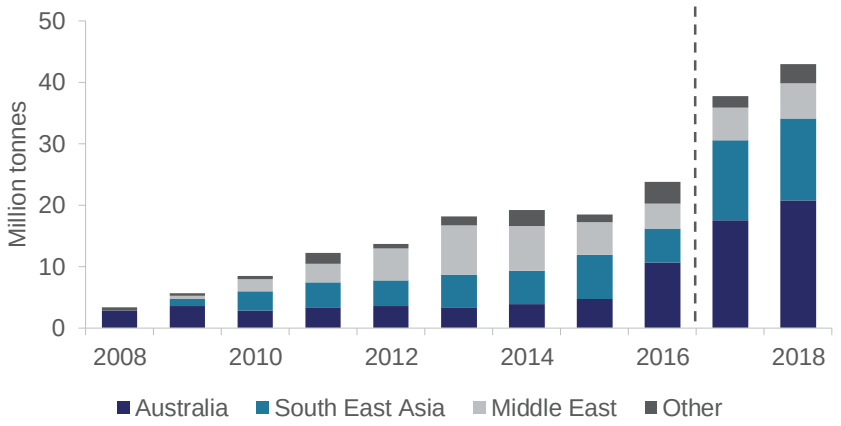
Europe is expected to be another key source of demand growth to 2018. LNG imports are forecast to increase by 21 per cent a year, to reach 65 million tonnes in 2018. Production in Europe is expected to fall, partly as a result of lower production at Europe's largest natural gas field — Groningen in the Netherlands. In September, the Dutch parliament approved a government proposal to lower the annual production cap at the Groningen gas field from 27 to 24 billion cubic metres from October 2016. The policy is aimed at reducing the frequency and intensity of earthquakes associated with production from the field.

Figure 7.7: China's quarterly LNG and pipeline imports



Source: CEIC (2016)

Figure 7.8: China's LNG imports



Source: Nexant World Gas Model (2016); Department of Industry, Innovation and Science (2016)

World supply

World LNG supply to increase

The global LNG market is going through a period of significant transformation, with a major expansion in liquefaction capacity currently underway. Global liquefaction capacity is forecast to rise by 11 per cent in 2017, and by 8.8 per cent in 2018 to 343 million tonnes. The majority of new capacity will be added in Australia and the US. All five LNG projects currently under construction in the US are scheduled to add to capacity by the end of 2018, although only the first of 3 trains at the Freeport LNG project will reach completion. The completion of LNG projects in a number of other countries, such as Malaysia and Angola, will also contribute to growth in global liquefaction capacity over the next two years.

Australia

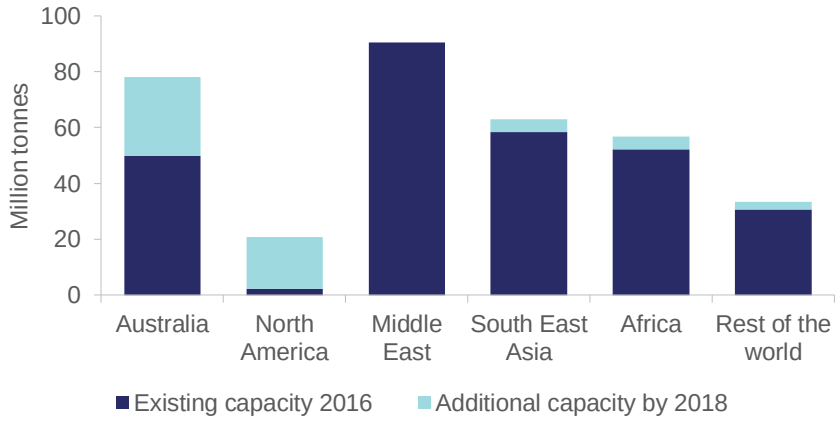
Domestic gas production continues to rise

Australian gas production is estimated to have increased by 21 per cent in the September quarter, to around 25 billion cubic metres, supported by higher conventional and coal seam gas production. The quarter saw first production from the Gorgon domestic gas plant, which will initially produce 150 terajoules a day for the western gas market.

Australian gas production is forecast to increase from 81 billion cubic metres in 2015–16 to 128 billion cubic metres in 2017–18, an increase of 58 per cent. Conventional gas production is forecast to rise by 34 billion cubic metres to 91 billion cubic metres in 2017–18. Coal seam gas (CSG) production is forecast to increase by 13 billion cubic metres to 38 billion cubic metres.

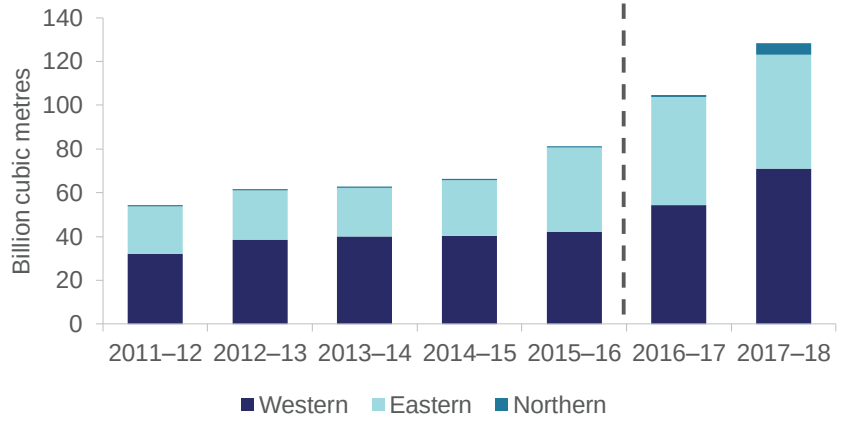
In the Western market, Australia's largest gas producing area, production is expected to rise as the Gorgon project ramps up and the Wheatstone and Prelude projects come on line. In the Eastern market, increased CSG production to support exports from recently completed LNG projects will contribute to growing gas production. Rising production in the small Northern market will be driven by the completion of the Icthys project.

Figure 7.9: World liquefaction capacity



Source: Nexant World Gas Model (2016)

Figure 7.10: Australian gas production by market



Source: Department of Industry, Innovation and Science (2016)

Australia's LNG export earnings and volumes to increase

The value of Australia's LNG exports increased by 8 per cent year-on-year to $4.6 billion in the September quarter 2016. The result was driven by higher export volumes. Export unit values of Australian LNG declined, with (linked) oil prices in mid-2016 remaining lower than a year earlier.

Australia's LNG export volumes increased by 50 per cent year-on-year in the September quarter, to around 12 million tonnes. Three LNG plants have commenced production over the past year — Gorgon, Australia Pacific LNG and Gladstone LNG. Australian exporters have increased their share of imports in the key markets of Japan, South Korea and China. In the September quarter, Australia accounted for 57 per cent of China's imports, up from 36 per cent a year earlier.

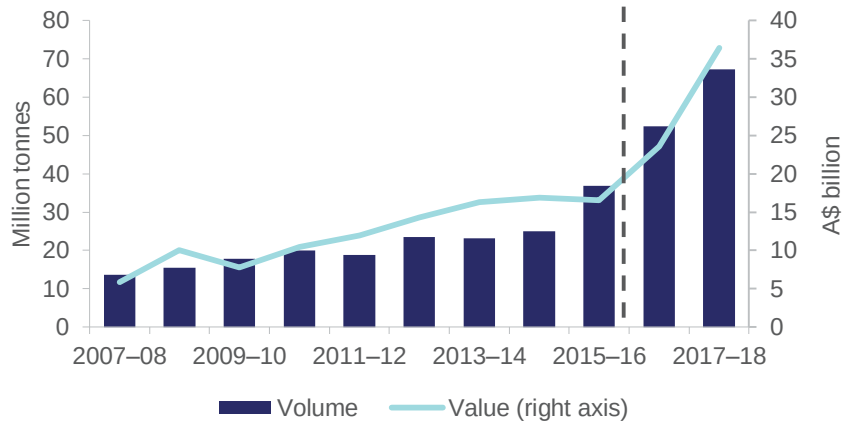
The value of Australia's LNG exports is forecast to increase by 50 per cent a year to $37 billion in 2017–18, as a result of increasing LNG prices and higher export volumes. LNG contract prices, under which most Australian LNG is sold, are expected to increase as oil prices recover.

However, while the outlook for LNG export prices to 2017–18 is positive, growth in LNG export prices is expected to be subdued in year-on-year terms in 2016–17. The lagged JCC price (which determines LNG contract prices) fell less sharply in 2015–16 than other oil prices, and is also forecast to recover less quickly than other oil prices in 2016–17.

Australia's LNG export volumes are forecast to increase by 35 per cent a year between 2015–16 and 2017–18, to 67.3 million tonnes. The four LNG projects currently under construction are expected to commence production by mid-2018, bringing Australia's LNG export capacity to around 87 million tonnes. However, some uncertainty surrounds the timing of Shell's Prelude project in the Browse Basin, where start up could be complicated by the cyclone season — which runs from November to April.

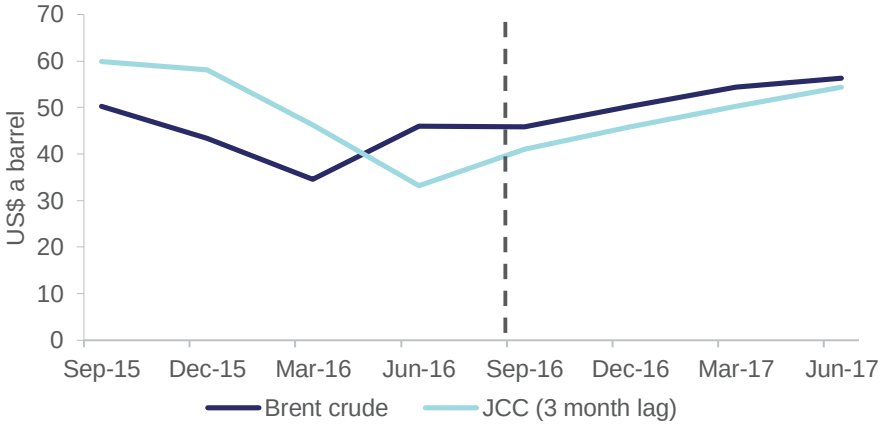
Increased exports to Japan, South Korea and China are expected to drive the rise in Australia's export volumes. Australian producers are expected to capture an increasing share of these countries' imports with the commencement of a number of long-term contracts over the outlook period.

Figure 7.11: Australia's LNG exports



Source: ABS (2016) International Trade in Goods and Services, 5368.0; Department of Industry, Innovation and Science (2016)

Figure 7.12: Brent and Japanese Customs-cleared Crude oil prices



Source: ABS (2016) International Trade in Goods and Services, 5368.0; Department of Industry, Innovation and Science (2016)

Table 7.1: LNG outlook

	unit	2014–15	2015–16	2016–17 [f]	2017–18 [f]	Per cent change
Australia						
Production [b]	Bcm	66.4	81.2	104.5	128.3	22.7
– Eastern market	Bcm	25.3	38.6	49.5	51.9	4.9
– Western market	Bcm	40.4	42.0	54.4	71.1	30.8
– Northern market [c]	Bcm	0.7	0.6	0.7	5.3	697.6
LNG export volume [d]	Mt	25.0	36.9	52.4	67.3	28.5
– nominal value	A$m	16,895	16,546	23,713	37,000	56.0
– real value [e]	A$m	17,411	16,819	23,713	36,221	52.7
LNG export unit value [g]						
– nominal value	US$/MMBtu	11.3	6.5	6.7	8.1	20.9
– real value [e]	US$/MMBtu	11.6	6.6	6.7	8.0	18.3
– nominal value	A$/GJ	12.8	8.5	8.6	10.4	21.5
– real value [e]	A$/GJ	13.2	8.6	8.6	10.2	18.9

*Notes: **b** Production includes both sales gas and gas used in the production process (i.e. plant use) as well as ethane; **c** Gas production from Bayu-Undan Joint Production Development Area is not included in Australia's production. Browse basin production associated with the Ichthys project is classified as Northern market; **d** 1 million tonnes of LNG is equivalent to approximately 1.36 billion cubic metres of gas; **e** In current financial year Australian dollars.; **g** 1 MMBtu is equivalent to 1.055 GJ; **f** Forecast; **s** Estimate*

Source: ABS (2016) International Trade, cat. no. 5368.0; Company reports; Department of Industry, Innovation and Science (2016)


Oil

Market summary

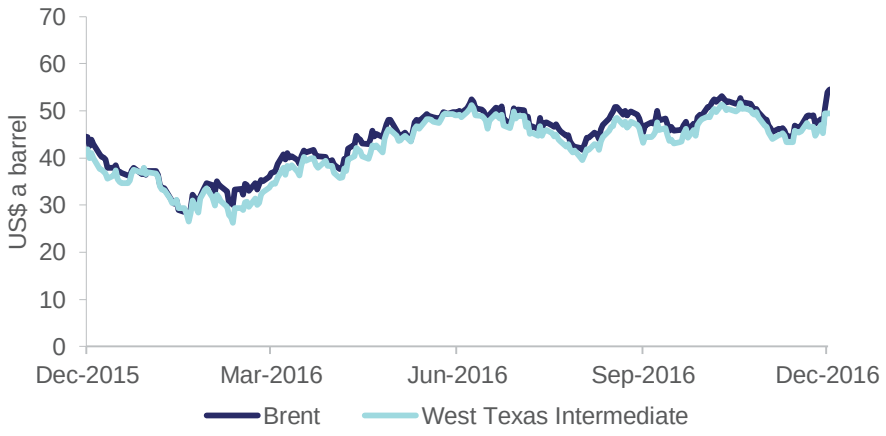
The value of Australia's crude oil and condensate exports is forecast to increase by 27 per cent a year over the forecast period, to $8.7 billion in 2017–18, supported by higher volumes and prices. Growth in export volumes will be supported by the ramp-up of condensate production at a number of new LNG projects. Oil prices are forecast to increase over the outlook period, as global consumption starts to outpace production, drawing down global stocks. Global supply is expected to be constrained by the implementation of recently-agreed OPEC production targets, and falling output in a number of non-OPEC producing countries. Non-OECD economies are expected to (continue to) drive growth in global demand.

Prices

Oil prices increase following OPEC agreement

The price of Brent crude averaged an estimated US$51 a barrel in the December quarter, slightly above the previous forecast of US$49 a barrel.

Figure 8.1: Recent movement in oil prices

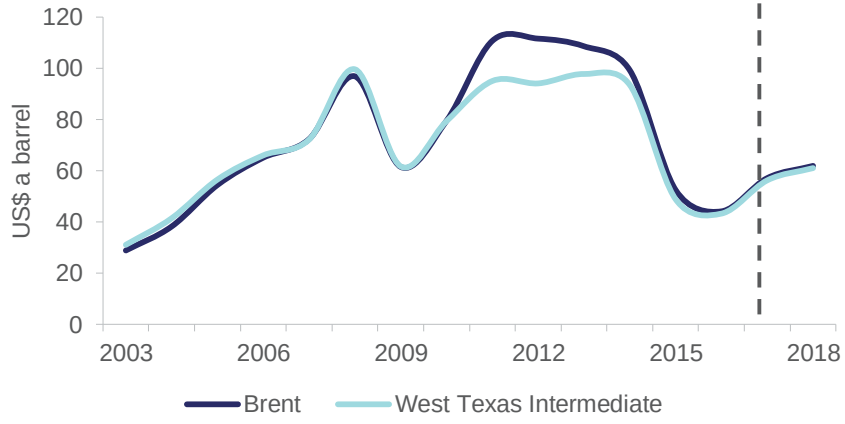


Source: Bloomberg (2016), Brent and West Texas Intermediate spot prices

Oil prices increased to over US$50 a barrel in October, after OPEC announced a production target of 32.5–33.0 million barrels a day on 28 September. Oil prices then declined in November, following announcements from key producers that seemed to undermine the likelihood of OPEC agreeing to a successful implementation plan.

On 30 November, OPEC members agreed to individual production targets to reduce the cartel's crude oil output to 32.5 million barrels a day — 1.2 million barrels a day lower than October 2016 levels. The agreement will take effect from 1 January 2017. The largest cuts will be shouldered by Saudi Arabia, followed by Iraq, the United Arab Emirates and Kuwait. As part of the agreement, non-OPEC countries agreed to reduce production by 558,000 barrels a day, of which Russia will contribute 300,000 barrels a day. OPEC has stated that the duration of the agreement is six months, with the possibility of a six month extension should soft market conditions persist.

Figure 8.2: Annual oil prices



Bloomberg (2016), Brent and West Texas Intermediate spot prices; Department of Industry, Innovation and Science (2016)

The outlook for prices has improved

The price of Brent crude is estimated to have averaged US$45 a barrel in 2016, slightly above the previous REQ forecast of US$44 a barrel . Brent oil prices are forecast to average US$57 a barrel in 2017, and US$62 a barrel in 2018. Led by non-OECD economies such as China and India, global consumption growth is expected to outpace growth in global production.

Production is expected to remain broadly unchanged in 2017, with a slight fall in OPEC production offsetting a small increase in non-OPEC output. Growth in oil output in 2018 is expected to be modest, with sharp falls in investment in new capacity over the past few years having sown the seeds for tighter future supply conditions.

The outlook remains sensitive to a number of factors; most notably, OPEC's ability to achieve its stated production target, and the implementation of output reductions pledged by some non-OPEC countries. Slower-than-expected growth in emerging economies in Asia, and a faster-than-expected return in US shale oil production, also represent downside risks to the outlook.

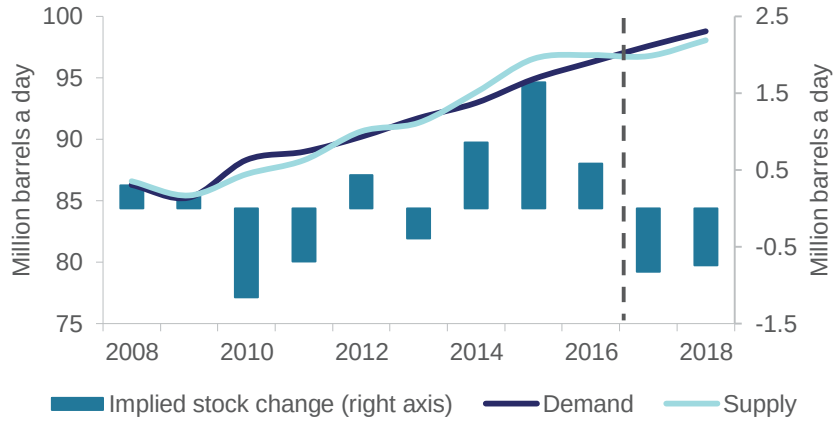
World oil consumption

Growth in world oil consumption is estimated to have slowed to 1.4 per cent in 2016, as a result of weak demand growth in non-OECD economies. Consumption is forecast to increase by 1.4 per cent in 2017, and by 1.2 per cent in 2018.

Non-OECD economies to drive growth in global consumption

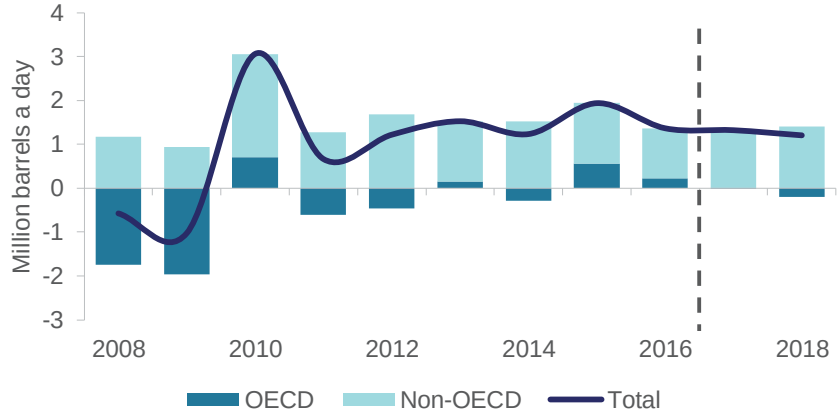
Growth in non-OECD oil consumption slowed to just 1.6 per cent in the September quarter. Demand in China was constrained by the economy's ongoing transition to a consumer-led growth model, heavy flooding in the south (which kept motorists off the road), and government efforts to curtail factory activity in Hangzhou (ahead of the G20 meetings). Non-OECD demand is estimated to rise by 2.4 per cent in 2016, to 49.7 million barrels a day — the lowest growth since 2002.

Figure 8.3: Oil supply, demand and stocks



Source: International Energy Agency Monthly Oil Data Service (2016); Department of Industry, Innovation and Science (2016)

Figure 8.4: Change in world oil consumption



Source: International Energy Agency Monthly Oil Data Service (2016); Department of Industry, Innovation and Science (2016)

Despite the recent slowdown in non-OECD oil consumption, these economies are expected to drive future growth in world oil consumption. Growth is forecast to recover from recent lows, with consumption increasing 2.7 per cent in 2017 and 2.8 per cent in 2018, to 52.4 million barrels a day. Increased consumption will be led by China and India, and will be driven by the transport sector, as vehicle fleets expand across emerging economies. OECD oil consumption is forecast to remain broadly unchanged over the outlook period.

World oil production

World oil supply is estimated to have been broadly stable in 2016, as higher OPEC production acted to offset declines in non-OPEC production. Global oil supply is forecast to decline by 0.1 per cent in 2017 — driven by recently agreed OPEC production targets — before increasing by 1.3 per cent in 2018.

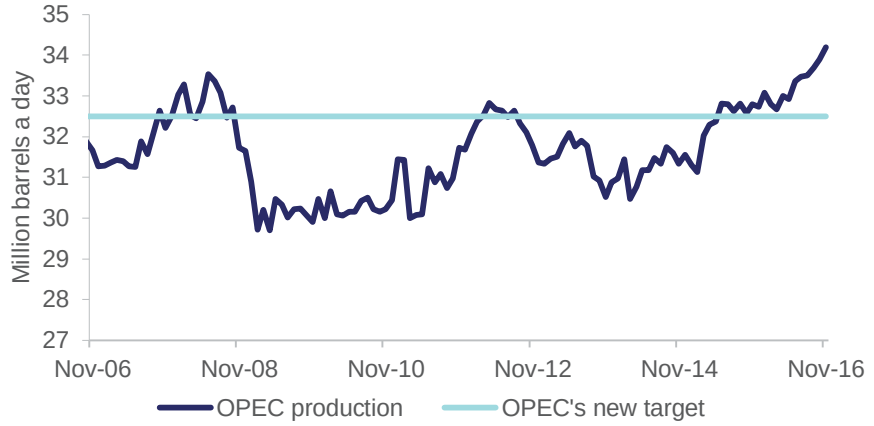
OPEC sets a new production target, but challenges remain

OPEC supply (crude oil, natural gas liquids, and non-conventional oils) reached a record high of 41.1 million barrels a day in November. Saudi Arabia's continued efforts to defend market share, the return of Iranian production (after sanctions were lifted in January), and strong Iraqi production, have all driven growth in OPEC output over the past year. Other major producers, such as Kuwait and the United Arab Emirates, have held production around record levels. OPEC output is estimated to have increased 2.8 per cent to 40.1 million barrels in 2016, of which crude oil accounted for 33.3 million barrels a day.

OPEC output is forecast to decline by 0.7 per cent in 2017, before increasing by 1.7 per cent in 2018, to around 40.5 million barrels a day. On crude oil alone, OPEC is assumed to produce slightly above its targeted levels, and to extend its agreed production targets for an additional 6 months in mid-2017.

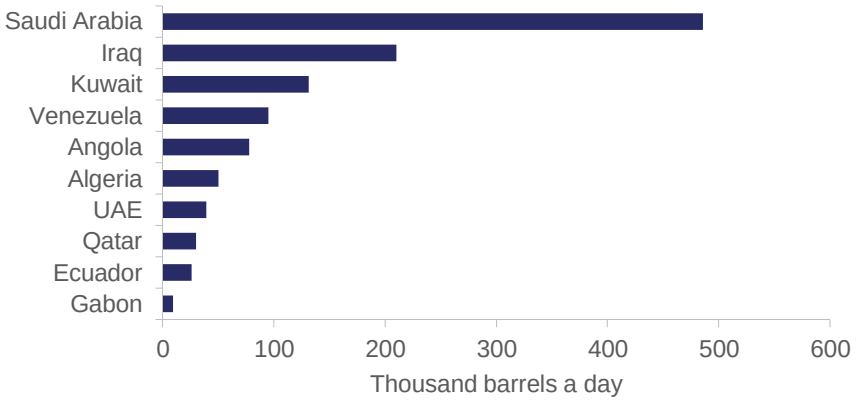
A key downside risk to the outlook remains OPEC's ability to achieve the targeted level of production. OPEC has failed to achieve production targets in the past. Budgetary pressures across a number of OPEC countries have added to incentives for individual member countries to exceed production quotas.

Figure 8.5: OPEC production



Source: International Energy Agency Monthly Oil Data Service (2016)

Figure 8.6: Agreed reductions in crude output by OPEC member countries



Source: Organization of the Petroleum Exporting Countries (2016), OPEC Press Release: Agreement

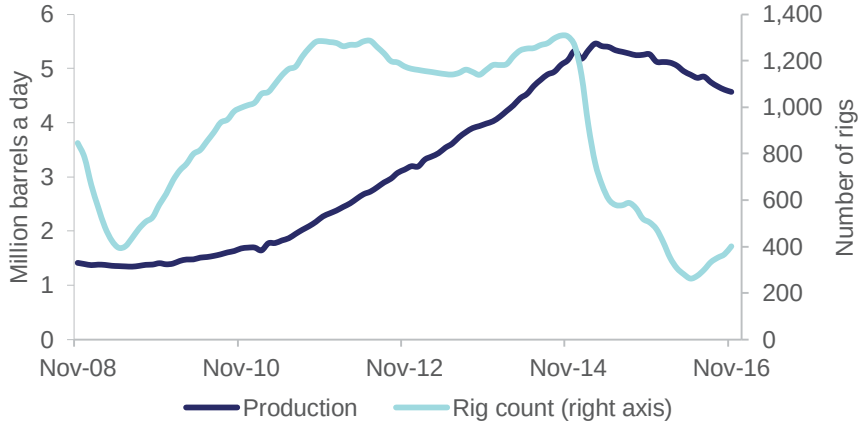
Notes: Targeted reductions in output are in relation to October 2016 production except for Algeria, where targets are in relation to September 2016 production.

A faster-than-expected return of US shale output remains a downside risk

Non-OPEC supply declined by 1.4 per cent to average 57.0 million barrels a day in the three months to November 2016. The result was driven by falling Chinese and US production. China's output has fallen over the past year, as a result of the closure of high-cost projects and natural decline at older fields. Shale oil output in the 7 key producing regions in the US was down 14 per cent year-on-year in the three months to November. Non-OPEC supply is estimated to have decreased 1.4 per cent in 2016.

Non-OPEC output is forecast to remain broadly stable in 2017, before returning to growth in 2018. Increased production will be driven by Canada and Brazil, partially offset by lower output in China and, in 2017, Russia. A key uncertainty is the price at which US shale output can stabilise and reverse course. The rig count rose for a sixth consecutive month in November, albeit from a low base, suggesting that prices of about US$45 a barrel are attracting some producers back to the market. However, other producers remain heavily indebted. The number of bankruptcies of North American oil and gas producers in 2016 rose from 48 to 61 in the three months to October.

Figure 8.7: Output and rig count in US shale oil regions



Source: US Energy Information Administration (EIA), Drilling Productivity Report

Australian production and trade

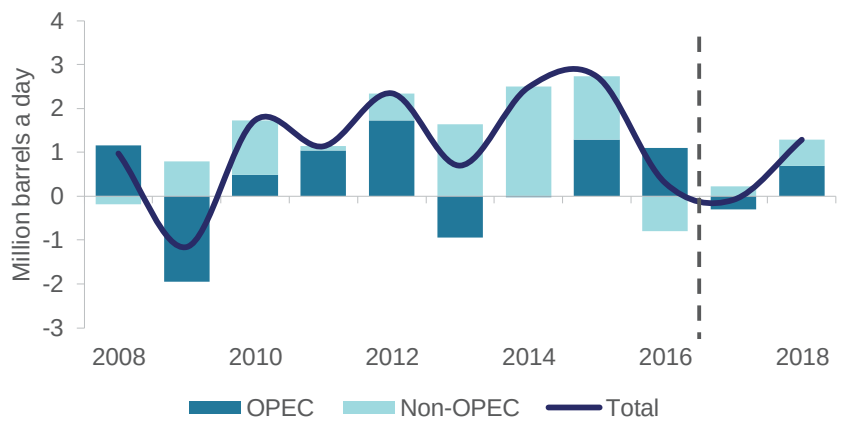
Exploration remains lower than a year earlier

Australia's petroleum exploration expenditure was $355 million in the September quarter, down 39 per cent year-on-year, but up 25 per cent quarter-on-quarter.

Condensate production associated with new LNG projects drives growth

Australia produced 291,000 barrels of crude and condensate a day in the September quarter, down 17 per cent year-on-year. Output is expected to fall slightly in 2016–17. However, in 2017–18, output is expected to increase by 21 per cent, to 380,000 barrels a day, driven by condensate production at the Gorgon, Icthys and Prelude LNG projects. Condensate production at Icthys is expected to be 100,000 barrels a day at its peak. Prelude and Gorgon are expected to produce peak levels of 36,000 and 20,000 barrels of condensate a day, respectively.

Figure 8.8: Change in world oil supply



Source: International Energy Agency Monthly Oil Data Service (2016); Department of Industry, Innovation and Science (2016)

Increasing prices and volumes to support export earnings growth

The value of Australia's exports of crude oil and condensate declined 23 per cent year-on-year in the September quarter, to $1.3 billion. Lower prices compounded reduced export volumes, which fell in line with production.

The value of Australia's exports of crude oil and condensate is forecast to increase to $8.7 billion in 2017–18, supported by both higher prices and export volumes. The forecast for export earnings has been revised up by $1.2 billion since the March REQ, reflecting an improved outlook for prices.

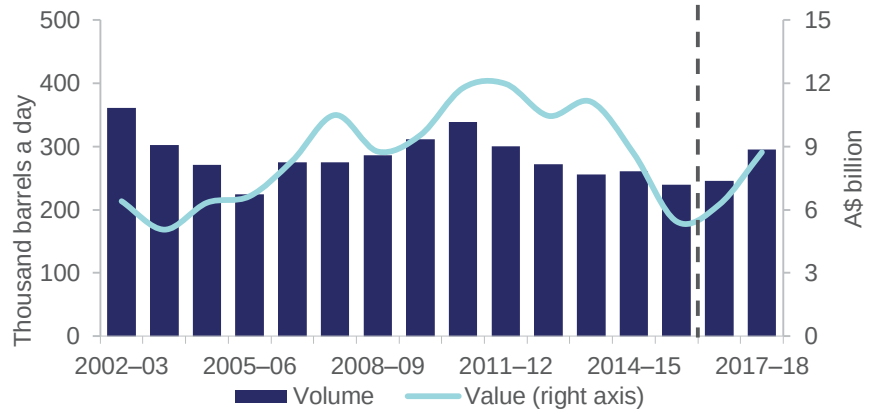
Australian refineries to remain under pressure

Australia's refined production declined by 2.2 per cent to 453,000 barrels a day in the September quarter. Australian refineries are expected to remain under pressure over the outlook period, as global refining capacity expands. Capacity expansions will be driven by investments in non-OECD economies in the Middle East and Asia, particularly China.

Figure 8.9: Australia's petroleum exploration expenditure

Source: ABS (2016) Mineral and Petroleum Exploration Expenditure, 8412.0

Figure 8.10: Australia's exports of crude and condensate



Source: ABS (2016) International Trade in Goods and Services, 5368.0; Department of Industry, Innovation and Science (2016)

Table 8.1: Oil outlook

World	Unit	2015	2016 [s]	2017 [f]	2018 [f]	Per cent change
Production [b]	mb/d	96.6	96.9	96.8	98.1	1.3
Consumption [b]	mb/d	94.9	96.3	97.6	98.8	1.2
WTI crude oil price						
Nominal	US$/bbl	48.9	43.3	56.3	61.1	8.5
Real [c]	US$/bbl	49.4	43.3	55.1	58.5	6.1
Brent crude oil price						
Nominal	US/$bbl	52.5	44.8	57.2	61.9	8.3
Real [c]	US$/bbl	53.1	44.8	55.9	59.3	6.0
Australia	**Unit**	**2014–15**	**2015–16**	**2016–17 [f]**	**2017–18 [f]**	**Per cent change**
Crude and condensate						
Production [b]	kb/d	328	317	314	380	21.1
Export volume [b]	kb/d	261	239	244	295	20.8
Nominal value	A$m	8,656	5,444	6,221	8,723	40.2
Real value [d]	A$m	8,921	5,534	6,221	8,539	37.3
Imports [b]	kb/d	426	342	338	322	–4.5
LPG						
Production [be]	kb/d	57	53	55	65	18.3
Export volume [b]	kb/d	36	34	37	44	18.2
Nominal value	A$m	807	547	641	949	48.2
Real value [d]	A$m	831	556	641	929	45.0
Refined products						
Refinery production [b]	kb/d	527	445	429	419	-2.4
Exports [bg]	kb/d	12	10	14	9	–33.8
Imports [b]	kb/d	504	593	596	622	4.2
Consumption [bh]	kb/d	951	955	953	965	1.3

Notes: ***b*** *Number of days in a year is assumed to be exactly 365. A barrel equals 158.987 litres;* ***c*** *In current calendar year US dollars;* ***d*** *In current financial year Australian dollars;* ***e*** *Naturally occurring;* ***g*** *Excludes LPG;* ***f*** *Forecast;* ***h*** *Domestic sales of marketable products;* ***s*** *Estimate*

Source: ABS (2016) International Trade in Goods and Services, Australia, cat. no. 5368.0; IEA (2016) Monthly Oil Market Report; Department of Industry, Innovation and Science (2016)


Uranium

Market summary

Australian uranium production is forecast to decrease by around 7 per cent in 2016–17, as uranium prices slide to historic lows. Domestic exploration for uranium deposits also remained low in September quarter 2016, as prices fell further below 'break-even' level.

Conditions for suppliers will be difficult over the short to medium term. A range of long-term contracts are set to expire over the next 12-18 months, with buyers seeking to lock in prices for future contracts that will make it hard for many suppliers to continue operating. However, reactor construction in China, India, Russia and South America continues at a rapid pace, and while high uranium inventories may restrain prices for a time, higher global demand is likely to start putting upward pressure on prices by late 2017.

Prices

High inventories and abundant supply continue to weigh on prices

The uranium spot price has fallen steadily over 2016, as inventories continue to build, and progress in bringing Japanese nuclear reactors back on line remains slow. At the end of November, the uranium spot price was US$18.00 a pound — down by almost 50 per cent since the start of the year, and well below the production cost in most mines. The long-term contract price also declined to US$33.00 a pound, down 25 per cent from the start of 2016.

For 2016 as a whole, the uranium spot price is forecast to decrease by 30 per cent, averaging US$25.50 a pound. Supply cuts and higher demand are likely to bring about some price recovery in the latter half of 2017, but prices over 2017 are nonetheless expected to remain low in historical terms, at around $US23.20 a pound. In 2018, spot markets are likely to come under pressure, as growing reactor construction in China and India increases demand. Spot prices in 2018 are expected to lift to around $31 a pound, with most price pressure occurring in the second half of the year.

Sixteen new reactors were commissioned during 2016: nine of these were in China, with the remainder in South Korea, India, Russia and the United States. One reactor in Japan also resumed operation in August. In 2017, further reactors will commence operation in China and India, and some existing reactors in Japan are also expected to return to operation.

Figure 9.1: Uranium prices, monthly

Source: Cameco Corporation (2016) Uranium Spot and Long Term Prices.

Figure 9.2: Outlook, quarterly uranium prices

Source: Cameco Corporation (2016) Uranium Spot Price; Ux Consulting (2016) Uranium Market Outlook.

Although prices are currently low in historical terms, several factors will work to lift them over the next two years. Low prices have seen exploration activity virtually cease, which will constrict supply in the long term. Utilities are currently favouring spot prices over long-term contracts, but any significant drop in supply will see a push back into long-term contracts, which are likely to raise realised prices. While progress in restoring Japanese reactors remains sluggish, more than 50 reactors are under construction in China. These reactors are expected to come on-line at an increasingly rapid rate.

Consumption

China, India, Russia and South Korea to drive consumption growth

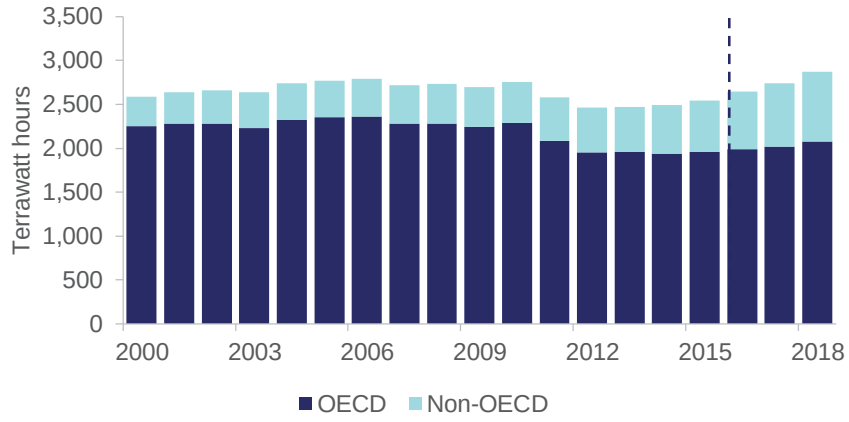
Growth in uranium consumption is largely driven by the development of new nuclear power generation capacity. Commissioning a new reactor requires substantially more uranium for its initial core than refuelling existing operating plants. Subsequent annual requirements decrease as a reactor reaches a 'steady-state' level of operation. Most reactors are refuelled every one to two years, when a quarter to a third of the fuel assemblies are replaced.

World uranium consumption is estimated to have increased by 4.0 per cent in 2016, driven by the start-up of new reactors in China, India, Russia, South Korea and the United States. Some uplift is also expected from potential reactor restarts in Japan, as well as moderate output increases at existing reactors in advanced economies.

China has brought 9 new reactors online during 2016, and was working to bring a tenth online before the end of the year. Outside China, ten additional reactors were expected to be completed by the end of 2016 — six in India, and one each in Russia, the US, Pakistan, and South Korea. These reactors will have a combined capacity of 8,072 megawatts.

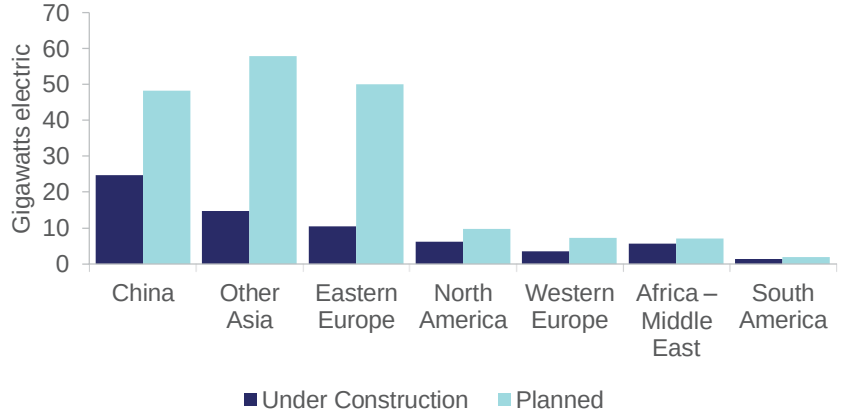
Japan successfully restarted Units 1 and 2 at the Sendai nuclear plant back in 2015. However, progress in restarting the remaining 24 reactors that have applied for approval has been very slow. The timetable for further restarts is likely to be slow and difficult to predict, due to uncertainties related to political and legal decisions, and the effect of public opinion. It is anticipated that between three and six reactors will re-open over the next two years.

Figure 9.3: World nuclear power generation



Source: International Energy Agency (2015); World Nuclear Association (2016).

Figure 9.4: New nuclear capacity



Source: World Nuclear Association (2016).

Consumption in France in 2017 is uncertain, impacted by safety checks on a significant number of nuclear power plants. World uranium consumption is forecast to increase by 5.8 per cent in 2017 to 84,000 tonnes, before rising further, to 86,400 tonnes in 2018. Higher demand reflects an array of new capacity under construction. A total of 22 new reactors with a total capacity of 22,444 megawatts are scheduled for completion in 2017. These include eight new reactors in China, totalling 8,510 megawatts; two new reactors in South Korea, totalling 2,680 megawatts; and two new reactors in Russia, totalling 2,199 megawatts. Other new reactors are scheduled for completion in India, Pakistan, Slovakia, and the United Arab Emirates (UAE).

Production

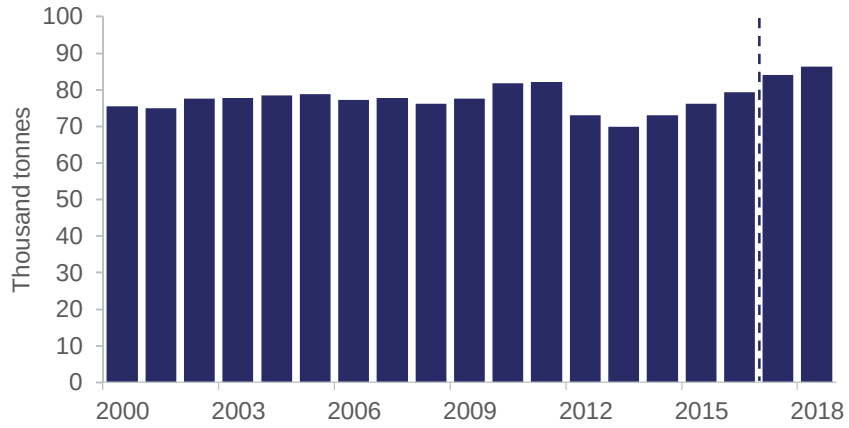
Mine production to increase in 2016 and 2017

World uranium production is forecast to increase by 1.5 per cent in 2016, to 72,700 tonnes. Production is rising at key US mines, including the Peninsula Energy's Lance mine, the Nichols Range mine, and the White Mesa mine in Utah. Cameco's Cigar Lake mine in Canada is also expanding production significantly, as are the Inkai and Budenovakoye mines in Kazakhstan.

World uranium supply is increasingly being driven by uranium inventories held by nuclear utilities and secondary market supplies (where existing stocks are traded). In late 2015, Ux Consulting estimated that there were sufficient inventories held by nuclear utilities to cover forward demand for around five years in Japan, two and a half years in both the United States and Europe, and around seven years in China. It is expected that uranium producers will focus on reducing output and cutting costs over the next eighteen months, with high-cost mines likely to scale back or close. New projects are expected to remain on hold until price increases improve their commercial viability.

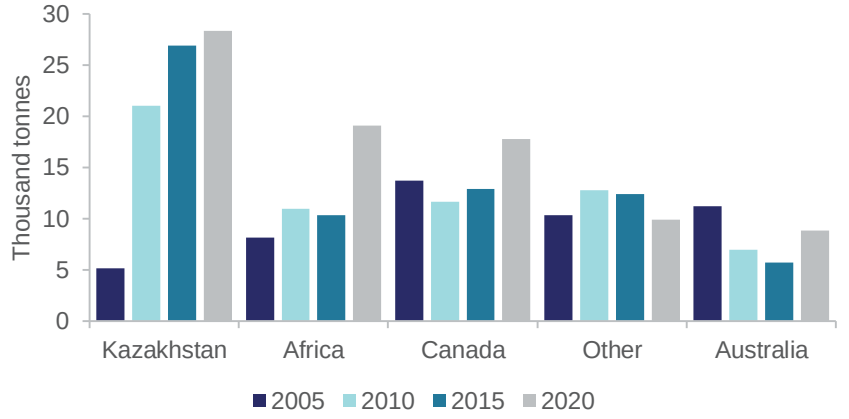
World uranium production is forecast to increase by 3.7 per cent in 2017, to 75,400 tonnes, underpinned by continued increases in production at CGN/Swakop Uranium's Husab mine in Namibia, and the Lance and Cigar Lake mines in North America. Production is expected to rise to 78,427 tonnes in 2018, as additional production comes on line in Namibia and Canada.

Figure 9.5: World uranium consumption (U_3O_8)



Source: International Energy Agency (2016); World Nuclear Association (2016).

Figure 9.6: World uranium production (U_3O_8)



Source: Nuclear Energy Agency (2015); Ux Consulting (2016) Uranium Market Outlook; World Nuclear Association (2016).

Australia's exploration, production and exports

Exploration expenditure remains historically low

After steep falls in recent years, Australia's uranium exploration expenditure recovered slightly in the September quarter, lifting by 14 per cent to $4.9 million. Despite the rise, exploration remains under one-tenth of the level recorded during 2009 and 2010, reflecting the effect of historically low uranium prices.

Exploration totalled $17.1 million over the first three quarters of 2016. This compares to $33.3 million over the first three quarters of 2015.

Australia's production to fall in 2016–17

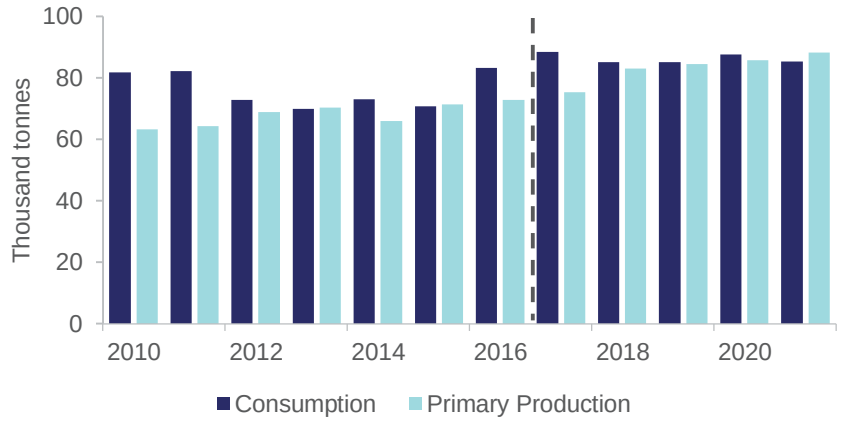
Australia's uranium production is forecast to decrease by around 6.8 per cent in 2016–17, to 7,141 tonnes, as production gradually shifts back down to normal levels at the Olympic Dam and ERA Ranger facilities. These facilities had previously recorded spikes in production, after operational disruptions in 2014–15. Expected strong production at the BHP Olympic Dam mine and a ramp-up of production at Quasar Resources' Four Mile Mine, are expected to support a rebound in production to 7,850 tonnes in 2017–18.

Australian producers may face tighter conditions in the medium term, as long-term supply contracts expire. It is likely that a greater share of global demand will be met from the spot market in 2017, due to the historical low in prices. The price is currently below the cost of production for most miners.

Nuclear power growth across Asia to drive Australia's uranium exports

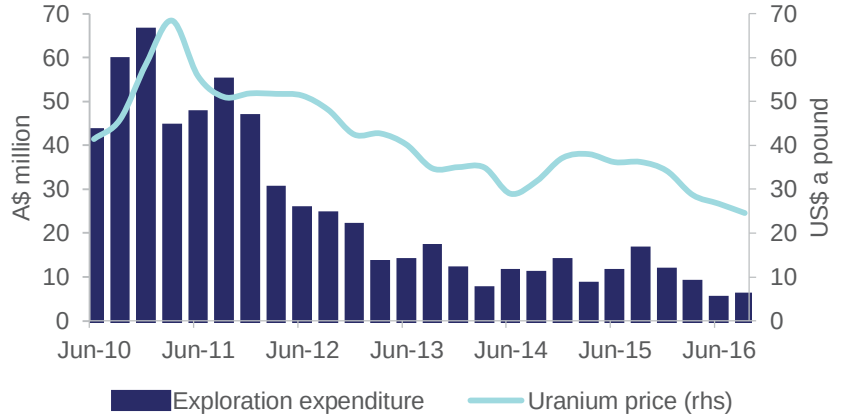
Australia exported 7,837 tonnes of U308 in 2015–16 — a substantial increase on the volume exported in 2014–15. However, export values were somewhat disappointing, at $A959 million. This reflects the impact of ongoing weak prices. Export volumes are expected to ease slightly in 2016–17, to 7,141 tonnes. In line with lower export volumes, export earnings are forecast to decline over the outlook period, falling to $907 million. Stronger production is expected to lift export volumes to 7,850 tonnes in 2017–18, while export values are expected to rise to $995 million, driven by volumes as well as an expected recovery in prices.

Figure 9.7: Uranium supply–demand balance (U_3O_8)



Source: International Atomic Energy Agency (IAEA); Ux Consulting (2016); World Nuclear Association (2016).

Figure 9.8: Australia's uranium exploration

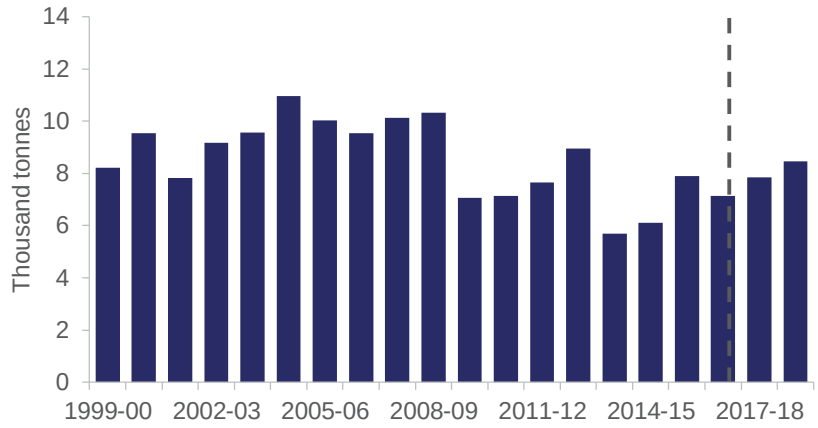


Source: ABS (2016) Mineral and Petroleum Exploration, cat. no. 8412.0; Cameco Corporation (2016) Uranium Spot Price.

Although the outlook for exports remains tight in the short term, there is still strong potential for future growth in key regions, including North America, Western Europe, and Southeast Asia. In particular, future export growth is likely to be supported by increasing demand from China, where consumption is expected to rise strongly in coming years — as a string of new reactors commence operation.

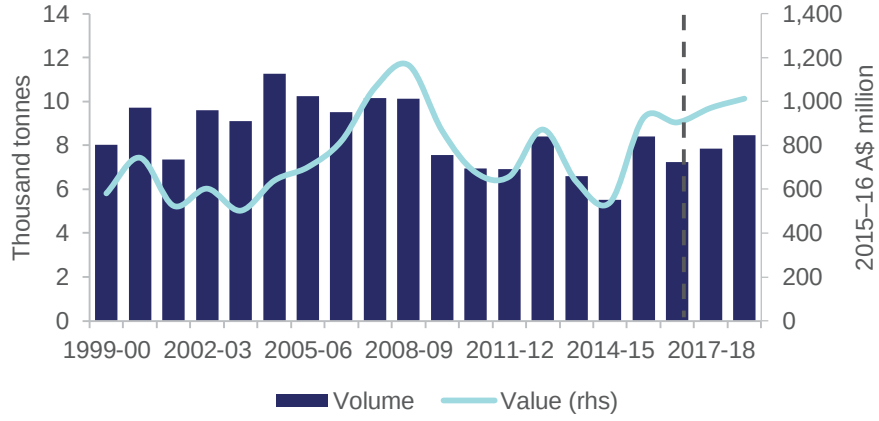
Although exports to Japan are expected to remain subdued, there could be risks to the upside in the event that the pace of re-opening reactors is faster than anticipated. Australia may also have greater opportunities to export uranium to Ukraine in the future, as the two governments have recently concluded a new supply agreement.

Figure 9.9: Australia's uranium production



Source: BHP Billiton (2016) Operational Review; Department of Industry, Innovation and Science (2016); Energy Resources of Australia (2016) ASX Announcement – Operations Review; Company media announcements (2016).

Figure 9.10: Australia's uranium exports



Source: Australian Safeguards and Non–Proliferation Office (2015); Department of Industry, Innovation and Science (2016).

Table 9.1: Uranium outlook

World	unit	2015	2016 s	2017 f	2018 f	Per cent change
Production	kt	71.6	72.7	75.4	78.4	4.0
Africa b	kt	8.9	9.5	11.3	12.9	14.0
Canada	kt	15.7	15.9	16.2	16.7	2.8
Kazakhstan	kt	28.1	28.1	28.1	28.1	0.0
Russia	kt	3.6	3.6	4.0	4.2	5.7
Consumption	kt	76.3	79.4	84.0	86.4	2.8
China	kt	10.6	13.8	17.1	17.5	2.3
European Union 28	kt	22.7	22.2	22.4	24.3	8.7
Japan	kt	0.2	0.5	1.2	2.1	80.1
Russia	kt	6.0	6.1	6.6	6.9	4.6
United States	kt	22.7	23.0	22.5	22.1	–1.9
Spot price						
– nominal	US$/lb	36.5	25.5	23.2	31.3	34.9
– real c	US$/lb	36.9	25.5	22.7	29.9	32.0
Australia	**unit**	**2014–15**	**2015–16**	**2016–17 f**	**2017–18 f**	**Per cent change**
Production	t	6,496	7,889	7,141	7.850	9.9
Export volume	t	5,515	7,837	7,141	7,850	9.9
– nominal value	A$m	532	959	907	995	9.8
– real value d	A$m	548	975	907	974	7.5
Average nominal price	A$/kg	96.4	122.4	127.0	126.8	–0.1
– real d	A$/kg	99.4	124.4	127.0	124.1	–2.2

b Includes Niger, Namibia, South Africa, Malawi and Zambia. **c** In current calendar year US dollars. **d** In current financial year Australian dollars. **f** forecast **s** estimate

Source: Department of Industry, Innovation and Science (2016); Cameco Corporation (2016); Company reports (2016); Ux Consulting (2016) Uranium Market Outlook.

Gold

Market summary

Gold prices declined noticeably in the December quarter 2016. The stronger US dollar, along with a push into equity markets, saw investment flows out of the gold market. Rising US interest rates will remain a key headwind for gold prices, as they act to push the US dollar higher.

Fabrication consumption has been subdued, largely due to higher prices throughout most of 2016. Jewellery consumption is expected to increase in the short term, as several cultural events encourage retail purchases in key Asian markets. High Australian dollar gold prices and relatively high imports of unwrought gold in the September quarter 2016, point to higher Australian export earnings in 2016–17. Earnings from gold are forecast to increase by 4 per cent in 2017–18 to $17 billion.

Prices

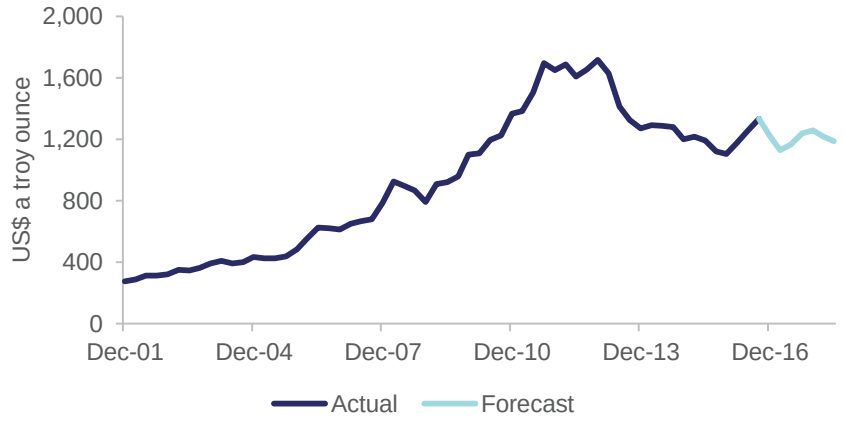
Gold prices fall on rising US dollar

The London Bullion Market Association (LBMA) gold price declined during the December quarter, to average about US$1,235 a troy ounce in the December quarter 2016. Investor demand was affected by a stronger US dollar and high anticipation of the December hike in the Fed Funds rate by the US Federal Reserve. Gold performed its safe haven role during the unexpected US election result — briefly rising to over $US1,330 per troy ounce on the day of the election. However, the subsequent announcement of infrastructure investment favoured a stronger US dollar and higher US equities, and gold declined thereafter.

Gold prices are expected to be lacklustre over the next eighteen months. Drivers will be improved economic conditions, rising US interest rates and a stronger US dollar. Gold is forecast to average US$1,200 a troy ounce in 2017, down from an average of US$1,250 a troy ounce in 2016.

Rising inflation and high equity valuations will be the key upside risks to the outlook for gold prices. Jewellery consumption and central bank purchases should be encouraged by the relatively low gold price.

Figure 10.1: Quarterly LBMA gold prices



Source: LBMA (2016) Gold Price PM; Department of Industry, Innovation and Science (2016)

Figure 10.2: Recent movement in gold prices

Source: LBMA (2016) Gold Price PM

The gold price is forecast to average US$1,180 per troy ounce in 2018, as investors look to other assets as economic conditions improve. However, historically high debt levels across Europe, Japan, US and China will provide some investor interest in gold as a safe haven asset.

World consumption

Global gold consumption was subdued in 2016. Total consumption in the first three quarters of 2016 was 18 per cent lower than same period in 2011 (the peak) — continuing a long term steady decline since then. World consumption is forecast to increase by 2 per cent a year to 2,908 tonnes in 2018.

Jewellery consumption remains lacklustre

After hitting a 16-year low in the June quarter, gold jewellery consumption staged a modest recovery in the September quarter. Swings in Indian gold demand drove the global picture. The recent demonetisation of high value Indian currency notes is expected to dampen Indian gold sales in the short term, as the majority of gold transactions in India are cash-based.

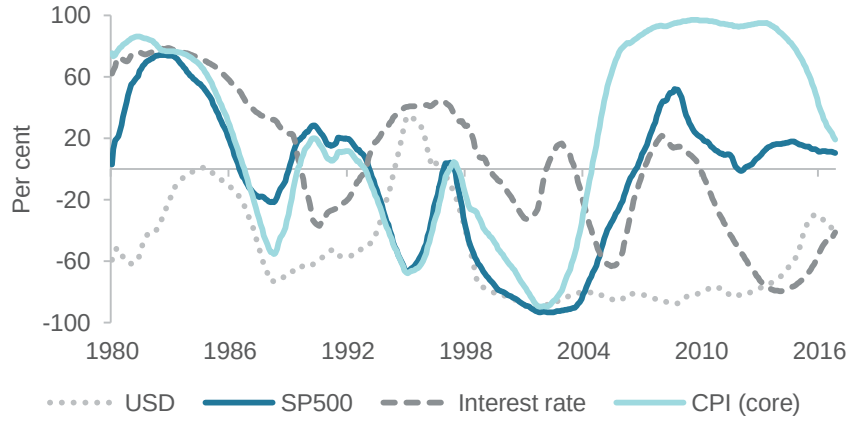
Jewellery consumption — which accounts for 80 per cent of total fabricated demand — is expected to improve over the outlook period. Continued economic growth in India and China — the world's two major jewellery markets — will likely encourage higher discretionary spending on gold. Jewellery consumption is forecast to increase by 3 per cent in 2017, more than offsetting a forecast 6 per cent decline in technology use.

Gold consumption in electronics declined 8 per cent year-on-year in the September quarter. Producers substituted cheaper metals for gold in industrial applications throughout much of 2016, as high gold prices diminished their relative attractiveness.

Investor demand falls as US dollar rises

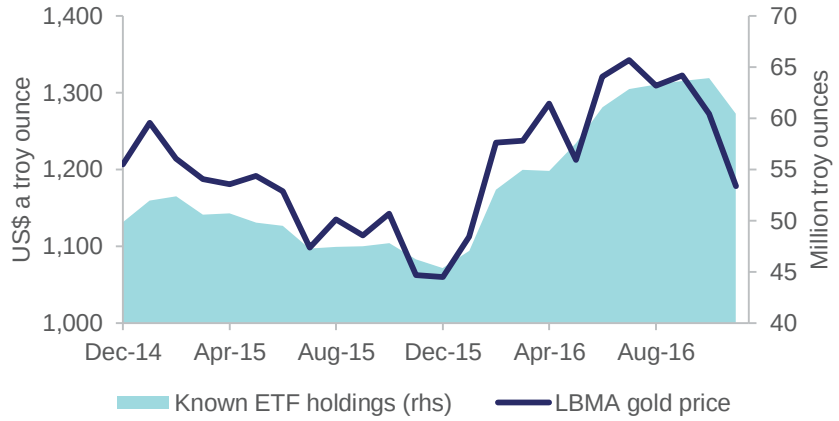
Investment demand declined 28 per cent quarter-on-quarter in the September quarter, led by a strong decline in demand for bullion-backed Exchange Traded Funds (ETFs). ETF holdings rose strongly in the first half of 2016, but declined by 47 per cent in the September quarter. Despite the recent decline, ETF inventories remain at a four year high.

Figure 10.3: Correlation of gold price to US: dollar, equities, interest rates and inflation



Source: LBMA (2016) Gold Price PM; Thompson Reuters (2016) US dollar major currency index; S&P 500 composite index; Federal funds target rate and US CPI – all items less food & energy.

Figure 10.4: ETF gold holdings and gold spot price



Source: Bloomberg (2016) ETF Gold Holdings and Spot Gold Price

The surprise US election result and the US economic landscape will have a mixed impact on investor demand over the next two years. US President-elect Trump's pledge of stronger fiscal stimulus has increased expectations of higher economic growth and higher inflation in the US. If US economic growth does improve significantly, this may discourage investment in gold, as investors expect equities to offer higher returns.

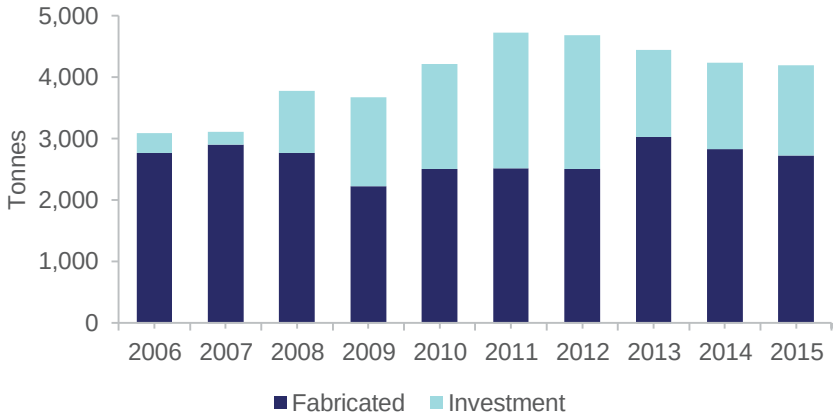
Historically, gold has been viewed as an inflation hedge. US interest rates are expected to increase over the forecast period, discouraging investment in gold. Rising US interest rates put upward pressure on the US dollar, which makes gold more expensive for non-US investors to buy. The past decade has shown a strong (inverse) correlation between the US gold price and US real bond yields.

Central bank demand for gold declined 55 per cent year-on-year over the first three quarters of 2016. However, official sector purchases remain historically high, as emerging markets continue to diversify reserves with non US dollar-denominated assets.

Figure 10.5: US dollar gold price and real bond yields

Source: LBMA (2016) Gold Price PM; Thompson Reuters (2016) US Federal Reserve Inflation linked 10 year bond yield

Figure 10.6: Global gold consumption



Source: World Gold Council (2016) Gold Demand Trends Full Year 2015

Central bank demand is expected to increase over the outlook period, led by purchases from Russia and China. Central bank buying will provide support for gold prices during 2017.

World production

Lower mine production offset by recycled supply

Total gold supply increased moderately in 2016, as an increase in recycled output offset a decline in mine production. World mine production is forecast to increase by 1.3 per cent in 2016, to 3,263 tonnes. World mine production is forecast to increase by 1.7 per cent, to just over 3,318 tonnes in 2017, then decline to 3,109 tonnes in 2018.

World mine production decreased by just 1 per cent year-on-year in the first three quarters of 2016. World mine production has largely plateaued, as increased capacity at various operations is offset by cost-cutting measures — enacted in line with falling prices over the last several years. In contrast, recycled output increased by 12 per cent year-on-year, adding a further 980 tonnes to supply in the first three quarters of 2016.

Mine production declined substantially in Asia and North America year-on-year in the first three quarters of 2016. Indonesian production declined by 10 per cent to 90 tonnes over the same period. Production at Indonesia's Grasberg mine declined by 28 per cent to 18 tonnes, due to lower ore grades. Grasberg's owners expect production to rise in 2017, due to increased access to higher grade sections of the open pit. Mexico's production fell 13 per cent year-on-year for the nine months ending September 2016.

Gold recycling boosts world supply

World recycled supply continued to increase in the first three quarters of 2016, boosting total world gold supply. Over 336 tonnes of recycled supply came onto the market during the September quarter. Scrap responded to higher prices throughout most of 2016. Recycled supply is expected to taper in 2017, as lower prices discourage trading.

Australia's production and exports

Exploration expenditure improves

Australia's gold exploration expenditure increased 19 per cent year-on-year to $160 million in the September quarter 2016. Gold exploration expenditure has been rising steadily since March 2014. The rise in expenditure has been motivated by higher profit margins relative to many other resources. Gold exploration has also been encouraged from a rising domestic gold price due to exchange rate effects over most of the last three years.

Exploration expenditure continued to increase in Western Australia rising 7 per cent quarter-on-quarter in the September quarter 2016. Western Australia remains the largest centre of gold exploration activity in Australia, attracting 70 per cent of total national gold exploration expenditure. Gold exploration expenditure rose strongly by 51 per cent in New South Wales to 11 million in the September quarter — the highest level since June 2013. Expenditure in Queensland remained steady at 12 million, while the Northern Territory declined 28 per cent quarter-on-quarter to 9 million in the September quarter.

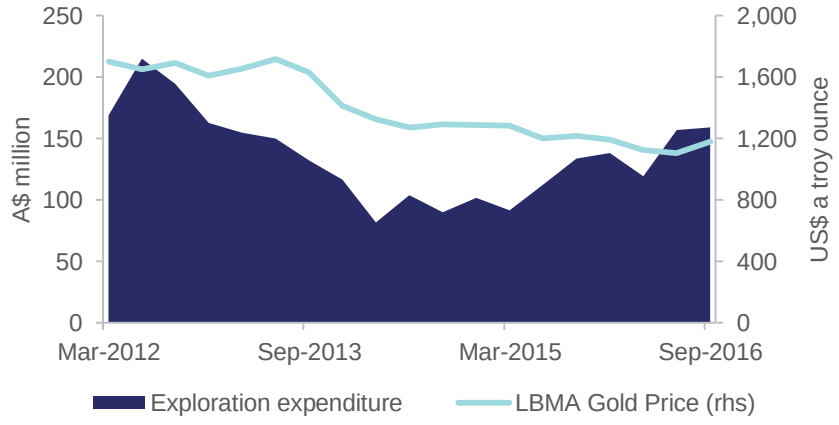
Production increases in the September quarter

Australia's gold mine production is forecast to increase by 2.8 per cent in 2016–17, to 292 tonnes. The increase is due to the faster than expected ramp up in production from several larger mines. Production is forecast to increase by 3.5 per cent in 2017–18, to 302 tonnes.

Australia's gold production increased by 2.2 per cent year-on-year in the September quarter 2016. The higher output was achieved despite wet weather disrupting several mines in NSW, Victoria and South Australia. In the September quarter, Newmont's Boddington mine in Western Australia increased production by 7.3 per cent year-on-year to 6.8 tonnes — a record high for Australia's largest gold mine.

Newcrest's Cadia Valley increased 9.3 per cent to over 6 tonnes in the September quarter, due to increased output from the ramp up of Cadia East. Newcrest lifted estimates for Cadia Valley to produce 23 to 26 tonnes in 2016–17. Production at the Kalgoorlie Super Pit was better than expected in the September quarter. Output increased to 5.9 tonnes, due to better ore grades.

Figure 10.6: Australia's gold exploration expenditure



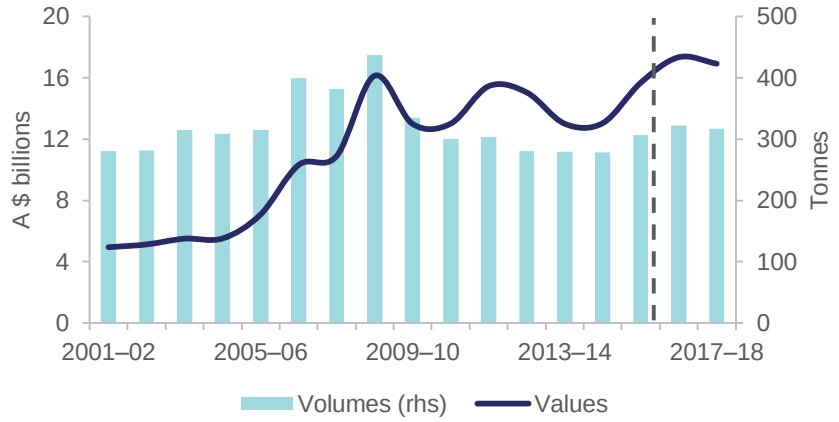
Source: LBMA (2016) Gold Price PM; ABS (2016) Mineral and Petroleum Exploration, 8412.0

Export volumes of gold near record high

Australia's gold exports increased 25 per cent year-on-year to $5.2 billion in the September quarter of 2016. The increase was due to higher production, supported by higher imports of unwrought and semi-manufactured gold for processing. Export volumes increased 10 per cent over the same period, to 92 tonnes.

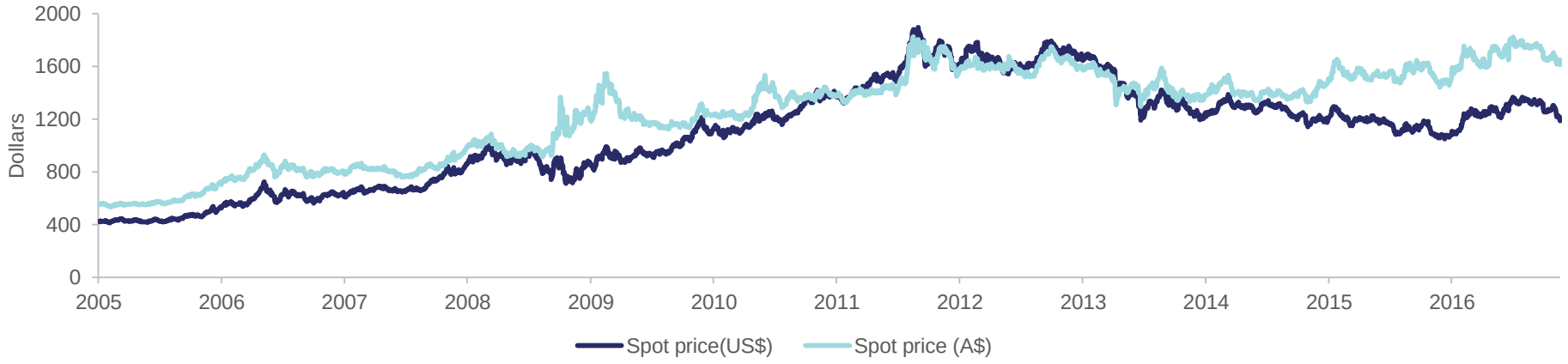
The forecast for Australia's gold exports in 2016–17 has been revised upwards to 323 tonnes. The increase is due to the higher than expected exports in the September quarter. Higher processing of imported unwrought gold was driven by higher prices during the second and third quarters. Imported unwrought gold is expected to taper over the outlook period, due to lower prices. Export volumes are forecast to total 317 tonnes in 2017–18, due to higher domestic production. The value of Australia's gold exports is forecast to total $17 billion in 2017–18, as higher production offsets the impact of lower gold prices.

Figure 10.7: Australia's gold exports



Source: ABS (2016) International Trade, 5465.0; Department of Industry, Innovation and Science (2016)

Figure 10.8: US dollar versus Australian dollar gold price



Source: LBMA (2016) Gold Price PM; Bloomberg (2016) Australian Dollar Spot Price

Table 10.1: Gold outlook

World	unit	2015	2016 [s]	2017 [f]	2018 [f]	Per cent change
Fabrication						
Consumption [b]	t	2,731	2,786	2,845	2,908	2.2
Mine production	t	3,221	3,263	3,318	3,109	–6.3
Price [c]						
– nominal	US$/oz	1,160	1,250	1,200	1,180	–1.7
– real [d]	US$/oz	1,173	1,250	1,174	1,130	–3.8

Australia		2014–15	2015–16	2016–17 [f]	2017–18 [f]	Per cent change
Mine Production	t	275	285	292	302	3.5
Export volume	t	278	306	323	317	–1.6
– nominal value	A$m	13,048	15,687	17,353	16,929	–2.4
– real value [e]	A$m	13,446	15,946	17,353	16,573	–4.5
Price						
– nominal	A$/oz	1,468	1,602	1,667	1,659	–0.5
– real [e]	A$/oz	1,513	1,628	1,667	1,625	–2.6

*Notes: **b** Includes jewellery consumption and industrial applications; **c** London Bullion Market Association PM price; **d** In current calendar year US dollars; **e** In current financial year Australian dollars; **f** Forecast; **s** Estimate.*

Source: Sources: ABS (2016) International Trade, 5465.0; London Bullion Market Association (2016) gold price PM; World Gold Council (2016); Department of Industry, Innovation and Science.

Aluminium, alumina, bauxite

Aluminium

Market summary

The outlook for Australia's aluminium exports remains positive, thanks to increased demand from the US, Europe and China, where vehicle sales and production are projected to increase in 2016–17 and 2017–18. As a result, Australia's aluminium exports are forecast to rise 3.4 per cent in 2016–17 and 2.8 per cent in 2017–18, to 1.49 and 1.53 million tonnes, respectively. Export earnings for 2016–17 and 2017–18 are forecast to increase at an annual rate of 3.4 per cent to $3.4 billion and $3.5 billion, respectively.

However, both the power outage on 1 December 2016 and the termination of the hedge contract between the Portland smelter and AGL in August 2017, present risks to Australia's production assessment. Without a new favourable power agreement in place before August 2017, Portland's production is likely to be adversely affected, reducing Australia's production and export capacity. Moreover, there are uncertainties about the changes that the Trump administration will implement after 20 January 2017. These changes will have direct and indirect impacts on export markets and opportunities for Australian aluminium.

Prices

Aluminium prices to continue to rise

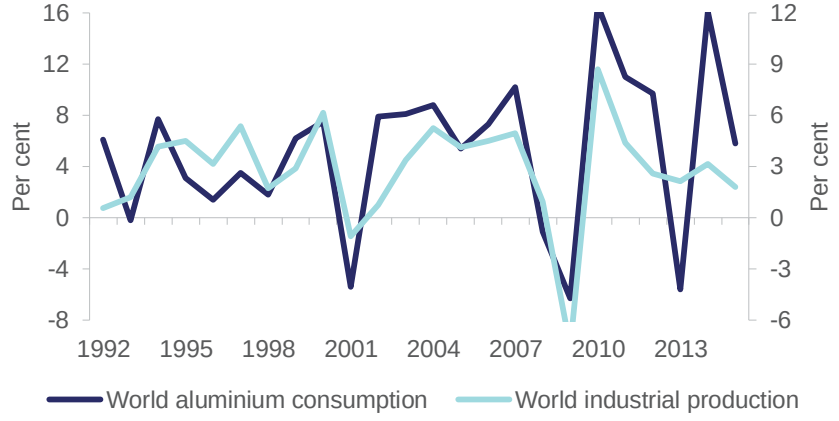
The average London Metals Exchange (LME) spot aluminium price has increased 15 per cent (year-to-date to average US$1,592 a tonne) from the end of 2015, mainly driven by increased consumption in China, the world's largest aluminium consumer.

Economic activity in aluminium-intensive industries in China, notably transport and construction, has continued to drive growth in aluminium consumption. From the supply side, higher aluminium prices have encouraged facility restarts in China, the world's largest aluminium producer. However, the pace of supply increase in China has been largely in line with expectations, due to supply discipline imposed by the government's 'supply-side reform' policy.

Figure 11.1: Annual aluminium prices and stocks

Source: LME (2016) spot prices; Department of Industry, Innovation and Science (2016)

Figure 11.2: Growth in world aluminium consumption and industrial production



Source: International Aluminium Institute (2016); Netherlands CPB (2016) World Trade Monitor September

LME stocks have continued to decline over the past quarter, and are now 2.1 million tonnes. However, the pace of decline in stocks has slowed, as global production resumes growing. For 2016 as a whole, prices are forecast to average US$1,586 a tonne.

The proposed increased in infrastructure spending by US President-elect Donald Trump is likely to push aluminium prices higher in the short term. Aluminium prices are forecast to increase 3.7 and 3.3 per cent in 2017 and 2018, to average US$1,645 and US$1,700 a tonne, respectively. Other drivers will be firm demand from China and the global automotive sector, which are projected to outweigh increased production associated with capacity restarts in China.

Consumption

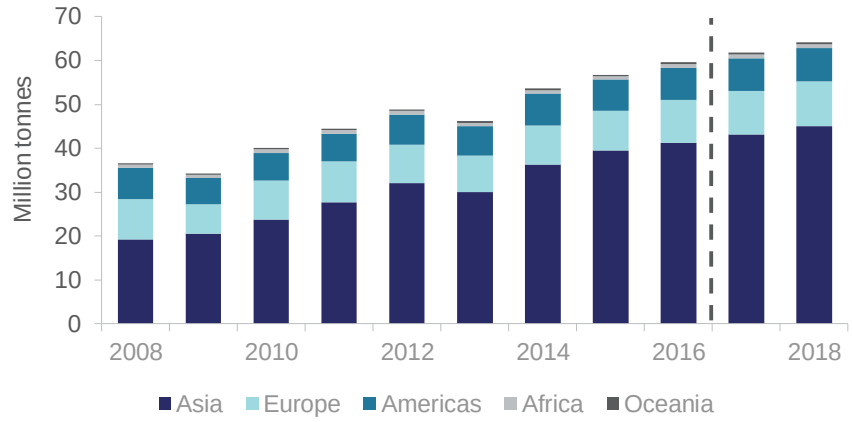
World aluminium consumption to remain strong

World aluminium consumption is estimated to have grown by 5.0 per cent in 2016, to 60 million tonnes, supported by stronger demand from automotive producers in China, North America and Western Europe. In China, the government's decision to cut the tax on small cars by 50 per cent from October 2015 to the end of 2016, has boosted car sales by 6.7 per cent in the first half of 2016. Car sales in the US have been recovering since 2010. Sales rose 1.7 per cent in the first three quarters of 2016 to nearly 16 million units, and are estimated to have continued to grow over the remainder of 2016, supported by improved economic growth and labour markets. In Europe, car sales in the first half of 2016 increased by 6.4 per cent year-on-year, driven by low interest rates and improvements in consumer confidence. Growth in global car sales is forecast to have increased by 3.0 per cent in 2016; a slight moderation is likely in 2017 and 2018.

China is now the world's largest automotive market, both in terms of demand and supply. In 2016, China's vehicle sales are forecast to increase 13 per cent, with growth forecast to accelerate over the next few years. By 2020, over 200 million vehicles will be on Chinese roads, and annual vehicle sales are forecast to reach 35 million units.

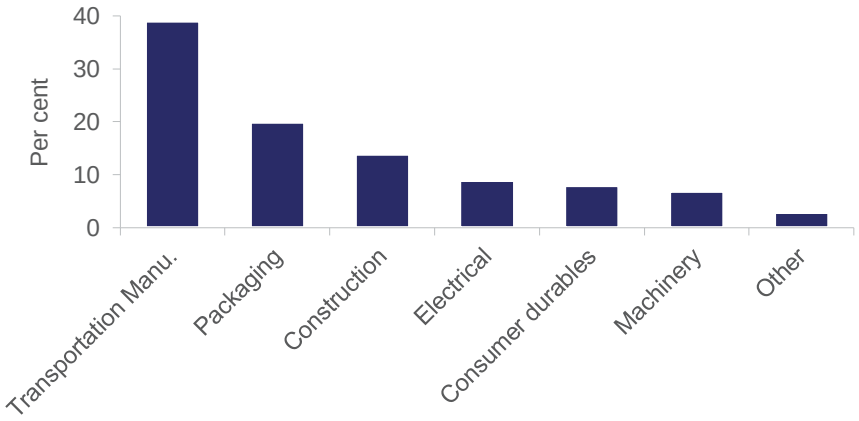
The global construction sector is also expected to contribute to a projected increase in aluminium consumption over the short term. In the US, the ambitious infrastructure program (highways, bridges, tunnels,

Figure 11.3: World aluminium consumption



Source: World Bureau of Metal Statistics (2016); Department of Industry, Innovation and Science (2016)

Figure 11.4: Aluminium end-use by sector



Source: United States Geological Survey

and airports) pledged by the incoming US President Donald Trump, would boost the demand for aluminium. In China, aluminium demand is forecast to grow by 18 per cent in the next two years, as a result of increased use of high-end products in transportation and construction.

Global aluminium consumption is forecast to rise 3.7 per cent in 2017 and 3.8 per cent in 2018, to 62 and 65 million tonnes, respectively. Stronger car sales, particularly in China, will generate stronger demand for aluminium auto sheets and aluminium alloys.

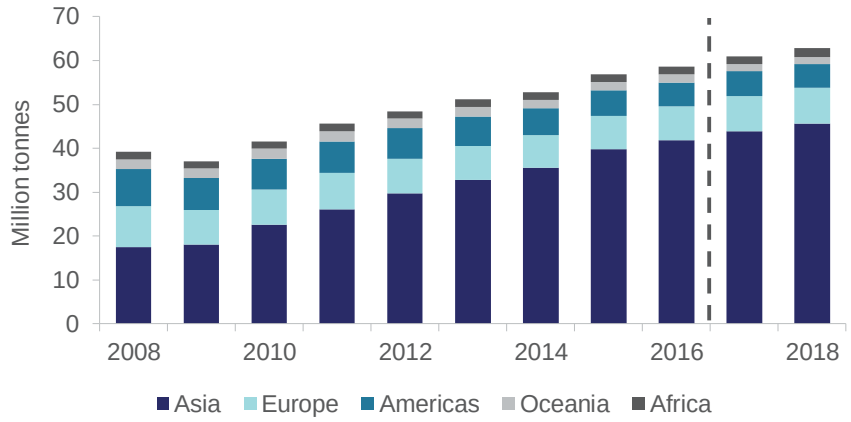
One risk to the forecasts is whether or not the incoming Trump administration will change tough U.S. emissions regulations previously imposed by the Environmental Protection Agency and the National Highway Traffic Safety Administration, and also impose tariffs on imported aluminium. Any major change is likely to have an impact on the US automotive industry and aluminium consumption and production in the US.

Production

New and restart capacity to boost global production

World aluminium production increased by 2.1 per cent in the September quarter 2016 to 15 million tonnes, as aluminium smelters responded to price rises. In China, production rose 2.4 per cent over the year to September, to 8 million tonnes. The recovery of aluminium prices in 2016 has provided Chinese smelters with a greater incentive to restart idled capacity and boost output. Outside of China, production in Canada increased 1.2 per cent in the third quarter of 2016, to 811,000 tonnes. Production growth is forecast to have remained strong over the December quarter 2016, supported by further ramp-ups and restarts of idled capacity in China. The Jharsuguda and Korba expansion projects in India began to ramp-up production in April 2016, and are expected to reach full capacity of 800,000 tonnes and 230,000 tonnes, respectively, before the end of 2016. As a result, global aluminium production is forecast to have increased by 3.1 per cent in 2016 to 60 million tonnes.

Figure 11.5: World aluminium production



Source: International Aluminium Institute (2016); Department of Industry, Innovation and Science (2016)

In 2017 and 2018, new capacity in China will continue to provide additional output. Production in other countries, such as Russia and India, is also forecast to increase, to meet growing demand from global automakers. In Russia, the expansion of the Boguchansk 150,000 tonnes project is scheduled to be completed in 2017. Capacity in the Middle East is projected to increase by more than 4.0 per cent in 2017, to nearly 7 million tonnes. Saudi Arabia's aluminium production is forecast to increase by 15 per cent, to over 900,000 tonnes in 2017, before exceeding 1 million tonnes in 2018. As a result, world aluminium production is forecast to rise by 4.1 per cent in 2017 and 3.0 per cent in 2018, to 62 and 64 million tonnes, respectively.

Australia's production and exports

Production to remain steady but facing challenges

In 2016–17, Australia's aluminium production is forecast to remain at 1.6 million tonnes, with some uncertainty due to the impact on production of a power outage at the Portland smelter on 1 December 2016.

The power contract between the Victorian Government and Alcoa's Portland smelter expired in November 2016. Portland Aluminium secured a 20-year contract with AGL to supply power from November 2016. However, this new contract is to be terminated in August 2017, because of a significant rise in the price of power to the Portland smelter.

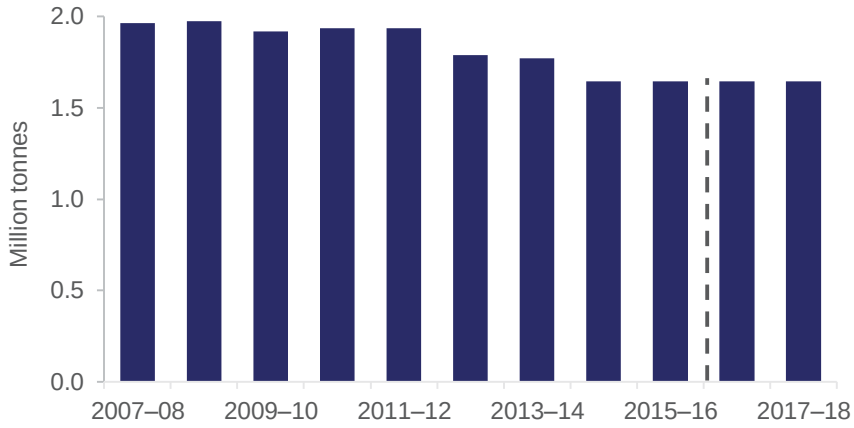
The early termination of the power supply contract between Portland smelter and AGL presents a risk to Australia's aluminium production in 2017–18. Without a new favourable power agreement in place before August 2017, Portland's production — accounting for about 18 per cent of Australian aluminium production — could be adversely affected, and reduce Australia's production. Our forecast is for 2017-18 production to remain at 1.6 million tonnes.

Increased aluminium demand from the automotive industry provides more ore opportunities for Australia's exports

Australia's aluminium exports are estimated to increase by 3.4 per cent in 2016–17 and by 2.8 per cent in 2017–18, to 1.49 and 1.53 million tonnes, respectively. Exports will be supported by increased demand from the automotive sector in South Korea, the US, Europe and China. The outlook for global motor vehicle production and sales is very bright, and this in turn, is providing more opportunities for Australian aluminium exports. As a result, export earnings for 2016–17 and 2017–18 are forecast to rise at an annual rate of 3.4 per cent to $3.4 billion and $3.5 billion, respectively.

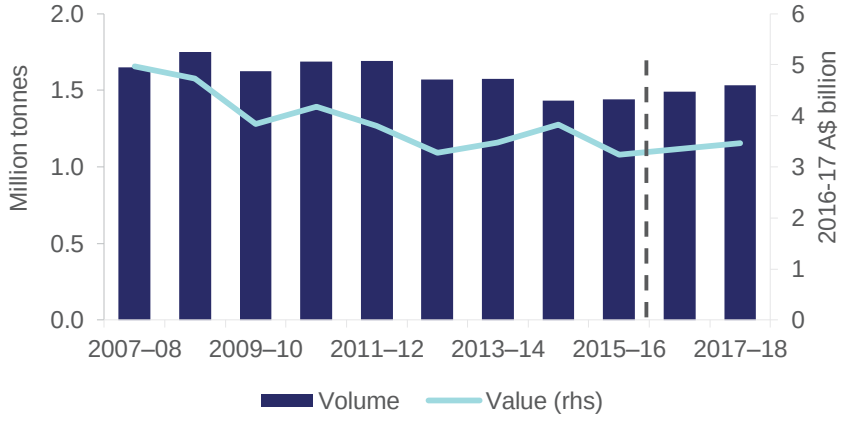
There are uncertainties about the changes that the Trump administration will implement after 20 January 2017. These changes will have the potential to impact directly and indirectly on commodities, including export markets and opportunities for Australian aluminium. Therefore, the forecasts have more than usual uncertainty.

Figure 11.6: Australia's aluminium production



Source: Department of Industry, Innovation and Science (2016)

Figure 11.7: Australia's aluminium exports



Source: ABS (2016) International Trade in Goods and Services, 5368.0; Department of Industry, Innovation and Science (2016)

Alumina

Market summary

The prospect for Australia's alumina exports is broadly positive, supported by increased demand from China following aluminium smelter restarts in that country during 2016. Exports are forecast to increase by 3 per cent in 2016–17 to 18 million tonnes, and remain at that level in 2017–18, as production capacity constraints kick in. Export earnings are forecast to fall 2.5 per cent in 2016–17 to $5.8 billion, due to price falls in the first quarter of 2016–17. Nevertheless, export earnings will rise in 2017–18, with a forecast increase of 4.5 per cent to $6.1 billion.

Prices

Aluminium production supports alumina prices in 2017 and 2018

The average FOB Australia alumina price has increased by 30 per cent since December 2015, to around US$266 a tonne (November 2016 average), driven by reduced supply from China, the world's largest alumina producer, and increased global aluminium production. For 2016 as a whole, alumina prices are forecast to average US$236 a tonne, supported by aluminium production growth.

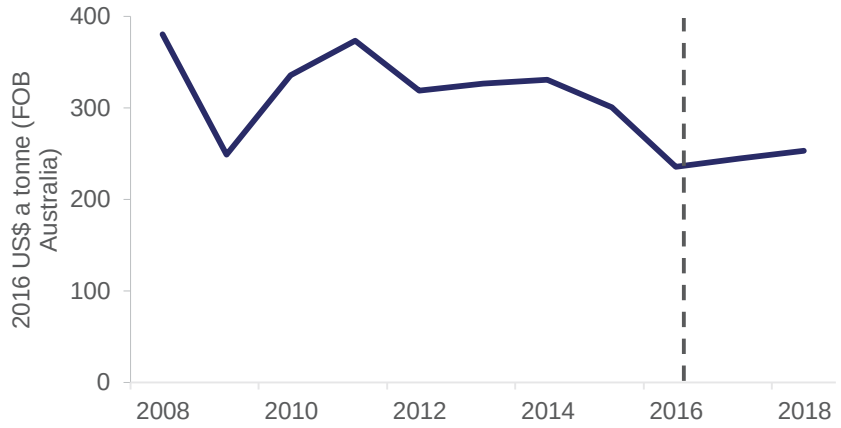
In 2017 and 2018, the projected growth in global aluminium production is expected to support higher alumina prices, which are forecast to increase to an average of US$245 and US$253 a tonne, respectively. However, the risk to alumina prices remains to the downside: the rise in prices in 2016 has encouraged refinery restarts in China, and may spur production increases. Another potential impact is from increased aluminium scrap recovery in China. If alumina prices continue to rise in the short term, it may induce higher levels of aluminium recycling; this would reduce primary aluminium production, reducing alumina demand.

Consumption

Growth in global alumina consumption continues

World alumina consumption is estimated to have grown by 2.4 per cent in 2016, to 116 million tonnes. Global aluminium smelting capacity increased 2.7 million tonnes in the first nine months of 2016, and consuming an additional 4.4 million tonnes of alumina. In China,

Figure 11.8: Annual alumina price



Source: Bloomberg (2016) alumina monthly price; Department of Industry, Innovation and Science (2016)

the recovery of aluminium prices has provided Chinese aluminium smelters with a greater incentive to restart idled capacity and boost aluminium output. In the September quarter 2016, Chinese aluminium production increased 2.4 per cent to 8 million tonnes. In India, alumina demand is expected to increase to around 1.5 million tonnes per annum in 2016, as Vedanta expands aluminium production at Jharsuguda and Korba. In the Middle East, Saudi Arabia is forecast to increase its alumina consumption to around 1.5 million tonnes in 2016. The rise in alumina consumption largely reflects the Government's plan to expand the aluminium sector and diversify the economy away from oil.

Global alumina consumption is forecast to increase 4.3 and 3.3 per cent in 2017 and 2018, to 121 and 125 million tonnes, respectively. The gains are in line with the growth in aluminium supply. New capacity and the re-start of idled aluminium capacity in China will continue to provide support for alumina demand. Outside of China, the increased alumina demand is expected to come from India, where increased public investment in

infrastructure, reforms in the power sector and stronger rural demand, are expected to see the country's aluminium production register double-digit growth. In the Middle East, alumina consumption is projected to rise at annual rate of 3.0 per cent over the next two years. Saudi Arabia's aluminium production is forecast to increase by 15 per cent in 2018, to over 1.0 million tonnes. Southeast Asia is an emerging aluminium industry, supported by cheap power costs for aluminium smelting. Aluminium smelters in Malaysia and Indonesia — operated by Press Metal and Inalum — are the main sources of alumina demand in this region. Further upside in global alumina demand will be boosted by expansions at both the Inalum and Press Metal facilities, and new aluminium projects in Vietnam and Brunei.

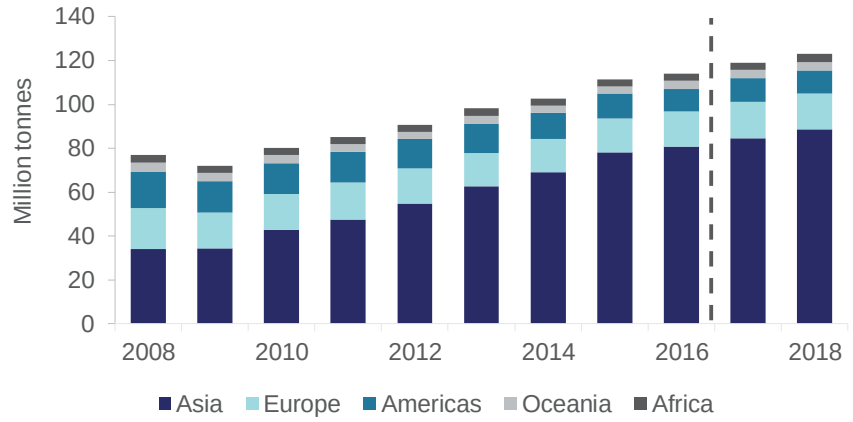
Production

Alumina production to rise in response to high prices

World alumina production increased by 2.1 per cent in the September quarter 2016, to 29 million tonnes, as alumina refineries responded to high alumina prices in the June quarter 2016. In China, producers were very quick to bring idled capacity back into production, raising output by 2.8 per cent in the September quarter to 15 million tonnes. Outside of China, the 1 million tonnes per annum Well Harvest plant in Indonesia commenced operation in the June quarter 2016. Production growth appears to have remained strong in the second half of 2016, supported by increased aluminium smelting capacity. As a result, global alumina production for 2016 is forecast to increase by 0.9 per cent to 116 million tonnes.

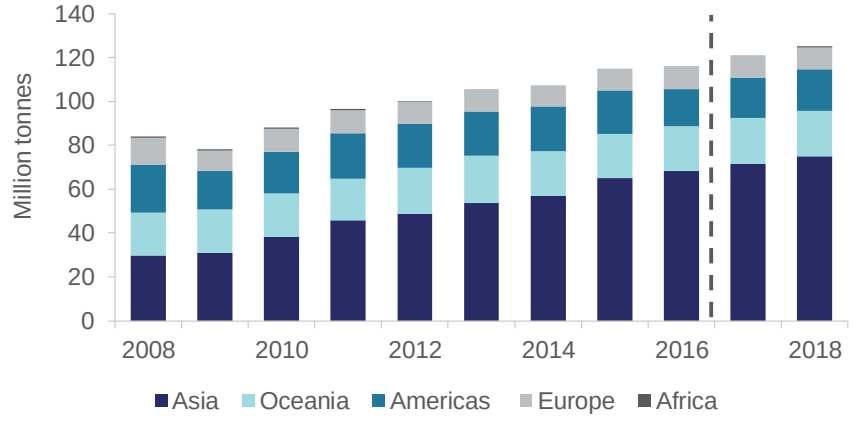
In 2017 and 2018, world alumina output is forecast to rise by 4.3 and 3.5 per cent, to 121 and 125 million tonnes, respectively. Growth will be supported by continued capacity restarts in China and new capacity in other parts of the world. The 2 million tonnes per annum Al Taweelah refinery project in the Middle East, which is owned and operated by Emirates Global Aluminium, is expected to begin operation in the December quarter 2017. The 2 million tonnes per annum Lanjigarh refinery project in India is also expected to be operating in 2017, subject to bauxite availability. Other new/expansion projects in Indonesia, China, Vietnam and India, are expected to come online over the forecast period, adding 18 million tonnes per year to global alumina capacity.

Figure 11.9: World alumina consumption



Source: AME Group (2016); Department of Industry, Innovation and Science (2016)

Figure 11.10: World alumina production



Source: International Aluminium Institute (2016); Department of Industry, Innovation and Science (2016)

Australia's production and exports

Australia's alumina production remains steady

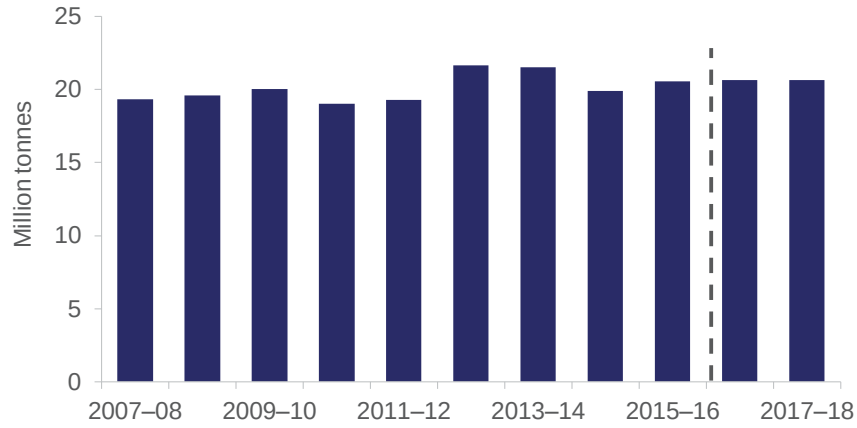
In 2016–17 and 2017–18, Australia's annual alumina production is forecast to be steady at 20.7 million tonnes, assuming no major disruptions or expansions at existing operations. Alumina mines in Western Australia account for 67 per cent of Australian alumina production, and the remaining 33 per cent is located in Queensland.

Aluminium alumina export capacity to be constrained by production capacity

Australia's alumina exports are forecast to increase by 3.0 per cent in 2016–17 to 18 million tonnes, underpinned by increased demand from China following aluminium smelter restarts during 2016. Australia is the principal alumina supplier to China, accounting for 55 per cent of China's total imported alumina. However, over this forecast period, export earnings are forecast to fall by 2.5 per cent to $5.8 billion, due to an 8 per cent fall in alumina prices in the first quarter of 2016–17.

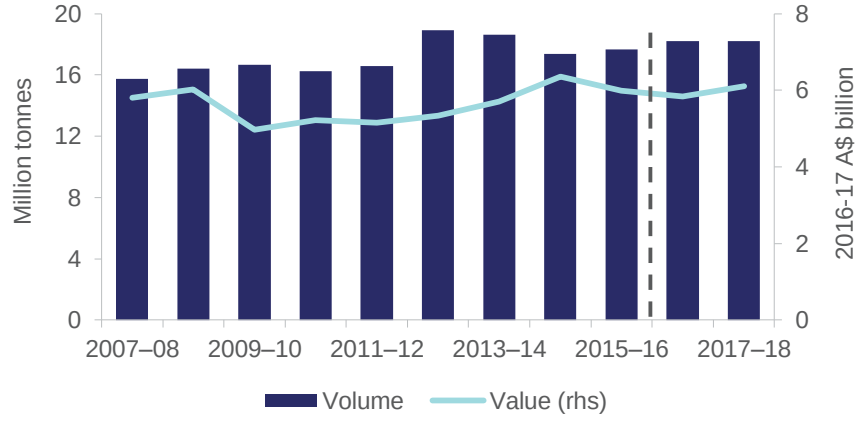
In 2017–18, Australia's alumina exports are forecast to remain at 18.2 million tonnes, due to constraints in production capacity. Over the forecast period, Australia's alumina production is forecast to be unchanged at 20.7 million tonnes. It is estimated that 2.5 million tonnes (12 per cent) of Australia's alumina production are consumed domestically, and 18.2 million tonnes (88 per cent) are exported. As a result, there is no room for a further rise in exports. Export earnings are forecast to rise by 4.5 per cent in 2017–18 to $6.1 billion, driven by higher alumina prices.

Figure 11.11: Australia's alumina production



Source: Department of Industry, Innovation and Science (2016)

Figure 11.12: Australia's alumina exports



Source: ABS (2016) International Trade in Goods and Services, 5368.0; Department of Industry, Innovation and Science (2016)

Bauxite

Market summary

Australia's bauxite exports are forecast to remain steady in 2016–17, at 21 million tonnes. Australian exports will be supported by increased alumina production in China and reductions in bauxite supply from Malaysia and Indonesia. The forecast for 2017–18 is brighter, with bauxite export volumes estimated to increase by 10 per cent to 23 million tonnes. Export earnings are forecast to rise by 14 per cent in 2017–18, to more than $1 billion. The possible removal of both a bauxite mining ban in Malaysia and a bauxite export ban in Indonesia over the forecast period, and the rise of Guinea as the world's major bauxite producer and exporter, will present significant challenges to the Australian industry. Australia is currently the world's largest bauxite producer and the world's second largest bauxite exporter.

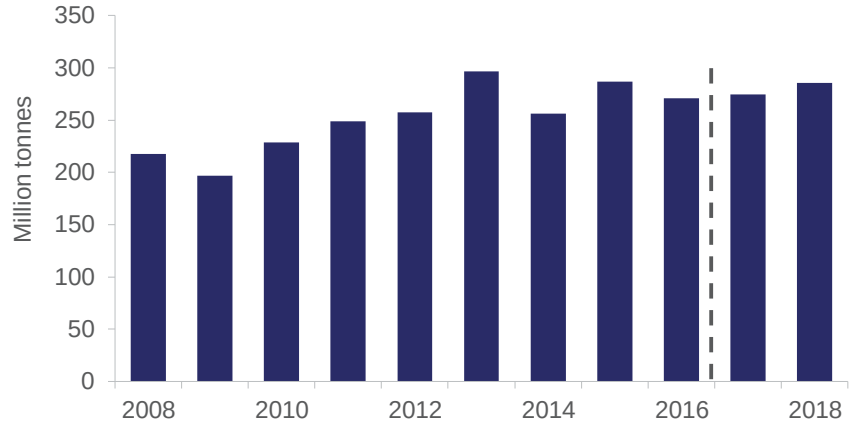
Production

Guinea and Australia to be the key drivers of production growth

World bauxite production decreased by 5.7 per cent year-on-year in the first three quarters of 2016, falling to 202 million tonnes, due to supply reductions from Malaysia. Over this period, Malaysia's production decreased by 63 per cent year-on-year to under 6 million tonnes, as the government limited supply growth to address socio-environmental concerns. The ban on bauxite mining in Malaysia, which has been in place since early 2016, has been extended until the end of 2016.

The fall of production in Malaysia was offset by increased output from Australia and Guinea, the newly-emerged major global bauxite producer. Over this period, Australia's production rose by 1.4 per cent to 61 million tonnes. Guinea's production increased by 29 per cent to 18 million tonnes. Production in China, the world's second largest bauxite producer, remained steady over this period, at 49 million tonnes. The rise in production in Australia and Guinea was driven by alumina capacity restarts in China. As a result, global bauxite production is forecast to fall by 5.7 per cent in 2016, to 271 million tonnes.

Figure 11.13: World bauxite production



Source: World Bureau of Metal Statistics (2016); Department of Industry, Innovation and Science (2016)

In 2017 and 2018, world bauxite production is forecast to increase by 1.5 and 4.0 per cent, to 275 and 286 million tonnes, respectively. The drivers of production growth will be Australia and Guinea, where output is forecast to increase moderately in the next two years. The revised global bauxite production for 2017 is 18 per cent lower than forecast in the September 2016 *Resources and Energy Quarterly* edition. The ban on bauxite mining in Malaysia has been extended a few times in 2016, and might continue into 2017 and 2018. In addition, there is still uncertainty over when the Indonesian Government will lift its bauxite export ban, implemented in early 2014. Prior to the export ban, Indonesia's bauxite production was 57 million tonnes in 2013, before it fell 99 per cent in 2015, to just 471,000 tonnes.

Australia's production and exports

Australia's bauxite production to grow modestly

In 2016–17 and 2017–18, Australia's bauxite production is forecast to grow by 1.0 and 5.6 per cent, to 83 and 87 million tonnes, respectively. The gains will come from increased production by the major producers, and the expected production commencement of Metro Mining's Bauxite Hills mine in Queensland in the June quarter of 2018. Over the forecast period, the rise in bauxite production is expected to be all exported, as producers respond to increased demand from global alumina refineries, particularly from China.

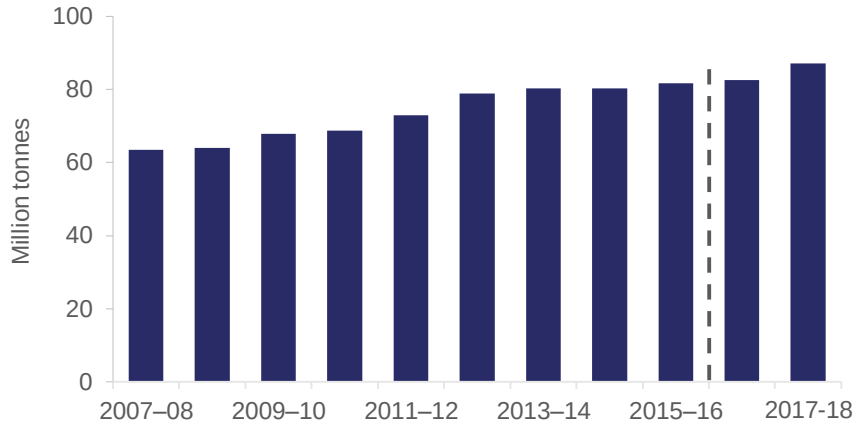
Australia's bauxite exports positive but facing challenges

In 2016–17, Australia's bauxite exports are forecast to remain at 21 million tonnes, an upward revision of 8 per cent from the forecast in the September quarter 2016 edition. Australia's bauxite exports to China increased by 18 per cent in the September quarter 2016, and are estimated to increase further over the remainder of 2016–17, supported by increased alumina production in China and supply reductions from Malaysia and Indonesia. As a result, export earnings have been revised up by 5.0 per cent from the September 2016 forecast, to $926 million.

Australia's bauxite exports are forecast increase strongly in 2017–18, rising by 10 per cent to 23 million tonnes, as demand for Australian bauxite rises to accommodate alumina capacity restarts and new refineries in China. The uncertainty on the timing of lifting bauxite export bans in Malaysia and Indonesia is a contributing factor to the expected increase in Australia's bauxite exports. Australia's bauxite export earnings are forecast to increase by 14 per cent in 2017–18, to more than $1 billion.

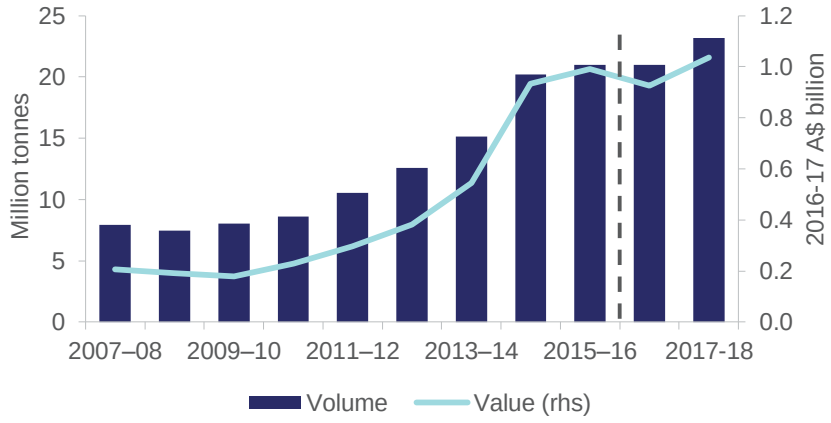
The risk to this assessment is the possibility of the lifting of the bauxite mining ban in Malaysia and the bauxite export ban in Indonesia over the forecast period. In Malaysia, the government is facing pressure from local authorities to remove the ban on bauxite mining, as a slump in mining royalties hits local government revenues. With rising bauxite stockpiles from Kuantan's port, the Malaysian government recently issued temporary export permits to producers, to allow them to export bauxite to China.

Figure 11.14: Australia's bauxite production



Source: Department of Industry, Innovation and Science (2016)

Figure 11.15: Australia's bauxite exports

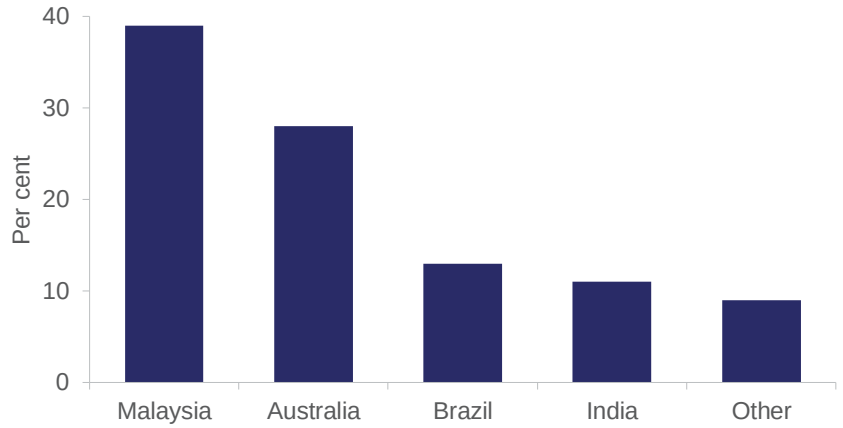


Source: ABS (2016) International Trade in Goods and Services, 5368.0; Department of Industry, Innovation and Science (2016)

In the September quarter 2016, Malaysia exported 1.3 million tonnes of bauxite to China, an increase of 42 per cent in just one quarter. In Indonesia, the Association of Indonesia Bauxite and Iron Ore Producers has called on the Indonesian Government to relax the bauxite export ban rule implemented over two years ago, pointing to job creation and business survival issues. However, there is growing opposition from domestic aluminium smelters and overseas investors to any decision to remove the export ban. Prior to the export ban, Indonesia exported 55 million tonnes of bauxite in 2013, mainly to China.

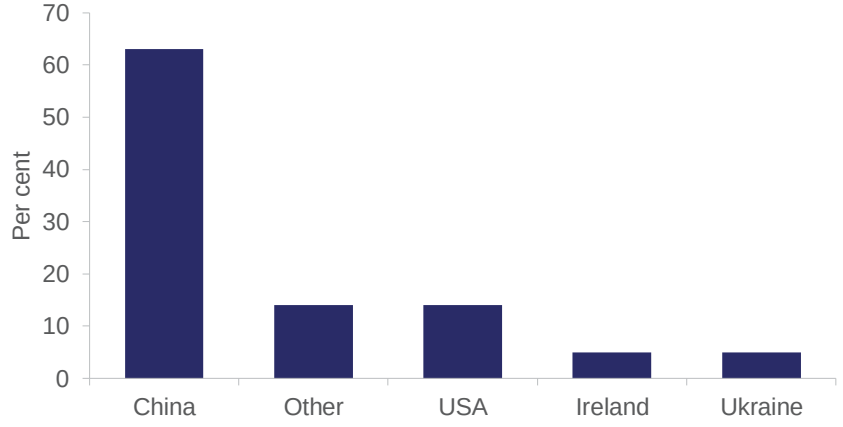
Another important risk to the assessment is the rise of Guinea as a major global producer and exporter of bauxite. In the first nine months of 2016, Guinea's bauxite production increased by 29 per cent year-on-year to 18 million tonnes. Further gains are expected in the future. Over the same period, Australia's bauxite production rose by just 1.4 per cent, to 61 million tonnes. In terms of exports to China, Guinea exported 7.4 million tonnes of bauxite in the first nine months of 2016, an increase of 7300 per cent. While Australia exported 14 million tonnes of bauxite to China, a fall of 8.0 per cent.

Figure 11.16: World bauxite export - 2015



Source: World Bureau of Metal Statistics (2016)

Figure 11.17: World bauxite import - 2015



Source: World Bureau of Metal Statistics (2016)

Table 11.1: Aluminium, alumina and bauxite

World	unit	2015	2016 [s]	2017 [f]	2018 [f]	Per cent change
Primary aluminium						
Production	kt	57,890	59,660	62,087	63,919	3.0
Consumption	kt	57,120	60,001	62,240	64,584	3.8
Closing stocks [b]	kt	7,197	6,857	6,704	6,039	-9.9
– weeks of consumption		6.6	5.9	5.6	4.9	-13.2
Prices						
World aluminium [c]						
– nominal	US$/t	1,663	1,586	1,645	1,700	3.3
	USc/lb	75.4	71.9	74.6	77.1	3.3
– real [d]	US$/t	1,682	1,586	1,609	1,627	1.1
	USc/lb	76.3	71.9	73.0	73.8	1.1
Alumina spot						
– nominal	US$/t	301	236	245	253	3.4
– real [d]	US$/t	304	236	239	242	1.2
Australia		**2014–15**	**2015–16**	**2016–17 [f]**	**2017–18 [f]**	**Per cent change**
Production						
Primary aluminium	kt	1,647	1,647	1,643	1,643	0.0
Alumina	kt	19,895	20,550	20,675	20,675	0.0
Bauxite	Mt	80.3	81.7	82.6	87.2	5.6
Consumption						
Primary aluminium	kt	214	206	153	111	-27.4
Exports						
Primary aluminium	kt	1,432	1,442	1,490	1,532	2.8
– nominal value	A$m	3,823	3,241	3,350	3,463	3.4
– real value [e]	A$m	3,940	3,294	3,350	3,390	1.2
Alumina	kt	17,363	17,676	18,211	18,211	0.0
– nominal value	A$m	6,353	5,995	5,843	6,106	4.5
– real value [e]	A$m	6,547	6,094	5,843	5,977	2.3
Bauxite	kt	20,204	20,971	21,006	23,189	10.4
– nominal value	A$m	934	992	926	1,059	14.4
– real value [e]	A$m	962	1,008	926	1,037	12.0
Total value						
– nominal	A$m	11,110	10,228	10,119	10,628	5.0
– real [e]	A$m	11,449	10,397	10,119	10,405	2.8

*Notes: **b** Producer and LME stocks; **c** LME cash prices for primary aluminium; **d** In current calendar year US dollars; **e** In current financial year Australian dollars; **f** Forecast; **s** Estimate*

Sources: ABS (2016) International Trade in Goods and Services, 5368.0; AME Group (2016); Department of Industry, Innovation and Science (2016); International Aluminium Institute (2016); World Bureau of Metal Statistics (2016)


Copper

Market summary

World copper prices have staged a remarkable turnaround in the final quarter of 2016. The rise has been driven by higher consumption in China's construction sector and lower-than-expected mine supply in the September quarter. Australian production fell 7.6 per cent year-on-year in the September quarter, but is expected to rise in 2017. Australia's copper exports increased by 1 per cent year-on-year in the September quarter. Copper exports are forecast to increase in 2017–18 with earnings rising by 13 per cent to 8.6 billion and volumes (in metal-content terms) increasing 4 per cent to 1 million tonnes .

Prices

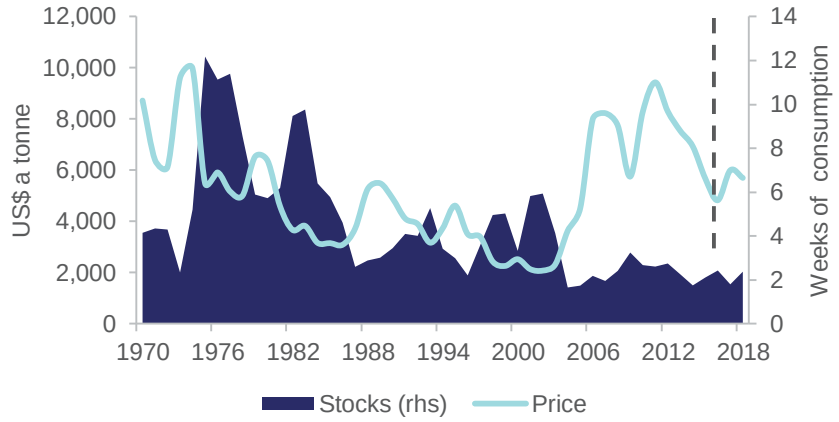
Copper prices rebounded sharply as 2016 came to a close

The London Metal Exchange (LME) copper price rose rapidly during October and November, reaching a one-year high of US$5,935 per tonne. Several factors contributed to the sudden rise. Expansionary monetary and fiscal policy in China throughout 2016, greatly improved demand for copper from the construction sector. Supply disruptions led to worse-than-expected September quarter output by several key miners. The possibility of highly stimulatory US fiscal policy in 2017 has also raised expectations for copper consumption in 2017.

Copper demand remains heavily reliant on government stimulus programs in countries such as China. Any further depreciation in the RMB may also subdue Chinese copper demand. Purchasing Managers Indices in Manufacturing — important leading indicators for copper — suggest improved economic conditions, at least over the short-term, in the US, Eurozone and China. The LME price is forecast to average US$6,000 per tonne in 2017, as demand growth improves — supported by stronger economic growth in emerging economies. Growing supply is expected to outweigh demand towards the end of the outlook, and the price is expected to decline, to average US$5,700 per tonne in 2018.

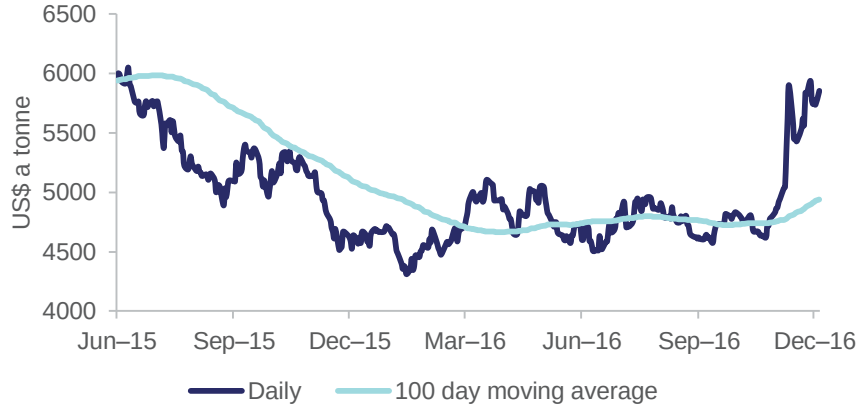
Several key risks remain to the outlook for copper prices in the near term. The US dollar is expected to rise, making copper more expensive to non-US consumers. On the supply side, mine production remains at an all-time high, and new records are likely to be set, on the back of mine expansions and restarts.

Figure 12.1: Annual copper prices and stocks



Source: LME (2016) spot price; World Bureau of Metal Statistics (2016) World Metal Statistics

Figure 12.2: Recent movement in copper prices



Source: LME (2016) official cash copper price

World consumption

Copper consumption increases

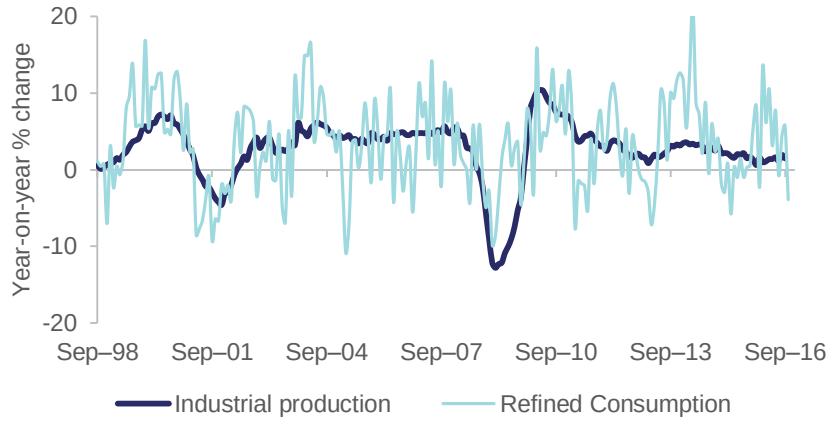
World refined copper consumption increased 3 per cent year-on-year in the September quarter, to over 5.7 million tonnes. September quarter consumption was lower than the record high set in the June quarter 2016. Consumption is expected to rebound in the December quarter, taking the total for the year to 23.4 million tonnes, up 3 per cent on 2015.

Copper consumption in China declined 8 per cent quarter-on-quarter in the September quarter, to 2.8 million tonnes. China's copper consumption remains near historic highs, and is expected to increase in 2017. China's construction sector was boosted by government stimulus earlier in the year, and construction continued to rise in October. So far this year, over 137,000 square meters of commercial buildings have commenced construction — 8 per cent higher than in October last year. China continues to invest heavily in its power grid, to keep pace with rising electricity demand. Total capital investment in the power grid construction was 28 per cent higher than October last year.

In the US, copper consumption declined 2 per cent quarter-on-quarter in the September quarter. Copper consumption in the US remains 40 per cent lower than the 2000 peak, largely due to a sectoral shift away from manufacturing. Despite this long-term trend, recent construction data points to stronger copper consumption over the outlook period. New house starts in the US increased by 23 per cent year-on-year in October, and houses under construction reached an 8-year high. New housing permits have risen each month since March this year, and reached a one-year high in October. Rising housing permits indicate that the construction sector will continue to strengthen as 2017 begins.

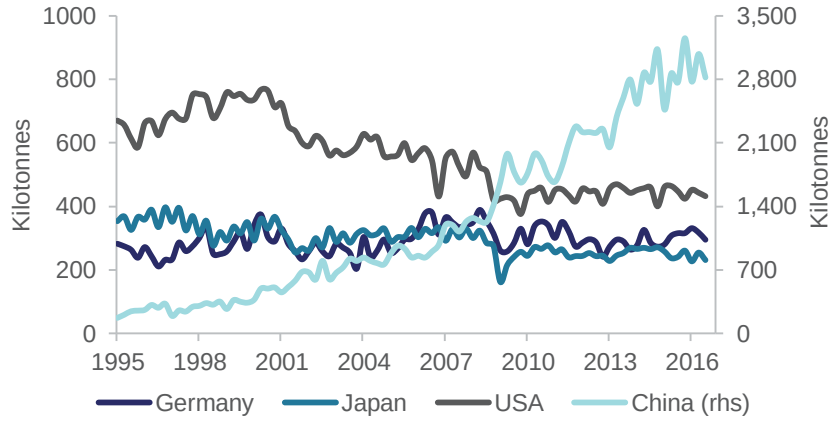
In Europe, refined copper consumption declined by 10 per cent quarter-on-quarter in the September quarter. The decline was due to lower consumption in Germany and Russia, which fell by 7 and 30 per cent quarter-on-quarter, respectively. The decline is Russia is largely due to softer housing construction, which declined by 13 per cent year-on-year in October.

Figure 12.3: World industrial production and copper consumption



Source: World Bureau of Metal Statistics (2016) World refined copper consumption YoY % change; World Bank (2016) World industrial production YoY % change

Figure 12.4: Refined quarterly copper consumption



Source: World Bureau of Metal Statistics (2016)

Increased investment in infrastructure and construction in the US and the emerging economies, is expected to drive much of the growth in copper consumption over the next two years. Copper consumption is forecast to rise by 2 per cent in 2017 to 24 million tonnes, and to rise by a further 3 per cent in 2018, to 24.6 million tonnes.

World production

World mine copper production remains historically high

World mine production was lower than expected in the September quarter of 2016, but remains high in historical terms. World mined copper production in 2016 is estimated at 20.1 million tonnes, up 4.5% on 2015.

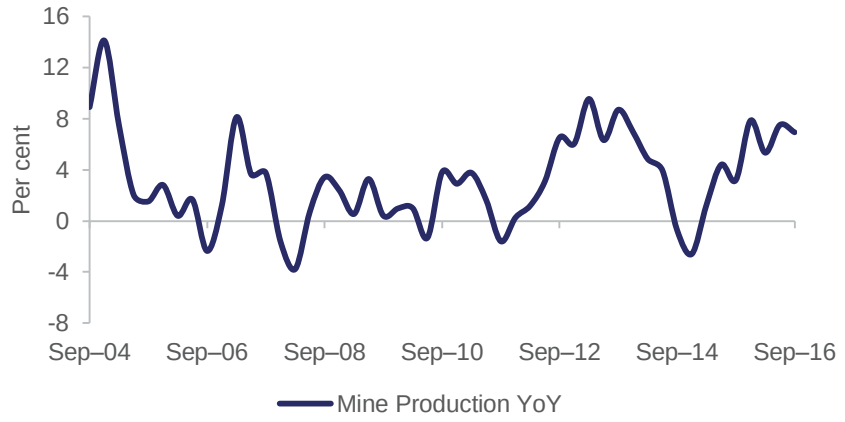
Canada, United States, Chile and the Democratic Republic of Congo all had lower production quarter-on-quarter in the September quarter. Output at the world's largest copper mine, Escondida in Chile, declined by 19 per cent quarter-on-quarter, to 218,000 tonnes. The decline was due to operational disruptions and lower ore grades. In Kazahstan, the new Bozshakol and Aktogay mines — operated by KAZ Minerals — produced a combined 24,000 tonnes of copper in the September quarter. Bozshakol is expected to produce 100,000 tonnes in 2017, while Aktogay is expected to be fully operational in the first half of 2017.

Several new, large-scale operations and existing expansions are expected to commence production in 2018. Notably, First Quantum Minerals remains on track for a phased commissioning of the Cobre Panama copper mine in 2018 — expected to produce over 300,000 tonnes annually.

In addition, the current higher copper prices are encouraging producers to recommence operations. In early December, Glencore announced their intention to restart the Katanaga mine in the Democratic Republic of Congo by late 2017, and the recommencement of production at their Mopani mine in Zambia by late 2018.

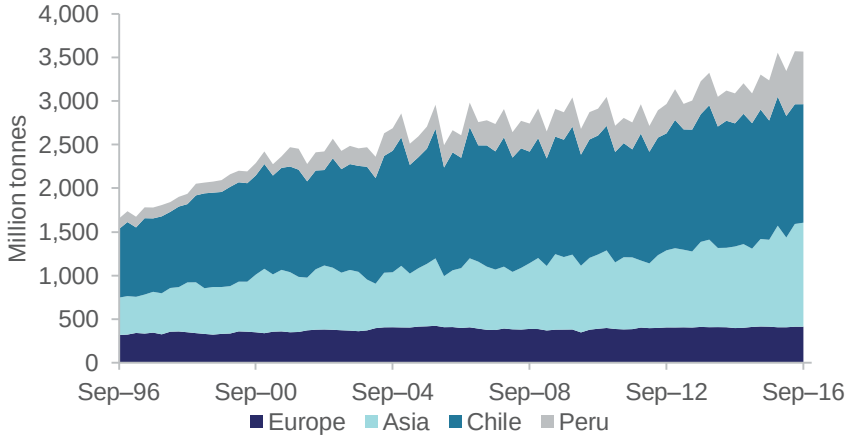
As further new mines commence production and others expand, copper mine production is forecast to rise by 3 per cent in 2017 to 21 million tonnes, and rise by 4 per cent in 2018 to 21.8 million tonnes.

Figure 12.5: Mine production year-on-year per cent change



Source: World Bureau of Metal Statistics (2016)

Figure 12.6: Global quarterly mine production



Source: World Bureau of Metal Statistics (2016)

World refined copper production rises in September

World refined copper production increased by 4 per cent quarter-on-quarter in the September quarter, to over 6 million tonnes. Refined copper output has been boosted by historically high mine supply. Refined copper output is estimated to have hit a new high of 23.6 million tonnes in 2016.

In the September quarter, refined production in China increased by 8 per cent quarter-on-quarter, to just under 2.2 million tonnes. Over the past two decades, Chinese copper producers have greatly expanded their refinery capacity, from 200,000 tonnes per quarter in 1995 to over 2 million tonnes per quarter in 2016. In contrast, Chilean refined copper production peaked at 835,000 tonnes per quarter in 2009, and has since drifted lower. Chile's refined copper production fell 3 per cent quarter-on-quarter in the September quarter, to 639,000 tonnes. Refined production in India increased 23 per cent quarter-on-quarter in September, to 206,000 tonnes.

World refined production is forecast to increase by 2.5 per cent in 2017, to 24 million tonnes. As world mine supply rises, refined production is forecast to increase by 4 per cent to 25 million tonnes in 2018.

Australia's production and exports

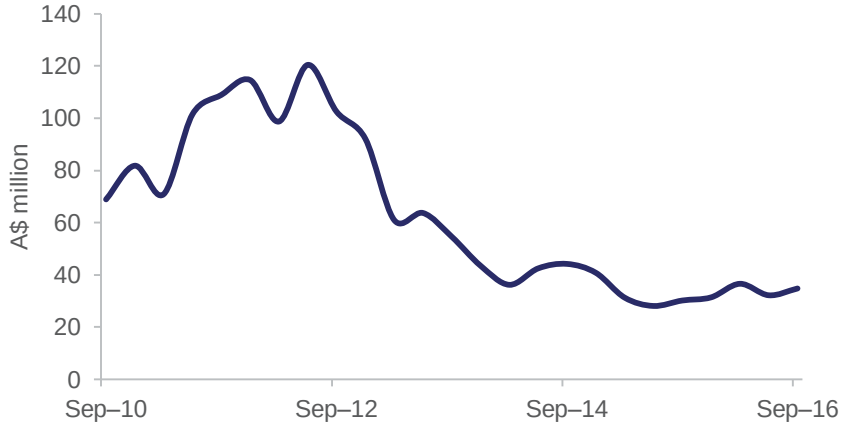
Exploration expenditure increases for third consecutive quarter

Australia's copper exploration expenditure increased by 8 per cent quarter-on-quarter in the September quarter 2016, to over $35 million. The increase was largely due to increased expenditure in Queensland and Western Australia. In South Australia, expenditure declined by 36 per cent quarter-on-quarter, to $5 million. The decline is attributed to severe weather during the September quarter. Despite improving each quarter in 2016, copper exploration remains at historically low levels. Current copper exploration expenditure is around 60 per cent lower than 2012 levels. Expenditure is expected to rise in 2017, as higher prices in the December quarter of 2016 and signs of further price rises encourage new exploration.

Production declines in third quarter

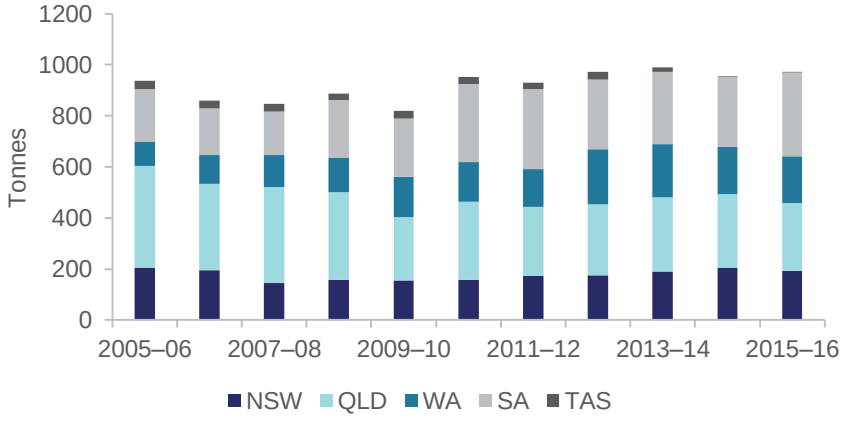
Australia's mine production decreased by 6 per cent quarter-on-quarter, to 227,000 tonnes in the September quarter. The decline was due to lower production in Queensland and Western Australia. Production in South Australia and New South Wales was steady.

Figure 12.7: Australia's copper exploration expenditure



Source: ABS (2016) Mineral and Petroleum Exploration, 8412.0

Figure 12.8: Australia's copper production



Source: Department of Industry, Innovation and Science (2016)

Production at Australia's largest copper mine, Olympic Dam was 41,000 tonnes in the September quarter. This was down 26 per cent year-on-year. September quarter output was barely impacted by a State-wide power outage, which knocked out the mine's power supply for 15 days — starting in the last few days of September. Glencore's Mount Isa mine in Queensland recorded a 2 per cent quarter-on-quarter drop in output in the September quarter. OZ Minerals announced the successful completion of their pre-feasibility study for Carrapateena project. OZ Minerals expects the mine to produce 61,000 tonnes of copper and 63,000 ounces of gold annually.

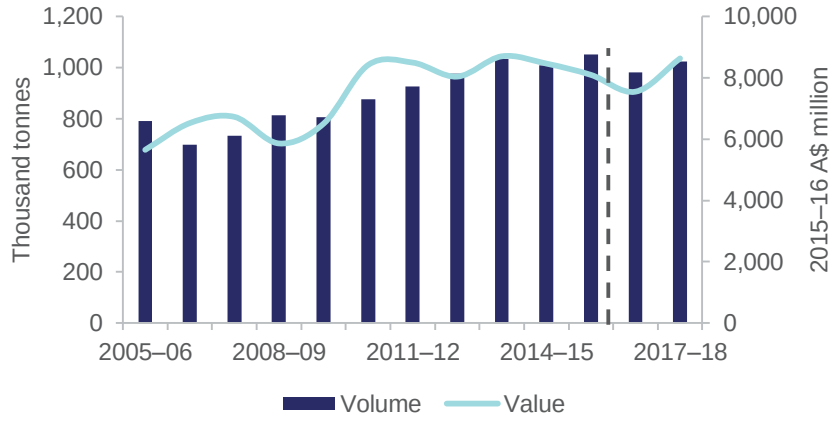
Australian production is forecast to decline by 2 per cent in 2016–17, to 951,000 tonnes. Production at Olympic Dam is expected to rise over the outlook period, as zones of higher grade ore are mined. Additional supply from CuDeco's Rocklands and REX Minerals Hillside operations are expected to contribute to higher production in 2017. Production is forecast to increase by 4.4 per cent in 2017–18, to 994,000 tonnes.

Refined copper exports fall

Australia's copper export earnings declined by 8 per cent quarter-on-quarter in the September quarter, to $1.1 billion. The decline was due to lower export volumes of copper ores and concentrates, which fell by 6 per cent in the September quarter, to 424,000 tonnes. The quarterly decline was driven by lower export volumes of copper ores and concentrates to China, Japan, South Korea and Taiwan. Exports of copper ores and concentrates to the Philippines and India rose by 40,000 and 27,000 tonnes, respectively. Exports to the Philippines were impacted by lower domestic production. The decline in exports to China is expected to be reversed over the outlook period.

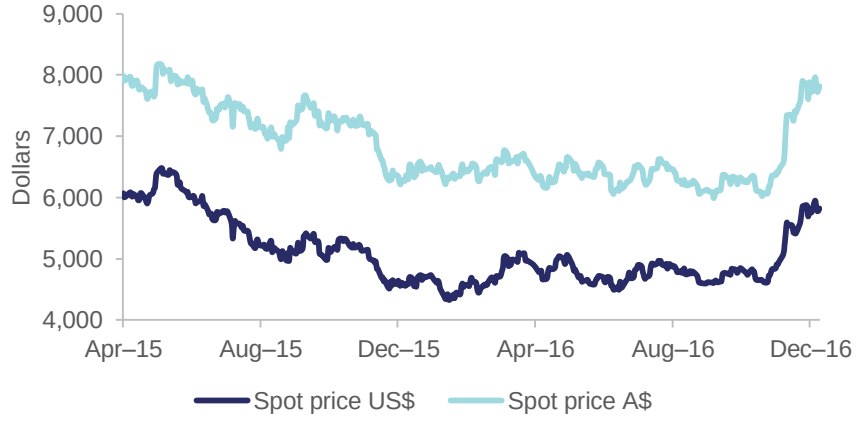
Australia's copper exports (in metal-content terms) are forecast to decline by 6.7 per cent in 2016–17, to 981,000 tonnes. Copper exports remain supported by historically high consumption in China, which accounts for 47 per cent of Australia's copper exports. Australia's copper exports are forecast to decrease by 6.5 per cent in 2016–17 to $7.6 billion, due to lower output. Copper exports are forecast to rise by 4 per cent in 2017–18, to 1 million tonnes (in metal-content terms). These exports will be valued at $8.6 billion (up 13 per cent).

Figure 12.9: Australia's annual copper exports



Source: Department of Industry, Innovation and Science (2016)

Figure 12.10: US dollar versus Australian dollar copper price



Source: LME (2016) official cash copper price; Bloomberg (2016) AUD/USD exchange rate

Table 12.1: Copper outlook

World	Unit	2015	2016	2017 [f]	2018 [f]	Per cent change
Production						
– mine	kt	19,330	20,203	20,820	21,670	4.1
– refined	kt	23,052	23,589	23,943	24,921	4.1
Consumption	kt	22,757	23,419	24,200	24,632	1.8
Closing stocks	kt	924	1,095	838	1,126	34.4
– weeks of consumption		2.1	2.4	1.8	2.4	32.0
Price						
– nominal	US$/t	5,678	4,828	6,000	5,700	–5.0
	US$/lb	258	219	272	259	–5.0
– real [b]	US$/t	5,743	4,828	5,871	5,457	–7.0
	US$/lb	261	219	266	248	–7.0
Australia		**2014–15**	**2015–16**	**2016–17 [f]**	**2017–18 [f]**	**Per cent change**
Mine output	kt	955	969	951	994	4.4
Refined output	kt	454	509	496	478	–3.6
Exports						
– ores and cons [c]	kt	2,056	1,872	1,738	1,906	9.6
– refined	kt	423	507	463	462	–0.3
Export value						
– nominal	A$m	8,468	8,105	7,579	8,549	12.8
– real [d]	A$m	8,727	8,239	7,579	8,369	10.4

*Notes: **b** In current calendar year US dollars; **c** Quantities refer to gross weight of all ores and concentrates; **d** In current financial year Australian dollars; **f** Forecast; **s** Estimate.*

Source: Sources: ABS (2016) International Trade, 5465.0; LME (2016) spot price; World Bureau of Metal Statistics (2016) World Metal Statistics; Department of Industry, Innovation and Science.

Nickel

Market summary

Australia's nickel export earnings are forecast to decrease by 9 per cent in 2016–17, to $2.2 billion. Despite the recent rally in the nickel price, the decline in export earnings is underpinned by weak domestic production, with several operations placed on care and maintenance earlier in the year. A recovery in Australia's nickel exports earnings is expected in 2017–18, with export values forecast to increase by 27 per cent, to $2.9 billion. The rise in export earnings will be driven by a forecast increase in the price and the ramp up of production at the new Nova mine.

Prices and stocks

Nickel price forecast to increase over the outlook period

The London Metal Exchange (LME) nickel price steadily increased over the four months to November, averaging US$10,479 a tonne. By the end of November, the price had reached a 14 month high of US$11,583 a tonne. The price rallied following concerns of supply side disruptions — after the suspension of operations at nickel mines in the Philippines — and as the market examined the implications for demand of Donald Trump's presidency win for US infrastructure spending. The price was also buoyed by stainless steel production growth in China.

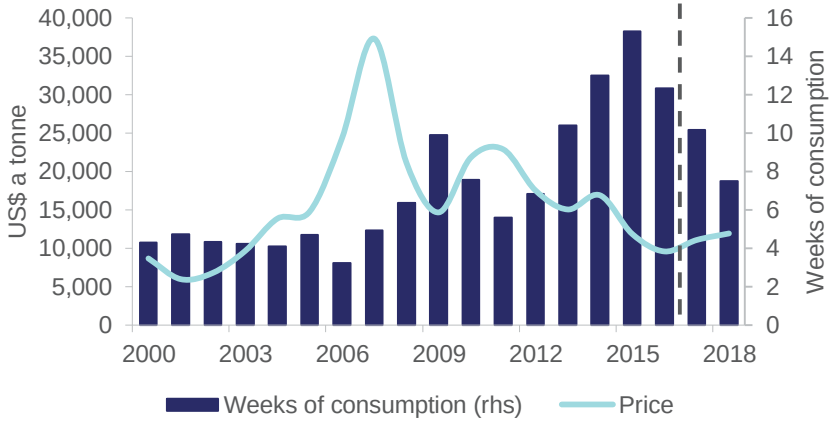
While stocks remain relatively high — with combined LME and SHFE stocks at 471,000 tonnes at the start of December — there were 11 consecutive weeks of declining stocks to the start of December, the first substantial decline since SHFE nickel trading commenced in April 2015. China's port stocks of nickel have also declined, down by 3.7 per cent to 15,200 tonnes at the end of November.

The nickel price is forecast to increase modestly through the outlook period, averaging US$11,050 a tonne in 2017 and US$11,900 a tonne in 2018, driven by a tightening market. The risks are to the upside on these forecasts. Consumption growth will be supported by continued infrastructure investment in China, India and the United States, and strong growth in stainless steel production in China. Disruptions to mine supply from the Philippines will also provide support to the price. However, there is uncertainty around the enforcement of mine suspensions in the Philippines, and the pace at which output from newly built smelters can grow in Indonesia.

Figure 13.1: Nickel LME spot price

Source: Bloomberg (2016) London Metal Exchange

Figure 13.2: Nickel stocks and price



Source: Bloomberg (2016) London Metal Exchange; International Nickel Study Group (2016); Department of Industry, Innovation and Science (2016)

World consumption

World nickel consumption to grow through 2017 and 2018

World refined nickel consumption is estimated to have increased by 6.0 per cent in 2016, to just over 2 million tonnes. Consumption is forecast to increase by 2.4 per cent and 3.3 per cent in 2017 and 2018, respectively, to 2.1 million tonnes.

World refined nickel consumption increased by 7.9 per cent year-on-year to 500,000 tonnes in the September quarter. The rise was primarily driven by increased consumption from China, up 11 per cent year-on-year, to 268,000 tonnes. China's production of nickel-bearing stainless steel — which accounts for about 65 per cent of nickel use — increased by 15 per cent year-on-year in the September quarter, supported by the resurgence of the construction sector, higher infrastructure investment and increased production of automobiles, machinery and appliances.

Increased consumption in the United States (up 5.7 per cent year-on-year in the September quarter) has been supported by firm domestic stainless steel production. Anti-dumping measures on a range of stainless steel productions has resulted in imports of stainless steel products declining by 27 per cent year-on-year in the September quarter.

While world nickel consumption is forecast to grow at a more moderate pace over the outlook period — weighed down by slowing residential construction activity in China — this is expected to be offset by increased demand for higher quality stainless steels and alloys in infrastructure investment in China, India and the United States.

World production

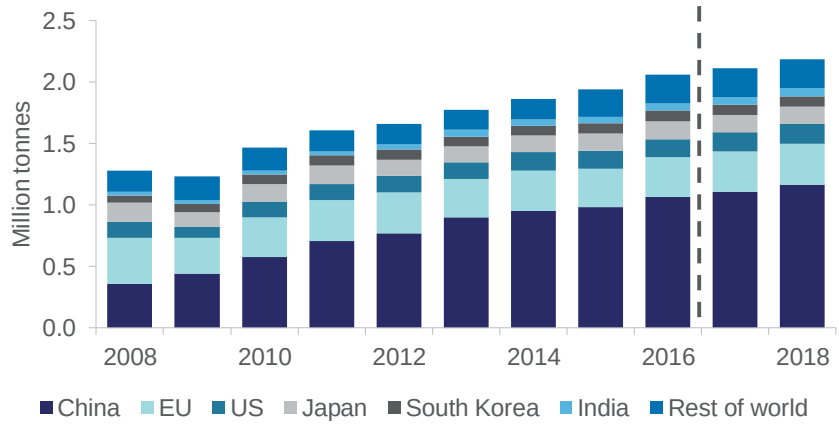
World mine production supported by ramp up in Indonesia and New Caledonia

World mine production is estimated to have decreased by 6.2 per cent in 2016, to just over 2 million tonnes. Mine output is forecast to increase by 3.9 per cent and 1.7 per cent in 2017 and 2018, respectively, to 2.1 million tonnes.

World mine production declined by 1.0 per cent year-on-year in the September quarter, to 568,000 tonnes. Declining production in Russia and Australia was partially offset by increased production in New Caledonia (up 29 per cent to 58,000 tonnes) and Indonesia (up 39 per cent to 45,000 tonnes). Production also increased in the Philippines (up 9.5 per cent to 170,000 tonnes), despite 18 mines being recommended for suspension following an environmental audit earlier in the year.

The actual effect of these Filipino suspensions on mined nickel exports over the outlook period, and consequently, whether there will be a shortage of mined supply, depends on how the Philippines government enforces the suspensions. If they are enforced, it then becomes a matter of whether the affected mines can address issues and resume operations ahead of the mid-year seasonal ramp up of production. Nevertheless, increased mine output over the outlook period will be driven by increased production in New Caledonia and Indonesia, as mines continue to ramp up.

Figure 13.3: World refined nickel consumption



Source: International Nickel Study Group (2016); Department of Industry, Innovation and Science (2016)

World refined production forecast to grow in 2017 and 2018

World refined production is estimated to have decreased by 2.8 per cent in 2016, but is forecast to increase by 2.3 per cent annually in 2017 and 2018, to just over 2 million tonnes.

World production of refined nickel decreased 0.2 per cent year-on-year in the September quarter, to 492,000 tonnes. Production increased in Indonesia (up 191 per cent to 27,000 tonnes) and New Caledonia (up 30 per cent to 26,000 tonnes). There was a substantial decline in Russia's nickel production (down 24 per cent to 43,500 tonnes), as Norilsk Nickel decommissioned their nickel plant, as part of an ongoing plan to upgrade facilities.

Growth in refined nickel production over the outlook period will be supported by the continued ramp up of operations in Indonesia, however power shortages, poor infrastructure and other issues will constrain the pace of this growth.

Australia's exploration, production and exports

Exploration activity remains subdued

Exploration expenditure remains at historical lows as a result of low nickel prices, which have reduced the feasibility of new projects and incentives to explore. Nickel and cobalt exploration expenditure increased 16 per cent quarter-on-quarter in the September quarter, to $12.3 million. The year-on-year move was a decline of 16 per cent in the September quarter.

Mine production boosted by new Nova mine

Australia's mined nickel production decreased by 21 per cent year-on-year in the September quarter to 46,000 tonnes, and is forecast to decline by 7.4 per cent to 200,000 tonnes in 2016–17. Production at Glencore's Murrin Murrin operation declined in the September quarter, due to lower grades. Panoramic Resources' and Mincor's nickel mines were placed on 'care and maintenance' earlier in the year, with the companies focused on preserving cash balances and cutting costs. Partially offsetting this was increased production at BHP Billiton's Nickel West operations, due to higher grade ore at Mt Keith, the ramp up of mining at Leinster, and the ramp up of Independence Group's new Nova mine (which began production in the December quarter).

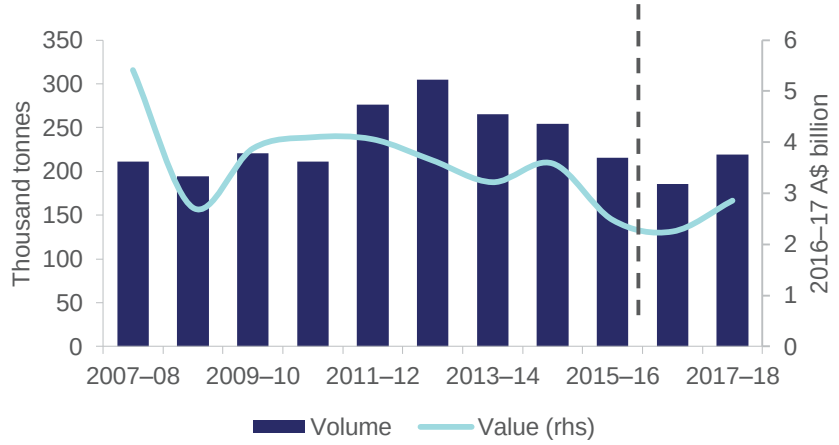
Mined nickel production is forecast to increase by 17 per cent in 2017–18, to 234,000 tonnes. The Nova mine is expected to reach full capacity by mid-2017. Poseidon Nickel's Silver Swan mine is also expected to commence production, with the company progressing key pre-production activities, pending a sustained recovery in the nickel price.

Export volumes and values

The effects of mines and refineries being placed on 'care and maintenance' — due to low prices — has been reflected in declining nickel exports. In the September quarter, Australia's nickel exports declined by 29 per cent year-on-year to 42,000 tonnes (metal content), while the value of Australia's exports declined by 43 percent to $448 million. Export values in 2016–17 as a whole are forecast to decline by 9 per cent to $2.2 billion, due to declining volumes (down by 14 per cent to 186,000 tonnes).

A recovery in Australia's nickel exports is expected in 2017–18, with export values forecast to increase by 27 per cent to $2.9 billion, supported by increasing export volumes (up 18 per cent to 219,000 tonnes) and higher forecast prices.

Figure 13.4: Australia's nickel export volumes and values



Source: ABS (2016) International trade in goods and services, cat. no. 8412.0; Bloomberg (2016) London Metal Exchange; Department of Industry, Innovation and Science (2016)

Table 13.1: Nickel outlook

World	unit	2015	2016 s	2017 f	2018 f	Per cent change
Production						
– mine	kt	2,147	2,009	2,076	2,135	2.8
– refined	kt	1,979	1,923	1,976	2,022	2.3
Consumption	kt	1,890	2,003	2,051	2,117	3.3
Stocks	kt	554	473	399	304	–23.8
– weeks of consumption		15.2	12.3	10.1	7.5	–26.2
Price LME						
– nominal	US$/t	11,839	9,559	11,050	11,900	7.7
	USc/lb	537	434	501	540	7.7
– real b	US$/t	11,975	9,559	10,812	11,393	5.4
	USc/lb	543	434	490	517	5.4

Australia	unit	2014–15	2015–16	2016–17 f	2017–18 f	Per cent change
Production						
– mine cs	kt	245	216	200	234	17.0
– refined	kt	115	128	111	112	0.4
– intermediate	kt	82	53	39	44	12.0
Export volume ds	kt	255	215	186	219	18.1
– nominal value s	A$m	3,583	2,478	2,245	2,855	27.2
– real value es	A$m	3,692	2,519	2,245	2,795	24.5

Notes: ***b*** *In current calendar year US dollars* ***c*** *Nickel content of domestic mine production* ***d*** *Includes metal content of ores and concentrates, intermediate products and nickel metal* ***e*** *In current financial year Australian dollars* ***f*** *forecast* ***s*** *estimate*

Source: ABS (2016) International Trade in Goods and Services, cat. No. 5368.0; Company reports and presentations; International Nickel Study Group (2016); Bloomberg (2016) London Metal Exchange; World Bureau of Metal Statistics (2016); Department of Industry, Innovation and Science (2016)


Zinc

Market summary

Zinc prices have rallied noticeably further since the last *Resources and Energy Quarterly*, providing Australian miners with a greater incentive to restart idled capacity and lift output.

Australia's current zinc exports remains relatively weak, following the closure of MMG's Century mine in late 2015. In 2015–16, mined zinc production in Australia decreased by 28 per cent. Export volumes of ore and concentrates fell by 24 per cent to 2.2 million tonnes and export earnings declined by 15 per cent, to $2.6 billion. Export earnings are forecast to remain roughly stable in 2016–17 and 2017–18, with price effects making up for lower volumes.

Prices

Zinc prices outperform as demand outstrips supply

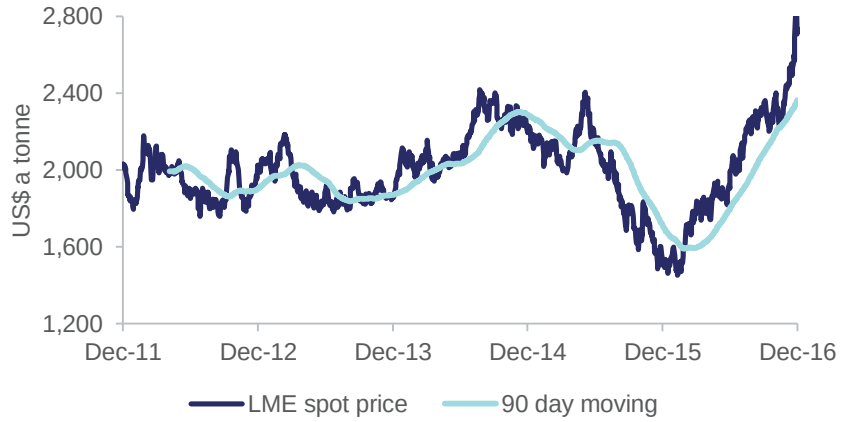
LME zinc prices rose strongly in October and November, almost reaching US$3,000 a tonne at their peak. Helping to drive the rally was speculation that a surge in US infrastructure spending would see shortages in the market. The market is now focusing on the likelihood of Glencore soon reversing the mine production closures/cutbacks it implemented in 2015.

After a decline in the early part of the year, SHFE zinc stocks are decreasing, edging down 1.0 per cent year-on-year in value terms over the first 11 months of 2016. SHFE stocks reached a 9-month low at the end of August, falling to 190,579 tonnes.

Prices are expected to average just over US$2,000 a tonne over 2016. This represents an upward revision from the September edition.

From current levels, the risks to the price outlook are definitely to the downside, with the potential for a supply response from new or existing mines. The price of zinc is forecast to remain relatively high in 2017, with a year-on-year increase of 6.2 per cent (to an average of US$2,138 a tonne) expected. Average prices are subsequently expected to edge down, to just under $2,000 over 2018.

Figure 14.1: Zinc daily price



Source: LME (2016) zinc spot price

Figure 14.2: Annual zinc prices and weeks of stocks

Source: LME (2016) zinc spot price; Department of Industry, Innovation and Science (2016)

World consumption

Global zinc consumption to ease

World refined zinc consumption is estimated to have eased slightly in 2016, to 13.4 million tonnes. This represents a 2.8 per cent decline from the total for 2015, with the result largely driven by lower demand in China. China accounts for almost half of global zinc demand, and slowing momentum in the Chinese construction sector is reducing demand for a range of metal inputs.

In 2017, zinc consumption is expected to decline by a further 3.5 per cent, as Chinese demand continues to decline. Over the longer term, demand in India is likely to play a greater role, with a significant pipeline of construction emerging across many Indian cities. Increased demand globally for zinc as an alloy for automotive, electrical and household materials is also expected to provide longer-term support for zinc producers.

World production

Global mined zinc production to edge down in 2017

Global zinc production is estimated to have declined by 2.1 per cent in 2016, to 13.2 million tonnes. This reflects a range of mine closures and production cuts by major zinc producers, in response to soft prices in 2015. Glencore's decision to close 500,000 tonnes of zinc capacity from its operations — in Australia, Kazakhstan and the US — from the second half of 2015, has contributed to the fall in global output.

In 2017, zinc production is forecast to decline by a further 3.9 per cent, to 12,666 tonnes. Most of the decline is expected to come about due to lower production in China, with some offsetting rises occurring in Australia, Canada and non-China Asia. Ongoing falls in Chinese output are expected to reduce global production to 12,165 tonnes in 2018.

Production risks are primarily weighted to the upside: should Glencore resume production at its partially closed mines — in response to higher zinc prices — an additional 500,000 tonnes of capacity may re-enter the market.

Recovering ore and concentrate supply supports refined production

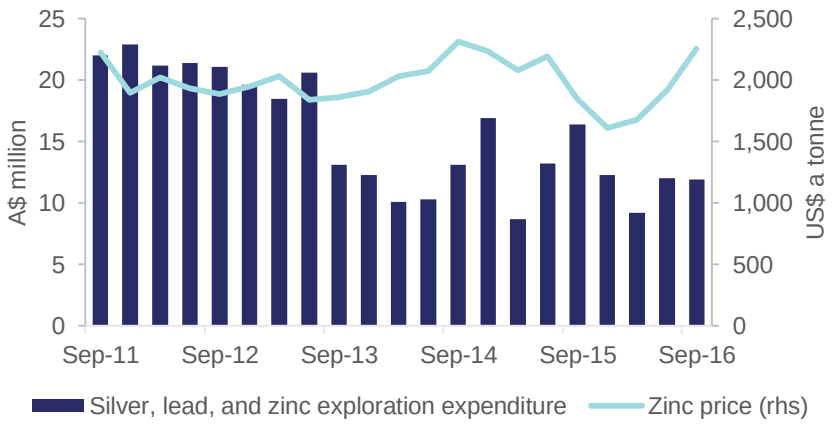
World refined zinc production is estimated to have declined by 2.9 per cent in 2016, reflecting a reduced availability of zinc ore and concentrates. In particular, production in India has dropped sharply, as a result of low output from Vedanta's mines and smelters. Longer term production of zinc ore and concentrates production will rely, in part, on the recovery in zinc prices being sustained.

Australia's zinc exploration, production and exports

Exploration expenditure was modest in the September quarter

Australia's expenditure on silver, lead and zinc exploration totalled $11.9 million in the September quarter 2016. This is virtually unchanged from the June quarter, but down by 27 per cent from a year ago. Exploration remains relatively low, reflecting uncertainty over long-term prices.

Figure 14.3: Australia's silver, lead and zinc exploration expenditure



Source: ABS (2016) Mineral and Petroleum Exploration, 8412.0; LME (2016) zinc spot price

Australia's mined zinc production reduced with Century mine closure

Australia's mined zinc production fell by just over one-quarter in 2015–16, to 1.2 million tonnes (metal content). Driving the decline was the processing of final ores from the Century mine in January 2016, and the curtailment of production at other mines — in response to low prices.

However, the recent price response to global production cuts has encouraged Australia's mined zinc producers to boost output in the September quarter 2016. Production in the September quarter increased by 4.2 per cent quarter on quarter, to 210,000 tonnes. Glencore's Mount Isa mine increased its production by 13 per cent in the quarter, while the Independence Group's Jaguar mine increased its production by 15 per cent.

In 2016–17, Australia's mined zinc production is forecast to decrease by 22 per cent to 0.9 million tonnes, as the full effects of MMG's Century mine closure and curtailed production at other mines are realised. Risks are balanced to the upside, with the potential for Glencore to boost its capacity in Australia in response to higher prices. Production in 2017–18 is expected to lift by around 2.5 per cent.

Australia's refined production remains flat

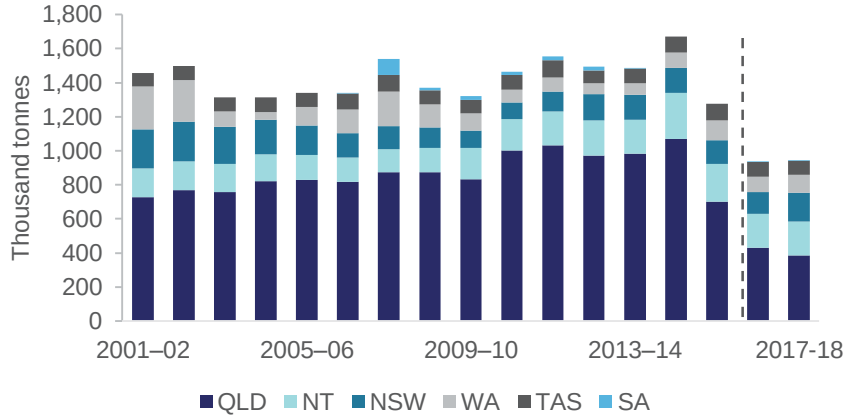
Australia's refined zinc production increased 8 per cent in the September quarter 2016 to 120 thousand tonnes, driven up by rising output from the Nyrstar Hobart smelter and Korea Zinc Townsville smelter. Refined production for 2015–16 declined by 8 per cent to nearly 459,000 tonnes.

Australia's refined zinc production is forecast to edge up by 1.7 per cent in 2016–17. Production over 2017–18 is expected to be roughly stable, at around 463,000 tonnes, as the redevelopment of Nyrstar's Port Pirie smelter offsets declines in output elsewhere.

Australia's zinc exports are constrained due to mine closures

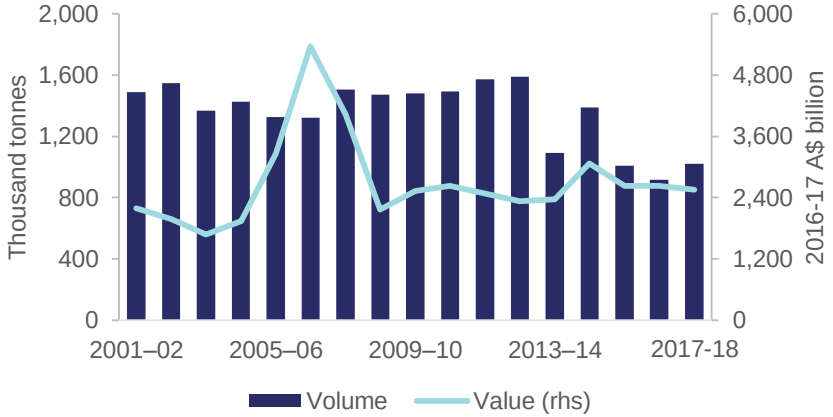
In 2016–17, Australia's zinc export volumes are forecast to decline by 9 per cent to 918,000 tonnes, due to supply constraints. However, export earnings are forecast to actually lift slightly, due to the rally in the price. Exports are expected to recover in volume terms in 2017–18, with an increase to 1.021 million tonnes forecast. This may understate total exports, should Glencore resume activity at its Australian mines.

Figure 14.4: Australia's mine production by state



Source: Company reports; Department of Industry, Innovation and Science (2016)

Figure 14.5: Australia's zinc exports



Source: ABS (2016) International Trade in Goods and Services, 5368.0; Department of Industry, Innovation and Science (2016)

Table 14.1: Zinc outlook

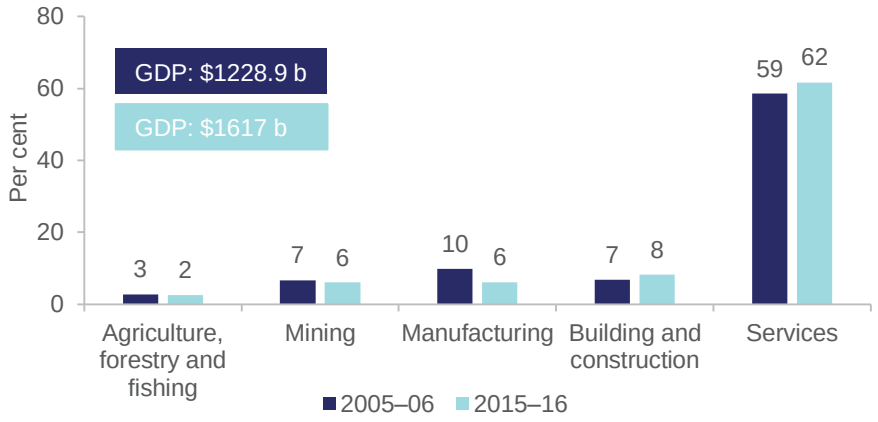
World	unit	2015	2016 s	2017 f	2018 f	Per cent change
Production						
– mine	kt	13,464	13,180	12,666	12,165	-4.0
– refined	kt	13,897	13,361	12,893	12,445	-3.5
Consumption	kt	13,747	13,361	12,893	12,445	-3.5
Stocks	kt	1,570	1,694	1,604	1,593	0.0
– weeks of consumption		6.0	6.3	5.8	5.7	3.6
Price LME						
– nominal	US$/t	1,932	2,013	2,138	1,979	-7.4
	USc/lb	88	91	97	90	-7.4
– real b	US$/t	1,944	2,012	2,118	1,940	-8.4
	USc/lb	88	91	96	88	-8.4
Australia	**unit**	**2014–15**	**2015–16**	**2016–17 f**	**2017–18 f**	**Per cent change**
Mined output	kt	1,656	1,197	939	963	2.5
Refined output	kt	501	459	467	463	-0.9
Export volume						
– ore and conc. c	kt	2,919	2,226	2,134	2,373	11.2
– refined	kt	329	497	315	326	3.3
– total metallic content	kt	1,389	1,009	918	1,021	11.3
Export value						
– nominal	A$m	3,073	2,626	2,582	2,552	-3.1
– real d	A$m	3,116	2,627	2,595	2,467	-4.9

*Notes: **b** In current calendar year US dollars; **c** Quantities refer to gross weight of all ores and concentrates; **d** In current financial year Australian dollars; **f** Forecast **s** estimate*

Source: ABS (2016) International Trade in Goods and Services, 5368.0; Company reports; International Lead Zinc Study Group (2016); London Metal Exchange (2016); World Bureau of Metal Statistics (2016); Department of Industry, Innovation and Science (2016)

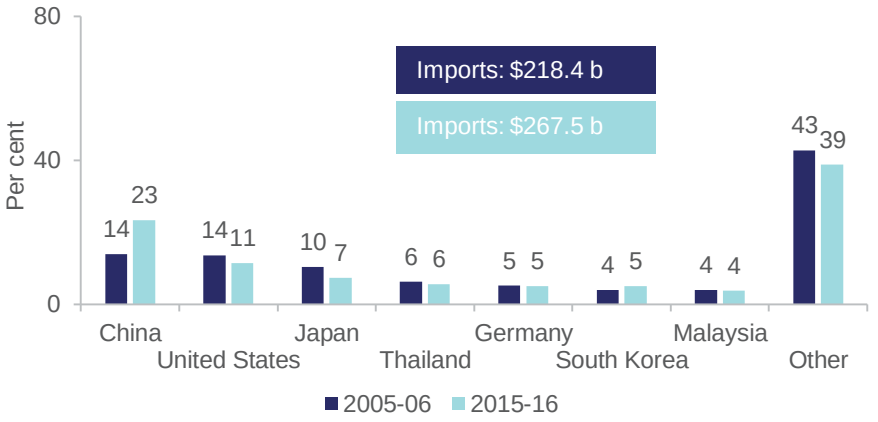

Trade summary charts

Figure 15:1: Contribution to GDP



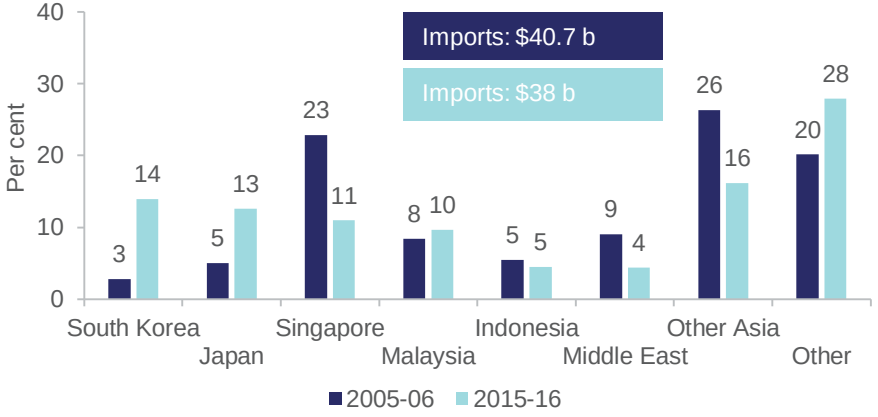
Note: GDP levels are chain volume measures. Industry shares are in current prices.
Source: ABS(2016) Australian National Accounts, National Income, Expenditure & Production, 5204.0.

Figure 15.2: Principal markets for Australia's total imports, 2016–17 dollars



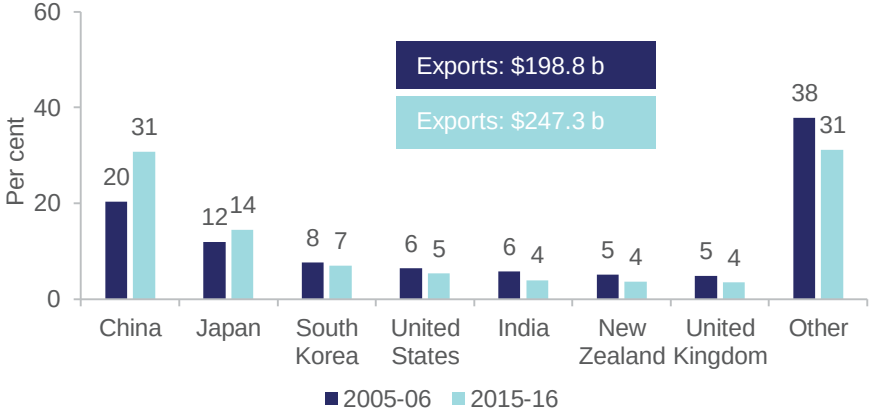
Source: ABS (2016) International Trade in Goods and Services, 5368.0

Figure 15.3: Principal markets for Australia's resources and energy imports, 2016–17 dollars



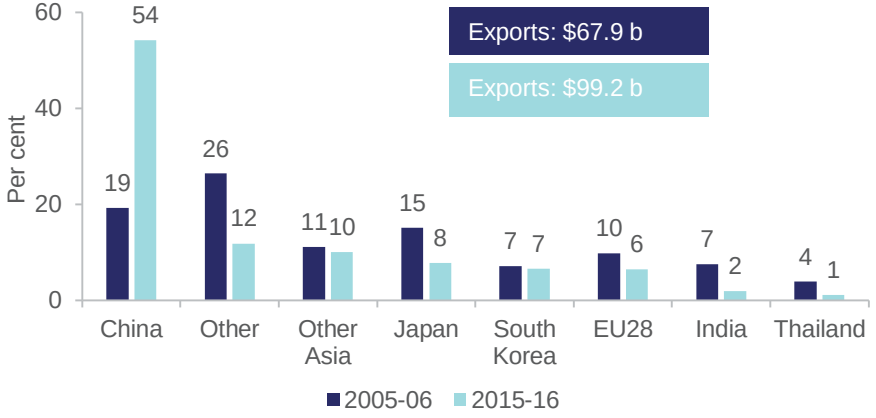
Source: ABS (2016) International Trade in Goods and Services, 5368.0

Figure 15.4: Principal markets for Australia's total exports, 2016–17 dollars



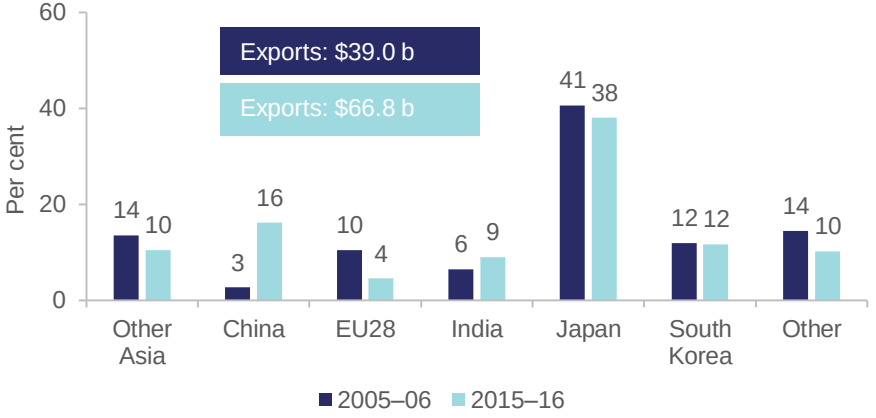
Source: ABS (2016) International Trade in Goods and Services, 5368.0

Figure 15.5: Principal markets for Australia's resources exports, 2016–17 dollars



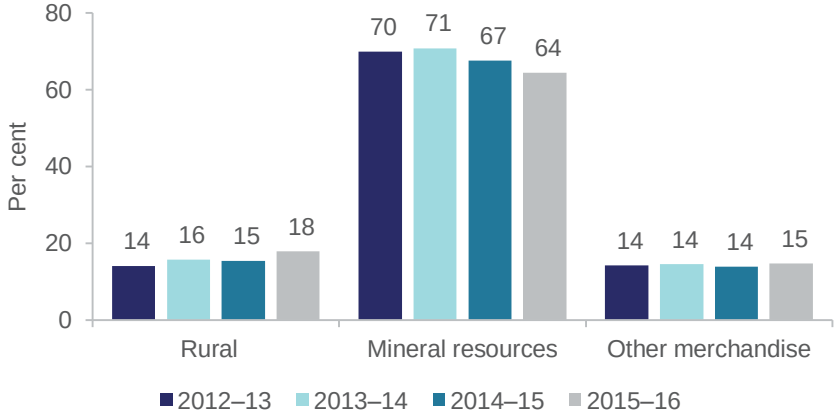
Source: ABS (2016) International Trade in Goods and Services, 5368.0

Figure 15.6: Principal markets for Australia's energy exports, 2016–17 dollars



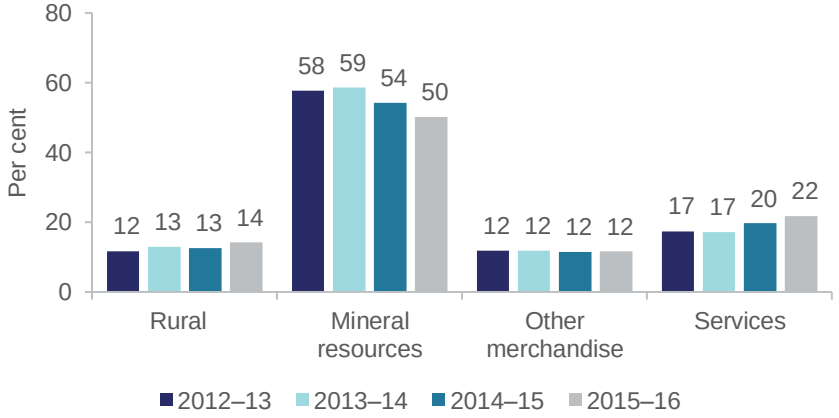
Source: ABS (2016) International Trade in Goods and Services, 5368.0

Figure 15.7: Proportion of merchandise exports by sector



Source: ABS (2016) Balance of Payments and International Investment Position, 5302.0

Figure 15.8: Proportion of goods and services exports by sector



Source: ABS (2016) Balance of Payments and International Investment Position, 5302.0

Table 15.1: Principal markets for Australia's thermal coal exports, 2016–17 dollars

	unit	2011–12	2012–13	2013–14	2014–15	2015–16
Japan	$m	9,046	8,327	8,040	7,317	6,955
South Korea	$m	3,216	2,912	2,892	2,738	2,549
China	$m	2,993	3,077	3,621	2,820	1,761
Taiwan	$m	2,001	1,792	1,731	1,822	1,602
Malaysia	$m	392	292	361	602	487
Thailand	$m	188	255	302	281	319
Total	**$m**	**18,850**	**17,409**	**17,510**	**16,548**	**14,942**

Source: ABS (2016) International Trade in Goods and Services, 5368.0

Table 15.2: Principal markets for Australia's metallurgical coal exports, 2016–17 dollars

	unit	2011–12	2012–13	2013–14	2014–15	2015–16
India	$m	7,115	4,939	5,043	5,169	4,691
Japan	$m	9,714	6,412	5,765	4,755	4,433
China	$m	3,946	4,958	6,139	4,920	3,939
South Korea	$m	4,218	2,616	2,576	2,453	2,122
Taiwan	$m	2,023	1,243	1,221	1,175	987
Netherlands	$m	1,396	1,047	1,052	858	930
Total	**$m**	**33,805**	**24,154**	**24,375**	**22,479**	**20,130**

Source: ABS (2016) International Trade in Goods and Services, 5368.0

Table 15.3: Principal markets for Australia's oil and gas exports, 2016–17 dollars

	unit	2011–12	2012–13	2013–14	2014–15	2015–16
Japan	$m	14,202	15,537	16,595	15,644	11,638
China	$m	3,998	2,918	830	1,147	4,064
South Korea	$m	1,919	2,335	1,481	1,336	2,331
Singapore	$m	3,004	2,897	2,408	2,217	899
Thailand	$m	1,076	886	1,720	1,306	710
India	$m	651	380	526	399	673
Total	**$m**	**27,400**	**27,784**	**30,067**	**27,162**	**22,910**

Source: ABS (2016) International Trade in Goods and Services, 5368.0

Table 15.4: Principal markets for Australia's gold exports, 2016–17 dollars

	unit	2011–12	2012–13	2013–14	2014–15	2015–16
China	$m	4,693	6,444	8,474	7,166	8,909
United Kingdom	$m	4,980	2,817	671	601	4,004
Singapore	$m	1,236	1,017	2,383	3,209	1,215
Thailand	$m	1,770	1,368	466	925	258
Switzerland	$m	37	308	361	15	76
Turkey	$m	71	502	563	162	49
Total	**$m**	**17,026**	**16,210**	**13,637**	**13,446**	**15,932**

Source: ABS (2016) International Trade in Goods and Services, 5368.0

Table 15.5: Principal markets for Australia's iron ore exports, 2016–17 dollars

	unit	2011–12	2012–13	2013–14	2014–15	2015–16
China	$m	47,861	45,152	59,778	43,389	39,381
Japan	$m	11,975	9,276	10,130	6,901	4,766
South Korea	$m	7,121	5,305	6,391	4,171	3,099
Taiwan	$m	1,976	1,611	1,792	1,337	1,038
Indonesia	$m	0	0	116	220	184
India	$m	0	51	43	112	6
Total	**$m**	**69,037**	**61,449**	**78,270**	**56,184**	**48,554**

Source: ABS (2016) International Trade in Goods and Services, 5368.0

Table 15.6: Principal markets for Australia's aluminium exports, 2016–17 dollars

	unit	2011–12	2012–13	2013–14	2014–15	2015–16
South Korea	$m	645	729	714	792	1,133
Japan	$m	1,456	1,081	1,168	1,501	708
Taiwan	$m	409	491	465	504	303
Thailand	$m	361	392	318	295	273
China	$m	209	161	244	52	95
Indonesia	$m	333	268	205	141	96
Total	**$m**	**4,181**	**3,528**	**3,647**	**3,940**	**3,291**

Source: ABS (2016) International Trade in Goods and Services, 5368.0

Table 15.7: Principal markets for Australia's copper exports, 2016–17 dollars

	unit	2011–12	2012–13	2013–14	2014–15	2015–16
China	$m	2,749	3,269	4,128	3,757	3,642
Japan	$m	1,636	1,739	1,703	2,050	1,452
Malaysia	$m	773	728	641	543	627
India	$m	1,598	1,195	991	828	520
South Korea	$m	948	472	613	376	498
Philippines	$m	21	151	299	265	225
Total	**$m**	**9,361**	**8,660**	**9,126**	**8,727**	**8,258**

Source: ABS (2016) International Trade in Goods and Services, 5368.0