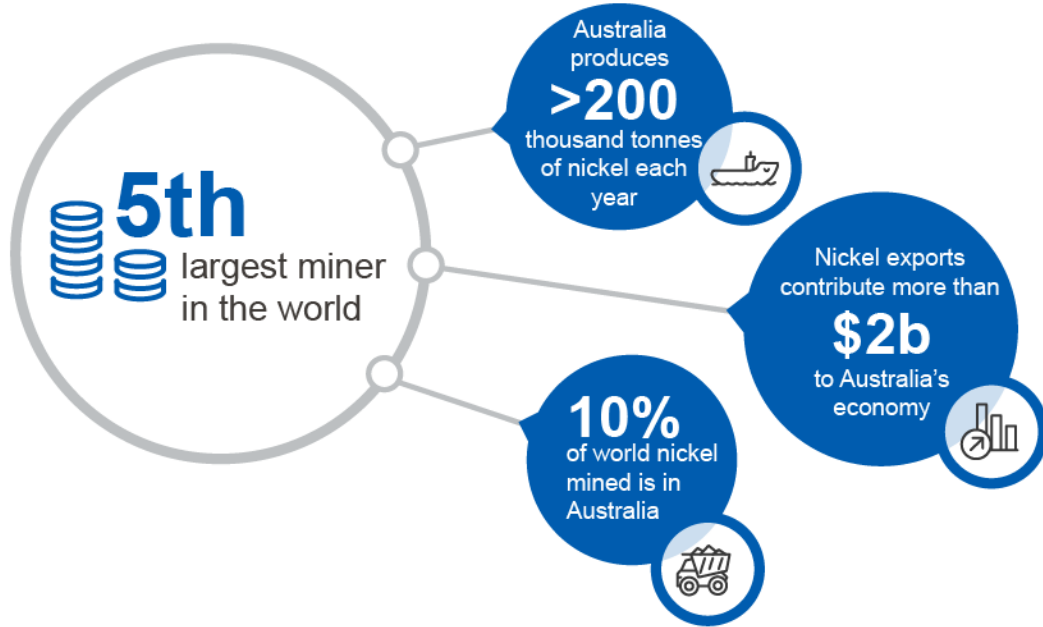


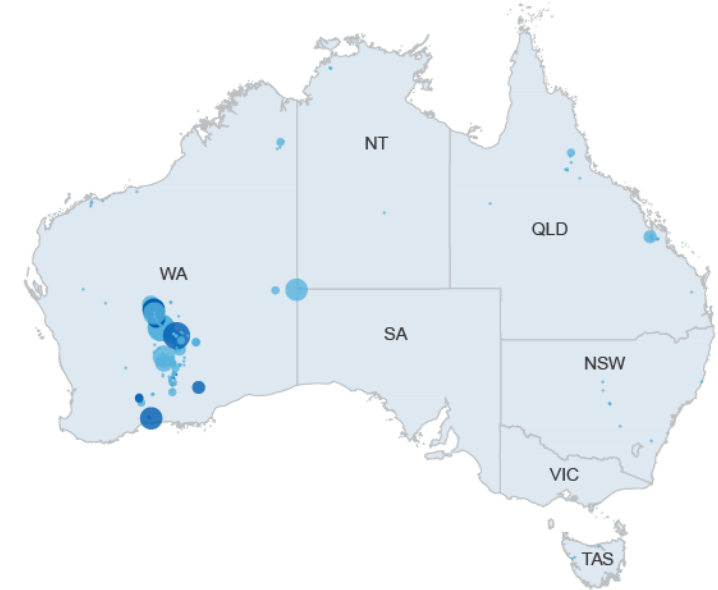
# Nickel

Resources and Energy Quarterly June 2018

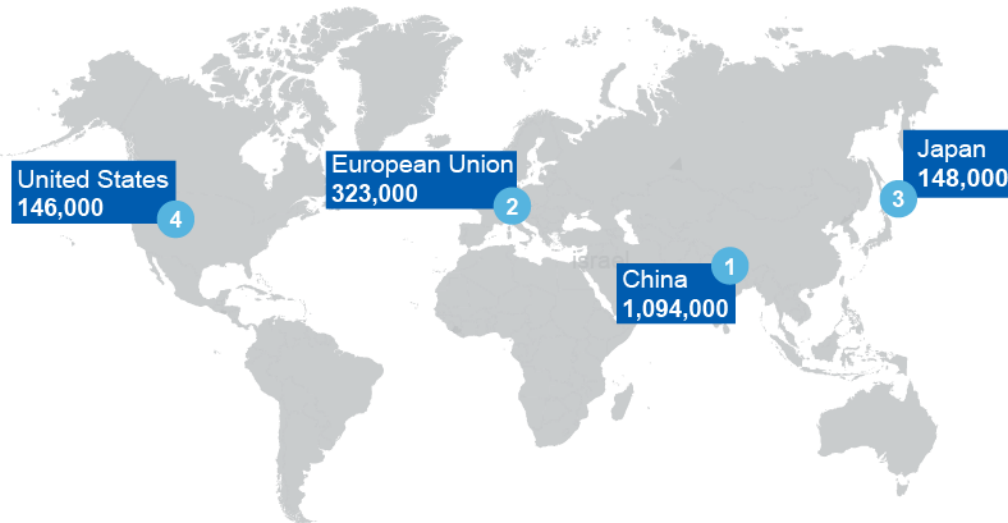


## Major Australian nickel deposits (Mt)

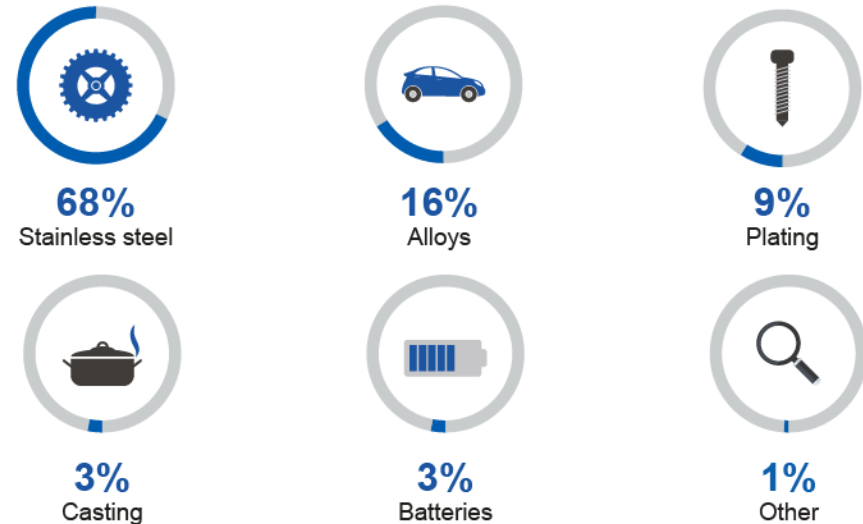
- <0.05
- 0.06–0.21
- 0.22–0.58
- 0.59–0.83
- 0.84–1.69
- >1.70
- Deposit
- Operating mine



## Key nickel consumer markets (tonnes)



## Global uses of nickel



## 13.1 Summary

- Nickel prices are expected to rise above US\$13,400 a tonne in 2018, supported by increased stainless steel demand. Prices are then expected to largely hold this level over the rest of the outlook period, with marginal declines towards the end as supply lifts.
- Strong demand conditions are expected to encourage development of two new mines in Western Australia, which will drive a lift in production from 163,000 tonnes in 2017–18 to 178,000 tonnes by 2019–20.
- A significant upgrade to the Kwinana nickel refinery should also see Australia's refined and intermediate nickel production rise — from 134,000 to 157,000 tonnes by 2019–20.
- Strong prices, in conjunction with rising mined and refined production, should see Australia's nickel export earnings lift from \$2.3 billion in 2017–18 to \$2.8 billion by 2019–20.

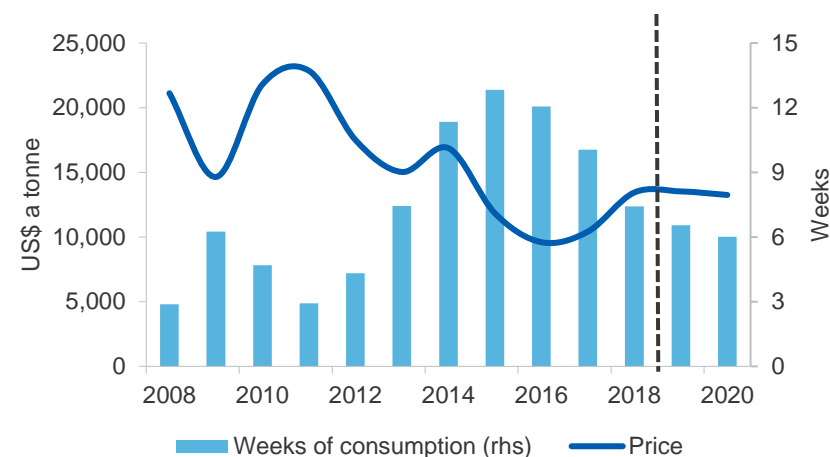
## 13.2 Prices

### Nickel prices are still growing from a low point reached in mid-2017

Nickel prices faced significant upward pressure in the June quarter, rising from just over US\$13,000 a tonne at the start of April to US\$13,600 a tonne by the end, and then to over US\$15,450 a tonne in early June. Prices have been supported by the emergence of a significant supply deficit driven by higher stainless steel production.

Prices are expected to hold onto much of their recent gains over the remainder of 2018, easing off only slightly towards the end of the year — as growth in the production of stainless steel slows marginally, and the supply of pig-iron nickel picks up. Prices are expected to continue easing marginally out to 2020, as new supplies of pig iron continue to enter the market. However, longer-term demand for new battery and medical technology (nickel is the biggest component of most medical implants) is expected to start adding more significant price pressures in the refined nickel market towards the end of the outlook period.

Figure 13.1: Nickel LME spot prices and stocks



Source: Source: Bloomberg (2018) London Metal Exchange; International Nickel Study Group (2018); Department of Industry, Innovation and Science (2018)

## 13.3 World consumption

### Rising stainless steel and battery output is driving nickel usage

Nickel consumption is expected to rise from 2.3 million tonnes in 2018 to 2.5 million tonnes by 2020. This will be driven by increased demand for stainless steel, which is growing by around 5 per cent each year. A rapid roll-out of stainless steel smelters in China and Indonesia is currently underway. Smelters in these nations now account for half of all nickel use.

Rising use of stainless steel is driving up the demand for nickel pig iron — a cheaper alloy used as a substitute for pure nickel. This is leading to higher nickel pig iron production across Indonesia. Nickel ore and connected nickel pig iron production is increasingly shifting into a separate supply chain, splitting away from the markets for high grade and pure nickel used for energy storage and superalloys. The pig iron market is likely to grow strongly over the outlook period, while the high grade market is expected to pick up just beyond the outlook period, as battery and electric vehicle demand becomes increasingly important.

## 13.4 World production

### Production growth is being supported by several new mines

Nickel supply has risen significantly in recent quarters, and growth is expected to continue. Mine output is projected to rise from 2.3 million tonnes in 2018 to 2.5 million tonnes in 2019 and 2.6 million tonnes in 2020. Refined output is expected to grow a little more rapidly, as output from Chinese smelters increases and improvements in efficiency reduce wastage from ores.

Some recent mine cutbacks have added to price pressures. Vale — a large global producer of nickel — announced in May that its investment projects in Canada and New Caledonia will be pared back, removing almost 500,000 tonnes of production over the outlook period. This is expected to help keep the nickel market relatively right, and reflects efforts by the firm to protect its reserves.

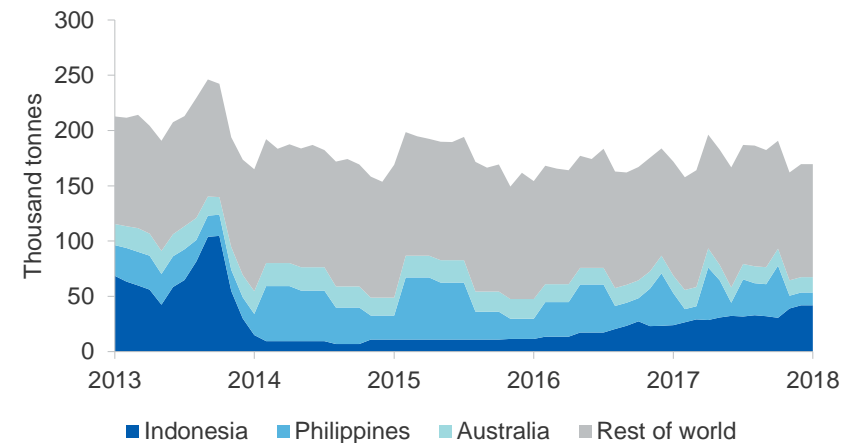
New nickel mines are commencing in Indonesia in response to growing demand for nickel pig iron in China. Indonesia has also relaxed some export controls, allowing greater export of nickel ore from the country. Environmental reviews in the Philippines are also expected to conclude by the end of the June quarter, and suspended mines may then be allowed to start producing again if environmental requirements are met. World production growth is thus expected to slightly exceed consumption growth, leading to a gradual narrowing of the supply deficit out to 2020.

## 13.5 Australia

### Exploration expenditure was flat in the March quarter

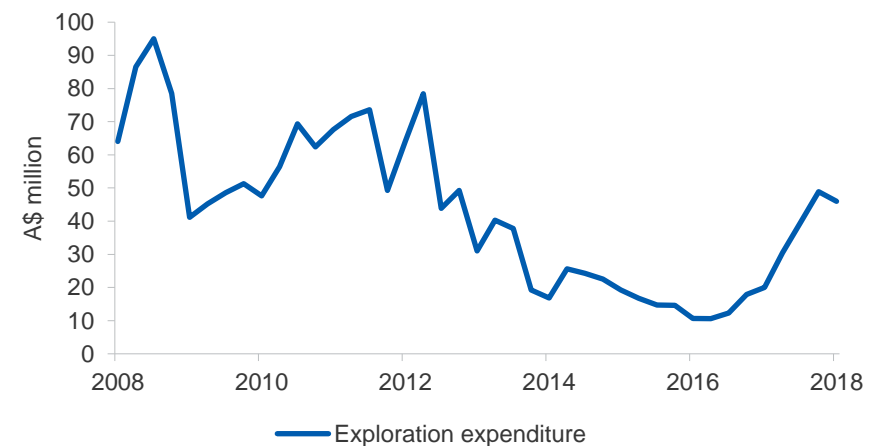
Exploration for nickel and cobalt largely stabilised in the March quarter, with \$46 million spent. While this represents minimal change from the \$48.6 million spent in the December quarter, it is more than double the spending of a year ago. Price growth has led to greater interest in nickel discovery, with the bulk of growth in exploration spending occurring among the large untapped deposits of Western Australia.

Figure 13.2: World mined nickel production, monthly



Source: International Nickel Study Group (2018)

Figure 13.3: Australia's nickel and cobalt exploration expenditure, quarterly



Source: ABS (2018) Mineral and Petroleum Exploration 8412.0

### Australian production is expected to rebound from a low point

Over the forecast period, Australia's nickel production is expected to rapidly recover from a period of significant mine and facility closures in 2016 and 2017. Mine production is expected to rise from an estimated 163,000 tonnes in 2017–18 to 168,000 tonnes in 2018–19 and 178,000 tonnes in 2019–20.

This recovery reflects some small rises in output from existing mines, as well as the opening of two additional mines in Western Australia: Mincor's mine at Kambalda, and Poseidon Nickel's new mine at Mount Windarra.

Australia's annual refined and intermediate nickel production is expected to rise from 134,000 tonnes to 157,000 tonnes over the outlook period. This is largely the result of a projected rise in output from BHP's Kwinana plant, where upgrades are expected to lift nameplate capacity to 100,000 tonnes a year from April 2019.

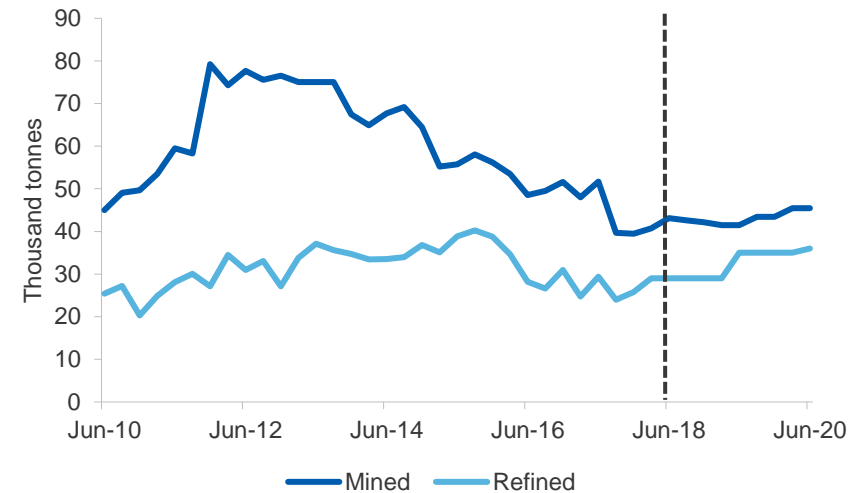
The upgraded facility will use both nickel and sulphuric acid from the Kalgoorlie nickel smelter to produce nickel sulphate for use in electric batteries. The \$60 million upgrade reflects BHP's efforts to supply the rising electric vehicle market, and strength in this market could support a second upgrade to the facility (which would double capacity to 200,000 tonnes) sometime in the early 2020s.

### Export earnings are expected to rebound in line with production

Australia's nickel export earnings have dropped for several successive years, but are expected to bottom out at \$2.3 billion in 2017–18. These export earnings figures have been revised up from March 2018 *Resources and Energy Quarterly* estimates, reflecting an earlier than expected beginning of the recovery in nickel prices.

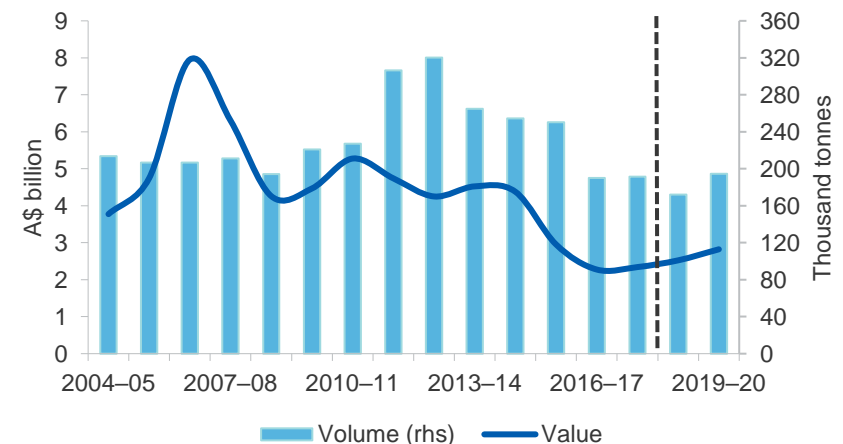
Export earnings are forecast to rise to \$2.5 billion in 2018–19, and then to \$2.8 billion in 2019–20. This rise is largely the result of the expansion currently underway in the Kwinana refinery, which is expected to significantly increase exports of refined nickel from mid-2019.

Figure 13.4: Australia's nickel production



Source: Department of Industry, Innovation and Science (2018)

Figure 13.5: Australia's nickel export volumes and values



Source: ABS (2018) International Trade in Goods and Services, 5368.0; Department of Industry, Innovation and Science (2018)

**Table 13.1: Nickel outlook**

World	Unit	2017	2018 <sup>s</sup>	2019 <sup>f</sup>	2020 <sup>f</sup>	Annual percentage change		
						2018 <sup>s</sup>	2019 <sup>f</sup>	2020 <sup>f</sup>
Production								
– mine	kt	2,145	2,264	2,452	2,586	5.5	8.3	5.5
– refined	kt	2,079	2,194	2,377	2,490	5.5	8.3	4.8
Consumption	kt	2,162	2,286	2,401	2,503	5.7	5.0	4.2
Stocks	kt	417	325	301	289	–21.9	–7.4	–4.2
– weeks of consumption		10.0	7.4	6.5	6.0	–26.2	–11.8	–8.1
Price LME								
– nominal	US\$/t	10,404	13,444	13,525	13,250	29.2	0.6	–2.0
	Usc/lb	472	610	613	601	29.2	0.6	–2.0
– real <sup>b</sup>	US\$/t	10,650	13,444	13,237	12,726	26.2	–1.5	–3.9
	Usc/lb	483	610	600	577	26.2	–1.5	–3.9
Australia	Unit	2016–17	2017–18 <sup>s</sup>	2018–19 <sup>f</sup>	2019–20 <sup>f</sup>	2017–18 <sup>s</sup>	2018–19 <sup>f</sup>	2019–20 <sup>f</sup>
Production								
– mine <sup>cs</sup>	kt	201	163	168	178	–18.8	2.8	6.1
– refined	kt	112	108	122	141	–3.5	13.2	15.6
– intermediate		37	26	16	16	–29.9	–37.7	0.0
Export volume <sup>ds</sup>	kt	190	192	172	194	0.8	–10.1	12.9
– nominal value <sup>s</sup>	kt	2,275	2,343	2,524	2,823	3.0	7.7	11.8
– real value <sup>es</sup>	kt	2,320	2,343	2,466	2,694	1.0	5.3	9.3

Notes: **b** In 2018 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 2017–18 financial year Australian dollars; **f** Forecast, **s** Estimate

Source: ABS (2018) International Trade in Goods and Services, Australia, Cat. No. 5368.0; Company reports; Department of Industry, Innovation and Science; International Nickel Study Group (2018); LME (2018); World Bureau of Metal Statistics (2018)