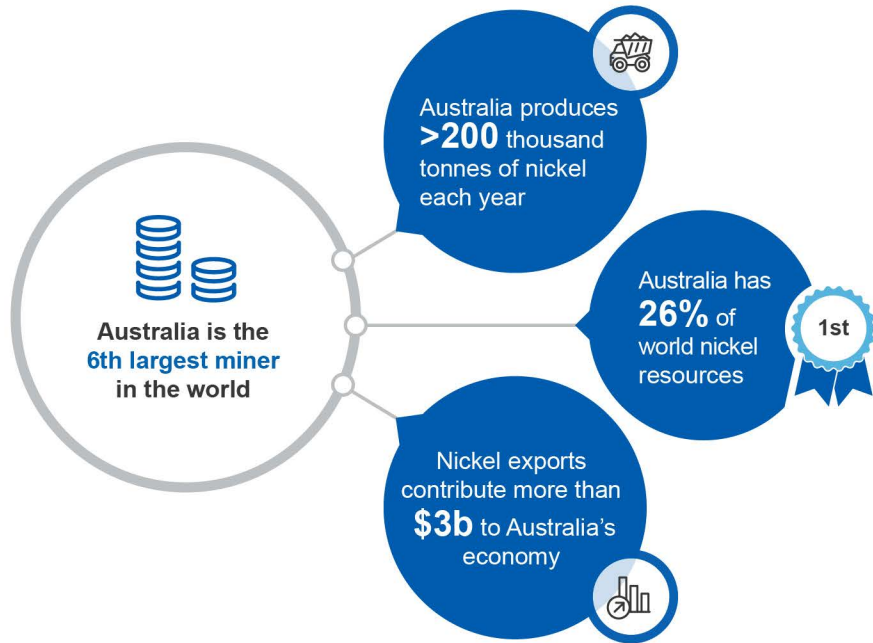


# Nickel

Resources and Energy Quarterly December 2019

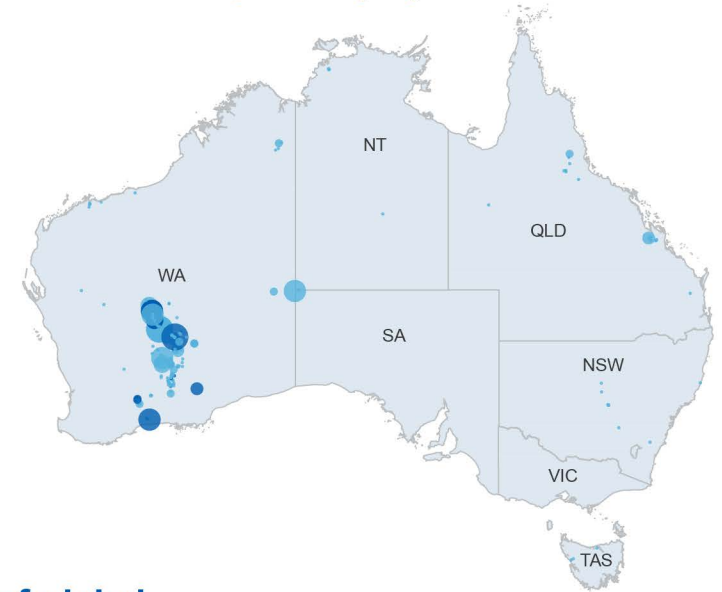


## Key nickel consumer markets (tonnes)

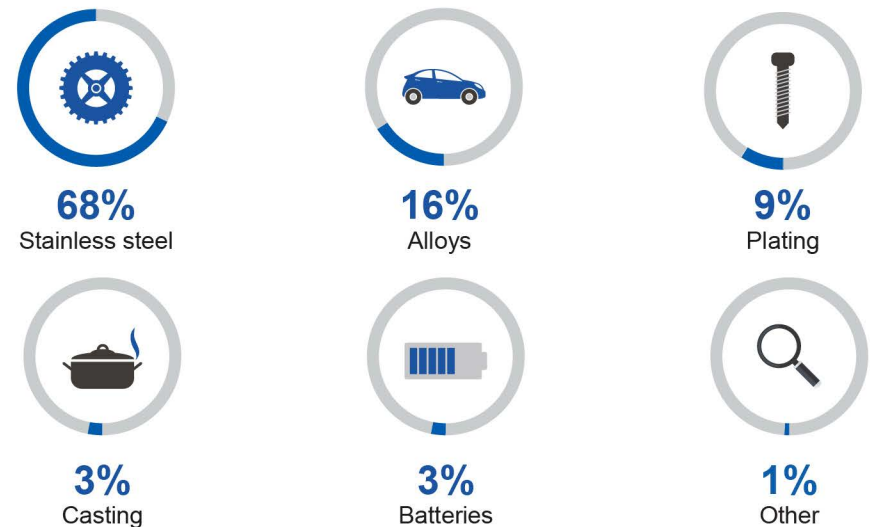


## Major Australian nickel deposits (Mt)

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



## Global uses of nickel



### 13.1 Summary

- Nickel prices are expected to rise as a result of higher consumption and Indonesia’s restrictions on exports of nickel ore. Prices are forecast to average US\$16,500 a tonne in 2021, up from US\$14,000 in 2019.
- New projects and expansions in Australia’s production should support exports, which are forecast to increase from 225,000 tonnes in 2018–19 to 270,000 tonnes in 2020–21.
- Both higher prices and growing export volumes are expected to support Australia’s export earnings, which are forecast to reach \$4.7 billion in 2020–21, up from \$3.6 billion in 2018–19.

### 13.2 Prices

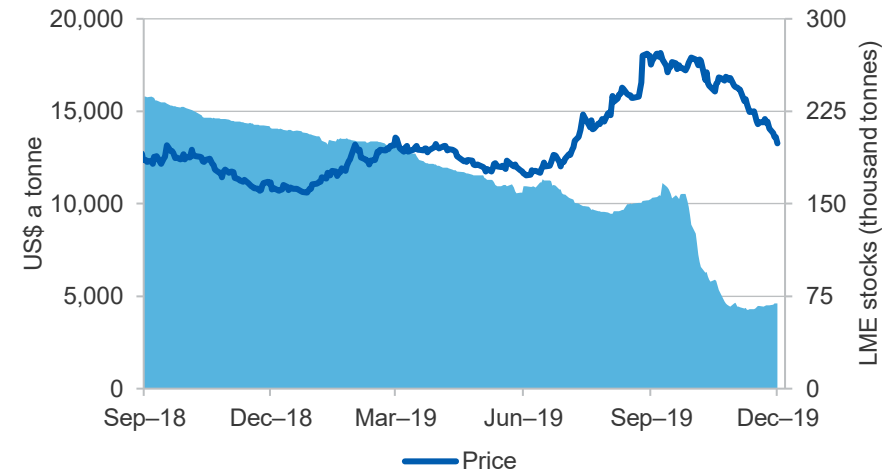
#### Policy shock spikes prices and lowers stocks

Nickel prices moderated in the December quarter, after strong gains in the first three quarters of the year. The nickel price averaged an estimated US\$16,000 a tonne in the December quarter, 39 per cent higher than the same period in 2018 (Figure 13.1). Uncertainty around Indonesia’s export ban — which was brought forward two months from the recently changed January 2020 implementation date — prompted fears of a market deficit. Speculation around looming market shortages prompted a significant drawdown of warehouse stocks. London Metal Exchange (LME) stock levels fell to 60,000 tonnes at the start of November — the lowest level for 11 years. Towards the end of the quarter, the impact of lower stainless steel production in China started to weigh on prices. The nickel price is estimated to be US\$14,000 a tonne in 2019, 7.0 per cent above 2018.

#### Continuing market deficit to support strong prices

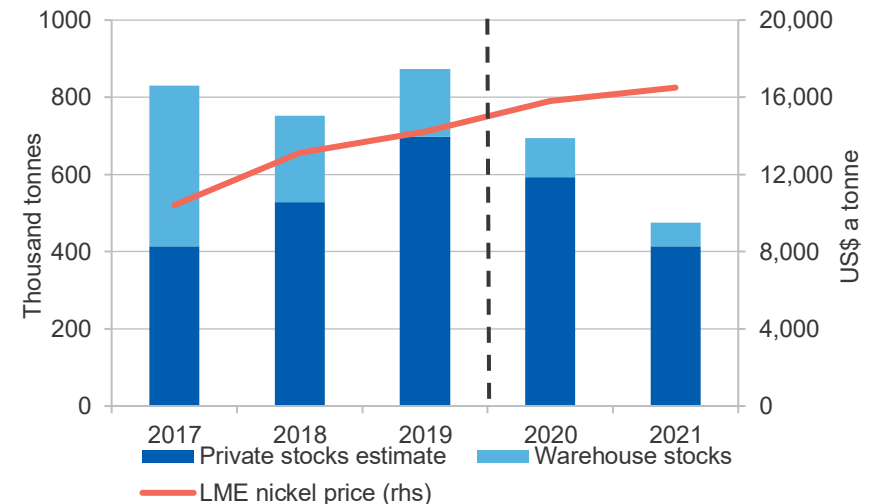
World consumption is expected to outpace constrained production growth over the outlook period, supporting price growth. Prices are forecast to increase to US\$15,800 a tonne in 2020, before rising to US\$16,500 a tonne in 2021 (Figure 13.2). China’s stainless steel consumption growth and the ongoing influence of the US-China trade tensions represent significant swing factors, as well as the extent of Indonesia’s export ban.

Figure 13.1: Recent nickel price and stock level trends



Source: Bloomberg (2019), London Metal Exchange (2019)

Figure 13.2: Forecast nickel spot price and stock levels



Source: Bloomberg (2019) London Metal Exchange; S&P Platts Global 2019; Department of Industry, Innovation and Science (2019)

### 13.3 World consumption

#### China's manufacturing supports consumption growth

In 2019 world nickel consumption is estimated to be 2.4 million tonnes — 2.5 per cent higher than in 2018. This is slower than recent years, as growth has been weighed down by deteriorating world economic conditions. China accounts for more than half of world nickel consumption, and in the year to September, nickel consumption grew 13 per cent compared to the same period in 2018 (Figure 13.3). Stainless steel production, the largest use of nickel, has been stagnant in most countries except for China. World nickel consumption excluding China fell 2.9 per cent in the year to September, primarily due to lower consumption in Japan and flat consumption in Indonesia.

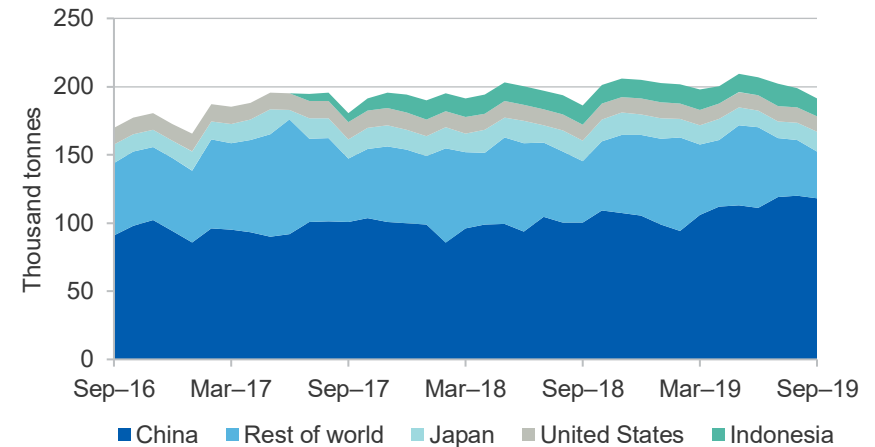
#### Healthy consumption growth expected over outlook period

World nickel demand is forecast to grow at an average 2.0 per cent a year over the outlook period, reaching 2.5 million tonnes in 2021. Higher usage in China is expected to account for most of this growth. However, China nickel pig iron processing is heavily reliant on imports of Indonesian nickel ore, which may be constrained by export restrictions. Usage in Indonesia is expected to continue growing, with downstream investment in nickel smelting capacity and expanding stainless steel manufacturing. Partly supported by Indonesia's export ban, 6,500 tonnes of new stainless steel capacity is expected to come online in Indonesia over the outlook period.

Nickel used in batteries is currently a small market, accounting for about 3 per cent of nickel usage. However, growth in stationary energy storage and electric vehicles is expected to raise nickel usage, particularly as nickel intensity in battery chemistry rises. The potential growth prospects are significant — Bloomberg New Energy Finance forecasts nickel used in batteries could rise by over 20 per cent a year over the outlook period.

Strong consumption forecasts are expected to outpace production growth and leave markets in continued deficit — although the production outlook is very uncertain with a number of political factors at play.

Figure 13.3: Nickel consumption by major country



Source: International Nickel Study Group (2019), Department of Industry, Innovation and Science (2019)

### 13.4 World production

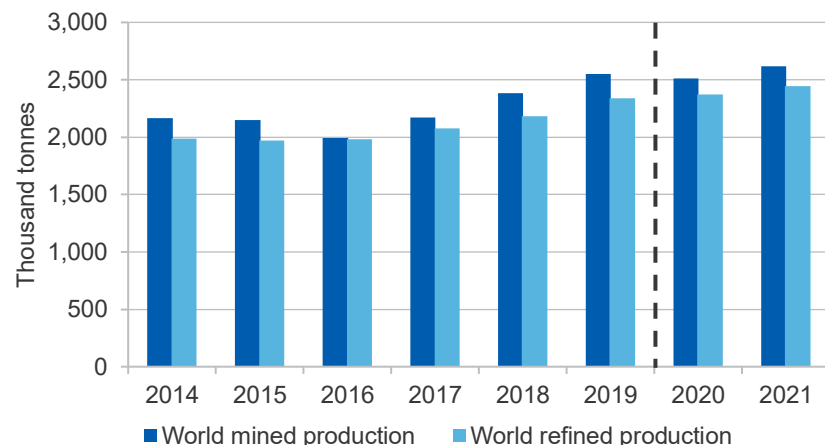
#### Nickel output grows amid positive price signals

In 2019, mined nickel output is estimated to have reached 2.6 million tonnes, 7.0 per cent higher than 2018 (Figure 13.4). Nickel output has been incentivised by strong price signals and prospective consumption growth, and Indonesia has accounted for most of this growth. Production from the Philippines — the world's third largest producer — has been constrained in 2019. Increasing environmental standards and government audits have led to a number of open pit mines being temporarily closed, and there is potential for the policy to be extended. Mine output is forecast to decline slightly in 2020, before recovering to 2.6 million tonnes in 2021.

Investment in refinery capacity is expected to support further growth over the outlook period, with refined production forecast to reach 2.4 million tonnes by 2021, up from an estimated 2.3 million tonnes in 2019. There is a potential 130,000 tonnes of new refined nickel capacity being considered in China that could come online over the outlook period, as well as 90,000

tonnes of capacity in Indonesia. The progress of these projects will be dependent on nickel prices maintaining current strength.

**Figure 13.4: World nickel production**



Source: International Nickel Study Group (2019), Department of Industry, Innovation and Science (2019)

### Indonesia's export ban to change market fundamentals

Announcements relating to Indonesia's ban on the export of unprocessed nickel had a significant impact on market sentiment in the second half of 2019. The policy is designed to force the development of downstream refining capacity in Indonesia, including nickel pig iron and stainless steel capacity, as well as potential battery manufacturing. In late August, the Indonesian Government announced that nickel ore exports will be banned from January 2020, earlier than the original 2022 start date. This resulted in price hikes, a rush to increase exports and a lowering of warehouse stock levels. China's imports of unprocessed nickel jumped following the announcement, increasing 56 per cent year-on-year in September.

In late October, the Indonesian Government placed an immediate ban on exports in response to the spike in exports. For companies that could

prove sufficient investment in downstream processing capacity, the export ban was lifted in mid-November.

Removing Indonesia's nickel output from the world market is expected to have significant impacts on world supply, and constrain refinery activity in China. In the past the loss of Indonesia's exports have been accommodated by higher Pilipino production. However, this production is likely to be constrained by capacity limits and seasonal factors.

## 13.5 Australia

### Export earnings up with strong prices and growing production

Australia's nickel exports are forecast to grow at an average rate of almost 9.0 per cent a year, from \$3.6 billion in 2018–19 to \$4.7 billion in 2020–21 (Figure 13.5). Stronger prices are a significant driver behind this growth. However export volumes are also expected to increase steadily over the outlook period, increasing from 225,000 tonnes in 2018–19 to 270,000 tonnes in 2020–21.

### New projects support Australia's production growth

A positive market environment continues to incentivise growth in Australia's nickel production. Mine production is expected to recover from the outages and closures experienced in 2018–19, lifting from 161,000 tonnes in 2018–19 to a forecast 223,000 tonnes in 2020–21. BHP's Mt Keith Satellite project, which includes the Yakabindie and Venus deposits, is expected to support higher production over the outlook period. The Yakabindie deposit is expected to be exploited first, potentially starting before the end of 2019, however at the time of writing, this had not been confirmed.

A number of mines on care and maintenance are considering reopening, including First Quantum's Ravensthorpe mine, which closed in October 2017. First Quantum has indicated the mine may reopen in the first half of 2020. A drilling program is being pursued to investigate the restart of Poseidon Nickel's Black Swan project, which was placed on care and

maintenance in 2009. Once approved, it is expected these projects could quickly bring production to the market, in 6-12 months.

Growing nickel sulphate demand from battery makers is prompting a flurry of investment activity in nickel (and cobalt) refining capacity. New investment is forecast to push Australia's refinery production up from 114,000 tonnes in 2018–19 to 141,000 tonnes by 2020–21. BHP's Kwinana refinery expansion in Western Australia is one of the largest projects under development. The first stage of 100,000 tonnes of annual capacity is expected to come online in 2020, and will produce nickel sulphate for export to China.

There are a number of nickel-cobalt projects under consideration that could come online beyond the outlook period, pending favourable nickel and cobalt price outlooks (see *Major Projects* chapter).

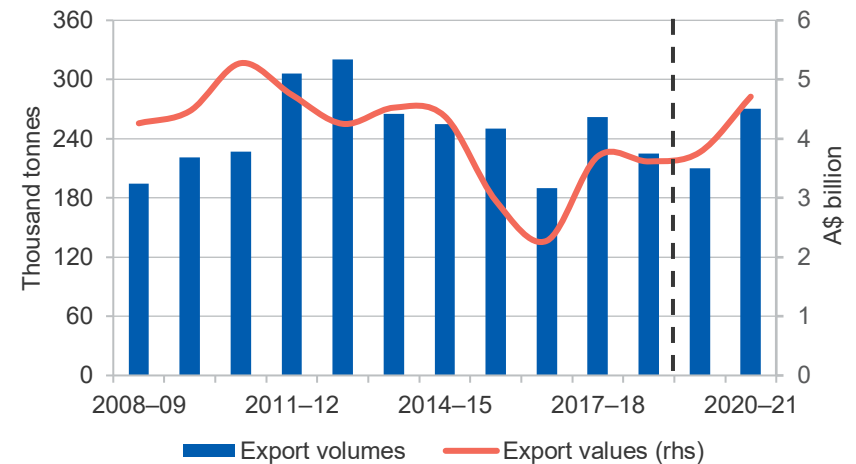
#### Positive signs for exploration activity

Nickel and cobalt exploration continued to increase in the September quarter, reaching \$64 million, 37 per cent higher year-on-year (Figure 13.6). Higher nickel prices and an interest in cobalt sourced outside of the Democratic Republic of the Congo may have stimulated exploration activity.

#### Revisions to the outlook

Forecasts for Australia's nickel export earnings have been revised down since the September 2019 *Resources and Energy Quarterly*. Lower forecast volumes and price revisions have prompted downward revisions to export earnings of \$1.2 billion and \$896 million for 2019–20 and 2020–21, respectively.

**Figure 13.5: Australia's nickel export volumes and values**



Source: ABS (2019) International Trade in Goods and Services, 5368.0; Department of Industry, Innovation and Science (2019)

**Figure 13.6: Quarterly nickel and cobalt exploration expenditure**



Source: ABS (2019) Mineral and Petroleum Exploration 8412.0

**Table 13.1: Nickel outlook**

World	Unit	2018	2019 <sup>s</sup>	2020 <sup>f</sup>	2021 <sup>f</sup>	Annual percentage change		
						2019 <sup>s</sup>	2020 <sup>f</sup>	2021 <sup>f</sup>
Production								
– mine	kt	2,383	2,550	2,513	2,618	7.0	-1.5	4.2
– refined	kt	2,183	2,336	2,371	2,442	7.0	1.5	3.0
Consumption	kt	2,327	2,386	2,445	2,482	2.5	2.5	1.5
Stocks	kt	225	175	101	62	-22.0	-42.3	-39.2
– weeks of consumption		5.0	3.8	2.2	1.3	-23.9	-43.7	-40.1
Price LME								
– nominal	US\$/t	13,133	14,049	15,795	16,501	7.0	12.4	4.5
	Usc/lb	596	637	716	748	7.0	12.4	4.5
– real <sup>b</sup>	US\$/t	13,374	14,049	15,470	15,829	5.1	10.1	2.3
	Usc/lb	607	637	702	718	5.1	10.1	2.3
Australia	Unit	2017–18	2018–19	2019–20 <sup>f</sup>	2020–21 <sup>f</sup>	2018–19	2019–20 <sup>f</sup>	2020–21 <sup>f</sup>
Production								
– mine <sup>c</sup>	kt	167	161	158	223	-4.0	-1.4	40.8
– refined	kt	111	114	115	141	2.1	1.0	23.1
– intermediate		27	13	18	16	-53.2	41.6	-9.6
Export volume <sup>d</sup>	kt	262	225	210	270	-14.2	-6.6	28.7
– nominal value	A\$m	3,701	3,616	3,771	4,711	-2.3	4.3	24.9
– real value <sup>e</sup>	A\$m	3,827	3,679	3,771	4,623	-3.9	2.5	22.6

Notes: **b** In 2019 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 2019–20 financial year Australian dollars; **f** Forecast; **s** estimate.

Source: ABS (2019) International Trade in Goods and Services, Australia, Cat. No. 5368.0; Company reports; Department of Industry, Innovation and Science; International Nickel Study Group (2019); LME (2019); World Bureau of Metal Statistics (2019)