

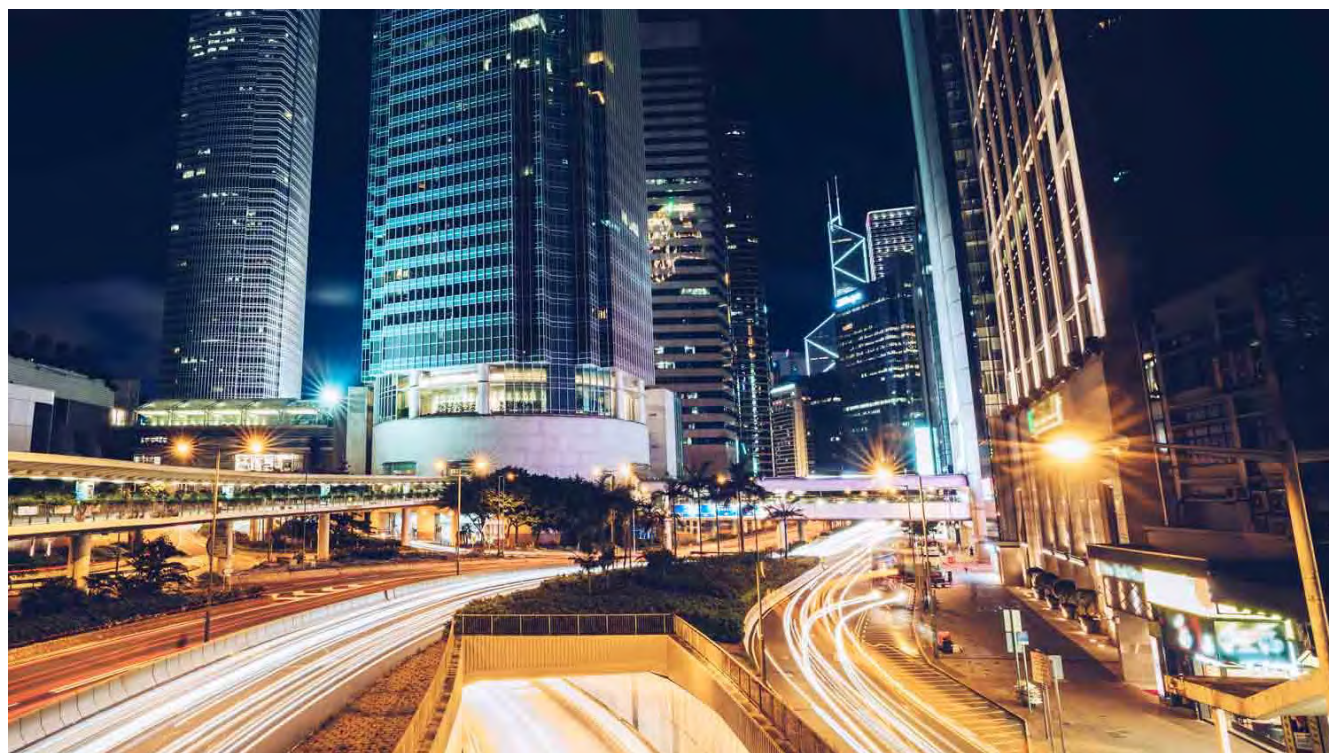
# BHP

## BHP's economic and commodity outlook

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## Market outlook

Twelve months ago, in advance of our full year results for the 2017 financial year, an air of cautious optimism was beginning to permeate commodity markets. On balance, events since have justified that optimism.

While many policy and geopolitical challenges remain, some new and others of long standing, happily the global economy has been resilient to this backdrop to date, and has performed well.

The result has been a solid price performance by our key commodities.

While uncertainties remain, and it is expected that prices *will* be volatile, we continue to feel confident that we have left the cycle trough behind us. That said, we have revised our near-term world growth mid-case downwards.

The downgrade reflects the negative impact of rising trade protection, which we expect will be partially offset by more expansionary domestic policy settings.

The net impact on key end-use sectors is expected to be modestly negative relative to the previous forecast.

For the year ahead, we assess that the directional risks to prices across our diversified portfolio are mixed. We anticipate that benchmark prices for steel making raw materials are likely to remain above long run marginal cost, on average. Within that grouping, metallurgical coal may sustain such a price level deeper into the cycle than iron ore. Quality differentials in both commodities are expected to remain wide, based on [durable changes in the operating environment](#) of the Chinese steel industry. The upside and downside risks for oil are balanced. Copper prices remain susceptible to swings in global policy uncertainty. The near-term commodity-specific fundamentals of both the oil and copper markets are sound.

Looking beyond the immediate picture, in the medium-term, we see the need for additional supply, both new and replacement, to be induced across most of the sectors in which we operate.

In many cases, this could lead to higher-cost supply entering the cost curve.

This projected steepening of cost curves can reasonably be expected to reward disciplined owner-operators with high quality assets.

On the demand side, we continue to see emerging Asia as an opportunity rich region. China, [India](#), ASEAN and the global impact of [China's Belt and Road initiative](#) are all expected to provide additional demand for our products.

As the true economic costs of trade protection are progressively recognised by global consumers, we anticipate that a popular mandate for a more open international trading environment will eventually emerge.

Looking even further ahead, the basic elements of our positive long-term view remain in place.

Population growth and rising living standards are likely to drive demand for energy, metals, and [fertilisers](#) for decades to come.

New demand centres will emerge where the twin levers of industrialisation and urbanisation are still developing today. Emerging themes, such as sustainable end-to-end supply chains, will become even more important for competitiveness.

Technology will advance, creating both [opportunities](#) and threats, and climate change policy, technology and market responses will evolve.

Against that backdrop, we are confident we have the right assets in the right commodities in the right jurisdictions, with attractive optionality, with demand diversified by end-use sector and geography.

Near-term uncertainty, attractive long-term fundamentals

Short

Medium

Long

Policy uncertainty	Growth moderating	New copper & oil supply	Steeper cost curves	Growth in population, wealth	New demand centres and themes
Sentiment mixed	Prudently cautious	Sustainable productivity	Emerging Asia	Decarbonisation and electrification	Technology

## Global economic growth

World economic growth is likely to be in the range of 3½ to 4 per cent in real terms in calendar year 2018, similar to calendar year 2017. That is up from around 3¼ per cent in calendar year 2016. Nominal growth rates are also looking healthy, reflecting a welcome exit from the deflationary risks of the relatively recent past. In 2018, advanced economies should enjoy their strongest collective growth outcome since 2010, offsetting a modest growth slowdown in China.

The recovery of commodity prices has enabled large parts of the emerging world, and resource rich regions in the developed world, to stabilise. The manufacturing export economies of Europe and North Asia have also established healthier growth trajectories.

Global trade volumes are expected to expand about 1 percentage point faster than world GDP for the second consecutive year in calendar year 2018. However, sustaining that relativity will be very difficult given the emerging policy climate.

We have accordingly revised our near-term estimates of world GDP and trade growth.

We now expect world GDP growth to fall in the range of 3¼ to 3¾ per cent in 2019 and 2020. World trade volumes are expected to expand at a similar pace to GDP.

**“While we stress that an increase in trade protection alone is not a recessionary level shock for the global economy, it is an exceedingly unhelpful starting point for the pursuit of broad based growth across regions, expenditure drivers and industries.”**

That observation highlights the importance of continued advocacy for free trade and open markets by corporations, governments and civil society, led by the “fourth estate”. On this point, we welcome both the signing of the Comprehensive and Progressive Agreement for Trans–Pacific Partnership (CPTPP) in March of this year, and the openness of this group to new membership. We have a physical presence in eight of the eleven signatory jurisdictions.<sup>1</sup> We are also encouraged by the apparent progress being made towards concluding the Regional Comprehensive Economic Partnership (RCEP).<sup>2</sup>

Financial conditions have tightened only modestly in advanced countries, with higher policy interest rates in the United States offset by a relatively flat Treasury yield curve and the continuation of easy monetary policy elsewhere. In emerging markets, however, financial conditions have tightened more appreciably, particularly for oil importers with large external financing requirements.

The US dollar has strengthened recently. Over the last twelve months though, the US dollar is essentially unchanged on a real, trade–weighted basis. The wide ranging impact of the US Federal Reserve’s policy tightening cycle, conducted against a backdrop of fiscal expansion, tariff–induced price increases and full employment at home, and pockets of financial fragility abroad<sup>3</sup>, remains a key source of uncertainty.

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<sup>1</sup> Australia, Chile, Peru, Malaysia, Singapore, Japan, Mexico and Canada. The remaining three nations are Vietnam, Brunei and Thailand.

<sup>2</sup> RCEP attempts to bring together ASEAN and the six nations with which ASEAN has an existing FTA (Australia, New Zealand, China, India, Japan, South Korea).

<sup>3</sup> In general, emerging markets with large ‘hard currency’ external financing requirements are exposed to heightened risk in the current environment. Turkey is the most topical current example.

## Chinese economic growth

China's economic growth is expected to slow modestly in the coming years, following a robust performance in calendar year 2017 that has spilled over into the first half of calendar 2018. We have lowered our forecasts for next year, modestly, reflecting the likely impact of US trade protection on the export sector and an appropriately calibrated countervailing domestic policy response.

For the remainder of calendar year 2018 specifically, we anticipate a cooling of growth rates in the housing and automobile markets in combination with the continuation of strength in machinery. We anticipate that infrastructure will rebound somewhat following a slight dip in the June quarter. Exports to the US will undoubtedly slow in response to rising protection, but overall export growth remains healthy, for now, reflecting the solid, broad based global demand backdrop.<sup>4</sup>

The contribution to GDP growth of fixed investment is likely to be lower than in calendar year 2017, while the contribution from consumption is likely to be similar. This constellation of expenditure drivers is consistent with the ongoing transition from high-speed to more sustainable rates of growth.

Our modelling suggests that the *gross* negative impact of US–Sino trade protection on Chinese GDP growth will fall in the range of  $-\frac{1}{4}$  to  $-\frac{3}{4}$  of a percentage point. The expected *gross* negative impact on the US also falls within that range.<sup>5</sup>

Our previous expectation was that the Chinese policy mix in calendar years 2019 and 2020 would feature modestly expansionary fiscal policy and modestly restrictive monetary and credit policies. We now anticipate that both major arms of policy will be calibrated to help offset the anticipated shock to the export sector. Recent communications from the State Council and subsequent actions from the People's Bank of China support this contention. This tilt in the policy stance will reduce the net impact on overall Chinese growth – and on end-use demand for our commodities.

News-based measures of policy uncertainty<sup>6</sup> in China show that trade tensions have had a material impact on Chinese consumers and businesses. However, the scale of the increase is smaller than the impulses we have observed historically during times of pronounced domestic policy uncertainty, which is somewhat encouraging.

In terms of more enduring frameworks, China's policymakers are expected to continue to seek a balance between the pursuit of reform and the maintenance of macroeconomic and financial stability. We anticipate a continuation of current efforts to address excess capacity; further encouragement for the financial system to focus on supporting the real economy; and additional measures aimed at improving both sectoral and aggregate balance sheet health, including local government.

Nevertheless, China is expected to remain the largest incremental contributor to global industrial value-added and fixed investment activity through the 2020s even as its growth rates mature.

<sup>4</sup> In nominal US dollar terms, China's exports and imports of goods grew at 11.3 per cent and 14.1 per cent respectively, in June 2018. In nominal local currency terms, the respective growth rates were around 3 per cent and 6 per cent. Despite the general perception of balance of payments strain on emerging markets, USD/CNY has actually moved in China's favour over the year to June 2018.

<sup>5</sup> We have simulated three versions of the trade tensions, of escalating severity, with the US\$50bn tariff tit-for-tat being the middle scenario. The impact on China in each scenario is slightly larger than the impact on the US, reflecting the relative importance of the bilateral trade to each economy. However, given the importance of foreign value-added to gross Chinese exports, it is important not to overstate the impact on Chinese domestic value-added by a literal application of changes in gross export growth rates or shares. Our simulations are run in *G-Cubed*, a large model of the global economy featuring integration of the real and financial markets across economies and intertemporal accounting of both real and financial assets. For more details please refer to: <https://www.brookings.edu/wp-content/uploads/2016/06/bdp118.pdf>

<sup>6</sup> The underlying data series referred to captures the relative frequency of references to policy and economic uncertainty in major media channels over time. They are available from [www.policyuncertainty.com](http://www.policyuncertainty.com). The May 2018 reading was 2.4 standard deviations above the long run mean. This is a smaller jump than what we have historically observed at times of stock market turmoil (peak of 4.2 standard deviations) or major leadership transitions (peak of 3.1 standard deviations in 2012). Major economic events such as WTO accession or the GFC tends to produce readings above 4 standard deviations.

**“One objective of China’s Supply Side Reforms has been to return highly–indebted heavy industrial sectors to profitability, thereby reducing [systemic risk in the financial system](#).”**

This objective is roughly on track, in our view.

A second objective of China’s Supply Side Reforms has been to improve urban living standards by tightening environmental regulations and improving the enforcement of those regulations. This objective is being pursued with considerable resolve.

We anticipate that housing policies will remain directed towards limiting speculation, building rental markets and fine–tuning the shantytown redevelopment programme. However, there is a possibility that some controls, such as those related to credit availability and purchasing activity, could be eased as a temporary counter–cyclical measure to solidify domestic demand in response to slowing exports.

Over the longer-term, our view remains that China’s economic growth rate should moderate as the working age population falls and the capital stock matures. China’s broad production structure is expected to continue to rebalance from industry to services and its expenditure drivers are likely to shift from investment and exports towards consumption.

Within industry, we expect a concerted move up the manufacturing value–chain, consistent with the strategic sectors nominated in the *Made in China 2025* policy. More broadly, we anticipate that environmental concerns will become an even more important consideration in future policy design than they are today.

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## Major advanced economies

The near-term outlook for the US economy is sound.

With the nation close to full employment based on traditional measures, housing prices on an upswing, inflation edging towards target and domestic demand enjoying a tailwind of fiscal stimulus,<sup>7</sup> the US Federal Reserve’s forward policy guidance of three to four 0.25 per cent rate increases in calendar year 2018, two of which have already been delivered, seems reasonable. Despite the policy outlook, the shrinking of spare capacity in the real economy, the imminent inflationary impact of tariff increases and the measured unwinding of quantitative easing that is now under way, long-term nominal yields in the US remain below 3 per cent at the time of writing.

News–based policy uncertainty in the United States is presently low by historical standards. That, perhaps, highlights the domestic prominence of the tax package and the well telegraphed path of monetary policy normalisation, rather than a studied reflection on the risks embodied in the emerging state of affairs in foreign and trade policy.

**“We note that the true costs of protectionism, particularly diminished consumer purchasing power, have not yet been felt by US households and businesses.”**

<sup>7</sup> We detailed our modelling of this issue at the time of the half–year results. The simulations suggested that average medium-term living standards in the US are likely to rise as a result of the package. The most sustainable element of the initial gains are those attributed to the higher investment that may be motivated by the lower corporate tax rate, with positive spill–overs to productivity and job creation. As the corporate tax rate cut is “permanent” and the personal income tax cuts are “temporary” (expiring in 2027), forward looking consumers are expected to change their behavior much less than firms.

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Weakening domestic consumption, and hence sales, and declining international competitiveness, are the inevitable medium-term outcome of such a turn inwards. Further, it is very unlikely that the current policy mix in the US will lower the nation's trade deficit, which seems to be a core objective of the current administration. US deficits are principally a function of its low relative national savings rate and the US dollar's role as the world's principal vehicle currency.<sup>8</sup>

In Europe and Japan, business confidence, particularly among manufacturers, picked up in calendar year 2017, and conditions remained generally positive in early calendar year 2018. Trade tensions have partially reversed that trend in recent months, although actual activity levels remain healthy enough.

For both regions, where the limits of monetary policy effectiveness may have been reached and public sector finances are stretched, we gauge that any upside to growth in the medium-term will have to come from external demand sources. Shorter-term, both regions have seen improved outcomes over the last year and a half on the back of the recovery in global trade, as well as firmer domestic demand. If bilateral tensions between the US and China escalate further, both regions are likely to see an increase in their exports to each country. However, uncertainty with respect to EU-US and EU-UK trade relations, as well as the lack of alignment among the G7 nations on Iranian sanctions, seem to be front of mind for many continental firms in both the manufacturing and services sectors. The possibility of the US instituting global auto tariffs – the US Commerce Department is presently studying the matter – would clearly be a damaging development for both Europe and Japan.

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## India

India's [economy](#) is on a healthy medium-term growth trajectory. Reform signposts have been positive, underscoring the nation's long run potential. We note in particular its ascent as the number one destination globally for announced greenfield foreign direct investment; the introduction of a nationwide goods and services tax; an improved institutional setting [for infrastructure planning and project execution](#); and the determined efforts of policymakers to address non-performing loans in the banking system, particularly in the steel and power industries. On a short-term note, moving into a critical election year for the central government, the observed lift in oil prices is likely to drive an increase in Indian inflation, and act as a drag on its balance of payments and fiscal position. Offsetting that is the reality of a strong rebound in commercial and industrial activity as the disruptive impact of earlier policy reforms fades.

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<sup>8</sup> The link between trade deficits and reserve currency status is known as the "Triffin dilemma".



## Steel and pig iron

Global steel production growth rebounded strongly in calendar year 2017, with output increasing by 4 per cent YoY. That positive momentum has continued in the first half of calendar 2018. The recovery has been broad based and synchronous. According to *worldsteel* the global production run-rate hit a record of 1,842 Mtpa in June 2018, representing a growth rate of 5.8 per cent YoY. During H1 CY2018, production reached 1,778 Mtpa, or 4.6 per cent YoY. Pig iron output growth has been slower than that of total steel production, at 3.8 per cent YoY as of June 2018, or 1.3 per cent in H1 CY2018. Chinese output of pig iron increased by 3.8 per cent YoY during the month.

**“Rising demand from key end-use sectors across all major regions and the ongoing impact of Supply Side Reform measures in China have led to higher capacity utilisation rates globally.”**

This has translated into wider margins and much improved profitability for mills. Global utilisation has reached around 78 per cent, the highest since calendar year 2012. That is around 13 percentage points higher than at the cycle trough.

The response to, and impact of, higher steel tariffs in the United States is a source of uncertainty. What is certain is that end-users in the US are paying considerably more for their steel than end-users in other regions. Hot-rolled coil (HRC) prices in the United States adjusted rapidly to pre-empt the tariffs. US HRC prices have now reached US\$1,000/t. That compares to prices in the mid US\$600s and the mid US\$500s in northern Europe and China respectively.

In line with the expected slowdown in housing and autos, and the intra-year constraints imposed by environmental policies, China’s steel production growth is expected to moderate in the remainder of the 2018 calendar year based on our analysis. However, the market is expected to remain relatively tight for some time, with margins elevated. The publication of the working plan for the “Blue Sky Campaign”<sup>9</sup> has alleviated some uncertainty with respect to how the authorities will proceed with environmental restrictions.

We estimate that 80 per cent is the long run equilibrium crude steel capacity rate, consistent with the stated objectives in China’s steel industry Five Year Plan (2016–2020). That compares to slightly less than 70 per cent at the cycle trough and upwards of 85 per cent at the height of disruptions. In the early part of the Chinese summer, with most blast furnaces ex-Tangshan essentially free to operate, utilisation was close to 80 per cent.

We firmly believe that China will ultimately double its accumulated stock of steel in use, which is currently about 6 tonnes per capita. That stock is about half of the current US level and slightly less than half the German, South Korean and Japanese levels. However, the exact path to this end point for China has become less certain due to increasing protection and aggressive capacity removal actions. Among the range of possibilities we consider, our base case remains that Chinese steel production is yet to peak. The most likely timing of the peak is the middle of next decade.

Notably, the annualised steel production run-rate in China hit a record of 976 Mt in June 2018, while the 2017 calendar year tracked at 832 Mt, despite the winter cuts. Both figures are comfortably above the previous historical annual high of 822 Mt achieved back in calendar year 2014.

The recovery in the rest of the world continued in the first half of calendar year 2018. Based on figures from *worldsteel*, global steel production excluding China was up 3.2 per cent during H1 CY2018, at 868 Mtpa. Global pig iron, ex China, expanded by 2.5 per cent YoY during the period.

<sup>9</sup> The “Blue Sky Campaign” was issued by China’s Ministry of Ecology and Environment on June 7 2018. It presents a timetable for, and the geographic boundaries of, a comprehensive range of anti-pollution measures.

India saw steel output growth of 5.1 per cent YoY in H1 CY2018, with domestic demand recovering across the infrastructure, construction and automobile sectors. Europe has been performing solidly (2.1 per cent YoY, run-rate 218 Mtpa during H1 CY2018), following the broad-based growth across key end-use sectors observed in calendar 2017. Eurofer is predicting a steady demand expansion through calendar year 2019, led by construction and machinery. Growth in North America was a healthy 2.4 per cent YoY in H1 CY2018, with a 119 Mtpa run-rate. The CIS (Commonwealth of Independent States), which had been lagging behind the recovery in the rest of the world in calendar year 2017, has rebounded to grow by 2.8 per cent YoY during the first half of CY2018.

Steel production elsewhere in Asia has been solid. The two major players, Japan and South Korea, are tracking well at 1.3 per cent YoY (run-rate of 107 Mtpa) and 3.7 per cent YoY (run-rate of 73 Mtpa) respectively during H1 CY2018. Japanese construction demand is improving, which is offsetting slower manufacturing demand and slightly lower direct exports. Some of our customers have indicated that construction activity is now expected to support solid end-use demand up to, and possibly beyond, the Tokyo Olympic Games in the summer of 2020.

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## Iron ore

**Iron ore prices (62%, CFR)** ranged between US\$63/dmt and US\$80/dmt over the past six months, averaging US\$70/dmt (-6 per cent YoY). Demand for high grade mainstream iron ore remained firm on the back of healthy pig iron production and exceptionally attractive steel margins created jointly by steel Supply Side Reform and production curbs aimed at air quality improvement. Seaborne lump premia have been volatile amid periodical sintering and pelletising restrictions. Having hit a record high of US\$0.46/dmtu in September 2017, and a low of US\$0.08/dmtu in December 2017, the lump premia has trended steadily upwards since the Chinese New Year. It reached US\$0.30/dmtu in late June 2018. Global contestable iron ore demand is estimated to increase 1 per cent YoY in calendar year 2018, to 1,562 Mt (62% Fe equivalent, dry basis) - the highest level on record.

In aggregate, the seaborne majors delivered exports at the lower to middle end of production guidance ranges in the March quarter, with the pace picking up through the June quarter in line with seasonal norms. Chinese imports of iron ore reached a run-rate of 1,108 Mtpa in May 2018, 2.9 per cent higher YoY, versus a more sedate year-to-date figure of 0.6 per cent. We observe that this incremental lift in supply has allowed the market to transition gently from relatively tight at the time of our half-year results, to relatively balanced as we write.

Price sensitive seaborne supply dissipated in the second half that the 2017 calendar year, as lower grade ores began to attract even steeper impurity discounts. There was no change to this general situation in the first half of calendar 2018. The run rate of Chinese domestic iron ore concentrate production was 193 Mtpa in June, -7.1 per cent lower YoY. Both private and SOE mines have lowered their production over the year. Going forward, in addition to structural market based drivers, safety and environmental inspections are likely to have a material influence on Chinese domestic iron ore production.

**“Our blast furnace customers in China continue to pursue enhanced productivity,”**

with both HRC and rebar gross margins having exceeded US\$100/t for most of the half. Given the elevated demand for medium and high grade products implied by these conditions, it is no surprise that the percentage of trader inventories of ores in the 56 to 60 per cent bucket have grown (+5 percentage points to 46 per cent) at the expense of the medium to high grade bucket (-5 percentage points to 54 per cent) over the six months period ending June 2018.

We note that the importance of aggregate port inventory levels for assessing future index price direction has been reduced somewhat by changes in the operating environment. Under these evolving conditions, the relative abundance of fines by category (as detailed above) has become at least as important as developments in the total for assessing price and differential trends.

At the time of our half-year results in February, we argued that we were “optimistic that the 62 per cent index price can be relatively resilient to slowing end-use demand and growing seaborne supply in the coming half year. Spreads between the 62 per cent index and lower grade ores are likely to remain wide, with penalties for impurities at least as important as Fe units as a driver of that trend.” That remains a reasonable starting point for assessing the outlook for the coming six months. The caveat is that the “Blue Sky” program has the potential to amplify intra-year volatility in the supply-demand balance, even if it does not translate into equal volatility in mill margins.

In the medium to long-term, the on-going Supply Side Reform, the migration of steel capacity to the coastal regions and more stringent environmental policies are all expected to underpin the demand for high quality seaborne iron ore fines and direct charge materials such as lump. The South Flank project, which was approved in June, will raise the quality of our overall portfolio, in addition to increasing the share of lump product in our total output.

We remain of the opinion that around two-thirds of the movement in [product quality differentials](#) since the introduction of Supply Side Reform will be durable.

We continue to contend that the long run price will likely be set by a higher-cost, lower value-in-use asset in either Australia or Brazil.

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## Metallurgical coal

**Metallurgical coal** prices<sup>10</sup> over the last six months have ranged from a low of US\$175/t FOB Australia on the PLV index in April 2018 to a high of US\$262/t in January 2018. MV64 has ranged from US\$167/t to US\$202/t; PCI has ranged from US\$129/t to US\$159/t; and SSCC has ranged from US\$113/t to US\$134/t. Approximately three-fifths of our tonnes reference the PLV index.

We have been pleased to see further growth in the met coal derivatives market, with traded turnover relative to the physical market rising at a faster pace than iron ore futures did at a similar stage of development.

**“The differential between the PLV and MV64 indexes averaged 18 per cent in the financial year 2018. That compares to an average of 12 per cent in financial year 2017.”**

Similar to our view on iron ore, our technical and market research, in addition to extensive customer liaison, indicate that the premia presently being attracted by high quality coking coals are predominantly a structural phenomenon.

Pig iron production in contestable met coal markets is estimated to have increased by 1.3 per cent year-to-date YoY as of June 2018.

On balance, the seaborne market for coals referencing the PLV, PMV and MV64 indices still feels relatively tight going into the second half of calendar 2018.

Demand growth has been reasonably broad based by region, with India and Europe leading the way. Blast furnace restarts in India have driven a 14 per cent YoY increase in import volumes (across all met coal categories) as of June 2018. Longer-term, we anticipate that India and south-east Asia will be the main sources of incremental growth in seaborne demand for metallurgical coal.

<sup>10</sup> The abbreviations used in the metallurgical coal section are as follows – PLV: Premium Low-Volatile, PMV: Premium Mid-Volatile, MV64: Mid-Volatile 64, PCI: Pulverised Coal Injection, SSCC: Semi-soft Coking Coal, as published by Platts

On the supply side, coal throughput and vessel queues at the major Queensland ports have normalised to some extent after the major disruptions of calendar year 2017. However, uncertainty remains with respect to mine-to-port logistics, due to both unplanned rail maintenance and prospective industrial relations activity. Met coal exports from the United States have responded to attractive seaborne prices, expanding by 22 per cent year-to-date YoY as of June. Europe, India and Brazil were the main destinations for US East Coast cargoes. Exports from Mozambique and Mongolia have been lower than expectations. Domestic Chinese supply has been relatively steady overall against a background of regional environmental pressures.

The extension of “Blue Sky” restrictions to China’s domestic coking coal (and merchant cokery) heartland (the Fenwei Plain), uncertainty around Mongolian supply, higher Chinese domestic logistics costs<sup>11</sup>, and increased Chinese tariffs on US met coal may all increase the competitiveness of high quality Australian coals into coastal China, at the margin. Notably, while there remains potential for intra-year import curbs during lower demand periods, such curbs tend to impact upon energy coal and lower grade of met coal, and on lower tier ports. The vast majority of premium met coal cargoes are destined for tier one ports.

We maintain a constructive medium-term outlook for metallurgical coal prices. The Supply Side Reform and heightened environmental controls in China are both supportive of the market. In the medium-term, the price benefits are expected to operate mainly through rising land-based logistics costs for domestic coals; enhanced value-in-use realisation for low impurity, high coke-strength after reaction products; policy induced as well as voluntary supply and capacity discipline among Chinese producers; and the overall productivity imperative among China’s blast furnace fleet in a world of structurally higher steel margins. So while prices will always be volatile within and across years based on both cyclical and idiosyncratic influences, it seems reasonable to suggest that met coal prices can sustain above long run marginal cost, on average, for some time to come.

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## Copper

**Copper prices** ranged from US\$6500/t to US\$7263/t (US\$2.95/lb to US\$3.30/lb) over the second half of the financial year, averaging US\$6,917/t (US\$3.14/lb).<sup>12</sup> Prices were trading near the top of this range in early June. They subsequently weakened across the end of the financial year and into July and August as investor appetite for pro-growth asset classes declined on the back of escalating trade tension. We assess that the current fundamentals support an approximate trading range of US\$6,500/t to US\$7,000/t. However, given the slightly lower global growth trajectory we now envisage, and the impact of trade tensions on financial market sentiment, the average for the coming year is more likely to be in the lower end of that range, rather than in the middle.

Chinese end-use demand has been solid, but on a narrower base than in calendar year 2017. Housing starts have grown modestly but the auto sector has been basically flat overall, notwithstanding rapid growth off a low base in ‘new energy vehicles’. Machinery has continued to grow at a healthy pace, while air conditioners have also performed well. Power infrastructure has been a soft spot. Grid capital spending and transformer production have both contracted from a year ago.

<sup>11</sup> There is some overlap here with the Blue Sky measures. However, the now ‘mature’ regulation with respect to over-loading of trucks, and the fact that the road-to-rail initiative was in place well beforehand, justifies the additional discrete observation.

<sup>12</sup> Settlement basis. Daily closes may differ slightly.

Demand from the rest of the world has been generally healthy overall, albeit mixed on a sectoral and regional basis. Housing starts have been strong in the United States. Upstream electronics demand has also been strong, with global semiconductor sales growth exceeding 20 per cent YoY in calendar year 2018 to date. Auto sales trends have been mixed, with the United States weak, but Europe, India, Brazil and other Asia all solid. However, purchasing managers' index readings in Europe and developed Asia have been softening since the end of the March quarter, partly reflecting uncertainty with respect to trade policy. That implies moderating near-term momentum in advanced manufacturing, which seems likely to spill into calendar year 2019.

Turning to supply, along with the Chinese ban on the import of low grade copper scrap, expectations of impending disruptions to primary supply gave a bullish tone to market commentary at the time of our half-year results. A number of major mines were facing major industrial relations negotiations, while in certain jurisdictions licensing and ownership issues that had emerged over the course of calendar 2017 seemed far from resolution. The reality has been that the majority of negotiations in South America have been concluded relatively amicably.<sup>13</sup> So despite the fact that actual fundamentals remain sound, the financial market's 'disappointment' on this front, plus heightened anxiety about the global trade situation, has seen the copper price decline considerably point-to-point from February to August.

Treatment and refining charges (TCRCs) for copper concentrates trended lower in the early months of the calendar year, reflecting the tight market of the time, driven mainly by new smelting capacity in China. That downtrend in TCRCs reversed with the closure of the Vedanta smelter at Tuticorin, India. The Metal Bulletin TC index has ranged between a high of just over US\$80/dmt and a low of US\$66/dmt. That compares to the benchmark settlement of US\$82.25/dmt. Shanghai Grade A cathode premia have been resilient to date in calendar year 2018 as China's scrap ban led to stronger than previously expected cathode imports.

Turning to the outlook, the global copper market is expected to remain roughly balanced for the next few years. Solid demand growth is expected to be matched with a combination of committed green and brownfield supply, restarts and rising scrap availability. Even so, the market looks to be finely, rather than comfortably balanced over this period, and accordingly it is expected to be vulnerable to supply shocks throughout this phase, particularly in the concentrate segment.

Developments in China are anticipated to be vital for the copper industry. Major themes include the evolution of the regulatory environment for scrap imports; the scale of investments in scrap processing capability; lifecycles of copper intensive capital stock; technical standards for aluminium usage in power cables; and the evolution of policies towards the production and uptake of electric vehicles.

Looking at the first of the questions in more detail, China's curbs on low grade scrap imports, which were phased in from the beginning of calendar year 2018, should be positive for primary demand, for a time. But beyond an inevitable adjustment phase, we do not believe this development is likely to sustainably alter longer run market balances, the incentive to invest in scrap processing capacity globally, or mine inducement dynamics.<sup>14</sup>

Subject to the above caveats on precise timing, a structural deficit is expected to open in the early 2020s, at which point we see some sustained upside for prices.

**“Grade decline, increased input costs, water constraints and a scarcity of high-quality future development opportunities are likely to result in the higher prices needed to attract sufficient investment to balance the market.”**

It is these parameters that we find are critical for assessing where the marginal tonne of primary copper will come from in the long run and what it will cost.

<sup>13</sup> An agreement with Union No. 1 at Minera Escondida was reached on 15 August 2018.

<sup>14</sup> China's announcement that they are studying a ban on the import of all solid waste by the end of 2020, including metals, is a source of uncertainty. While we are still awaiting details, some observers on the ground are arguing that Category 6 scrap may not be included in this policy.

Our view is that the price setting marginal tonne a decade hence is likely to come from either a lower grade brownfield expansion in a low risk jurisdiction, or a higher grade greenfield in a high risk jurisdiction. Neither source of metal is expected to come cheaply.

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## Crude oil

**Crude oil prices** trended upwards over the course of the March quarter, from a starting point in the mid US\$60s per barrel. They then spent most of the June quarter range trading between US\$70/bbl and US\$80/bbl. The front-month Brent minus WTI spread ranged from a low of US\$3 to a high above US\$11 in the half year, averaging a little under US\$6.

The strong performance of the oil price over the last eighteen months has surprised us in scale, but not in direction. Robust demand conditions, aggregate production discipline by the Vienna Group<sup>15</sup>, Venezuela's crisis and erratic Libyan supply, in addition to the return of a geopolitical premium, appear to have offset a sharp acceleration in US onshore production.

OPEC-12 compliance with the "Vienna Group" pact ran at 120 per cent as of June 2018, according to the International Energy Agency (IEA). That was down from 158 per cent in May. While those rates are biased upwards by the non-discretionary collapse of Venezuelan output, Saudi Arabian compliance has run at 115 per cent on average, which has effectively underwritten the credibility of the agreement to date. Going forward, the Vienna Group has agreed to target 100 per cent compliance to the original 2016 agreement. To meet this goal over the course of calendar 2019, in excess of 1.0 Mbpd of new supply will be required.

In the US, liquids production is expected to increase by almost +1½ Mbpd in calendar year 2019, with roughly half of that increase coming from the Permian. That compares to around +2 Mbpd in calendar year 2018. Pronounced take-away constraints in the Permian are evident in regional price discounting; while completion constraints are evident on a broader basis, with around 500 drilled but uncompleted wells added nationally in the calendar year to April. Takeaway constraints are expected to persist deep into calendar year 2019, while completion constraints are all expected to be alleviated somewhat earlier.

Global demand growth was strong and broad based in calendar year 2017, at +1.5 Mbpd, or 1.6 per cent YoY. The positive demand environment continued into calendar year 2018, with a very strong March quarter (+1.8 Mbpd, or 1.9 per cent YoY) recorded. However, indications are that a slowdown emerged in the June quarter. Chinese growth has remained robust overall, and is on track for an outcome between 3½ and 4 per cent in calendar year 2018. OECD demand overall has increased modestly YoY, with growth in the US and Europe partly offset by a small decline from developed countries in the Asia-Pacific. India closed the calendar year 2017 with some momentum, and this has spilled over into calendar year 2018. The IEA forecasts 6 per cent growth in India's crude demand in 2018. Transport demand continues to be a significant driver of its growth.

Vehicle miles travelled in the US, as reported by the Federal Highway Administration, are moderately higher year-to-date YoY. That represents a slowdown in growth from last year, and aligns with an observed decline in gasoline consumption. Diesel demand, however, continued to expand, consistent with anecdotal evidence of a buoyant trucking sector. Highway freight traffic in China expanded by 8.7 per cent year-to-date YoY as of May 2018, down from 10.3 per cent at the same time a year ago. The IEA estimates that Chinese demand for motor gasoline will expand by around 0.3 per cent YoY in calendar 2018, while diesel demand is expected to contract marginally.

<sup>15</sup> This term refers to all OPEC and non-OPEC nations that are participating in the current pact.

Elsewhere in transport, domestic air traffic growth<sup>16</sup> has been strong in the world's three most populous economies. In the latest data, China expanded by around 12 per cent YoY; India expanded by around 17 per cent; and the US increased by around 5½ per cent.

The IEA estimates that global demand growth will decelerate from +1.5 Mbpd in calendar year 2017 to +1.4 Mbpd in calendar year 2018. That is unchanged from six months ago. Their preliminary view on demand in calendar year 2019 is slightly higher at +1.5 Mbpd, although they acknowledge that risks are to the downside from escalating trade tensions and rising prices if supply is constrained.

A roughly balanced market is anticipated in calendar year 2018, with the risks around that view tilted towards a small surplus. We caution that this may still generate a decline in 'visible' OECD commercial inventories as we enter a seasonally stronger demand period over the second half of the calendar year.

Investment in upstream oil is expected to increase by around 5 per cent in nominal terms in calendar year 2018, according to the IEA. That follows a 4 per cent increase in calendar year 2017. The value of investment remains around 40 per cent lower than at the peak in 2014. US shale led the way, with an estimated increase of 20 per cent YoY in 2018, increasing its global share of upstream capital spending to almost one-quarter. A little more than half of the growth in shale is due to rising costs. In the conventional space, an emphasis on brownfields is clearly evident, with around two-thirds of newly sanctioned projects fitting this description.

**“In the long-term, we continue to see [compelling market fundamentals](#), underpinned by rising transport and industrial demand in the developing world in addition to a steepening cost curve underpinned by natural field decline.”**

We expect oil demand to grow by approximately 1 per cent per year over the next decade despite significant efficiency gains in the light-duty vehicle fleet. Our long run view on electric vehicles (EVs) is discussed below, as well as [here](#).

On the supply side of the market, with natural supply decline of between 3 per cent and 4 per cent per year added to the demand growth referenced above, by 2030 we see the need for new production equivalent to at least one-third of total global production today. We anticipate US tight oil production starting to plateau in the mid-2020s, at which point its role in setting global oil prices is expected to begin to diminish. That observation, and the relative lack of exploration success and investment in the conventional sphere in recent years, points to the need for known but more costly supply to be induced to fill the long run gap to demand.

By the mid-2020s, the marginal barrel is expected to come from a higher-cost non-OPEC deepwater asset.

## US natural gas

The **US natural gas price [Henry Hub]** ranged from a low of around US\$2.50/MMBtu to a high of around US\$3.20/MMBtu in the first half of calendar 2018 (excluding the very short lived spikes seen in January, when the US experienced severe winter weather).

US gas storage levels have been tracking below the five year average since late September 2017. They ended July around -20 per cent below the five year average. Remarkably, stocks were +15 per cent above the five year average as recently as April 2017. A cold winter, a strong power burn over the prior summer, growth in US LNG exports and pipeline exports to Mexico, and delays to North East pipeline projects have all helped to hasten the elimination of the storage surplus.

<sup>16</sup> All air traffic figures measured as revenue passenger kilometres.

## Liquefied natural gas (LNG)

The **Japan–Korea Marker (JKM) price for LNG** strengthened markedly last northern hemisphere winter. Prices hit a three year high in January 2018 on firm demand from end users in North Asia, particularly China. Chinese imports surged more than 40 per cent year-on-year to surpass South Korea as the #2 importer behind Japan. Slippage in the start date of new projects, along with planned and unplanned outages on the supply side also contributed to the tighter market. Prices dipped during the shoulder season, but rallied towards the end of the first half of calendar year 2018 on robust demand for the Asian summer. Strong oil prices were also a supportive factor for LNG.

Uncertainties on the demand side include China’s approach to the 2018/19 winter heating season, the timing and scale of nuclear restarts in Japan; and energy mix policies in South Korea.

On the supply side, we anticipate new supply coming online in the remainder of this calendar year, and a further lift in calendar year 2019.

Despite the strong LNG demand growth that we project for the medium-term, current and committed LNG capacity is likely to supply the market fully until the middle of next decade, with risks modestly skewed towards the need for additional supply sooner. Beyond the mid–2020s new supply will be required in a global gas market where marginal supply looks likely to come from US exports under a range of scenarios.

## Eastern Australian gas

The **East Australian natural gas** market continues to evolve. The ramp up of Queensland LNG projects has altered the shape of the market. Longer-term, we expect the domestic market will become closely linked to the international LNG market. This assessment derives from the conclusion that southern demand centres are expected to become increasingly reliant on the supply of gas from Queensland LNG resource holders, and potentially LNG imports to balance the market, due to declines from existing fields.

The domestic market remained tight throughout the 2018 financial year. Competing demand from LNG export projects and declines in conventional supply have both contributed to this tightness. On average, this has led to domestic users facing natural gas prices higher than historical norms.

A series of announcements by LNG producers to provide additional gas to the domestic market to address the projected supply shortfall has provided some relief in the first half of the calendar year. However seasonally stronger demand placed further pressure on the domestic market in June.

We continue to believe that lifting restrictions on onshore gas development – both conventional and unconventional – has the capacity to provide significant additional supply to the market.

## Australian power market

In the **National Electricity Market**, the Energy Security Board has released the detailed design of the National Energy Guarantee (the Guarantee). We await the final shape of the guarantee and a decision on whether it will be implemented<sup>17</sup>.

<sup>17</sup> This text was finalised on 13 August 2018 and accordingly will not reflect developments since.



**“Our analysis suggests the Guarantee should result in lower prices in due course, particularly compared to a scenario where there is no national coordination on climate and energy policy.”**

Just as importantly, the Guarantee is designed to ensure there is sufficient ‘dispatchable’ capacity in the system to balance the intermittency of wind and solar. Without this focus on dispatchability, the benefits of growing renewable penetration would likely be offset by a reduction in system strength and reliability.

Accordingly, we have called on Australian governments to embrace this opportunity for reform and begin the process of implementing the Guarantee.

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## Energy coal

**Energy coal prices** have benefited from robust demand from China, steady demand from other North Asian markets and supply disruptions in key export jurisdictions. Thermal power generation in China increased 8 per cent YoY in the first half of the 2018 calendar year, with strong industrial and residential demand for power. Supply constraints in the domestic gas and LNG markets also prevented ambitious gas usage targets from being met over the winter, which also favoured an increase in coal burn. Chinese energy coal imports have expanded by 20 per cent YoY in the first half of the 2018 calendar year. Weather, infrastructure and logistical issues and idiosyncratic localised constraints have simultaneously held back seaborne supply from Indonesia and South Africa.

From late March 2018, China reinstated a coal import ban at certain ports following strong inflows in the early part of the calendar year. This intervention came earlier than last year, with import curbs introduced in June in calendar year 2017. The customs clearance process was also tightened. Regulations on trucking have also been tightened in North China and the Fenwei Plain. This has led to an additional squeeze on already stretched rail capacity and a further lift in logistics costs.

Against this backdrop, the gcNewc 6000 kcal/kg FOB Newcastle index reached a high of around US\$118/t - a level last seen in 2012. It averaged US\$103/t over the first half of the 2018 calendar year. The 5500kcal index averaged US\$80/t over the same period. The spread between the spot indexes for 6000kcal and 5500kcal averaged 34 per cent in the first half of the calendar year, which compares to 25 per cent over calendar year 2017. The spread between the spot indices for semi-soft coking coal and 6000kcal averaged 20 per cent in the first half of calendar year 2018. However, with a bout of very hot weather in North Asia, and seaborne supply tight, as of early August the spread to 5500kcal had blown out to around 75 per cent, and the spread to semi-soft coking coal had narrowed dramatically to just 6 per cent.

**“The pace and method of implementation of China’s policy decisions on capacity and the environment remain the key source of uncertainty for the seaborne energy coal market.”**

The Chinese government has targeted cuts of ~150 Mt of coal capacity (including non-effective capacity) in the 2018 calendar year as part of ongoing coal Supply Side Reforms. Inspections on safety and environmental grounds are now the main tool used to curb or close production. Offsetting cuts, a number of new mines are targeted to be commissioned in calendar year 2018, which is anticipated to result in net growth in capacity for the year.

The Chinese government continues to urge domestic coal miners to execute more long-term contracts with end-users to stabilise prices within the “green zone” (US\$62–70 5500kcal CFR or RMB 500–570/t locally). The equivalent seaborne price (API8) has traded comfortably above this range in the calendar year to date.

On the non-China demand side, a rise in customs duty on pet coke imports in India, following a dramatic spike in pollution levels on the Ganges plain, especially around Delhi, which mostly impacts cement manufacturing, has been positive for high sulphur coal exports from the US. South Korea is planning to cap the sulphur level of seaborne coal which will impact Australian producers. Additionally, we were interested to observe an apparent breakdown in negotiations between the traditional price setters of the energy coal annual benchmark (although a small amount of volume was later settled). BHP remains a champion of the fair and transparent price discovery enabled by indexation.

On the supply side of the market, heavy monsoon rainfall impacted Indonesian production in the first half of the 2018 calendar year. South Africa is experiencing domestic production issues given years of under-investment in its coal mines. Production in Australia has been stable following the industrial settlement reached in late calendar 2017 in the Hunter Valley region.

Longer-term, we see total primary energy derived from coal (power and non-power) expanding at a compound rate slower than that of global population growth. Coal is expected to progressively lose competitiveness to renewables on a new build basis in the developed world and in China. The cross over point is anticipated to occur in these major markets by the end of next decade on a conservative estimate. However, coal power is expected to retain competitiveness in India and other populous emerging markets for a much longer time.

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## Potash

Muriate-of-potash (MOP) prices have been on an improving trend since mid-calendar year 2016, with a further step-up achieved in the last half year. Suppliers have successfully implemented higher prices in Brazil, the United States, South East Asia, China and India. Brazilian gMOP<sup>18</sup> prices reached US\$315–325/t CFR in July 2018, up around 21 per cent YoY. South East Asia sMOP saw slightly smaller percentage gains, while the US cornbelt saw average pricing of US\$320/t for gMOP, up around 14 per cent YoY. Annual CFR contract prices for China and India are not yet agreed. The calendar 2017 outcomes of US\$230/t and US\$240/t, respectively, are likely to be comfortably exceeded. As of early July 2018, the free-on-board standard grade Vancouver benchmark was up by around 7 per cent YoY.

Demand growth has diverged at the regional level in the calendar year-to-date, following a record year featuring broad based expansion in calendar year 2017. This sustained strong demand, allied with extended maintenance discretionary periods within the Canpotex grouping over the Northern winter, has allowed the market to tighten despite the introduction of several substantial capacity additions.

Year-to-date global trade volumes<sup>19</sup> have been roughly flat in level terms, but that hides wide regional differences. Canadian exports have increased 5 per cent YoY to 8.75 Mt in the calendar year to May. Exports from Belarus are up around 4 per cent YoY, to 4.56 Mt. Russia and Chile have seen export shipments decline.<sup>20</sup> Brazilian import volumes have declined almost 17 per cent YoY, while Chinese and Indian imports have increased by around 8 per cent and 40 per cent YoY respectively.

<sup>18</sup> Fertilizer-grade MOP is commonly sold in powder ("standard") or compacted "granular" forms, abbreviated as sMOP and gMOP respectively. gMOP typically sells at a premium of US\$10-25/t. Major markets for sMOP include China and India, while gMOP is prevalent in the Americas.

<sup>19</sup> Latest available data, not equivalent time periods in all cases

<sup>20</sup> Russia's monthly export data should be treated with considerable caution.

Two greenfield mines opened in calendar year 2017 (Canada and Turkmenistan), while Nutrien (created by the merger of PotashCorp and Agrium) completed a major expansion at its Rocanville mine, the last of a decade-long expansion programme. This greenfield capacity is still in the ramp-up phase, and it may not hit steady-state utilisation rates for some time yet. Looking ahead, further additions to capacity are scheduled out to 2021, notably two mines in Russia owned by EuroChem. This puts a considerable onus on demand to continue expanding in the short run if current pricing trends are to be sustained over the next few years.

**“Demand for potash sits at the intersection of a number of global megatrends.”**

Turning to the long-term, demand for potash sits at the intersection of a number of global megatrends. Potash benefits from rising population, changing diets and the need for the sustainable intensification of agriculture. While potash demand can be volatile year to year, we anticipate trend demand growth of 1.5–2.0 Mt per year (between 2 and 3 per cent per annum) through the 2020s. The pace of demand growth is important, because the need for new supply to be induced is only expected to arise once both the latent capacity and capacity additions that are under construction have been absorbed.

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## Nickel

Nickel prices ranged from US\$12,415/t to US\$15,750/t over the first half of the calendar year, averaging US\$13,871/t. Nickel prices were near the top of their calendar year range in early June, driven predominantly by greater demand for refined nickel as nickel pig iron (NPI) capacity in China was temporarily shut.<sup>21</sup> This contributed to a downward trend in exchange stocks over the last twelve months. Despite these positive fundamentals, prices declined over the end of the 2018 financial year as trade tension eroded investor confidence in pro-growth assets.

On the supply side, Indonesia surpassed expectations over the last year. The reversal of its ore export ban led to a rapid increase in its shipments to China. Nickel ore exports were down from the Philippines, however, reflecting the uncertain policy environment. Further increases in Indonesian ore exports and growing stainless steel production in Indonesia, reflecting considerable Chinese investments induced by the ore export ban, are expected in the coming year.

Nickel end-uses are dominated by the stainless steel sector. It comprises more than two-thirds of primary demand today. China produces roughly half of the world's stainless steel and is thus far and away the major consumer of nickel. Despite intense interest in the impact of electric vehicles on battery raw materials, we note that nickel demand from batteries is less than 5 per cent of consumption today. Nevertheless, with a rapid and prolonged drive towards the electrification of transport in prospect, there are plausible long run paths<sup>22</sup> where batteries and stainless steel will become equally important consumers of nickel.

<sup>21</sup> These temporary closures were related to both environmental inspections and the SCO summit. There were also closures as part of the broader bans on polluting activity in northern China during heating season.

<sup>22</sup> These paths depend in part on our range of internal views on EV penetration rates, fleet size and battery chemistry evolution.

## Freight

Dry bulk freight remains somewhat over supplied, but it seems evident that the absolute trough in freight rates is behind us. Policy-led dock capacity rationalisation in China is one factor in this assessment, as is the return of Clarkson's Cape Congestion Index to its highest average level since 2014. Higher global steel prices are expected to help prevent new build costs falling again to the lows of a few years back.<sup>23</sup> Balancing that, there is still an overhang of shipbuilding capacity globally; steady increases in average vessel size continue unabated; and the volume of new orders as a proportion of the existing fleet bottomed almost a year ago. The delivery of these orders should help to curtail the degree of any medium-term inflationary pressures. They will do so by keeping Capesize utilisation rates from sustaining at the sort of levels associated with steep inflation in the past.

The route from Western Australia to Qingdao peaked above US\$10/t late in calendar year 2017, before descending back to around US\$6/t early in the new year. We note that iron ore export volumes were hindered by supply chain disruptions in Brazil, Australia and Canada in the calendar year to April 2018, which amplified the usual seasonal softness of the March quarter. That suppressed freight rates on the C3 and C5 routes. Rates on C5 trended higher from April, reaching US\$8.50/t in May and US\$9.90/t in July.

In addition to the normal seasonal forces, a steep rebound in cargo availability from Brazil through the June quarter influenced the market. This created upward pressure on freight rates in the Atlantic basin, which was then transmitted to the Pacific, where Australia was exporting iron ore at record levels. The record run-rate of 289Mtpa (100 per cent basis) achieved by our WAIO operations in the June quarter, representing a 10 per cent uplift on the March quarter, is a case in point.

Panamax and Supramax rates have traded in a much narrower range than Capesize, both averaging US\$11,000/day in the first half of the 2018 calendar year - a similar level to that seen at the close of calendar year 2017.

**“We note that the swiftly approaching inception of the IMO’s environmental regulations on ballast water and low sulfur fuel are beginning to influence demolition decisions for older, less economical tonnage.”**

We continue to lead the freight industry towards higher safety, productivity and environmental standards. This will occur partly through our own commercial activities, such as opportunities in autonomous vessel development and our partnerships with respect to alternative fuels. We continue to engage proactively with sovereign entities and other regulators to leverage technological developments and promote improvements in safety and sustainability standards. We engage bilaterally and through our participation in Rightship. For more on our vision for the future state of freight, which we see as “Safer, Leaner and Greener”, [click here](#).

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<sup>23</sup> Steel represents around one-quarter of the total construction cost. The exact share for Chinese shipbuilders has drifted up from 23 per cent in 2016 to 26 per cent in 2018.

## Inputs and inflation trends

Over the last six months, industry wide operating cost inflation in US dollar terms has increased somewhat on the back of ‘uncontrollables’ such as higher raw and basic materials prices. Exchange rates were volatile over the half, with strength early on and weakness later in the period. Isolated pockets of inflation in controllable operating costs have emerged in both our petroleum and minerals businesses. Beyond these pockets, our high level assessment remains that general inflationary trends in both opex and capex are benign by historical standards. We are accordingly comfortable that our pipeline of high quality minerals and petroleum projects, which are costed based on conservative escalators, can be delivered within budget.

The Australian dollar and the Chilean peso both depreciated in the June quarter of calendar year 2018. These movements occurred against a backdrop of slim, or negative, interest rate differentials to the United States, and a general move towards more cautious asset allocation in global financial markets as the half wore on. In the specific case of Chile, negative sentiment towards emerging markets in the region contributed to the softening of the peso, which outweighed generally supportive cyclical fundamentals.

Over the half though, the Australian dollar has depreciated by just 1 per cent on average. Point-to-point over six months (i.e. from the last day of the calendar year 2017 to the last day of June 2018), the Australian dollar was 5.2 per cent lower. The Chilean peso approached 650 to the US dollar late in the June quarter of 2018, and the weakness has extended into the new financial year. Point-to-point (on the same basis as the Australian dollar above) it was 6.3 per cent weaker. However, it was 5.6 per cent stronger on average over the last six months, reflecting pronounced strength in the March quarter as copper prices exceeded US\$7000/t and the US dollar hit a soft patch.

In Australia, both consumer price inflation and local currency wage growth are running close to 2 per cent YoY, reflecting modest economy-wide price pressures and the presence of spare capacity in the labour market. The Reserve Bank of Australia expects headline inflation to be in the bottom half of its target range of 2 to 3 per cent until the end of 2020.<sup>24</sup>

**“Labour markets remain far from tight in aggregate in our major minerals producing regions, with local currency wage growth subdued in Chile and not far removed from historical lows in Western Australia and Queensland.”**

Mining sector wage growth at the national level in Australia has lifted slightly from a year ago, but it remains well below the economy wide average of 2.1 per cent YoY. Broader measures of employee remuneration, which incorporate non-wage costs, have been tracking at a slightly slower pace again. Higher increases in administered wage outcomes in calendar year 2017 have been offset by an ongoing downtrend in newly settled enterprise agreements.

Notwithstanding those general trends, we have observed higher inflation in certain segments of our minerals business, including some niche skill subsets. Our category analysis indicates that in many instances price increases have been driven by transitory and/or idiosyncratic factors. Despite the notable uplift in infrastructure activity in New South Wales and Victoria, we observe that construction wages are still running below the national average as of the latest update from the Australian Bureau of Statistics.

<sup>24</sup> Statement on Monetary Policy, August 2018, available from <http://rba.gov.au/publications/smp/2018/aug/pdf/05-economic-outlook.pdf>

In Chile and Peru, a large number of collective bargaining agreements across the industry have been re-negotiated in the last six months. In Chile specifically, wage growth has lagged well behind the observed lift in numbers employed. Migrant flows from within Latin America and the Caribbean, who cover most segments of the skill spectrum, may be contributing to this outcome. In addition to subdued wage growth, general inflation has also been modest. Pervasive indexation in the local contracting structure will sustain these conditions beyond the true cyclical turning point in domestic services costs.

The International Monetary Fund projects that Chilean inflation will remain subdued out to the early 2020s, with the average rate projected to be almost 1 per cent below the pre-GFC average of a little under 4 per cent.

Underlying cost drivers across our minerals business such as diesel, explosives and steel products have increased in price. Tyre raw material costs have fallen, led by declines in natural rubber. The Chilean spot power prices in the northern grid has seen an approximate 15 per cent decline over the full financial year 2018, while Australian NEM spot power prices edged 2 per cent lower versus the elevated financial year 2017 average.

We anticipate that the International Maritime Organisation's low sulfur shipping fuel regulation will impact the diesel market at least a year in advance of its formal introduction in calendar year 2020. We expect that the disruption will lead to an increase in refining spreads and higher diesel prices for end-users than would otherwise have been the case. The heavy machinery sector as a whole is now two years removed from its sector-specific cycle trough, the recovery from which was due principally to a wave of replacement demand.

**“In mining specifically, we anticipate that the bulk of the replacement cycle in mobile equipment will have been completed by 2020, give or take a year.”**

Timing will ultimately depend upon industry wide efforts to increase truck life to the productivity frontier. Globally, earth moving equipment orders have increased in consecutive years. Even so, spare capacity remains at major OEMs, which should allow for incremental volumes to be comfortably met from existing facilities. However, capacity may not be ample everywhere across the upstream supply chain. This may have an impact upon lead times and thus competitiveness on a total-cost-of-ownership basis. We also note that manufacturers whose supply chains are relatively more subject to recent tariff increases may be disadvantaged if they attempt to pass these costs through to end-users.

Pockets of cost inflation remain evident in some segments of the onshore petroleum business in the US. In particular, sand, completion crews, pressure pumping equipment and trucks for produced water haulage in the Permian have been in short supply. With the US steel market inflated by tariffs, and molybdenum prices also elevated, 'oil country tubular goods' – i.e. drill, casing and tubing pipes – have increased in price. Even so, all-in costs are still modest by historical standards; and a supply response has already been observed in the Permian sand market.

**“Deepwater capital costs remain close to all-time lows in real terms and vendor competition remains intense.”**

However, our observations from recent activity in this segment implies that offshore costs have probably, finally, bottomed.

A rigorous approach to bottom-up cost driver modelling and advanced analytics, leveraging synergies across our commercial businesses, are expected to drive increasing cost competitiveness as industry wide cost curves are expected to steepen in the medium-term.

## Technological developments in energy and transport

**The global market for light duty electric vehicles** (EVs, the sum of battery powered [BEVs] and plug-in hybrids [PHEVs]) expanded by 56 per cent YoY in calendar year 2017, with the total fleet surpassing 3 million. The EV fleet in China surpassed 1 million in calendar year 2017, with sales growth of 72 per cent YoY.

Our central case projection remains that there will be around 235 million EVs on the road in 2035 (around 140 million of which are expected to be BEVs). At this point, EVs would constitute around 14 per cent of the light duty vehicle fleet and around 30 per cent of annual sales.

That assumes that cost competitiveness without subsidies will be achieved for most vehicle segments around 2030, with an inflection point on mainstream adoption around 2025. As of today though, with battery costs per kWh still roughly double the level required for EVs to compete with mass market conventional vehicles on an unsubsidised basis, a true “people’s EV” is yet to emerge.

Signposts over the year have generally been supportive of our optimistic long run view. More models are being introduced and planned, costs are declining and ranges are increasing. However, charging times (a technical problem) and charging availability (an infrastructure question) remain challenging.<sup>25</sup> Policy signposts were mixed, with India recasting its ambitious penetration goals, while China redesigned its production subsidies to incentivise higher quality, more internationally competitive models. More countries, and many municipal authorities, predominantly in Europe, have announced future bans on internal combustion engine vehicle (ICEs) sales, joining early movers France and the United Kingdom, who are both targeting 2040.<sup>26</sup>

The first 100 million EVs on the road are expected to displace around 1.3Mbpd of oil demand circa 2030, equivalent to 2 per cent of annual demand. Constructing those same vehicles will take around 600kt of copper annually, equivalent to approximately 2½ per cent of annual demand. Looking somewhat further ahead, EVs are expected to consume around 5 per cent of the world’s electricity in 2050, by which time they will constitute around half the fleet and comprise around three-quarters of annual sales.

Our expectation is that once the current stability and cost issues are resolved, a nickel-rich lithium-ion 8-1-1 battery will ultimately provide the required energy density and range characteristics needed to power mass market EV models from the second half of the 2020s.

**Investment in renewable energy production** (principally hydro, solar and wind) surprisingly contracted by around 7 per cent in nominal value terms in calendar year 2017, with outlays totalling US\$298 billion. The decline occurred despite record levels of investment in solar and offshore wind. Increases in these sectors were offset by declines in hydro and onshore wind projects. Price deflation also contributed to the fall in absolute spending levels.

Regionally, we note that after doubling its 2020 solar generation targets midway through the current five year plan, China unexpectedly reduced subsidy rates in calendar year 2018; while in India, coal power investments were lower than renewables investments for the first time ever. The only major regions where investment in fossil generation still outstrips renewables are South East Asia and the Middle East.

Historical prices and other data in this report are sourced from multiple public and subscription sources, including Bloomberg, Reuters, Platts, Argus, Integer, IEA, I.H.S., CEIC, CRU, Wood Mackenzie, Mysteel, Worldsteel, Baker Hughes, SMM, the ABS, the IMF and the LME. All monetary values are in US dollars unless otherwise specified.

<sup>25</sup> The ratio of charging units to EVs sold is roughly 1:1 at present, which equates to roughly 3 million units. However, only around 110,000 of those are fast charging. Building public charging infrastructure in advance of demand, rather than relying on private residential charging that increases in lockstep with EV ownership, is one lever available to governments that wish to accelerate uptake.

<sup>26</sup> In some cases this ban was solely for diesel ICEs. The nations that have formally announced bans are France 2040, the UK 2040 (Scotland 2032), Ireland 2030, the Netherlands 2030, Norway 2025, Slovenia 2030, Sri Lanka 2040, Sweden 2045, Israel 2030.

## Disclaimer

### Forward-looking statements

This presentation contains forward-looking statements, including statements regarding: trends in commodity prices and currency exchange rates; demand for commodities; plans, strategies and objectives of management; closure or divestment of certain operations or facilities (including associated costs); anticipated production or construction commencement dates; capital costs and scheduling; operating costs and shortages of materials and skilled employees; anticipated productive lives of projects, mines and facilities; provisions and contingent liabilities; tax and regulatory developments.

Forward-looking statements can be identified by the use of terminology such as 'intend', 'aim', 'project', 'anticipate', 'estimate', 'plan', 'believe', 'expect', 'may', 'should', 'will', 'continue', 'annualised' or similar words. These statements discuss future expectations concerning the results of operations or financial condition, or provide other forward-looking statements.

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For example, future revenues from our operations, projects or mines described in this presentation will be based, in part, upon the market price of the minerals, metals or petroleum produced, which may vary significantly from current levels. These variations, if materially adverse, may affect the timing or the feasibility of the development of a particular project, the expansion of certain facilities or mines, or the continuation of existing operations.

Other factors that may affect the actual construction or production commencement dates, costs or production output and anticipated lives of operations, mines or facilities include our ability to profitably produce and transport the minerals, petroleum and/or metals extracted to applicable markets; the impact of foreign currency exchange rates on the market prices of the minerals, petroleum or metals we produce; activities of government authorities in some of the countries where we are exploring or developing these projects, facilities or mines, including increases in taxes, changes in environmental and other regulations and political uncertainty; labour unrest; and other factors identified in the risk factors discussed in BHP Billiton's filings with the US Securities and Exchange Commission (the "SEC") (including in Annual Reports on Form 20-F) which are available on the SEC's website at [www.sec.gov](http://www.sec.gov).

Except as required by applicable regulations or by law, the Group does not undertake any obligation to publicly update or review any forward-looking statements, whether as a result of new information or future events.

Past performance cannot be relied on as a guide to future performance.

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BHP Billiton results are reported under International Financial Reporting Standards (IFRS) including Underlying EBIT and Underlying EBITDA which are used to measure segment performance. This release may also include certain non-IFRS measures including Adjusted effective tax rate, Free cash flow, Gearing ratio, Net debt, Net operating assets, Underlying attributable profit, Underlying basic (loss)/earnings per share, Underlying EBIT margin and Underlying EBITDA margin. These measures are used internally by management to assess the performance of our business, make decisions on the allocation of our resources and assess operational management. Non-IFRS measures have not been subject to audit or review and should not be considered as an indication of or alternative to an IFRS measure of profitability, financial performance or liquidity.

### Presentation of data



Unless specified otherwise, all data is presented on a continuing operations basis to exclude the contribution from assets that were demerged with South32 and references to Underlying EBITDA margin and Underlying EBIT margin exclude third party trading activities.

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