

Escalation Factors - 2020 Benchmark Reserve Capacity Price

Final Report



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The analysis also assumes that a new Open Cycle Gas Turbine (OCGT) entrant is able to access labour, currency markets, steel and copper at average market rates. Should the OCGT entrant be able to access rates that are different from the market, the appropriate escalation factors for the entrant may be different to those provided in this report.

This report is not intended to provide guidance on the total cost of building a 160 MW OCGT, which is dependent on technical specifications and technological changes that are outside the scope of this engagement.

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Executive summary

Overview

The Australian Energy Market Operator (AEMO) has engaged PricewaterhouseCoopers Consulting (Australia) Pty Limited (PwC) to determine appropriate cost escalation factors related to the construction of a 160 MW open cycle gas turbine (OCGT) generation facility. The escalation factors cover five consecutive financial years, with the first year being the year ending June 2020.

The cost escalation factors comprise:

- labour cost escalation factors specific to labour costs for building and maintaining a power plant in the South West Interconnected System (SWIS)
- the exchange rate between the Australian Dollar (AUD) and the US Dollar (USD)
- steel and copper prices.

The cost escalation factors will be used by AEMO in the development of the Benchmark Reserve Capacity Price (BRCP).

Approach

To develop the cost escalation factors for the AUD/USD exchange rate and the prices of steel and copper we drew on price forecasts and commentary from various industry and institutional sources. For labour costs related to building and maintaining a power plant, we drew on macroeconomic data published by the Australian Bureau of Statistics and the Western Australia Treasury, supplemented by analysis of recent enterprise agreements approved in comparable sectors.

Proposed escalation factors

The proposed escalation factors reflect the dynamics of the labour market, including the impact of labour force underutilisation in Western Australia and building and maintenance specific trends. They also seek to reflect the impact of global factors on the AUD/USD exchange rate and expected movements in market prices for steel and copper. The table below summarises the cost escalation factors developed by PwC for the 2020 BRCP, compared with the 2019 BRCP cost escalation factors.

2019 BRCP Cost Escalation Factors and 2020 BRCP Cost Escalation Factors

Financial Year		2019	2020	2021	2022	2023	2024
WPI - EGWWS	2019 CEF	1.85%	2.85%	3.10%	3.35%	3.35%	-
	2020 CEF	-	2.46%	2.46%	2.46%	2.46%	2.46%
WPI - Con.	2019 CEF	1.75%	2.75%	3.00%	3.25%	3.25%	-
	2020 CEF	-	1.76%	1.76%	1.76%	1.76%	1.76%
AUD/USD (\$)	2019 CEF	0.7304	0.7363	0.7513	0.7650	0.7628	-
	2020 CEF	-	0.6944	0.7250	0.7375	0.7375	0.7375
Steel Price	2019 CEF	9.03%	-10.70%	-1.98%	-1.29%	0.48%	-
	2020 CEF	-	-8.56%	-4.15%	-2.55%	2.61%	-0.24%
Copper Price	2019 CEF	4.14%	5.27%	-0.33%	-1.56%	0.53%	-
	2020 CEF		3.06%	1.36%	0.32%	4.55%	-0.09%

Source: PwC analysis

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1. Project overview

1.1 Background

The Australian Energy Market Operator (AEMO) engaged PricewaterhouseCoopers Consulting (Australia) Pty Limited (PwC) to determine appropriate cost escalation factors related to the construction of a 160 MW open cycle gas turbine (OCGT) generation facility for five consecutive financial years, with the first year being the year ending June 2020.

The cost escalation factors comprise:

- labour cost escalation factors specific to labour cost for building and maintaining a power plant in the South West Interconnected System (SWIS)
- the exchange rate between the Australian Dollar (AUD) and the US Dollar (USD)
- steel and copper prices.

The cost escalation factors will be used by AEMO in the development of the Benchmark Reserve Capacity Price (BRCP).

1.2 Approach

In this report we analyse expected price and other market trends, across the relevant cost categories, to develop escalation factors. For each cost category, we have outlined the market trends and key factors which may impact cost component movements.

For the prices of steel and copper, and the AUD/USD exchange rate, we drew on historical price data and a wide variety of forecasts from various investment banks and forecasting institutions. This was supported by high-level analysis of commodity market trends, policy events affecting the AUD/USD rate and economic indicators, both national and global. For labour costs, we analysed the level and trajectory of construction costs separately from operation and maintenance costs, giving consideration to industry-specific trends and Western Australia employment data.

2. Labour

We recommend that AEMO escalate labour costs using separate series for the building and maintenance components related to the power plant. Wages growth is expected to remain modest for both sectors, with construction wages increasing by 1.76 per cent annually and maintenance wages by 2.46 per cent annually.

2.1 Overview

2.1.1 Data and sources

There are a range of data sets and indices that could form the basis of labour cost escalation specific to building and maintaining a power plant. In our analysis, we have considered:

- enterprise agreements covering employees in the Construction, Electricity, Gas and Water sectors
- ABS Series: 6345.0; Total hourly rates of pay excluding bonuses; Western Australia; Private and Public compensation of employees¹ (**WPI – WA**); this measure forms the basis for the Western Australia Treasury’s (WA Treasury) wage forecasts² (**WPI - WA Treasury**)
- ABS Series: 6345.0; Total hourly rates of pay excluding bonuses; Australia; Private and Public; Electricity, Gas, Water and Waste services³ (**EGWWS**)
- ABS Series: 6345.0; Total hourly rates of pay excluding bonuses; Australia; Private and Public; Construction⁴ (**Con.**)
- 2019 BRCP labour cost escalation factors (**BRCP 19 EGWWS; BRCP 19 Con**)

Consistent with the 2019 BRCP cost escalation factors, we based our forecasts on wage price based indices.⁵ Our analysis of regulatory submissions indicates that regulators have expressed a preference for labour cost escalation factors to be based on long-run historical growth or forecasts of WPI, as opposed to Average Weekly Earnings (AWE) based estimates. For instance, the Australian Energy Regulator’s (AER) Expenditure Forecast Assessment Guideline⁶ outlines a

¹ ABS (2019) 6345.0 - Wage Price Index, Australia, Mar 2019, available at: <http://www.abs.gov.au/ausstats/abs@.nsf/mf/6345.0>, Table 3b

² Western Australia Treasury (2019), *Economic Forecasts*, available at: https://www.treasury.wa.gov.au/Treasury/Economic_Data/Economic_Forecasts/

³ ABS (2019) 6345.0 - Wage Price Index, Australia, Mar 2019, Table 5b

⁴ ABS (2019) 6345.0 - Wage Price Index, Australia, Mar 2019, Table 5b

⁵ PwC (2018), *Estimating the Escalation Factors for the 2019 Benchmark Reserve Capacity Price Final report*, available at: https://www.aemo.com.au/-/media/Files/Electricity/WEM/Reserve_Capacity_Mechanism/BRCP/2019/Supporting-documents/PwC-Report-Estimating-the-Escalation-Factors-for-the-2019-Benchmark-Reserve-Capacity-Price.pdf, Page 5

⁶ AER (2013), *Explanatory Statement - Expenditure Forecast Assessment Guideline*, available at: <https://www.aer.gov.au/system/files/Expenditure%20Forecast%20Assessment%20Guideline%20-%20Explanatory%20Statement%20-%20FINAL.pdf>, Page 49

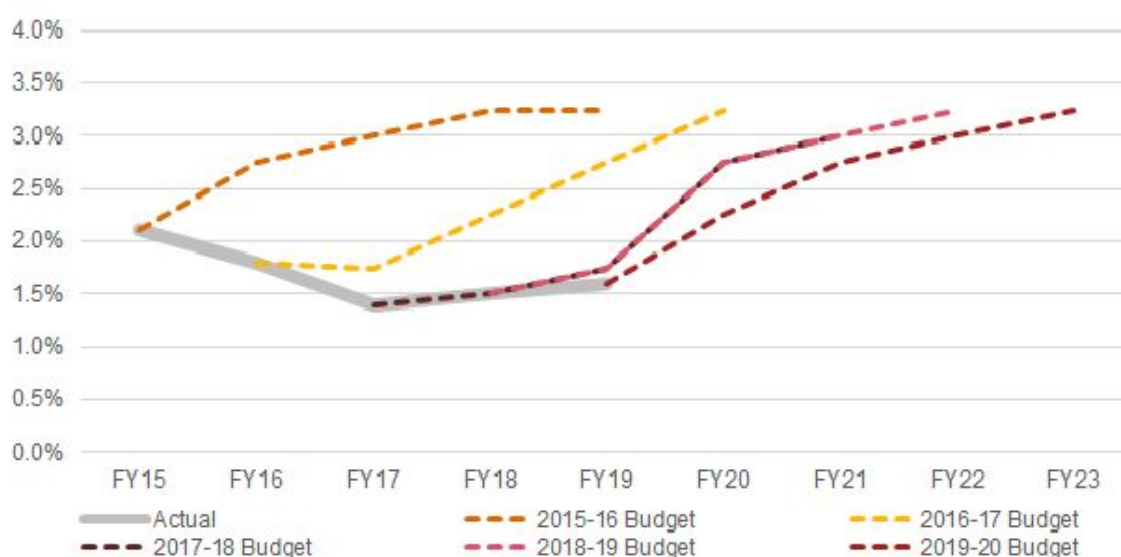
preference for the use of WPI in assessing expenditure. Recent approvals by the Queensland Competition Authority⁷ and the AER⁸ have used WPI based indices to escalate labour costs.

We developed separate series for construction and operations/maintenance work as the two series measure separate components of the labour force which rely on different skill sets, experience nuanced labour market dynamics, and are subject to different enterprise agreements. **Appendix 1** details wage increases agreed to as part of enterprise agreements covering workers in comparable sectors, including the Construction and Electricity, Gas, Water and Waste industries. Per the 2019 BRCP cost escalation factors, we have selected series which exclude bonuses as these better reflect the underlying cost of labour, rather than the fluctuating aspects of labour affected by the quantity and quality of work performed.

2.1.2 Market trends

WA Treasury has forecast wage growth in Western Australia to increase from 2.25 per cent in FY2020 to 3.25 per cent in FY2023, reflecting “the anticipated gradual improvement in labour market conditions”.⁹ WA Treasury has consistently published forecasts showing wages in Western Australia increasing to exceed 3 per cent (**Figure 2.1**). Wages have not exceeded growth of 2.5 per cent since FY2013.

Figure 2.1: WA Treasury annual wage growth estimates



Source: See Footnote 10

⁷ Queensland Competition Authority (2018), *Final Decision - Aurizon Network's 2017 draft access undertaking*, available at: <http://www.qca.org.au/getattachment/48b3c4b8-db7e-4702-999f-290131c58c2d/Final-decision.aspx>

⁸ Australian Energy Regulator (2019), *Final Decision - TasNetworks - Transmission and Distribution Determination 2019 to 2024*, available at: <https://www.aer.gov.au/system/files/AER%20-%20TasNetworks%202019-24%20-%20%20Transmission%20and%20Distribution%20determination%20-%20Final%20decision%20-%20Overview%20-%20April%202019.pdf>

⁹ Western Australia Government (2019), *State Budget 2019-20 - Budget Paper No 3 - Economic and Fiscal Outlook*, available at: <https://www.ourstatebudget.wa.gov.au/2019-20/budget-papers/bp3/2019-20-wa-state-budget-bp3.pdf>, Page 15

¹⁰ Western Australia Government (2019), *State Budget 2019-20 - Budget Paper No 3 - Economic and Fiscal Outlook*, available at: <https://www.ourstatebudget.wa.gov.au/2019-20/budget-papers/bp3/2019-20-wa-state-budget-bp3.pdf>; Western Australia Government (2018) *State Budget 2018-19 - Budget Paper No 3 - Economic and Fiscal Outlook*, available at: <https://www.ourstatebudget.wa.gov.au/2018-19/budget-papers/bp3/2018-19-wa-state-budget-bp3.pdf>; Western Australia Government (2017) *State Budget 2017-18 - Budget Paper No 3 - Economic and Fiscal Outlook*, available at: <https://www.ourstatebudget.wa.gov.au/2017-18/budget-papers/bp3/2017-18-wa-state-budget-bp3.pdf>; Western Australia Government (2016) *State Budget*

Labour force underutilisation continues to remain stubbornly high in Western Australia (**Figure 2.2**); currently the highest of the mainland states. There is an inverse relationship between labour force underutilisation and wage growth;¹¹ in the absence of an improvement in underemployment rates, there is unlikely to be significant upward pressure on wages in the short-term.

Figure 2.2: Annual wage growth and labour force underutilisation in Western Australia



Source: See Footnote 12

The Reserve Bank’s most recent Monetary Policy Decision¹³ discusses this development, shifting away from previous statements which highlighted expectations of wages growth,¹⁴ as does its August 2019 Statement on Monetary Policy.¹⁵ Taken together, these factors suggest that wages are more likely to follow the five-year average¹⁶ (**Figure 2.3**) than return to pre-FY2013 levels.

The outlook for the Australian construction market is sluggish, particularly in Western Australia where the State government has committed considerably lower levels of funding towards infrastructure spending (relative to total expenditure) than any other state or territory.¹⁷ The Australian Industry Group/Housing Industry Association Australian Performance of Construction

2016-17 - Budget Paper No 3 - Economic and Fiscal Outlook, available at: <https://www.ourstatebudget.wa.gov.au/2016-17/budget-papers/bp3/2016-17-wa-state-budget-bp3.pdf>; Western Australia Government (2015) State Budget 2015-16 - Budget Paper No 3 - Economic and Fiscal Outlook, available at: https://www.ourstatebudget.wa.gov.au/2015-16/budget-papers/bp3/2015-16-wa-state-budget_bp3.pdf

¹¹ PwC (2018), *Estimating the Escalation Factors for the 2019 Benchmark Reserve Capacity Price Final report*, Page 7, Figure 2

¹² ABS (2019), 6202.0 - Labour Force, Australia, Jun 2019, available at: <https://www.abs.gov.au/ausstats/abs@.nsf/mf/6202.0>, Table 23; ABS (2019) 6345.0 - Wage Price Index, Australia, Mar 2019, Table 3b

¹³ Reserve Bank of Australia (2019), *Statement by Philip Lowe, Governor: Monetary Policy Decision - August 2019*, available at: <https://www.rba.gov.au/media-releases/2019/mr-19-20.html>

¹⁴ The August 2019 statement simply reads “a further gradual lift in wages growth would be a welcome development.” This is more tempered than previous statements, including June and July 2019 which both stated “further gradual lift in wages growth is still expected.”

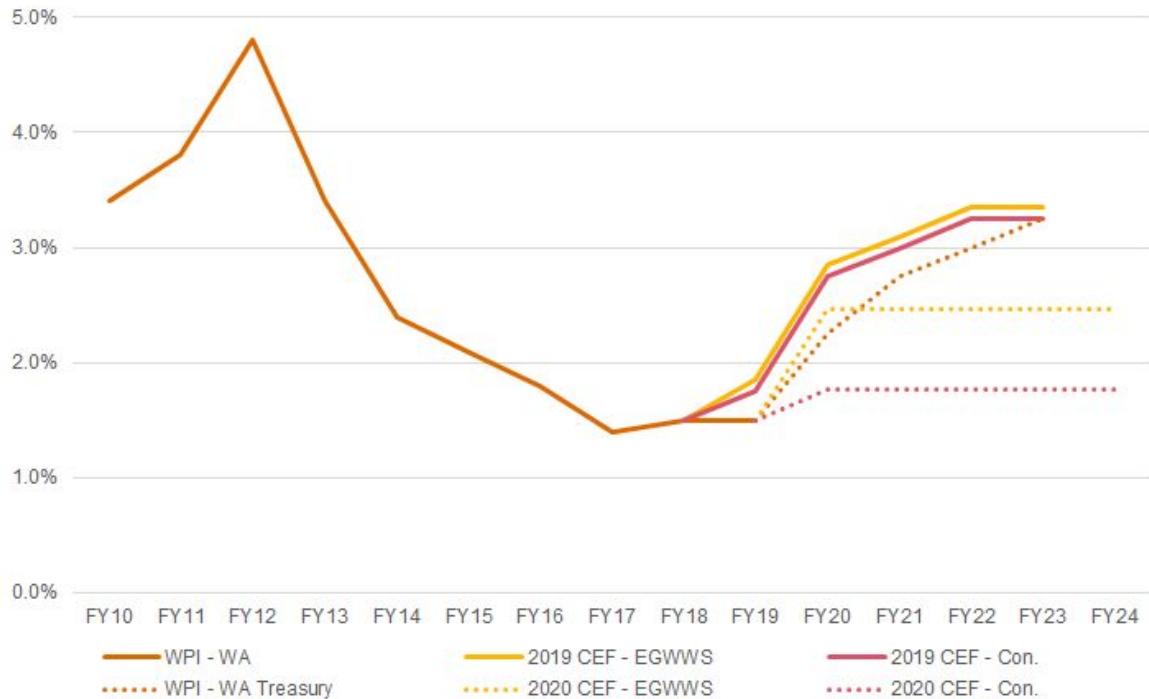
¹⁵ Reserve Bank of Australia (2019), *Statement on Monetary Policy - August 2019*, available at: <https://www.rba.gov.au/publications/smp/2019/aug/pdf/statement-on-monetary-policy-2019-08.pdf>

¹⁶ Being FY2015 to FY2019

¹⁷ Infrastructure Partnerships Australia (2019), *Government Infrastructure Funding*, available at: <https://infrastructure.org.au/chart-group/government-infrastructure-investment-by-proportion/>

Index, a leading indicator of new orders for housing, apartment, engineering and commercial construction, fell to its lowest level for six years in August 2019.¹⁸

Figure 2.3: Labour cost escalation



Source: ABS, PwC analysis, WA Treasury

The wage increases outlined in recent enterprise agreements for the EGWWS and Construction sectors (see **Table A.1** and **Table A.2**) are broadly in-line with the average wage growth across the sectors in the preceding five-year period (FY2015 to FY2019). The five-year average for EGWWS (2.46 per cent) and Construction (1.76 per cent) is lower than the growth outlined in the 2019 BRCP cost escalation factors for the respective series (**2019 CEF - EGWWS** and **CEF Con.**) for each of the forecast years.

2.2 Labour cost projections

We recommend adopting the **WPI-EGWWS** series below for labour costs specific to the operation and maintenance of the power plant, and the **WPI-Con.** series below for the construction of the power plant. These series apply the average wage growth for each sector for the preceding five years (FY2014 to FY2019) across the forecast period (**2020 CEF - EGWWS** and **2020 CEF - Con.**).

¹⁸ ABC (2019), *Construction recession deepens with sharpest decline in activity for six years*, available at: <https://www.abc.net.au/news/2019-08-07/construction-recession-deepens-sharpest-decline-in-activity/11392052>

This growth is above the current wages growth in Western Australia (1.5 per cent), capturing the impact of the RBA's rate cut and impending income tax cuts, but tempered to match flatlining market expectations for each sector and recent enterprise agreements.

The following labour cost escalators are proposed for the five year period:

Table 2.2: Labour cost projections

Financial Year	2020	2021	2022	2023	2024
WPI - EGWWS (%Δ)	2.46%	2.46%	2.46%	2.46%	2.46%
WPI - Con. (%Δ)	1.76%	1.76%	1.76%	1.76%	1.76%

Source: PwC analysis

3. AUD/USD exchange rate

We recommend that AEMO adopt the average of the most recent forecasts published by the Big Four Banks for FY2020 to FY2022 before holding the exchange rate constant for the remainder of the forecast period.

3.1 Overview

3.1.1 Data and sources

There are a range of data sets and indices that could form the basis of AUD/USD exchange rate projections. In our analysis, we have considered historical AUD/USD exchange rate data¹⁹ as well as government exchange rate forecasts, including the Commonwealth Government²⁰ and WA Treasury,²¹ and institutional exchange rate forecasts.²²

3.1.2 Market trends

The AUD has depreciated significantly against the USD since the 2019 BRCP cost escalation factors were estimated, with the AUD hitting a ten-year low of 0.6677 on 7 August 2019. The AUD faces significant downside risk with the potential for further escalation of the trade dispute between China and the US, and to a lesser extent the United Kingdom's exit from the European Union. In spite of this uncertainty, most forecasts published by financial institutions (across July and August 2019), and compiled by Bloomberg, show the AUD trending upward from its current position (**Figure 3.1**).

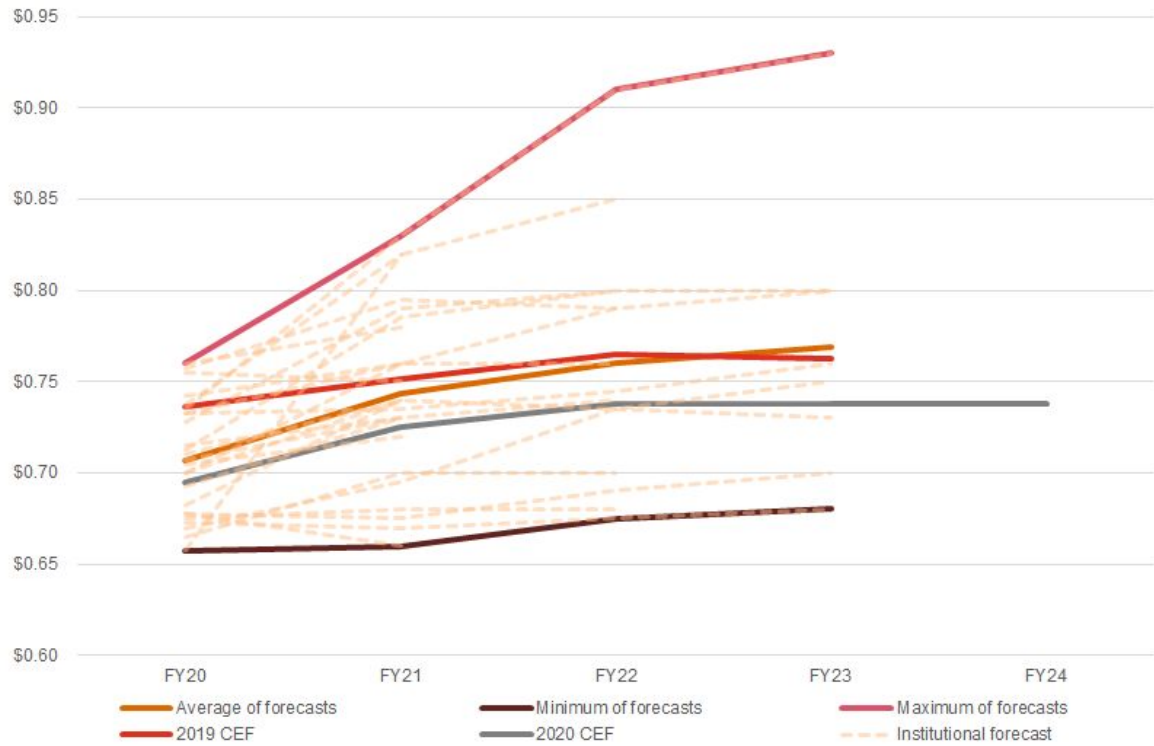
¹⁹ Reserve Bank of Australia (2019), *Historical Data*, available at: <https://www.rba.gov.au/statistics/historical-data.html>

²⁰ Commonwealth Government (2019), *Budget Strategy and Outlook Budget Paper No. 1 2019-20*, available at: <https://www.budget.gov.au/2019-20/content/bp1/download/bp1.pdf>

²¹ Western Australia Government (2019), *State Budget 2019-20 - Budget Paper No 3 - Economic and Fiscal Outlook*

²² Australian Dollar/US Dollar Exchange Rate data, accessed on the Bloomberg Terminal August 2019

Figure 3.1: AUD/USD exchange rate projection



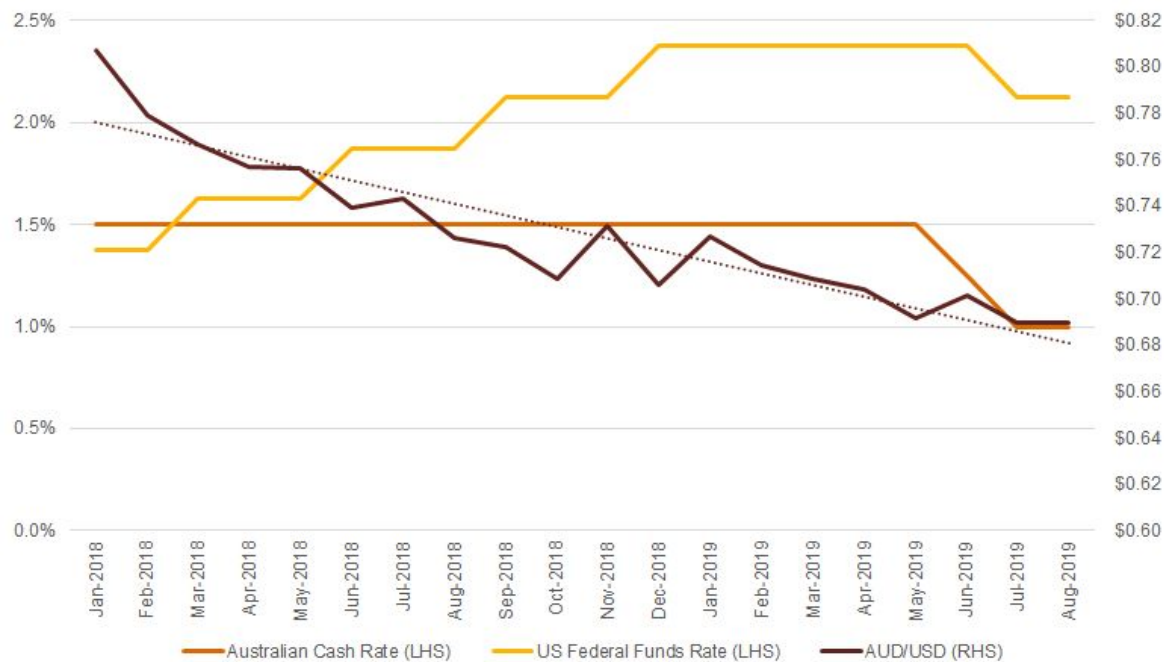
Source: Bloomberg²³, PwC Analysis

The depreciation of the AUD has also in part been driven by the relativity of the Australian Cash Rate and the US Federal Funds Rate (**Figure 3.2**). While Australian monetary policy has largely loosened (or remained unchanged), the US Federal Reserve has lifted rates nine times since 2015. It is important to note, though, that the Federal Reserve cut rates at its most recent meeting in July 2019 to “to insure against downside risks from weak global growth and trade policy uncertainty” and “to help offset the effects these factors are currently having on the economy.”²⁴

²³ Note that we have included projections compiled by Bloomberg which were published across July 2019 and August 2019

²⁴ Federal Reserve (2019), *Transcript of Chair Powell’s Press Conference - July 31, 2019*, available at: <https://www.federalreserve.gov/mediacenter/files/FOMCpresconf20190731.pdf>

Figure 3.2: Australian Cash Rate, US Federal Funds Rate²⁵ and AUD/USD



Source: Federal Reserve, RBA

The weighted average of forecasts compiled by Bloomberg (**Table 3.1**) show the interest rate differential remaining largely the same through FY2022, though, narrowing slightly. As interest rates are indicative of financial returns available, they are an important determinant of capital flows and hence the demand for the currency for which they are tied to. As the differential grows (or shrinks), the AUD becomes less (or more) attractive relative to the USD, leading to depreciation (or appreciation).

Table 3.1: Bloomberg weighted average interest rate forecasts (per cent)

Financial Year	2020				2021				2022	
Quarter	1	2	3	4	1	2	3	4	1	2
Australian Cash Rate	1.0	0.85	0.80	0.80	0.75	0.80	0.85	0.90	0.95	1.05
US Federal Funds Rate	2.15	2.05	2.00	1.95	1.90	1.90	1.90	1.90	1.90	1.90
Differential	-1.15	-1.20	-1.20	-1.15	-1.10	-1.05	-1.10	-1.00	-0.95	-0.85

Source: Bloomberg

²⁵ Midpoint of the target range

3.2 AUD/USD exchange rate projections

We recommend applying the average of the most recent forecasts published by the Big Four Australian Banks for FY2020 to FY2022, before holding the exchange rate constant for the remainder of the forecast period.

As noted above, a number of downside risks, including trade war escalation, exist for the AUD. Similar to wage growth, it is less likely that the exchange rate will return over the forecast period to the mining boom driven, near-parity levels recorded earlier this decade. As such we have not used the long-run average methodology outlined in the 2019 BRCP cost escalation factors which assumed that the exchange rate will return to its long-run average, 0.7614,²⁶ in a linear fashion.

The following exchange rates are proposed for the five year period:

Table 3.2: AUD/USD exchange rate projections

Financial Year	2020	2021	2022	2023	2024
AUD/USD	0.6944	0.7250	0.7375	0.7375	0.7375

Source: PwC analysis

²⁶ Since the floating of the AUD in 1983

4. Steel

We recommend that AEMO adopt the average of forecasted Chinese, European and United States hot rolled coil steel spot prices for the period FY2020 to FY2024.

4.1 Overview

4.1.1 Data and sources

There are a range of data sets and indices that could form the basis of steel price escalation. In our analysis, we considered global historical and forecast spot price data for different categories of steel from reputable sources including Bloomberg, Consensus Economics, Fitch Solutions and IHS Markit.

Consistent with the 2019 cost escalation factor estimates, we have used hot rolled coil (HRC) steel as the basis of our analysis. HRC steel provides a robust indicator for the price of the different types of steel used in power plant construction.²⁷

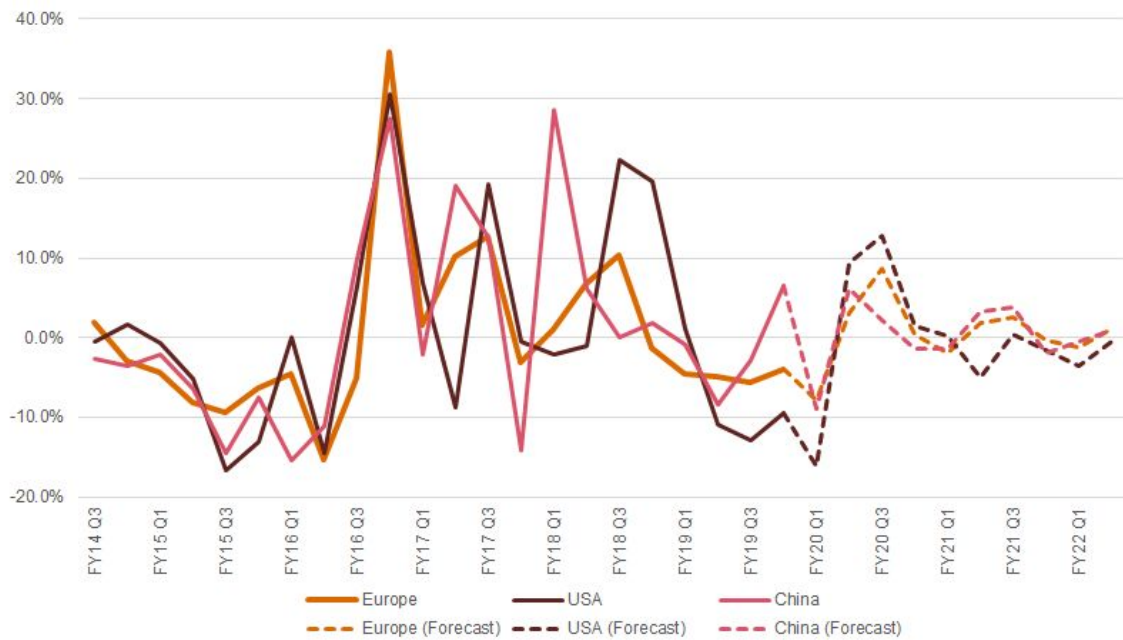
4.1.2 Market trends

The global price of steel has fluctuated significantly in recent years, driven by political and trade disputes as well as supply and demand factors (**Figure 4.1**). Owing to the slowing global economy, HRC prices declined by six per cent for Chinese steel, 18 per cent for European steel and 29 per cent for US steel in FY2019. Steel trade is intrinsically linked to the Chinese economy, with China accounting for 48 per cent of crude steel consumption and 52 per cent of crude steel production in 2019.²⁸ Chinese steel demand was supported in FY2019 by government stimulus measures that have boosted infrastructure spending.

²⁷ PwC (2018), *Estimating the Escalation Factors for the 2019 Benchmark Reserve Capacity Price Final report*, Pages 12-13, Figures 5-7

²⁸ Department of Industry, Innovation and Science (2019), *Resources and Energy Quarterly - June 2019*, available at: <https://publications.industry.gov.au/publications/resourcesandenergyquarterlyjune2019/documents/Resources-and-Energy-Quarterly-June-2019.pdf>, Page 25

Figure 4.1: HRC steel spot price (nominal quarterly percentage change)



Source: IHS Markit

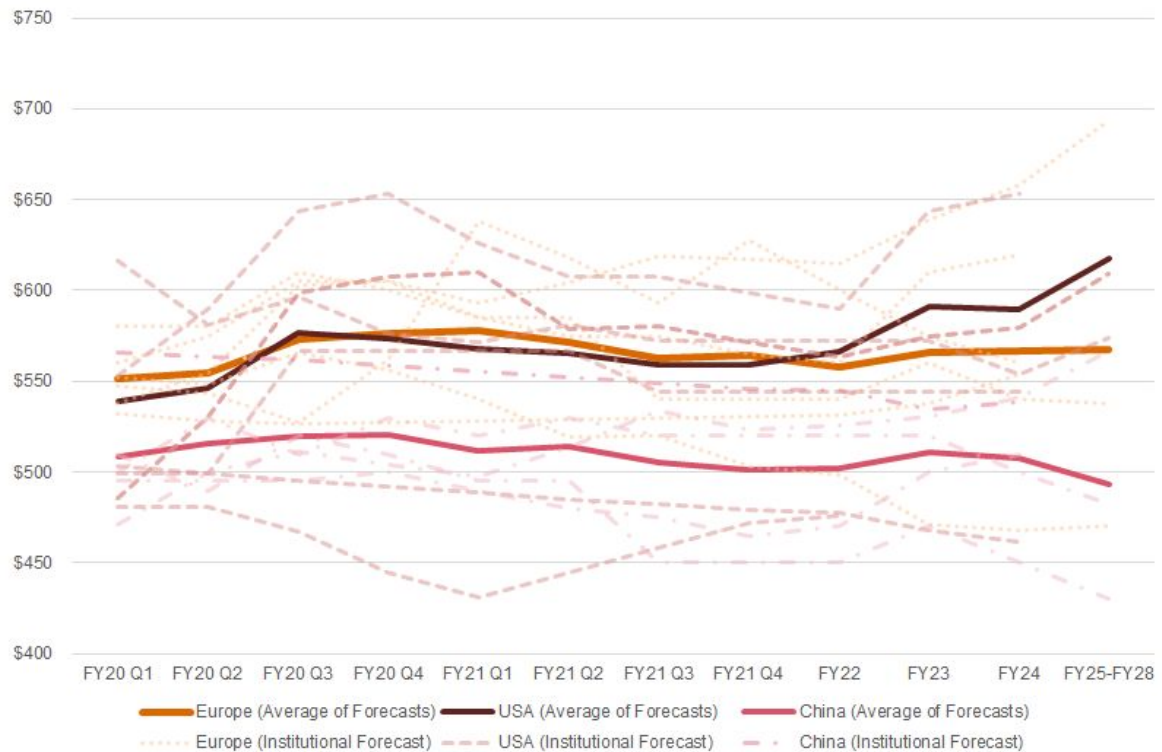
Over the longer-term there are a range of factors which may impact the global steel price. Were the Chinese economy to pivot (further) from heavy industry to a more service-based economy, downward pressure would be placed on demand/prices, while moves to curb pollution would place upward pressure on prices.²⁹ Fitch Solutions predict the average global surplus of steel to total 1.8 million tonnes annually from 2019 to 2028, far exceeding the average surplus of 0.7 million tonnes from 2009 to 2018, effectively capping prices.³⁰

Owing to the unpredictable political climate, forecasts developed by other industry sources, including Macquarie and Oxford Economics, show large divergences (**Figure 4.2**). Driven by forecasted large drops in US steel prices, not atypical in the heavily cyclical US steel market, the forecasted global/average price is projected to drop 11 per cent in FY2020 before virtually flatlining for the remainder of the forecast period.

²⁹ Reuters (2019), *China to tighten steel capacity swapping, boost domestic iron ore output*, available at: <https://www.reuters.com/article/us-china-steel-coal/china-to-tighten-steel-capacity-swapping-boost-domestic-iron-ore-output-idUSKCN1SF0YW>

³⁰ Fitch Solutions (2019), *Commodity Price Forecast - Steel Prices*

Figure 4.2: HRC steel spot price projections (nominal USD per metric tonne³¹)

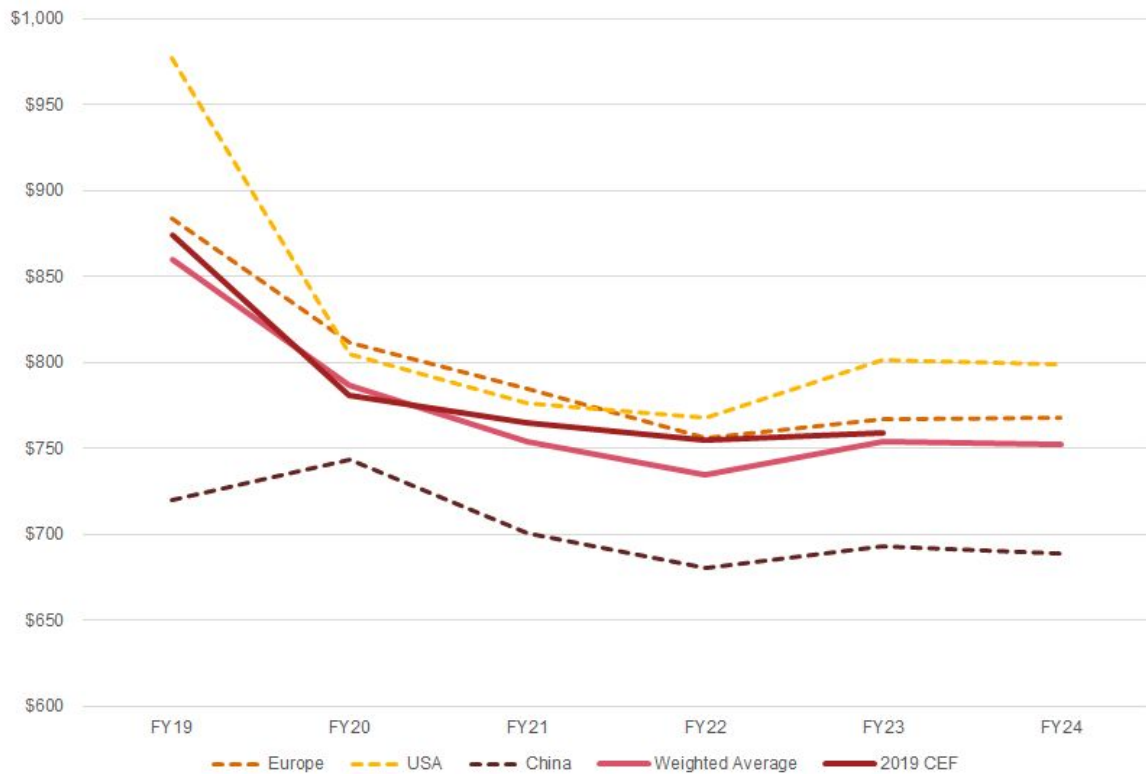


Source: Consensus Economics, PwC analysis

Figure 4.3 compares the average of the forecasts, for each of Europe, the USA and China (in AUD) relative to the 2019 BRCP cost escalation factors (**2019 CEF**) and our recommended 2020 BRCP cost escalation factors (**Table 4.1**). The weighted average of the forecasts (**Weighted Average**) follows a similar downward trajectory in FY2020 to the 2019 cost escalation factors (-8.6 per cent for the Weighted Average and -10.7 per cent for 2019 CEF). Beyond FY2020, the weighted average and the 2019 CEF both flatten out, reflecting ongoing pessimism amongst investors over the ongoing trade dispute between China and the US and its impact on the global economy.

³¹ As US steel prices are reported in short tonnes, we have applied a multiplier of 0.9072 to calculate a metric tonne equivalent

Figure 4.3: HRC steel spot price projections (nominal AUD per metric tonne)



Source: Consensus Economics, PwC analysis

4.2 Steel price projections

Consistent with the 2019 BRCP cost escalation factors, we recommend adopting the weighted average (**Weighted Average**) of Chinese, European, and United States HRC steel spot prices for the forecast period. Using this weighted average minimises the impact of country-specific supply and demand events on steel prices. We consider this granular view of steel forecasts by source market (Chinese, European and the United States) as important as the new OCGT entrant may source its steel from any one or combination of the markets.

The price of steel has been converted from USD to AUD using the exchange rate projections in **Table 3.2**.

The following steel prices are projected for the five year period:

Table 4.1: Steel price (per metric tonne) projections

Financial Year	2020	2021	2022	2023	2024
Steel price (AUD)	787	754	735	753	752
Steel price (%Δ)	-8.56% ³²	-4.15%	-2.55%	2.61%	-0.24%

Source: PwC analysis

³² Against the average FY2019 price

5. Copper

We recommend that AEMO adopt the average of institutional forecasts for the LME copper spot price for the period FY2020 to FY2024.

5.1 Overview

5.1.1 Data and sources

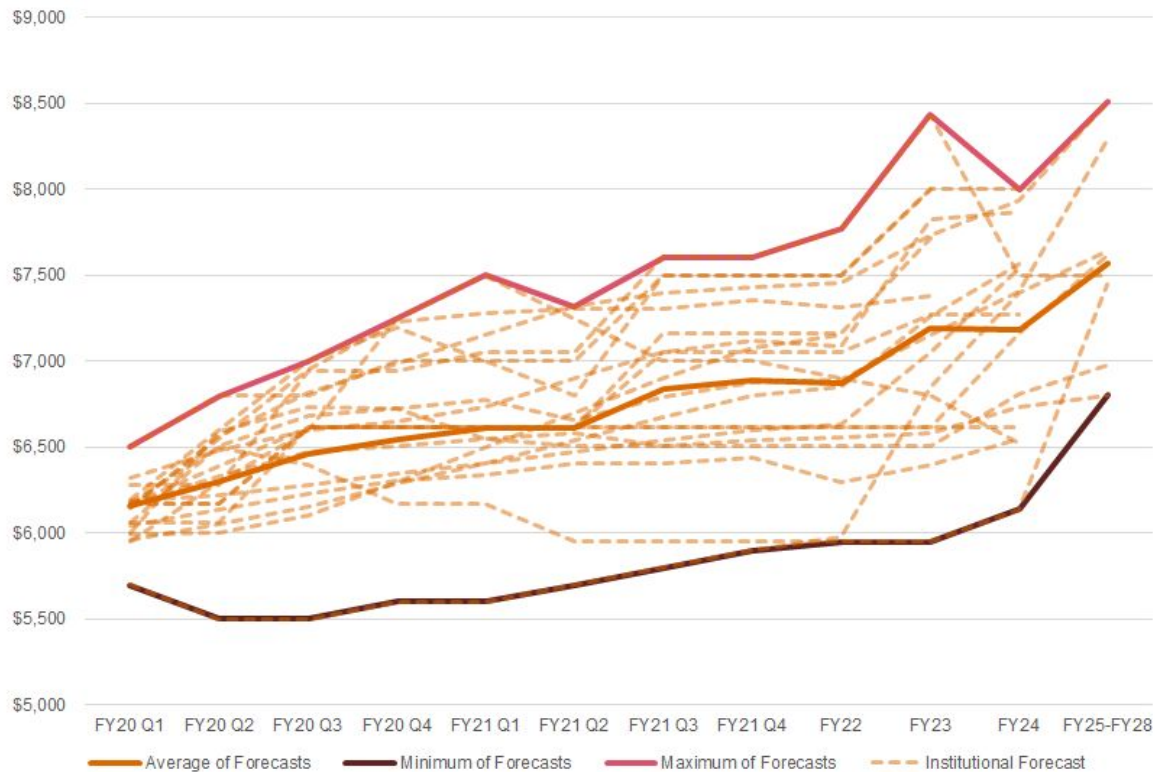
There are a range of data sets and indices that could form the basis of copper price escalation. In our analysis, we have considered global historical and forecast price data from various sources including Bloomberg, Consensus Economics, Fitch Solutions and IHS Markit.

Consistent with the 2019 BRCP cost escalation factor estimates, we have used the world copper LME spot price as the basis of our analysis.

5.1.2 Market trends

Institutional investors overwhelmingly anticipate that the price of copper will rise over the forecast period (**Figure 5.1**). A number of factors, including industrial action in Chile and greater investment in renewable energy and electric vehicles, lead forecasters to believe that the current global supply deficit will widen. Additionally, future global supply levels could be constrained by climate change action and stronger environmental policies, noting that copper mining is extremely energy intensive.

Figure 5.1: Copper spot price projections (nominal USD per metric tonne)

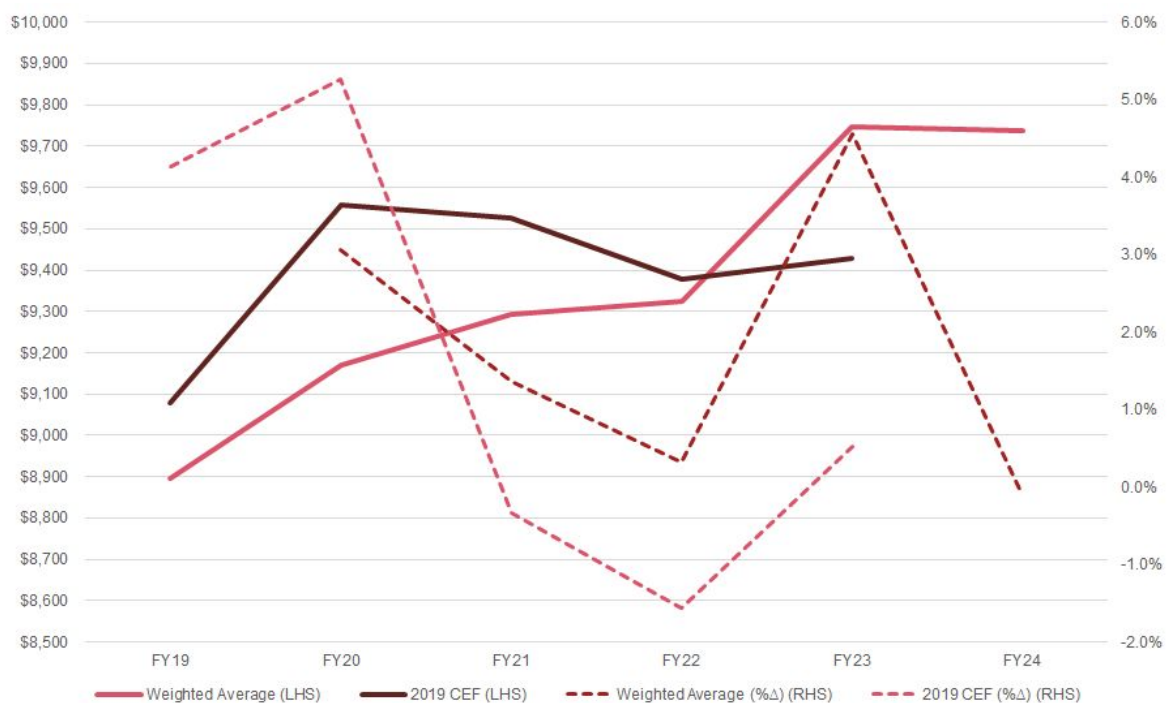


Source: Consensus Economics, PwC analysis

Similar to steel, the price of copper is heavily influenced by trends evident in the global metals market. Also like steel, China makes up much of global demand. While copper trade is not (currently) subject to the same level of political scrutiny as steel, recent price movements have trended downwards following the decision by the United States to place a 10 per cent tariff on all Chinese goods.³³ Figure 5.2 shows that 2019 BRCP cost escalation factors overshot the price point for FY2020, owing to the subsequent imposition of tariffs and the global economic slowdown. Beyond FY2020, however, the weighted average of forecasts (**Weighted Average**) shows stronger price growth, driven by the supply factors identified above.

³³ Reuters (2019), *Copper hits two-year low as U.S.-China trade war escalates*, available at: <https://www.reuters.com/article/global-metals/metals-copper-drops-to-2-year-low-as-u-s-china-trade-war-escalates-idUSL4N251289>

Figure 5.2: Copper spot price projections (nominal AUD per metric tonne and annual percentage change)



Source: Consensus Economics, PwC analysis

5.2 Copper price projections

Consistent with the recommended steel price projection, we recommend adopting the average of institutional forecasts (**Weighted Average**) of copper spot prices for the forecast period.

The price of copper has been converted from USD to AUD using the exchange rate projections in **Table 3.2**.

The following copper prices are projected for the five year period:

Table 5.1: Copper price (per metric tonne) projections

Financial Year	2020	2021	2022	2023	2024
Copper price (AUD)	9,169	9,293	9,323	9,748	9,738
Copper price (%Δ)	3.06% ³⁴	1.36%	0.32%	4.55%	-0.09%

Source: PwC analysis

³⁴ Against the average FY2019 price

Appendices

Appendix 1 - Enterprise Agreements

Table A.1: Recent Construction Enterprise Agreements

Agreement	Industry	Pay Increment
Perkins (WA) Pty Ltd Agreement 2019 ³⁵	Construction	The minimum rate will rise at the same percentage rate that the national minimum wage increases
Freo Group Pty Ltd Kwinana And Welshpool Transport And Stores Agreement 2019 ³⁶	Construction	Rates of Pay will be increased annually on each anniversary of the commencement of the Agreement at 2% or CPI Percentage (whichever is greater)
Downer Infrastructure Road Maintenance Agreement 2019 ³⁷	Construction	Downer will apply wage increases as follows: <ul style="list-style-type: none"> • CPI on the first pay period on or after 12 months from FWC approval • CPI on the first pay period on or after 24 months from FWC approval
Pacific Industrial Company (WA) Pty Ltd On-site Enterprise Agreement 2019 ³⁸	Construction	The wages shall be increased from 1 July each year, by the same percentage increase awarded to the minimum adult wage rate by the Fair Work Commission National Wage review
Srg Building (Western) Pty Ltd Enterprise Agreement 2019 ³⁹	Construction	The increase shall be in accordance with the September Quarterly issue and the All Groups Weighted Average of Eight Capital Cities CPI for the previous 12 months
Cranecorp Australia Perth Metro 2018 Enterprise Agreement ⁴⁰	Construction	The rates of pay will be increased annually on the anniversary by the Consumer Price Index published by the Australian Bureau of Statistics applicable to Western Australia, series A2325826V, at the time or 2% whichever is higher
Kae Pty Ltd Enterprise Agreement 2018-2022 ⁴¹	Construction	The minimum hourly rates shall be increased in July each year by at least the Consumer Price Index percentage movement for the year to March Qtr. for the 8 Capitals of Australia
Crown Construction Services And CFMEU (WA) Enterprise Agreement 2018-2020 ⁴²	Construction	Wages and allowances will be as follows: <ul style="list-style-type: none"> (i) 4.25% from 1st pay period commencing on or after 31 December 2018; and (ii) 4.375% from 1st pay period commencing on or after 31 December 2019
Lendlease – Services – Western Australia – Enterprise Agreement 2018 ⁴³	Construction	The wage rates and allowances will be increased in line with the following percentages from the first full pay period to fall after the following dates: <ul style="list-style-type: none"> (b) 1 August 2019 – 3%;

³⁵ Available at: <https://www.fwc.gov.au/documents/documents/agreements/fwa/ae504682.pdf>

³⁶ Available at: <https://www.fwc.gov.au/documents/documents/agreements/fwa/ae504703.pdf>

³⁷ Available at: <https://www.fwc.gov.au/documents/documents/agreements/fwa/ae504663.pdf>

³⁸ Available at: <https://www.fwc.gov.au/documents/documents/agreements/fwa/ae504360.pdf>

³⁹ Available at: <https://www.fwc.gov.au/documents/documents/agreements/fwa/ae504326.pdf>

⁴⁰ Available at: <https://www.fwc.gov.au/documents/documents/agreements/fwa/ae503590.pdf>

⁴¹ Available at: <https://www.fwc.gov.au/documents/documents/agreements/fwa/ae503435.pdf>

⁴² Available at: <https://www.fwc.gov.au/documents/documents/agreements/fwa/ae503316.pdf>

⁴³ Available at: <https://www.fwc.gov.au/documents/documents/agreements/fwa/ae503072.pdf>

(c) 1 August 2020 – **3%**; and
(d) 1 August 2021 – **3%**.

G N Construction (Aust) Pty Ltd Enterprise Agreement 2018 ⁴⁴	Construction	The base rate of pay will be adjusted by the CPI percentage for Australia as declared by the Australian Bureau of Statistics
Central Reo And CFMEU (WA) Enterprise Agreement 2018-2020 ⁴⁵	Construction	Wages and allowances under this Agreement will be increased over the life of the Agreement as follows: (i) 3.125% from 1st pay period commencing on or after 31 December 2018; and (ii) 3.125% from 1st pay period commencing on or after 31 December 2019

Source: Fair Work Commission

Table A.2: Recent Electricity, Gas, Water and Waste Enterprise Agreements

Agreement	Industry	Pay Increment
Programmed Facility Management - City West Water Agreement 2018 ⁴⁶	Water	Agreed increases for the life of the agreement are as follows and will be effective the 1st of August, or the first full pay period falling closest to 1 August: • 1 August 2017 2% • 1 August 2018 2% • 1 August 2019 3% • 1 August 2020 3%
Programmed Facility Management - City West Water/AMWU Agreement 2019 ⁴⁷	Water	Agreed increases for the life of the agreement are: • 1st July 2018 3% • 1st July 2019 3% • 1st July 2020 3% • 1st July 2021 3%
Gwmwater Enterprise Agreement 2018 ⁴⁸	Water	Salary rates shall be increased by 3.25% effective from the first full pay period on or after 20/09/2018. Salary rates shall be further increased by 3.25% effective from the first full pay period on or after: a) 15/07/2019 b) 15/07/2020 c) 15/07/2021
APA Transmission Pipelines (WA, NT, QLD & MOOMBA) Enterprise Agreement 2018 ⁴⁹	Gas	The Base Rate of Pay and applicable allowances will be increased as follows: a) from first pay period commencing on or after 1 July 2018 - 3% ; b) from first pay period commencing on or after 1 July 2019 - 3% ; and c) from first pay period commencing on or after 1 July 2020 - 3%
Synergy Perth Enterprise Agreement 2018 ⁵⁰	Electricity	Employees' TFR will be increased by \$1,000 per annum in September each year for the life of this Agreement. The \$1,000 per annum increase in TFR will be applied on a pro rata basis for part time and casual employees. If, during the life of the Agreement, the State Government changes the allowable agreement increases under the State

⁴⁴ Available at: <https://www.fwc.gov.au/documents/documents/agreements/fwa/ae502579.pdf>

⁴⁵ Available at: <https://www.fwc.gov.au/documents/documents/agreements/fwa/ae502433.pdf>

⁴⁶ Available at: <https://www.fwc.gov.au/documents/documents/agreements/fwa/ae504140.pdf>

⁴⁷ Available at: <https://www.fwc.gov.au/documents/documents/agreements/fwa/ae503706.pdf>

⁴⁸ Available at: <https://www.fwc.gov.au/documents/documents/agreements/fwa/ae502262.pdf>

⁴⁹ Available at: <https://www.fwc.gov.au/documents/documents/agreements/fwa/ae501523.pdf>

⁵⁰ Available at: <https://www.fwc.gov.au/documents/documents/agreements/fwa/ae502057.pdf>

		Government Public Sector Wages Policy, Synergy will honour the relevant increase
AEMO Enterprise Agreement 2018 ⁵¹	Electricity	The following increases to TEC rates will apply to employees covered by this Agreement: (a) 2.9% with effect from the beginning of the first pay period on 1 July 2018; and (b) 2.9% with effect from the beginning of the first pay period on 1 July 2019; (c) 2.9% with effect from the beginning of the first pay period on 1 July 2020

Source: Fair Work Commission

⁵¹ Available at: <https://www.fwc.gov.au/documents/documents/agreements/fwa/ae500641.pdf>

