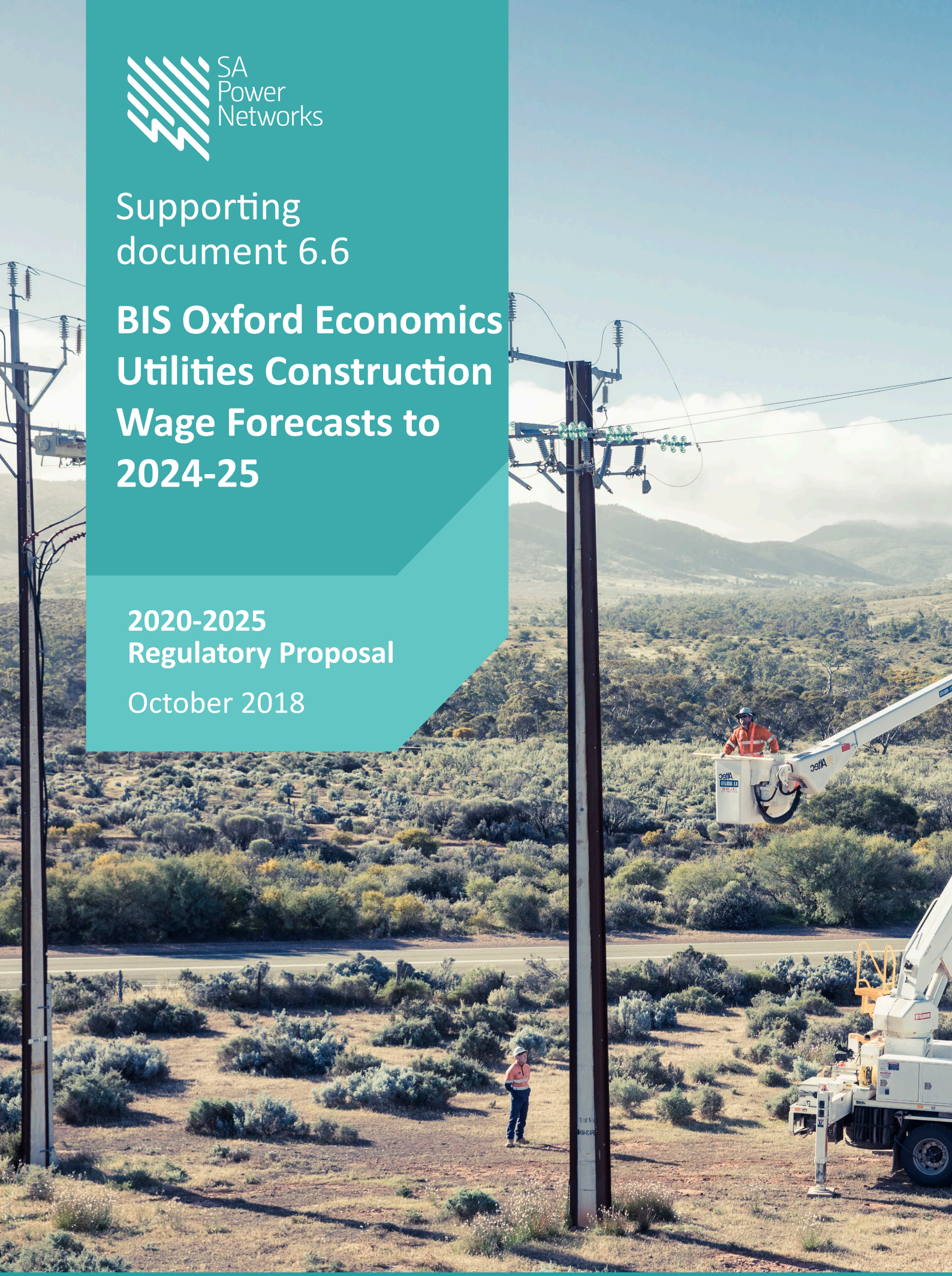
SA Power Networks

Supporting document 6.6

BIS Oxford Economics Utilities Construction Wage Forecasts to 2024-25

2020-2025 Regulatory Proposal

October 2018



BIS OXFORD ECONOMICS

UTILITIES & CONSTRUCTION WAGE FORECASTS TO 2024/25

FOR SA POWER NETWORKS

OCTOBER 2018

BIS Oxford Economics

Effective March 1 2017, UK-headquartered **Oxford Economics,** one of the world's foremost independent global advisory firms acquired a controlling stake in **BIS Shrapnel**. BIS Shrapnel had been in continuous operation since July 1, 1964 as a completely independent Australian owned firm providing industry research, analysis and forecasting services. The new organisation is now known as **BIS Oxford Economics**.

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October 2018

The modelling and results presented here are based on information provided by third parties, upon which BIS Oxford Economics has relied in producing its report and forecasts in good faith. Any subsequent revision or update of those data will affect the assessments and projections shown.

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EXECUTIVE SUMMARY

BIS Oxford Economics was engaged by SA Power Networks to provide price forecasts of labour costs relevant to electricity distribution networks in South Australia. Forecasts of wages will be used by SA Power Networks to develop the real price changes over its upcoming regulatory period, which, in turn, will be used by the business to construct its expenditure forecasts.

Although SA Power Networks' next revenue proposal covers the five-year period from 2020/21 to 2024/25 (inclusive), BIS Oxford Economics was asked to provide eightyear forecasts covering financial years 2017/18 to 2024/25 to allow for escalation over the full outlook period. Forecasts of both nominal and real price growth of the relevant inputs were provided. Our forecasts are summarised in Table 1.

+3.9%

Expected wage increases for employees in the utilities industry

BIS Oxford Economics expects total wage costs for the Australian Electricity, Gas, Water and Waste Services (EGWWS or 'Utilities') sector — expressed in Wage Price Index terms — will average 3.9% per annum over the five years to 2024/25, 0.4% higher than the national 'All Industries' average of 3.5% p.a. over the same five-year period.

Utilities wages are forecast to increase by more than the national average because of the following factors:

- the electricity, gas and water sector is a largely capital intensive industry whose employees have higher skill, productivity and commensurately higher wage levels than most other sectors.
- strong union presence in the utilities sector will ensure outcomes for collective agreements, which cover 61% of the workforce, remain above the wage increases for the national 'all industry' average. In addition, with the higher proportion of employees on EBAs, compared to the national average (37%), and EBAs wage rises normally higher than individual agreements, this means higher overall wage rises in the EGWWS sector.
- increases in individual agreements (or non-EBA wages) are expected to strengthen from current weak levels as a broadbased economic recovery takes a foothold from early next decade.
- demand for (tight) skilled labour has picked up and will strengthen with the large increases in utilities investment over 2017/18 and 2018/19, with investment levels expected to remain elevated over the medium term. This will also be a key driver of wages going forward.
- the overall national average tends to be dragged down by the lower wage and lower skilled sectors such as the Retail Trade, Wholesale Trade, Accommodation, Cafés and Restaurants, and, in some periods, also Manufacturing and Construction. These sectors tend to be highly cyclical, with weaker employment suffered during downturns impacting on wages growth in particular. The EGWWS sector is not impacted in the same way due to its obligation to provide essential services and thus retain skilled labour.

Over the past three years, overall WPI growth in the EGWWS sector in South Australia is estimated to have been slightly lower than the national EGWWS increase, and this is expected to persist over the next few years. South

Australian EGWWS WPI growth is expected to rise from recent lows, and pick up to 3% (nominal terms) by 2019/20.

However, a marked pick-up in economic growth in the state from early next decade is expected to see employment growth and the labour market tighten. This is expected to be accompanied by increases in utilities related construction in the state, mining-related investment and construction activity generally. The overall strengthening in the labour market, and particularly in the Construction and Mining sectors – which are key competitors to the utilities sector in terms of 'similarly' skilled workers - is expected to result in utilities WPI growth accelerating significantly over the 2021 to 2023 period, and subsequently remain elevated over the following two years to 2024/25.

Utilities WPI growth is forecast to average 3.9% p.a. in nominal terms over the five years to 2024/25 inclusive (i.e. over SA Power Networks' next regulatory period) – or 1.5% in real (inflation adjusted) terms (see Table 1).

In terms of SA Power Networks' contract or 'out-sourced' labour escalation, given utility service providers' outsourced labour is mostly supplied by firms in the construction industry, we proxy SA Power Network's contract labour cost escalation by wages growth (as measured by the WPI) in the state's construction industry.

Table 1. Wage Forecasts for South Australia and Australia

(Per cent change, year average, year ended June)

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Average (f)
NOMINAL LABOUR PRICE CHANGES	Actuals						Forecasts		Next Regulatory Period					
South Australia Wages														
(1) Electricity, Gas, Water and Waste Services Wages:														
Wage Price Index (a)	**3.9**	**3.5**	**2.9**	**2.2**	**2.0**	**2.0**	**2.6**	**3.0**	**3.5**	**3.9**	**4.1**	**4.0**	**3.8**	**3.9**
(2) Construction:														
Wage Price Index (a)	**2.9**	**2.2**	**1.9**	**1.4**	**1.4**	**1.3**	**2.0**	**2.4**	**3.1**	**3.8**	**4.1**	**3.7**	**3.3**	**3.6**
Australian Wages (b)														
(3) Electricity, Gas, Water and Waste Services Wages:														
- Wage Price Index	4.2	3.2	2.8	2.4	2.2	2.0	2.7	3.1	3.6	4.0	4.2	4.0	3.8	3.9
- Average Weekly Ordinary Time Earnings (c)	6.1	2.0	0.7	3.5	4.3	2.3	2.8	3.5	4.0	4.4	4.5	4.3	4.1	4.3
(4) Construction:														
- Wage Price Index	3.3	2.9	2.1	1.6	1.7	2.4	2.4	2.6	3.4	3.9	4.1	3.6	3.3	3.6
- Average Weekly Ordinary Time Earnings (c)	4.3	2.1	2.2	1.4	2.2	2.0	2.0	3.3	3.8	4.5	4.7	4.0	3.9	4.2
Consumer Price Index (headline) (d)	2.3	2.7	1.7	1.4	1.7	1.9	1.9	2.2	2.4	2.4	2.4	2.4	2.4	2.4
REAL LABOUR PRICE CHANGES (e)	Actuals						Forecasts		Next Regulatory Period					
South Australia Wages (Real)														
(R1) Electricity, Gas, Water and Waste Services Wages														
Wage Price Index	**1.7**	**0.8**	**1.2**	**0.8**	**0.3**	**0.1**	**0.7**	**0.8**	**1.2**	**1.5**	**1.7**	**1.6**	**1.4**	**1.5**
(R2) Construction														
Wage Price Index	**0.6**	**-0.5**	**0.2**	**0.0**	**-0.3**	**-0.6**	**0.1**	**0.2**	**0.7**	**1.4**	**1.7**	**1.3**	**0.9**	**1.2**
Australian Wages (Real)														
(R3) Electricity, Gas, Water and Waste Services Wages														
Wage Price Index	1.9	0.4	1.1	1.0	0.5	0.0	0.8	0.9	1.3	1.6	1.8	1.6	1.4	1.5
Average Weekly Ordinary Time Earnings	3.9	-0.7	-1.0	2.2	2.6	0.4	0.9	1.3	1.7	2.0	2.1	1.9	1.7	1.9
(R4) Construction														
Wage Price Index	1.1	0.2	0.4	0.2	0.0	0.5	0.5	0.4	1.0	1.5	1.7	1.2	0.9	1.2
Average Weekly Ordinary Time Earnings	2.0	-0.6	0.5	0.0	0.5	0.1	0.1	1.1	1.4	2.1	2.3	1.6	1.5	1.8

Source: BIS Oxford Economics, Department of Employment, RBA, ABS Data

(a) Wage price index for total hourly rates of pay excluding bonuses. It measures quarterly change in combined ordinary time and overtime hourly rates of pay. This series is unaffected by compositional shifts in earnings and is a pure labour price measure. That is, the WPI reflects changes in the demand and supply of labour. Note that the WPI for states by industry is only published for total hourly rates of pay excluding bonuses. Hence, for consistency we use this series. However, as bonuses are excluded, this series does not reflect compensation for productivity improvements.

(b) Australian wages provided for comparison.

(c) Average Weekly Ordinary Time Earnings for full-time adult persons. This series is also affected by compositional effects but to a lesser extent than the AWE (Average Weekly Earnings) series as AWOTE excludes all part-time employees, juniors, trainees and apprentices (included in AWE), along with all overtime earnings of full-time employees paid at the adult rate.

(d) Inflation forecasts are RBA forecasts for the next 2 years. Beyond that, forecasts are calculated as a geometric mean of the 'official' inflation forecasts over the next 10 years. This methodology has been adopted by the AER in their recent revenue decisions.

(e) Real price changes are calculated by deducting the inflation rate from nominal price changes.

(f) Expected average wage change for SAPN's next revenue determination period i.e. from 2020/21 to 2024/25 inclusive.

Our research has shown that construction activity (ie work done in the sector) normally has a strong influence on construction wages, although changes in wages tend to lag construction (in work done terms) by around one to two years. Hence, our wage forecasts are based on BIS Oxford Economics forecasts of construction activity by state (which includes residential and non-residential building, plus engineering construction) as well as predicted movements in the construction wages at the national level.

Construction wages at the national and South Australian level have weakened dramatically since 2011/12, and are well below the robust increases during the construction boom of the latter half of last decade. While collective agreements in the sector have maintained their relative high increases over the past 4 years, there has been a marked weakening in wages growth in the individual agreements segment (which at almost 63% of construction employees, dominate the method of pay-setting within the sector). However, with the overall labour market beginning to tighten, and the fall in overall construction activity reversing in 2017/18, we expect wages growth in the sector to begin to improve. Nevertheless, construction activity is set to again weaken over 2018/19 and 2019/20, and this will limit the improvement in construction wages growth over the next two years.

Construction wages growth is expected to pick up pace over 2020/21 to 2022/23, driven by a synchronised upturn in the three construction segments. Our forecast is for the Construction WPI to average 3.6% per annum over the five-year period to 2024/25 at both the national and South Australian level – or 1.2% p.a. on average in real (inflation adjusted) terms. While this is a marked improvement on the past five years, it is still well down on the 4.3% annual average (nominal) of the decade to 2011/12.

Note that most of the references to historical data and forecasts of **wages** in this report (particularly the Executive Summary and sections 3 and 4) **are in nominal terms**, unless specifically stated that the data/forecasts are in real (inflation adjusted terms).

1. INTRODUCTION

Project background, motivation and research agenda

BIS Oxford Economics was engaged by SA Power Networks to provide price forecasts of labour costs relevant to electricity distribution networks in South Australia. Forecasts of wages will be used by SA Power Networks to develop the real price changes over its upcoming regulatory period, which, in turn, will be used by the business to construct its expenditure forecasts.

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In keeping with my instructions, I, Richard Robinson, Associate Director (Economics) of BIS Oxford Economics, confirm that I have undertaken this engagement having regard to the Guidelines for Expert Witnesses in Proceedings in the Federal Court of Australia and the requisite statement to this effect is included in Appendix B. I have been assisted in the preparation of this report by Tyson Goddard (Research Assistant) at BIS Oxford Economics. Curriculum vitas of all relevant personnel are attached in Appendix C. Notwithstanding the assistance from the other economist, the opinions in this report are my own and I take full responsibility for them.

The Australian Bureau of Statistics is the primary data source for the consumer price index, wages, employment, real gross value added and investment (including engineering construction) data, and for a range of other economic variables shown in Tables 2 and 3. The most recent wages data is for the June 2018 quarter and the latest industry employment data is for the month of August 2018. The June 2018 quarter was the latest available data for real gross value added (at the Australian level only), investment and indeed most of the economic variables in Table 2. The detailed engineering construction data (by state and by category) have data up to March 2018 quarter. The latest data for Gross State Product and real gross value added for state industry sectors was 2016/17. Other inflation and interest rate data were sourced from the Reserve Bank of Australia, while data and information concerning enterprise agreements were obtained from the Department of Employment.

Forecasts of the economic variables in this report were mostly sourced from BIS Oxford Economics reports, including *Economic Outlook*, *Long Term Forecasts: 2018 – 2033*, *Engineering Construction: 2017/18 to 2031/32* and *Long Term Building Work Done Forecasts*, along with other unpublished forecasts and from BIS Oxford Economics internal research and modelling.

Structure of the report

The previous Summary section presents an overview of the outlook for the labour costs including numerical forecasts which are presented in summary tables.

Section 2 provides a macroeconomic outlook for Australia and South Australia. This section also has forecasts of key economic variables plus a discussion of the drivers and logic underpinning the forecasts. Section 2 essentially provides a context for our Australian wage forecasts including wage forecasts by state and by industry.

Section 3 discusses BIS Oxford Economics' model of wage determinations and provides forecasts of national ('all industries') wages and CPI inflation, which are used to deflate the nominal wage forecasts included in this report. Note that most of the **references to historical data and forecasts of wages** in both section 3 and section 4 **are in nominal terms**, unless specifically stated that the data/forecasts are in real (inflation adjusted terms).

Section 4 has wage forecasts for the Electricity, Gas, Water and Waste Services (EGWWS) and Construction sectors at the Australia level and for South Australia as measured by the WPI (wage price index).

Appendices include an explanation of different wage measures, CV's of key personnel and the Terms of Reference from SA Power Networks.

2. MACROECONOMIC OVERVIEW: AUSTRALIA AND SOUTH AUSTRALIA

2.1 AUSTRALIAN ECONOMIC OVERVIEW AND OUTLOOK

Good short-term outlook for Australian economy, mainly driven by exports

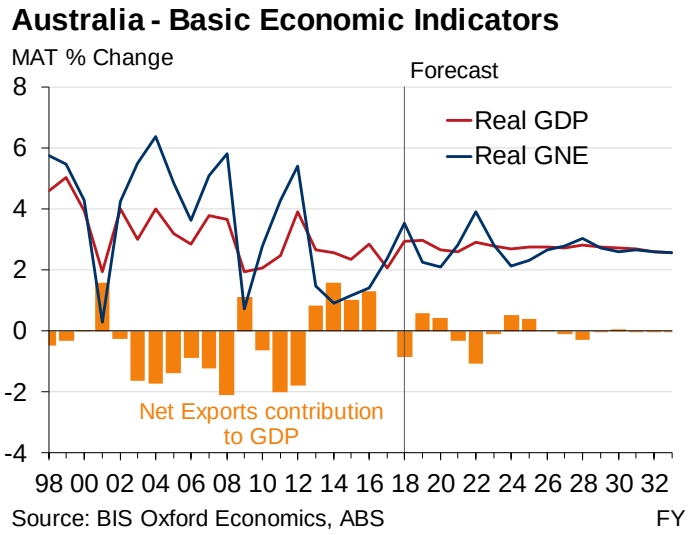
Australia's economic growth has bounced back over the past year, with GDP growth increasing by 2.9% in 2017/18, following only 2.1% in 2016/17 and an average of 2.5% over the past 6 years. The current momentum in overall growth is expected to be maintained over the next year, with a slight pickup to 3.0% in 2018/19, before slowing again to 2.7% in 2019/20.

Over the next 2 to 3 years, GDP will be boosted by net exports, with solid growth in export volumes forecast. Underpinning this will be positive momentum in the global economy, new LNG capacity, and moderate increases in capacity in other key commodities. Also contributing is strong growth in services exports, led by inbound international tourism and education, which is being boosted by a more competitive dollar. The outlook for rural and manufacturing exports is also positive, with both sectors taking advantage of Australia's comparative advantage in high quality, high value-added output.

Pace of expansion has been relatively subdued over past 6 years

Growth in GDP and particularly domestic demand has been considerably lower over the past six years than the previous two decades. The main drag has been a major decline in mining investment, which has coincided with (and contributed to) weakness in non-mining business investment. Net exports has acted as a partial offset during this period, due to booming resource and services exports and weak growth in import volumes.

Fig. 1.



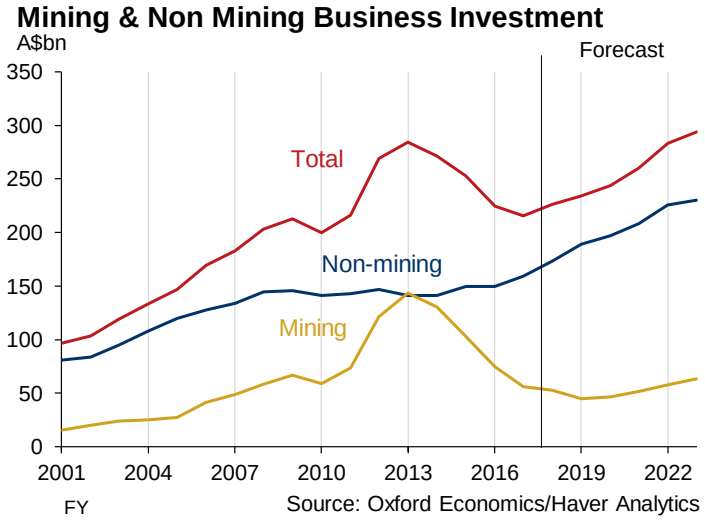
Looking ahead, it is becoming apparent that the structural shift in the Australian economy back to broad-based growth following the mining boom is finally gathering speed, with the economy now more balanced and sustainable – back to where it was 15 years ago.

Major structural changes over past 15 years appear to have run their course, and come full circle

Australia moved from broad-based growth in the early 2000s – underwritten by a very low and competitive exchange rate (below US60 cents) – and into an unprecedented mining investment boom over the decade to 2013. This shift was driven largely by the industrialisation and urbanisation of China (where annual GDP growth averaged over 10%). Chinese and other countries' demand pushed up commodity prices and Australia's terms of trade to new heights, lifting the Australian dollar to over US$1.00 – a level not seen since the previous commodity boom of the early 1980s. The economy shifted resources toward servicing the mining investment boom and away from the (other) tradeables sector which were impacted by the appreciation of the A$. The tourism and international education sectors suffered, while the manufacturing sector was severely impacted – gross value added fell a cumulative 13% over the decade to 2016/17, including a 5% fall during 2009/09 (mainly due to the global financial crisis) and another 9% over the five years to 2016/17.

The end of the commodities boom and depreciation of the A$, which fell over 30% peak-to-trough, has triggered a second structural shift over the past five years. The economy has shifted back towards non-mining tradables sectors. Accompanying this, we estimate that there will be a 69% decline in mining investment from its 2012/13 peak to 2018/19 trough. As mining comprised just over half of total business investment (32% of total investment) at its peak, the steep plunge in mining investment has put a significant drag on economic growth over the past five years.

Fig. 2.



Broad-based growth has returned, with lower A$ a key factor

The lower A$, which has held steady in a US$72-79 cent band for over a year, has been fundamental in facilitating the return of broad-based growth. Together with rising capacity utilisation and the recovery in profits, it has facilitated a turnaround in non-mining investment, which has become a key driver of domestic demand over the last year. Businesses in the agriculture, mining, tourism, international education and some other services have seen their competitiveness improve markedly, enabling them to compete on the international stage. But the depreciation is still not quite enough for many parts of the manufacturing sector (which need a dollar well below US75 cents).

Nevertheless, with all the major industry shutdowns now complete (the last being car manufacturing last year), manufacturing output bounced back in 2017/18 and is expected to sustain solid growth in 2018/19.

Strong global economy is supporting exports, but trade protectionism concerns rising

The acceleration in global growth over the past two years has also been supportive, boosting export volumes and initiating a recovery in commodity prices. Looking ahead, global economic growth is expected to peak in 2018 at 3.8% and then gradually decelerate over the next five years to 3.3% in calendar 2022. The US economy is currently growing at its fastest pace in four years, but with capacity constraints starting to bite, we expect growth to slow as the fiscal boost (tax cuts) dissipates and inflation and US interest rates rise. Chinese growth will continue to decelerate as the economy proceeds with its own structural transformation toward domestic led growth and services. Momentum is also expected to ease in Japan and Europe as they return to full employment. On the other hand, solid growth is expected to continue in India and most of east Asia (excluding China and Japan), which augers well for Australian exports. Nevertheless, rising US interest rates will pose a risk for a number of emerging economies.

Of more concern is rising protectionism in the form of tariffs imposed by the USA and the reciprocal responses from China and Europe. Although our current view is that the trade war will have a minimal impact on overall global growth, the downside risks have increased. Much of the risks relate to uncertainty and their effects on business and consumer confidence. Already there has been a sharp correction to commodity prices recently (with the exception of oil), and we expect the trade uncertainty to weigh on prices for the next 1-2 years. However, by the early 2020s, the tightening supply-demand balance in a number of commodity markets is expected to initiate a recovery in prices, which will fuel the next round of mining investment.

Slower growth in domestic demand next two years, following 2017/18 rebound

The recovery in domestic demand over 2017/18 (+3.5%) boosted Australia's GDP last year, but we expect it to weaken again over the next 2 years. Momentum in household spending remains weak, with consumers held back by weak growth in wages and other sources of income (including interest receipts and dwelling rental income). And despite the upturn in non-mining investment, total capital expenditure will be somewhat patchy as residential and mining capital expenditure and the end of the NBN roll out (in 2019/20) putting a drag on the outlook.

Synchronisation of investment to drive stronger growth from early 2020s

By early next decade, the investment cycles – which are currently offsetting each other and out-of-synch – are all expected to move into upswing and gradually synchronise and broaden, although there will be differences in the strength and timing among the different residential, business and public investment components. The strengthening in investment will lead to an increase in pace of employment growth and, with the labour market tightening, an increase in wages, household incomes and consumer spending. In addition, with the government's budgetary position improving due to increased taxes, the government is expected to loosen fiscal policy – either via increased recurrent or capital spending or tax cuts, or more likely a combination of all three.

The upshot is that growth in domestic demand will strengthen, while export growth is forecast to moderate as the increase in LNG production increases hit capacity, although services and non-commodity exports are expected to

continue to grow. However, much stronger imports (in line with domestic demand) will see net exports detract from economic growth. Nevertheless, GDP growth is forecast to lift and average around 3% over 2021/22 to 2022/23. outlook.

Table 2. Australia – Key Economic Indicators, Financial Years

Year Ended June					Forecasts						
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Total New Private Investment (+)	**-2.2**	**-4.9**	**-1.6**	**3.6**	**0.8**	**1.5**	**3.9**	**7.4**	**2.4**	**-1.9**	**0.8**
New Public Investment (+)	**-7.6**	**6.7**	**10.5**	**6.9**	**4.2**	**-3.2**	**0.7**	**2.6**	**3.8**	**0.8**	**2.6**
Gross National Expenditure (GNE)	**1.1**	**1.4**	**2.4**	**3.5**	**2.4**	**2.1**	**3.2**	**4.1**	**2.9**	**1.6**	**2.4**
GDP	**2.4**	**2.8**	**2.1**	**2.9**	**3.1**	**2.7**	**2.9**	**3.1**	**2.9**	**2.4**	**2.9**
Inflation and Wages											
CPI (Yr Avg)- RBA forecasts (*)	1.7	1.4	1.7	1.9	1.9	2.2	2.4	2.4	2.4	2.4	2.4
Wage Price Index (Jun on Jun)(**)	2.3	2.1	1.9	2.1	2.6	2.7	3.5	3.7	3.8	3.5	3.3
Wage Price Index (Yr Avg)(**)	2.4	2.1	2.0	2.1	2.4	2.6	3.3	3.7	3.8	3.5	3.3
Average Weekly Earnings (Yr Avg)(^)	2.4	1.9	2.0	2.4	2.8	3.2	3.7	4.3	4.4	3.9	3.8
Employment											
– Employment Growth (Yr Avg)	1.3	2.3	1.5	3.0	1.9	1.1	1.4	2.1	1.7	1.0	1.3
– Employment Growth (May on May) (%)	2.0	1.8	2.1	2.6	1.5	1.1	1.7	2.3	1.3	1.1	1.4
– Unemployment Rate (May) (%)	5.9	5.7	5.5	5.4	5.5	5.6	5.4	4.7	4.8	5.1	5.0
Labour Productivity Growth											
– Total	1.1	0.6	0.6	-0.1	1.3	1.6	1.5	0.9	1.1	1.4	1.5
– Non-farm	1.1	0.8	0.3	0.2	1.3	1.6	1.4	1.0	1.1	1.4	1.5

Source: BIS Oxford Economics, ABS and RBA

+Expenditure on new assets (or construction work done). Excludes sales (or purchases) of second hand assets.
*Headline CPI forecasts based on Reserve Bank of Australia's forecasts to December 2020 quarter. Beyond this, we've used the mid-point of the Reserve Bank's 2 to 3 per cent inflation target range.
** Based on Ordinary Time Hourly Rates of Pay Excluding Bonuses.
^ Average Weekly Ordinary Time Earnings for Full-Time Adult Persons.
e: estimate

Inflation and interest rates to remain low over the next 2 years, before gradually rising over early 2020s

With wages growth well below historical averages, domestic cost push pressures are expected to remain limited in the near term. Underlying inflation is forecast to rise from 1.9% now to 2.3% in 2019/20. A lack of inflation and continuing slack in the labour market is expected to keep the RBA on hold for a while, with the cash rate forecast to remain at 1.5% until mid-2020, before rising to 2.75% by the second half of 2022 as wages and CPI inflation rise back toward (and above) historical averages, and the unemployment rate dips below 5%. 10-year government bond rates will also gradually rise to over 4% by 2021/22, from around 2.7% now. Australian long-term bond rates are expected to track the rise in US bonds over the next few years, with US bond rates expected to rise as a result of monetary tightening in the US. Meanwhile, the 1.25% rise in the cash rate in Australia means the housing variable rate will rise above 6.3% by mid-2022, which will be enough to slow consumer spending and impact housing and business investment over 2022/23 and 2023/24.

Overall, average annual GDP growth over the five years to 2022/23 is forecast to be 2.9%, which will be an improvement on the 2.5% average of the 5 years to 2017/18. Growth will also be far more domestically oriented, with Gross National Expenditure forecast to average 2.9%, compared to only 1.8% in the 5 years to 2017/18.

Mild slowdown in mid-2020s as economy moves to trend growth

The tightening of monetary policy will precipitate an overall slowing of economic growth in the mid- 2020s. But as consumers and businesses re-adjust to the 'normalcy' of higher interest rates – although at much lower levels than the 2000s and early 2010s – investment and consumer spending will return to long term trend (or potential) rates of growth over the second half of the 2020s.

2.2 OUTLOOK FOR THE SOUTH AUSTRALIAN ECONOMY

The South Australian economy has finally gained traction over the past 2 years, after 6 years of anaemic growth to 2015/16 inclusive, when State Final Demand (SFD) averaged 1.1% p.a. and Gross State Product (GSP) averaged only 0.9% p.a. SFD rose 3.2% in 2016/17 and an estimated 3.4% in 2017/18, while GSP picked up to 2.2% in 2016/17 and an estimated 2.9% in 2017/18.

SA economy has picked over last 2 years thanks to surging investment

The pick-up in overall investment has been the key to the improvement in the state economy. Total investment increased 4.9% in 2016/17 and 7.7% in 2017/18, led initially by dwelling and public investment, and then joined by surging business investment over the past year. This has underpinned the recovery in employment, rising 1.3% and 2.1% respectively over the past 2 years, which has pushed the state unemployment rate down from 7.3% in 2015/16 to 5.4% in June 2018.

Another increase in overall investment is predicted for 2018/19, with moderate rises forecast for dwelling, business investment and public investment. New public investment has increased a cumulative 31% over the past 3 years, and after another small rise in 2018/19 is now forecast to suffer a steep two year decline, as a number of major projects are completed, and few new major projects commence. The $415m Osborne Shipyard upgrade (the building component of the $535m facility for the build of the Future Frigates, which commenced in the March quarter 2018) and the $180m Queen Elizabeth hospital expansion (commencing in 2019) will be the biggest public projects. Another round of road, rail and utilities infrastructure projects are projected to drive solid increases in public investment from 2021/22 to 2024/25.

Dwelling investment is forecast to increase again in 2018/19, but this is expected to worsen the residential oversupply in the state, and significant declines are forecast for the subsequent two years, before turning around in 2021/22. Solid growth is then projected for 2021/22 and 2022/23 before residential investment again weakens.

Business investment rebounded by 11% in 2017/18 and another 3% rise is forecast for 2018/19, before declining in 2019/20due to the completion of several projects. The recovery has been led by non-residential building and a turnaround in private engineering construction. The cumulative 37% rise in private non-dwelling building over these two years will be driven by the $190 million Skycity Casino expansion, the $210 million Calvary Hospital, the $100 million Adelaide Airport Terminal Expansion, and a strong recovery in office and shops construction. Work done will then fall back over the following two years before picking up from 2021/22. Private engineering construction will also be higher over 2017/18 and 2018/19, boosted by a $600 million debottling and enhancement project at Olympic Dam, a pick-up in gas-related activity, telecommunications-

related construction and major electricity-related construction, including wind farms, other generation capacity and network enhancements.

Employment growth is expected to slow over the next 3 years, and particularly in 2019/20 and 2020/21due to the overall decline in investment. Coupled with weak wages growth and low population growth, the end result will be a sharp deceleration in consumer spending. Meanwhile, constrained state government finances will lead to slower growth in government spending, after the surprising strength over the past two years.

Low population growth and constrained public finances are inherent weaknesses

The economy continues to suffer from a lack of growth drivers. Population growth was only 0.6% in 2016/17 and we expect it to remain weak as South Australians go interstate in search of job opportunities.

Note that most of the rise in public investment over 2015/16 to 2017/18 has come from Commonwealth funding (roads, rail, defence, universities and telecommunications). The state government finances are constrained, with ongoing deficits and debt and a scarcity of public assets to provide revenue or to sell after most of the states' electricity and ports assets were privatised over the past two decades. State government finances are also likely to remain constrained with stamp duty revenue set to fall and payroll tax growth expected to weaken from next year in line with weak employment growth.

The decline in overall construction and investment in 2019/20and 2020/21is also expected to impact the state's labour market, with employment growth predicted to slow sharply. This in turn will lead to soft growth in household spending over the next three years. Overall, SFD growth is forecast to weaken in 2018/19 to 2.3%, before slowing sharply to 0.7% in 2019/20and a still weak 1.6% in 2020/21and GSP growth is expected to be faster due to positive export growth.

Holden closure is the latest set-back to growth, but Arrium saved

Although the shutdown of the local car manufacturing industry last year (Holden in South Australia and Toyota in Victoria) impacted the state's manufacturing sector (with total manufacturing employment declining almost 14% or by 10,700 jobs), the news isn't all bad. The severity of the overall impacts will depend on the ability of the remaining car component manufacturers to diversify and transition to exporting. However, most of these manufacturers only exported a small proportion of their output, and were heavily reliant on domestic car manufacturers for their sales.

Parts manufacturers may benefit from the lower exchange rate, which will help them to shift to an export focus. However, just like the Australian car manufacturing industry, car part makers face comparatively high production costs that make it difficult to compete with foreign operations. Additionally, there are well established component suppliers to overseas car manufacturing operations

The good news is that Arrium (operator of the Whyalla Steelworks and associated iron ore mines) did not shut down. Arrium went into receivership in April 2016, with debts of more than $2 billion, and there were grave fears that the Whyalla steelworks would close. However, the British-owned GFG Alliance acquired Arrium in September 2017, and announced plans to upgrade the plant and invest in renewables energy, both for the steelworks and state grid.

Prospects have also improved for the Whyalla operation due to major rail upgrades announced by the Commonwealth and the strong upturn in non-dwelling building and infrastructure construction – both significant users of the steel products from Whyalla. Indeed Whyalla steelworks is reported to be now increasing in output, back towards capacity.

Meanwhile, other parts of manufacturing and the tradeables sector generally (including agriculture, mining, education and tourism) will benefit over the medium term from the exchange rate in the more competitive band of US72 to 79 cents expected over the period to 2025.

Defence contracts will support the state economy

Following the end of car manufacturing in South Australia, state and federal government commitments to defence projects will support the 'Defence State' economy. Headquarters of major aerospace, land and maritime defence companies are located in the state and numerous large projects will be based in South Australia over the coming decades.

There is now a continuous timeline to construct surface warships and submarines for decades to come. The Commonwealth government announced that Adelaide would be the hub of a continuous naval shipbuilding industry, setting out plans worth $40 billion for the construction of naval patrol vessels and other boats to fill the gap before construction of frigates and submarines begin. The Minister for Defence announced plans to begin building 12 Offshore Patrol Vessels from 2018 (although after the initial vessels, the construction of the remainder would move to Western Australia). This is expected to avoid the so-called 'valleys of death' between projects, which would have seen a loss of employment and workplace expertise, once current work on the Air Warfare Destroyers is completed around 2018.

The last of the navy's three air warfare destroyers are still under construction in Adelaide and construction of 12 offshore patrol vessels will begin in Adelaide in 2018. The offshore patrol vessels then fill the gap until the $35 billion Future Frigate construction begins in Adelaide in 2020. The frigate program will directly contribute to more than 2,000 jobs, and maintenance through the vessels' lives will be worth another $400 million. There is also a $50 billion contract to build 12 new submarines in Adelaide, which is expected to create 2,800 jobs, but not get underway until early-to-mid next decade. Shipbuilding projects will have beneficial flow on effects, particularly to local steel manufacturers.

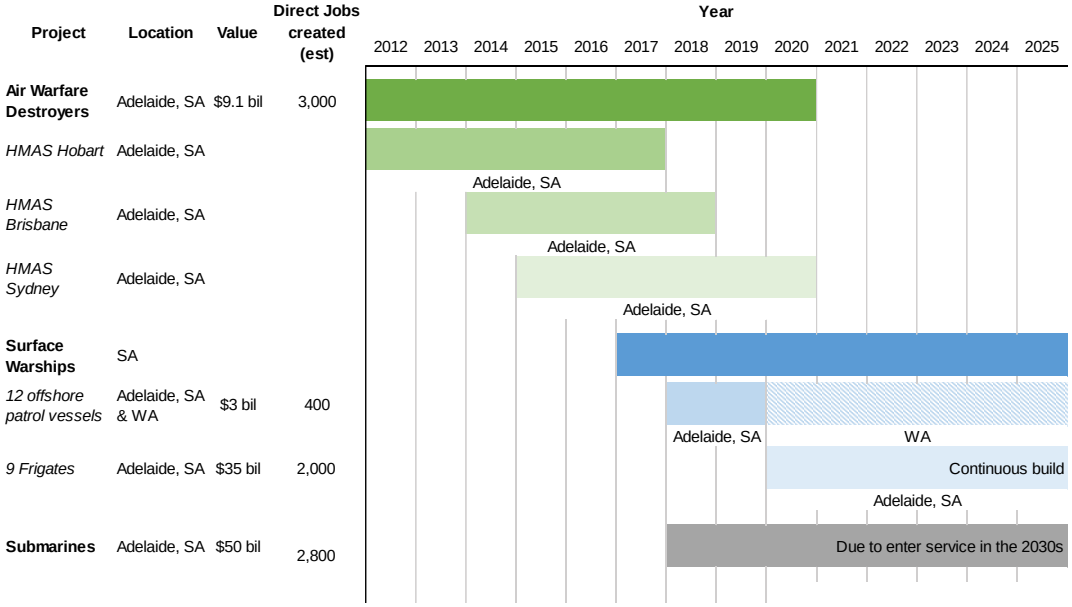
South Australia will also be the base for a number of land defence vehicle and aviation projects. For example, a $1 billion program to modernise the Army's fleet of M113 armoured personnel carriers will be based in South Australia, and South Australian manufacturers will also be part of the supply chain for the army's LAND 400 program to build land combat vehicles. South Australia will also benefit from 30 years of sustainment and upgrade work on the fleet of P-8A Poseidon maritime surveillance aircraft, which will be based at the RAAF Base in Adelaide.

Now recognised as the 'Defence State', South Australia will benefit from aviation, systems, maritime and land defence projects, with the largest boost to the state's manufacturing sector and flow-on effects to employment and consumer spending. However, it is important to recognise that this economic boost

essentially comes mostly from taxpayers in other states, given that South Australia only accounts for 6% of the national economy (% of GDP).

Figure 3

South Australia Timeline of Maritime Defence Projects



Source: BIS Oxford Economics

Olympic Dam expansion to drive strong growth over 2021 - 2025

BIS Oxford Economics expects non-mining business investment to pick-up and broaden from early next decade. Capacity constraints, improved profitability and sentiment are finally expected to precipitate a broad-based recovery in business investment. In addition, we anticipate that BHP Billiton will give the green light to a major expansion of the Olympic Dam copper-uranium mine, which we have assumed will cost $4.5 billion and will commence construction in 2021. This project will provide a major boost to South Australia and help drive strong growth in SFD and GSP over the period from 2021 to 2025.

Combined with a solid pick-up in residential, non-mining business and public investment, the net effect will be a marked pick-up in employment growth and a tightening in the state's labour market in the early years of next decade. Indeed, the state's unemployment rate is forecast to fall from around 5.7% now to under 5% in 2022/23, down to around the projected national average of 4.8% at that time. The tightening in the state's labour market will, in turn push up wages in the state.

Overall, SFD growth is forecast to average 2.4% growth over the five years to 2024/25 (compared to an average of 2.2% for the past 5 years), while GSP is forecast to average 2.4% over the five years to 2024/25 (compared to an average of 1.5% for the past 5 years and 2.3% for the past three decades).

Table 3. South Australia – Key Economic Indicators, Financial Years

					Forecast						
Year Ended June	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
South Australia											
Total Construction Activity(*)	-8.7	-1.4	3.9	17.6	2.3	-9.7	-9.9	5.7	7.3	0.5	-0.2
State Final Demand	1.8	1.2	3.2	4.0	2.3	0.7	1.6	3.9	3.1	1.5	1.9
Gross State Product (GSP)(**)	**1.3**	**0.3**	**2.2**	**2.9**	**2.0**	**1.3**	**1.7**	**3.1**	**2.9**	**2.2**	**2.2**
Employment Growth (Year Average)	0.5	0.5	1.3	2.1	0.8	0.7	0.6	2.0	1.7	0.9	0.8
Australia											
Total Construction Activity(*)	-7.0	-4.9	-3.2	11.4	-5.1	-3.1	-1.2	2.2	2.9	-2.2	-0.3
Australian Domestic Demand	0.9	1.4	2.3	3.5	2.4	2.1	3.1	4.1	2.9	1.7	2.3
Gross Domestic Product (GDP)	2.4	2.8	2.1	2.9	3.1	2.7	2.9	3.1	2.9	2.4	2.9
Employment Growth (Year Average)	1.3	2.3	1.5	3.0	1.9	1.1	1.4	2.1	1.7	1.0	1.3

Source: BIS Oxford Economics and ABS

* Total construction work done in constant 2015/16 prices as per the ABS Building Activity and Engineering Construction Activity
Total construction is the sum of new dwelling building (includes alterations and additions activity greater than $10,000), new non-building activity and new engineering construction.

** FY2018 values are estimates

3. INFLATION AND WAGE FORECASTS

3.1 CPI INFLATION: CURRENT CONDITIONS AND FORECASTS

Inflationary pressure to remain subdued for next 2 years

Consumer price inflation has been subdued for the past four years, with the substantial depreciation of the Australian dollar (which would normally increase inflation) between 2013 and 2016 coinciding with a sharp correction in oil prices (which reduced both petrol prices and freight costs) and falling internal price pressures. Underlying inflation fell below the Reserve Bank's target 2-3% band in March 2016 and has stayed there, while headline inflation has also remained (mostly) below 2% since late 2014 .

Tradeables inflation has been especially weak, and has been virtually non-existent since the June quarter 2014. Stagnant world prices for manufactured goods, reduced transport costs, margin compression by exporters, and potential hedging by importers have combined to limit price rises for imported consumer goods. Furthermore, the appreciation in the Australian dollar over the 18 months to December 2017 has contributed to lower import prices, although the A$ depreciation over the past 6 months has pushed up import prices and some retail prices. However, high levels of retail and supermarket competition have limited price growth.

Meanwhile, non-tradeables inflation – which now constitutes almost two-thirds of the CPI – has doubled over the past 18 months, from a low of 1.6% (annual growth) through-the-year to June 2016 to 3.0% in the recent June 2018 quarter. Driving non-tradeables inflation have been sharp rises in electricity and gas prices, cigarettes and tobacco (due to hikes in excise taxes), child care, house purchases, health services, education and insurance services. Other areas of non-tradeables inflation have been contained by dismal wages growth, which has kept down unit labour costs, limiting cost-push inflationary pressures and helping to keep a lid on underlying inflation.

In addition to low wage growth and the retail environment, rent growth has been subdued, with Sydney recording the largest annual fall in rents on record. Rents across the entire country have risen only 1.6% over the last year, according to CoreLogic, and year-ended rent inflation in the Consumer Price Index was 0.6%, the lowest since 1994. The story is quite different in the varying capitals, with Hobart in particular booming. The overall story, however, is definitely one of low inflationary pressure in what represents a significant part of household expenditure for many Australians but constitutes only 7.2% of the CPI basket. Rental price growth is likely to stay low until the early-to-mid 2020's, when currently oversupplied markets become more balanced.

Overall, the headline CPI inflation rate increased from to 1.9% in the March quarter, 2018, to 2.1% in the June quarter 2018 largely due to a spike in petrol prices, whilst underlying (or core) inflation – the average of the RBA's trimmed mean and weighted median inflation measures – eased slightly to 1.9% from 2.0% in the March quarter. With inflationary pressures building globally and the economy gradually absorbing the remaining spare capacity, we expect both headline and underlying inflation to rise from here, albeit only gradually and slowly.

Hefty jumps in tobacco excise to continue to boost headline CPI, with further rises in utility prices likely

Significant increase in utilities prices boosted headline inflation in the September quarter, 2017. Further above average price increases are expected over the next one to two years as higher wholesale energy prices are passed on to consumers, despite optimism as expressed by the RBA and competition regulators that competition among electricity retailers will see muted price rises. Also putting upward pressure on the headline rate will be further planned increases in tobacco excise duty over the next three years. Tobacco excise duties are legislated to increase by 12.5% each year on September 1 of each year from 2017 through to September 1 2020. This combined with the bi-annual indexation of the tobacco excise to average weekly ordinary time earnings, and aligning the tax treatment of roll your own tobacco and cigarettes, will add significantly to headline CPI – around 0.25% points to the annual rate.

A$ depreciation and higher oil and food prices to provide upward price pressure

In the near term, upward price increases will come from the depreciation of the A$ since early 2018, with the exchange rate declining from over US79 cents in January 2018 (65.3 on a trade-weighted index – TWI) to around US72 cents by late September (or around 62 on the TWI). Consumer import prices increased a cumulative 1.6% over the March and June quarters, while overseas holiday travel and accommodation prices in the CPI have increased. Our forecast is for the A$ to hold around 72 to 75 cents until late 2019, before gradually rising.

Meanwhile, higher oil prices combined with a declining A$ to push up automotive fuel prices by 7% in the June quarter. Further increases are expected in the September and December quarters. In addition, there will be indirect impacts via higher transport costs in the supply chain.

The current drought and higher food import prices (from the lower $A) are also expected to push up food prices over the next year, reversing a key factor which has muted prices over recent years – food accounts for over 10% of CPI basket (excluding meals out and takeaway food). In any case, food inflation is expected to rise over the medium term. Food inflation has averaged close to 3% p.a. over the past two decades but had been very weak over the past five years (averaging only 1.3% p.a.), due to intense competition between the major supermarkets (Coles, Woolworths and ‘new-comer’ Aldi) and falling or weak global agricultural prices. These two influences are unsustainable – the supermarkets cannot keep cutting prices (and either their own margins or suppliers’ margins), while world agricultural prices will pick up over the medium term as global oversupply dissipates.

The 1st July 2018 GST-free threshold scrapping for purchases under $1000 is a source of tradeables inflation pressure.

There has recently been a lot of discussion regarding the relationship between the increasing share of retail carried out online and the impact of this on inflation. What has widely been called an ‘Amazon effect’ in the United States, is likely at work locally through a range of online retailers.

As of the start of this financial year, businesses with over $75,000 in revenue will be required to register with the ATO and collect GST, regardless of their location. These changes have been in response to intense pressure from small business groups, who have long argued that the threshold was unfair. Large online retailers responded by restricting Australian shoppers to their local entity, with Amazon representing a salient example. In Amazon’s case, the prices of identical goods are much higher for their local online store, so this will clearly represent an inflationary pressure in the near future. However, the extent of this remains unknown but it is likely to be small. By ABS estimates 5% of retail

turnover is via online platforms, and of this around 20% is through international retailers.

However, softness in the economy will offset pressures on inflation in the near term, before inflation rises in early 2020's

Offsetting these inflationary pressures will be soft growth in wages and the competitive retail environment, which will limit final price rises over the next two years. Headline CPI inflation is forecast to gradually pick up to 2.5% by early 2021, while the underlying rate drifts back up to 2.3%, with the difference in the two measures of price inflation due to hikes in tobacco, utilities, food and fuel.

It is our view that inflation will subsequently pick-up from early next decade, and rise above the 2.5% mid-point of the RBA's band, by early 2022 as economic growth increases, profits, employment and wage growth strengthen, and inflationary pressures begin to build. The rise in the A$ toward US80 cents in late 2022 will provide some offsetting pressures over 2021/22 and 2022/23.

CPI inflation projected to average close to 2.5% over the long term.

Headline CPI inflation is expected to sit close to the mid-point of the RBA's 2-3% target band in the long run based on the following:

- Tradeables inflation, which constitutes around one-third of the CPI basket, is forecast to increase by an average of around 1.0% - 1.5% per annum contributing around 0.4% to annual inflation.
- Non-tradeables inflation (comprising the remaining two-thirds of the basket) is assumed to increase by around 3.0 to 3.3% per annum contributing roughly 2.1% to headline inflation.

Taken together, we expect annual CPI inflation to increase by 2.6% per annum on average. In forecasting annual tradeables inflation of around 1.5% (compared to 1.2% on average for the past 16 years), we have assumed the following:

- We don't expect a rapid rise in the Australian dollar to mute tradeables inflation like it did in the 2000s, and early this decade. The Australian dollar rose from US 54 cents in 2000/01 to US$1.03 by 2011/12. We have a modest rise back to 80 US cents in the early 2020s and then a drift back to the long-term average of 76 US cents.
- We don't expect a significant downward pressure on world inflation from significant increases in manufacturing productivity and rapid technological advances, as occurred particularly in China from the late 1990s to early 2010s.
- There will be upward pressure on food prices from rising demand from a growing Asian middle class.
- Oil prices will rise over the long term, due to the rising cost of extraction, as the lower cost reserves are exhausted

On the other hand, non-tradeables inflation is forecast to increase by 3-3.3% per annum over the next decade, weaker than the 3.7% average achieved from 2001 to 2015 when relatively high wage inflation, lower than average productivity growth to 2009 and also large rises in utilities prices pushed non-tradeables inflation to well outside of the RBA's 2 to 3% target range. We expect higher wages growth in the longer term will also contribute to the maintenance of relatively high non-tradeables inflation.

Fig. 4. Australia: Wages and Prices

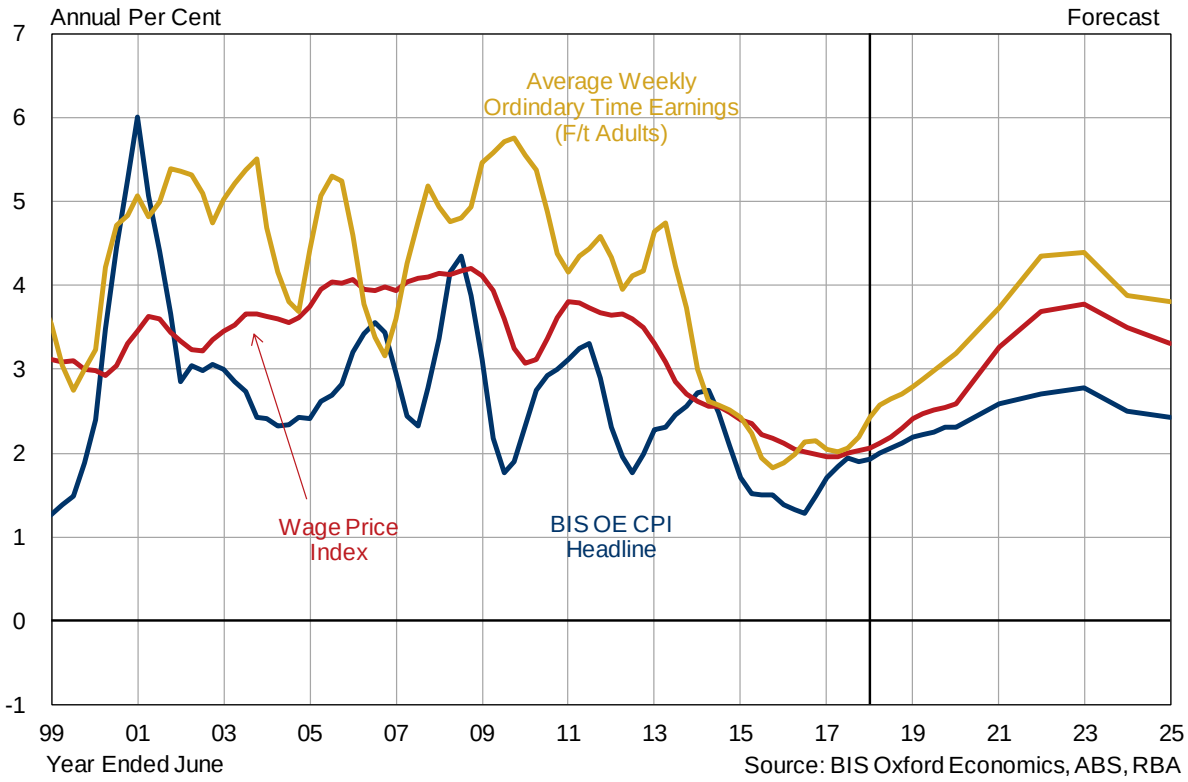


Fig. 5. Employment and Unemployment

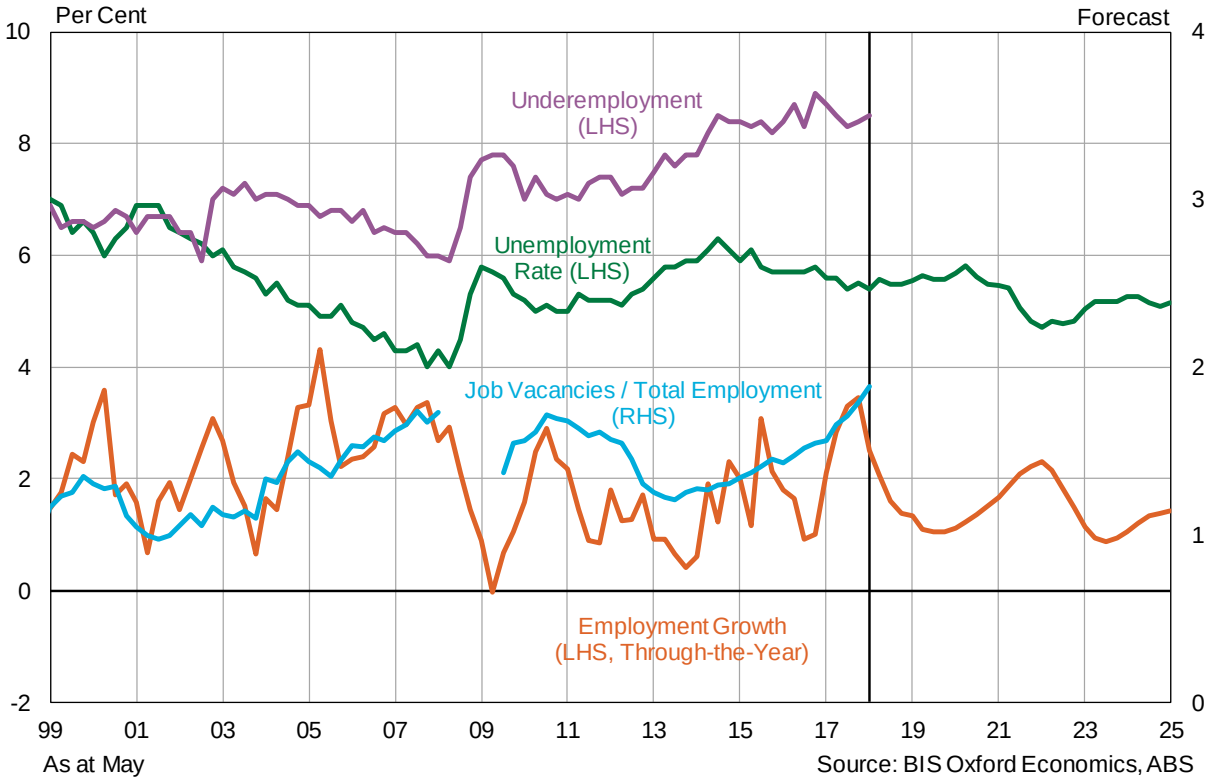


Table 4. Wages and Prices Growth - Australia

Year Ended June	Average Weekly Ordinary Time Earnings[1]		Wage Price Index (All Industries)		Official Headline CPI [2]	
	$/week	%CH	Index	%CH	Index	%CH
2000	765		71.7		69.4	
2001	804	5.1	74.2	3.5	73.6	6.0
2002	847	5.4	76.7	3.3	75.7	2.9
2003	890	5.0	79.3	3.5	78.0	3.0
2004	932	4.7	82.2	3.6	79.9	2.4
2005	973	4.4	85.3	3.7	81.8	2.4
2006	1,018	4.6	88.7	4.1	84.4	3.2
2007	1,054	3.6	92.2	3.9	86.9	3.0
2008	1,106	4.9	96.1	4.1	89.8	3.4
2009	1,166	5.5	100.0	4.1	92.6	3.1
2010	1,231	5.6	103.1	3.1	94.8	2.3
2011	1,283	4.2	107.0	3.8	97.7	3.1
2012	1,338	4.3	110.9	3.6	100.0	2.3
2013	1,400	4.6	114.6	3.3	102.3	2.3
2014	1,442	3.0	117.6	2.6	105.0	2.7
2015	1,477	2.4	120.4	2.4	106.8	1.7
2016	1,505	1.9	123.0	2.1	108.3	1.4
2017	1,536	2.0	125.4	2.0	110.2	1.7
2018	1,573	2.4	127.9	2.1	112.3	1.9
Forecasts						
2019	1,617	2.8	131.0	2.4	114.4	1.9
2020	1,669	3.2	134.4	2.6	116.9	2.2
2021	1,731	3.7	138.8	3.3	119.7	2.4
2022	1,806	4.3	143.9	3.7	122.6	2.4
2023	1,884	4.3	149.3	3.8	125.5	2.4
2024	1,958	3.9	154.6	3.5	128.5	2.4
2025	2,031	3.8	159.7	3.3	131.6	2.4
Compound Annual Growth Rates ([3])						
1990-2000	3.9				2.1	
2000-2010	4.9		3.7		3.2	
2010-2018	3.1		2.7		2.1	
2018-2025	3.7		3.2		2.3	
2020-2025	4.0		3.5		2.4	

Source: BIS Oxford Economics, ABS

(1) Average Weekly Ordinary Time Earnings for full-time adults. Data is year ended May (available only mid month of quarter).

(2) Headline CPI forecasts based on Reserve Bank of Australia forecasts to the December 2020 quarter. Beyond this, we've taken the 'geometric mean of the 'official' inflation forecasts over the next 10 years, which includes RBA forecasts to December quarter, 2020 and then 2.5% (mid-point of RBA's '2-3% target' range) beyond then.

(3) CAGR (Compound Annual Growth Rates) for 2020-2025 is CAGR for 2020/21 to 2024/25 inclusive (ie next Revenue Determination period).

3.1.1 RBA CPI Forecasts are used to calculate real wages

To calculate real wage increases, we deflate nominal wages growth by deducting expected inflation over a 10-year period, using the 'official' view of CPI forecasts from the Reserve Bank of Australia. The RBA's August 2018 'Statement on Monetary Policy' forecast the headline CPI rate at "1¾ per cent" in the December quarter 2018 and 2% in the June quarter 2019 – giving an average of 1.9% for 2018/19. The RBA then forecasts headline CPI to rise to "2¼ percent" in both the December 2019 and June 2020 quarters (giving a year average of 2.2% for 2019/20), holding at 2¼% in the December quarter 2020. We then assume that headline CPI rises to 2.5% by June 2021, giving a year average CPI rate of 2.4% for 2020/21.

Expected inflation for the next 10- years is derived by using the geometric mean of RBA forecasts for the next three years, with the 2.5% mid-point of the RBA's inflation target band (i.e. 2 to 3%) used for the remaining 7 years. This methodology has been adopted by the AER (Australian Energy Regulator) in their recent revenue decisions. For example, see Transgrid Draft Determination 2018-23, Attachment 3, page 142.

3.2 NATIONAL WAGES OUTLOOK

The key determinants of nominal wages growth are consumer price inflation, productivity, the relative tightness of the labour market (i.e. the demand for labour compared to the supply of labour), and compositional changes in the labour market following the end of the mining investment boom. Price inflation, in turn, is influenced by unit labour costs – referred to as `wage-push inflation' or more broadly `cost-push inflation'. Other factors which influence price inflation include the exchange rate, the stage of the business cycle and the level of competition in markets generally.

Wages growth has slowed markedly over the past 5 years, primarily due to weaker demand for labour, caused by both cyclical and structural factors. Low wages growth is both a product of and key cause of low underlying inflation. Low wages are keeping business costs down and thus muting upward price pressures, while a significant section of pay deals are being set in line with CPI inflation – especially for employees on awards.

The unemployment rate and underemployment rate are key indicators of the amount of slack in the labour market. The unemployment rate has been trending down in recent quarters, but it remains above the NAIRU, (the Non-Accelerating Inflationary Rate of Unemployment or the `natural rate of unemployment') of around 5%, and therefore represents spare capacity in the labour market. Compounding this, Australia's underemployment rate[1] is now at historic highs – averaging 8.4% over the past year. The high underutilisation rate – the sum of unemployment and underemployment – reflects considerable slack in the labour market, which limits the bargaining power of workers and reduces pressure on wages.

[1] Underemployment comprise all employed persons who are willing and available to work additional hours, and were not fully employed (worked less than 35 hours) in the reference week.

Progressive labour market tightening has pushed the unemployment rate down to 5.3% in July 2018, the lowest rate in over five years. Though the rate is closing the gap on the conventional estimate of NAIRU (thought to be around 4.5% to 5%), the current unemployment rate doesn't fully capture the potential capacity of the labour market. Underemployment is an additional measure of labour market utilisation, and current high levels suggest plenty of additional slack remains to be absorbed (see figure 5).

Among the underlying structural changes causing this unspectacular wage growth are increasing market flexibility and casualisation of the work force (what is commonly coined the 'gig-economy'), falling union membership, slower productivity growth and the effects of lower inflation expectations.

Looking ahead, we expect employment growth to weaken over the next two years. There has been a slowdown in the growth of job advertisements (a good leading indicator for employment growth), and the recent high frequency indicators have confirmed our view that the economy is growing at a solid but not spectacular pace. Jobs growth will weaken due to the worsening downturn in residential investment, slower growth in government spending and subdued consumer spending. With employment growth set to remain modest and unemployment to drift up marginally, upward pressure on wages will be limited.

Trends in wage growth by pay-setting method have diverged in recent years. Aggregate wage growth has slowed significantly since December 2012 due to a collapse in wage increases awarded to the 47% of non-managerial full-time workers who are on individual agreements (contracts) with their employers. In contrast, workers subject to collective agreements have maintained wage rises above 3% pa. However, with union membership at an all-time low, the proportion of the full-time non-managerial workforce on collective agreements has fallen from 42% in 2010 to 37% in 2016. Workers on individual agreements, whose wage rises respond more to prevailing labour market conditions, have been at the mercy of slackness in labour market and the end of the mining investment boom.

The latest data suggests that we are at the bottom of the current wage cycle, with wage increases for employees stabilising over the past three quarters. Indeed, the last two National Wage case saw the Fair Work Commission push up the minimum wage and associated awards by 3.3% and 3.5% respectively, the largest annual increase since the 3.4% in 2012 and well above the 2.4% given in 2016. Although only 16% of workers have their pay set by awards, a significant number of employees on individual arrangements also have their wage increases influenced by award movements.

3.5% increases in the National Wage Case and recent higher enterprise agreements will push wages up, off current lows.

At the Annual Wage Review in June 2018, the Fair Work Commission awarded a 3.5% increase to the National Minimum Wage (NMW). In its decision, the panel estimated 22.7% of the labour force have their pay set by awards. However, this accounts for only about 16% of the national wage bill; those paid at junior, apprentice or trainee rates based on the NMW and modern award rates and of course those on the NMW. The minimum award rises take effect from the 1st of July 2018. However, the effects may reach a much larger number of employees, potentially up to 40% in total, because wage increases in some enterprise agreements are linked or benchmarked in some way to the review's outcome. The extent to which this decision and its implementation will be present in the Q3 and Q4 WPI releases is yet to be seen.

There has also been an improvement in the outcome of enterprise agreements (via collective bargaining) since the low of 2.2% set in September quarter last year. Average annualised wage increases (AAWIs) formalised in the enterprise agreements rose to 2.5% and 2.7% in the December quarter 2017 and March quarters 2018 respectively, according to the Department of Jobs and Small Business. It's likely that these outcomes could have been influenced by the 2017 national wage case which awarded a 3.3% effective July 2017 (which was appreciably higher than the 2.4% and 2.5% increases awarded in the previous two years). The improving labour market may have helped lead to the recent higher outcome in collective agreements. The even higher 3.5% national wage case increase this year should underpin further upward momentum. However, the average duration for the collective agreement is around 3 years, so the recent improvement in formalised agreements will take time to manifest in overall wage outcomes. The AAWI in current operating agreements is 2.8%, and given the low agreement negotiated last year, overall wage agreements in the collective bargaining segment – which cover 37% of the workforce – will see little improvement on the 2.8% in this September over the next two years.

The remaining 47% of employees have their pay set by individual arrangements, whether it be individual contracts or some other form of salary agreement, which may include incentive-based schemes. As the accompanying table shows, it is this segment that has experienced the weakest wage outcomes over the past five years, averaging only 1.3% y/y in terms of the wage price index (WPI). It is this segment that has been impacted by the structural and cyclical weaknesses outlined above and is the main reason why WPI increases are at record lows. Nevertheless, we expect a continuation of the higher NMW and overall improvements in pay rises in the individual arrangements segment to lift the WPI from 2.1% in 2017/18 to 2.4% and 2.6% in 2018/19 and 2019/20 Other wage measures – average weekly earnings (AWE) and average weekly ordinary time earnings (AWOTE) - will also pick up over the next two years, slightly faster than WPI due to compositional effects and bonuses and incentives expected with recent higher profits.

Wage growth is then predicted to accelerate from 2020/21as a broadening in economic growth and accelerating investment drives stronger economic and employment increases. The forecast increases in profits, combined with rising price inflation and declines in unemployment, will push up wages over 2020/21 to 2022/23. The WPI is projected to increase 3.7% in 2021/22 and peak at 3.8% in 2022/23, before subsequently easing as economic growth slows around the mid-2020s – while AWE and AWOTE are forecast to rise to around 4.4% by 2022/23.

Long term wage pressures from tight labour markets

In the long run, wage growth is determined by productivity growth and inflation. We expect that AWE growth will level off at its long run level of around 3.8% over the decade to 2033, driven by non-farm productivity growth of around 1.3% and inflation of around 2.5%.

Longer-term, tight labour markets will emerge once again given the ageing population and become a chronic problem for non-tradeables inflation. The large pool of unemployed labour that was a feature of the 1990s has gone. Moreover, skilled labour shortages will remain a problem for the foreseeable future. In addition, administrative charges including health price increases (which invariably rise faster than overall CPI) will place upward pressure on domestic services inflation. Indeed, during the next decade, both skilled and general labour shortages will begin to emerge due to demographic factors, in particular retirements of Australia's 'baby boomers' generation. Australia will continue to experience sustained labour shortages in the decade to 2030 (and beyond), and these shortages will become more significant as the workforce ages. As Australia's 'baby boomers' generation move into the 65+ age group, the growth of the 15-64-year-old component of Australia's working age population (the overwhelming majority of Australia's workforce) will begin to slow.

With more people retiring, the supply of labour is expected to increase at a slower rate through the coming decade. This will lead not only to skilled labour shortages, but total labour shortages. Meanwhile, the demand for labour will continue to rise, particularly in periods of strong investment and economic growth. These sustained labour shortages will result in a long term upward bias in wage inflationary pressures.

Table 5. Wages Growth All Industries: Australia

(By Workforce Segmented by Pay Setting Method)

Year Ended June	% of Workforce in 2016	Year Average % change																
									Forecasts							Average	Average
		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2019-25	2021-25
Wage Price Index																		
Awards Only	15.9%	3.4	2.9	2.6	3.0	2.5	2.4	3.3	3.5	3.0	3.1	3.4	3.5	3.3	2.7	3.2	3.2
Collective Agreements	37.1%	3.9	3.6	3.5	3.3	3.2	3.1	2.8	2.8	2.9	3.2	3.5	3.7	3.7	3.5	3.3	3.5
Individual Arrangements	47.0%	3.5	3.2	1.9	1.4	1.1	0.8	1.0	1.7	2.2	3.4	3.9	3.9	3.4	3.3	3.1	3.6
Wage Price Index (a)	**100%**	**3.6**	**3.3**	**2.6**	**2.4**	**2.1**	**2.0**	**2.1**	**2.4**	**2.6**	**3.3**	**3.7**	**3.8**	**3.5**	**3.3**	**3.3**	**3.5**
Compositional Effects + Bonuses,etc		0.7	1.3	0.4	0.0	-0.2	0.1	0.4	0.4	0.6	0.5	0.7	0.6	0.4	0.5	0.5	0.5
AWOTE (b)	100%	4.3	4.6	3.0	2.4	1.9	2.0	2.4	2.8	3.2	3.7	4.3	4.4	3.9	3.8	3.8	4.0

Source: BIS Oxford Economics, Haver Analytics/ABS, Department of Employment

(a) Ordinary time hourly rates of pay for full-time adults.

(b) Average Weekly Ordinary Time Earnings for Full-time Adults (excludes overtime but includes bonuses).

BIS Oxford Economics Wage Growth Model

BIS Oxford Economics' model of wage determination is based on the analysis of expected future wage movements in the three main methods of setting pay, as each discrete pay setting method has its own influences and drivers (see Table 5). The main pay setting categories and their key determinants are:

- Employees under awards have their pay determined by Fair Work Australia in the annual National Wage case. When determining pay increases, Fair Work Australia aim to maintain the standard of living of those employed on awards by providing a safety net of fair minimum wages. Hence, they focus on the overall performance of the domestic economy, taking into account productivity, business competitiveness, inflation and employment growth. This means that increases in the Federal Minimum Wage are usually based on recent CPI growth along with Fair Work Australia's view on short term future conditions for the Australian economy. From 1 July 2018, the minimum wage has increased by 3.5% following a 3.3% rise in July 2017 and a 2.4% rise on 1 July 2016. At the all industries level, 16% of all non-managerial full-time employees (data excludes those in agriculture, forestry and fishing) have their pay rises determined by this method.
- For employees under collective agreements (representing 37% of all employees), their pay is determined through enterprise bargaining, and wage increases are influenced through a combination of recent CPI, inflationary expectations, profitability levels of relevant enterprises, business conditions, and the short term economic outlook. Workers unions can also play a significant part in negotiations, especially unions with a good position in industrial relations through strong membership. With the average duration of these agreements currently two to three years, BIS Oxford Economics use the most recent agreements formalised in recent quarters as a basis for our near term forecasts. Beyond that, collective agreements are based on our expectations of economic conditions.
- The remaining 47% of employees have their pay set by individual arrangements, whether it be individual contracts or some other form of salary agreement, which may include incentive-based schemes. Similar to the minimum wage and collective agreements, inflation and inflationary expectations have a strong influence on agreements, as well as the strength of the labour market. Individual arrangements are skewed towards more skilled workers, so the balance between demand and supply in skilled labour can be a large influence.

Note in table 5, wage increases under 'individual arrangements' are calculated by deduction. Data from DEEWR (Department of Education, Employment and Workforce Relations) are used for wage increases under collective agreements.
The limitation of this methodology is that because individual arrangements are calculated as a residual, all of the compositional effects in terms of AWOTE (ie from more or less lower-paid workers being employed in the relevant year) plus all (or most) of the bonuses and incentives from those under award or collective agreements end up in the individual arrangements residual, which distorts the pay increases in this segment. However, the methodology works well for the WPI, particularly at the all industries level, although some compositional problems occur at the sectoral level, particularly for sectors with a relatively small employment base (such as electricity, gas, water and waste services).

4. INDUSTRY WAGE FORECASTS – ELECTRICITY, GAS, WATER & WASTE SERVICES AND CONSTRUCTION: AUSTRALIA AND SOUTH AUSTRALIA

In this section, we provide an outlook and forecasts for the WPI (wage price index) for the EGWWS (electricity, gas, water and waste services) and construction sectors at the national level and for South Australia.

4.1 EGWWS WPI FORECASTS

Wages growth in the EGWWS sector is invariably higher than the total Australian national (all industry) average

The EGWWS wage price index growth has consistently been above the national average since the index's inception in 1997 and averaged 0.6% higher over the past 17 years (see Table 7 and Fig 6). While growth in average weekly ordinary time earnings (AWOTE) of the electricity, gas, water and waste services sector has displayed considerably more volatility over the past two decades (mainly related to compositional effects), AWOTE growth in the sector has also usually been higher than the national average over the past six years (see Table 7).

To a large extent, this has been underpinned by strong capital works program in the utilities sector since the beginning of the last decade until 2012/13 (resulting in robust employment growth over the same period), strong competition from the mining and construction workers for similarly skilled labour and the powerful influence of unions in the utilities sector.

In addition, the electricity, gas and water sector is a largely capital intensive industry whose employees have higher skill, productivity and commensurately higher wage levels than most other sectors. Further, the overall national average tends to be dragged down by the lower wage and lower skilled sectors such as the Retail Trade, Wholesale Trade, Accommodation, Cafés and Restaurants, and, in some periods, also Manufacturing and Construction (see Tables 6 and 7). These sectors tend to be highly cyclical, with weaker employment suffered during downturns impacting on wages growth in particular. The EGWWS sector is not impacted in the same way due to its obligation to provide essential services and the need to retain skilled labour.

Strong Union presence in the industry have seen collective agreements outcomes above the All Industry average

Despite the relative weakness of the economy since the GFC, wages remained elevated in the utilities sector due to the comparative strength of demand for skilled labour, and particularly because of the strength of unions in what is an essential service sector. The industrial relations reality is that there are powerful utilities unions such as the Communications, Electrical and Plumbing Union (CEPU) and Australian Services Union (ASU), which have a history of achieving high wage outcomes for the sector. Other unions active in the sector include the Australian Workers Union (AWU).

The key elements of the utilities wage forecast are set out in Table 8. This shows that collective bargaining dominates the pay setting arrangements in the utilities sector, while the relative absence of workers relying on (often) low-increase awards (set in the National Wage Case) means the overall average

for total utilities wages will generally be higher than the all industries average. Over the past five years, the outcomes from collective agreements have been 0.2% higher, on average, than the all industries average, at 3.5% compared to 3.3%. We expect this trend to continue over the outlook period, with collective agreements achieving average increases of 3.7% for the utilities sector, compared to 3.3% for all industries.

BIS Oxford Economics analysis shows collective agreements in the EGWWS sector have been on average around 1.5% higher than CPI inflation over the decade to 2010 (excluding the effects of GST introduction in 2000/01). In the five years to 2010 when the labour market was very tight, collective agreements were on average 1.7% above the CPI. Given the strength of unions in the sector and a still strong demand for skilled labour, collective agreements are forecast to remain around 1.3% above the 'official' CPI over the forecast period.

As well as increases in CPI, increases in collective agreements under enterprise bargaining are also influenced by a combination of inflationary expectations, the recent profitability of relevant enterprises, current business conditions and the short-term economic outlook, and, as mentioned, by the industrial relations 'strength' of relevant unions. Because the average duration

Table 6. Wage Price Index Growth by Industry Sector and by State

Sector	% of Total Employment May'18	Year Average Increase (A%ch)							Five-Year Average (YE June)
		Jun'12	Jun'13	Jun'14	Jun'15	Jun'16	Jun'17	Jun'18	
Private		3.7	3.4	2.6	2.3	2.0	1.8	2.0	2.1
Public		3.2	3.2	2.8	2.6	2.5	2.3	2.3	2.5
Industry									
Mining	1.9%	4.4	4.5	2.8	2.3	1.6	1.0	1.3	1.8
Manufacturing	7.6%	3.8	3.2	2.9	2.7	2.4	2.0	2.2	2.4
Electricity, Gas, Water and Waste Services	1.2%	3.5	4.2	3.3	2.8	2.4	2.2	2.0	2.5
Construction	9.4%	4.1	3.3	3.0	2.1	1.6	1.7	1.9	2.1
Wholesale Trade	2.9%	4.4	4.4	2.2	2.2	1.9	1.8	1.8	2.0
Retail Trade	10.2%	2.9	2.5	2.6	2.2	2.4	1.9	1.6	2.1
Accommodation and Food Services	7.2%	3.4	2.5	2.3	2.6	2.3	2.3	2.1	2.3
Transport, Postal and Warehousing	4.9%	3.5	3.5	2.5	2.4	2.2	2.0	1.8	2.2
Information Media and Telecommunications	1.8%	3.7	2.9	2.4	2.5	2.2	1.9	2.0	2.2
Finance and Insurance Services	3.5%	4.0	3.2	2.7	2.7	2.6	2.1	2.1	2.4
Rental, Hiring and Real Estate services	1.8%	3.8	2.8	2.7	2.3	1.6	1.3	1.7	1.9
Professional, Scientific and Technical Services	8.4%	4.5	3.5	1.9	1.9	1.6	1.4	1.7	1.7
Administration and Support Services	3.4%	3.3	3.3	2.5	1.9	1.4	1.4	1.8	1.8
Public Administration and Safety	6.3%	3.1	3.5	2.9	2.2	2.2	2.2	2.2	2.3
Education	8.0%	3.7	2.8	2.9	3.0	2.7	2.4	2.4	2.7
Health Care and Social Assistance	13.3%	2.9	3.3	2.9	2.7	2.5	2.4	2.8	2.6
Arts and Recreation Services	2.0%	3.7	2.9	2.7	3.0	2.4	2.0	2.5	2.5
Other Services	3.8%	4.2	3.2	2.4	2.2	2.2	1.9	2.3	2.2
State/Territory									
New South Wales	31.9%	3.6	3.1	2.5	2.3	2.1	2.1	2.1	2.2
Victoria	26.2%	3.5	3.3	2.7	2.7	2.3	1.9	2.3	2.4
Queensland	19.7%	3.7	3.0	2.7	2.4	2.0	2.0	2.1	2.2
South Australia	6.7%	3.4	3.3	3.3	2.5	2.3	2.2	2.1	2.5
Western Australia	10.7%	4.3	4.0	2.8	2.2	1.9	1.4	1.5	1.9
Tasmania	2.0%	3.4	3.2	2.3	2.5	2.2	2.2	2.4	2.3
Northern Territory	1.1%	3.8	3.3	2.7	2.6	2.2	2.2	1.3	2.2
Australian Capital Territory (ACT)	1.8%	3.3	3.7	2.4	1.7	1.7	1.8	2.0	1.9
Total All[1,2]	100%	3.6	3.3	2.6	2.4	2.1	2.0	2.1	2.2

Source: BIS Oxford Economics, ABS

(1) Measures changes in the price of labour. Ordinary hourly rates of pay (excludes overtime and bonuses)
(2) Excludes Agriculture, Forestry & Fishing

of agreements runs for two-to-three years, BIS Oxford Economics bases its near-term forecasts of Enterprise Bargaining Agreement (EBA) wages on the strength of recent agreements, which have been 'formalised' or 'lodged' (i.e. an agreement has been 'reached' or 'approved') over recent quarters.

We expect EBA outcomes to show modest growth over the next two years but remain above inflation and the 'all industries' average given that the demand for skilled labour remains strong and particularly given the recent high enterprise agreement outcomes in the construction sector. This will influence negotiations in the EGWWS sector, as some skills can be transferable. A mild recovery in EBA outcomes will occur over subsequent years as the labour market begins to tighten, unemployment falls and business profitability improves. However, forecast growth in wage agreements of around 3.6% per annum remains below that experienced over much of the decade to 2012/13.

Employment growth in the utilities sector over the 2003/04 to 2013/14 inclusive averaged 5.4% per annum, the second fastest growth among the 18 main industry sectors behind the Mining sector (11% per annum), with Health and Social Assistance employment growth third at 4.1% per annum.

We believe investment in the sector, particularly engineering construction, has been the key driver of employment growth in the sector over the past decade. Fig. 7 illustrates this relationship, and shows employment has a stronger relationship with utilities engineering construction rather than utilities output.

Fig. 6. Wage Price Index - Australia All Industries, Electricity, Gas, Water and Waste Services and Construction

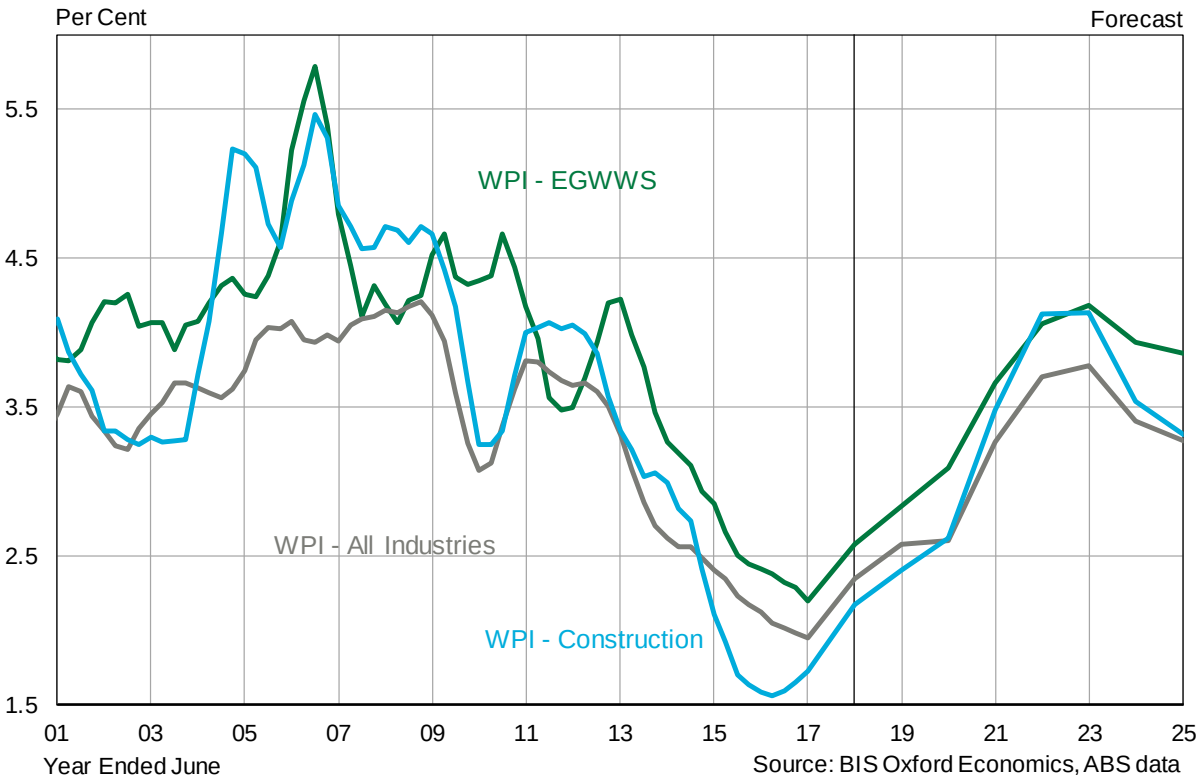


Table 7. Total Australia (All Industries) and Electricity, Gas, Water and Waste Services Average Weekly Ordinary Time Earnings and Wage Price Index (Year Average Growth)

Year Ended June	Average Weekly Ordinary Time Earnings (1)				Wage Price Index (2)			
	All Industries		Electricity, Gas, Water and Waste Services		All Industries		Electricity, Gas, Water and Waste Services	
	$	%CH	$	%CH	Index	%CH	Index	%CH
2000	765	3.2	867	4.8	71.7	3.0	68.2	3.8
2001	804	5.1	918	6.0	74.2	3.5	70.8	3.8
2002	847	5.4	981	6.8	76.7	3.3	73.8	4.2
2003	890	5.0	1,001	2.1	79.3	3.5	76.8	4.1
2004	932	4.7	1,057	5.5	82.2	3.6	79.9	4.1
2005	973	4.4	1,091	3.2	85.3	3.7	83.3	4.3
2006	1 018	4.6	1,111	1.9	88.7	4.1	87.6	5.2
2007	1 054	3.6	1,152	3.7	92.2	3.9	91.8	4.8
2008	1 106	4.9	1,183	2.7	96.1	4.1	95.7	4.2
2009	1 166	5.5	1,255	6.1	100.0	4.1	100.0	4.5
2010	1 231	5.6	1,351	7.6	103.1	3.1	104.4	4.3
2011	1 283	4.2	1,474	9.1	107.0	3.8	108.7	4.2
2012	1 338	4.3	1,510	2.5	110.9	3.6	112.5	3.5
2013	1 400	4.6	1,602	6.1	114.6	3.3	117.3	4.2
2014	1 442	3.0	1,635	2.0	117.6	2.6	121.1	3.2
2015	1 477	2.4	1,646	0.7	120.4	2.4	124.5	2.8
2016	1 505	1.9	1,704	3.5	123.0	2.1	127.5	2.4
2017	1 536	2.0	1,777	4.3	125.4	2.0	130.3	2.2
2018	1 573	2.4	1,818	2.3	127.9	2.1	132.9	2.0
Forecasts								
2019	1 617	2.8	1,869	2.8	131.0	2.4	136.5	2.7
2020	1 669	3.2	1,935	3.5	134.4	2.6	140.7	3.1
2021	1 731	3.7	2,013	4.0	138.8	3.3	145.8	3.6
2022	1 806	4.3	2,102	4.4	143.9	3.7	151.6	4.0
2023	1 884	4.3	2,196	4.5	149.3	3.8	158.0	4.2
2024	1 958	3.9	2,290	4.3	154.6	3.5	164.2	4.0
2025	2 031	3.8	2,383	4.1	159.7	3.3	170.4	3.8
Compound Annual Growth Rates (2)								
2000-2010	4.9		4.5		3.7		4.3	
2010-2018	3.1		3.8		2.7		3.1	
2018-2025	3.7		3.9		3.2		3.6	
2020-2025	4.0		4.3		3.5		3.9	

Source: BIS Oxford Economics, ABS

(1) Earnings per person for full-time adults. Data is year ended May (available only mid month of quarter).
(2) CAGR (Compound Annual Growth Rates) for 2020-2025 is the annual growth for 2020/21 to 2024/25 inclusive i.e. next Revenue Determination period.

Table 8. Wages Growth by Workforce segment by Pay Setting Method Electricity, Gas, Water & Waste Services

Year Ended June	% of Workforce in 2016	Year Average Per Cent Change (a)												
						Forecast							Average	Average
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2019-25	2020-25
Awards Only	5.7%	3.0	2.5	2.4	3.3	3.5	3.0	3.1	3.4	3.5	3.3	2.7	3.2	3.2
Collective Agreements	60.6%	3.3	3.2	3.0	2.9	3.1	3.2	3.5	3.8	4.1	4.1	3.9	3.7	3.9
Individual Arrangements	33.6%	1.9	0.9	0.6	0.0	1.7	2.9	4.1	4.5	4.4	3.9	3.8	3.6	4.2
Wage Price Index (a)	**100%**	**2.8**	**2.4**	**2.2**	**2.0**	**2.7**	**3.1**	**3.6**	**4.0**	**4.2**	**4.0**	**3.8**	**3.6**	**3.9**
Compositional Effects + Bonuses,etc		-2.2	1.1	2.1	0.3	0.1	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3
AWOTE (b)	100%	0.7	3.5	4.3	2.3	2.8	3.5	4.0	4.4	4.5	4.3	4.1	3.9	4.3

Source: BIS Oxford Economics, Haver Analytics, Department of Employment

(a) Ordinary time hourly rates of pay for full-time adults.
(b) Average Weekly Ordinary Time Earnings for Full-time Adults (excludes overtime but includes bonuses).

Individual agreements will strengthen from their current weakness

Increases in individual agreements (or non-EBA wages) are primarily influenced by the strength of the labour market (especially the demand-supply balance of skilled labour), inflationary expectations, the recent profitability of relevant enterprises (which influences bonuses and incentives, etc.), current business conditions and the short-term economic outlook.

Wage growth from individual agreements is estimated to have slowed appreciably over the past three years, although we believe there have been compositional effects that have negatively impacted the estimation for this segment. Nevertheless, some of this reflects general weakness in the economy and the full-time labour market. However, this is expected to turn around from this year, albeit gradually. Currently there are pressures building: a recent survey by the Australian Industry Group found that 3 in 4 employers reported an increasing shortage of technicians and trade workers, and employees with STEM skills. These are essential workers in the utilities sector. Other business surveys are reporting similar findings in terms of increasing difficulties in sourcing skilled workers.

With the economy expected to return to balanced and trend growth early next decade, employment growth will outpace population and labour force growth and the unemployment rate is expected to drop below 5% early next decade. Hence, from early the 2020s, we expect to again witness the re-emergence of skilled labour shortages and competition for scarce labour particularly from the construction sector, which will push up wage demands in the utilities sector. Stronger increases are expected from the beginning of next decade in line with a strengthening economy. Businesses will find they must ‘meet the market’ on remuneration in order to attract and retain staff and we expect wages under individual arrangements to continue to rise through the middle of the next decade.

Utilities wage growth is forecast to continue to outpace the national 'all industries' average over the forecast period

Overall, BIS Oxford Economics expects total wage costs for the Australian Electricity, Gas, Water and Waste Services (EGWWS or 'Utilities) sector — expressed in Average Weekly Ordinary Time Earnings (AWOTE) — will average 4.3% per annum over the five years to 2024/25, 0.3% higher than the national 'All Industries' AWOTE average of 4.0% per annum over the same five-year period (see Table 7). In terms of **underlying wages growth** in the 'utilities' sector for total Australia — expressed in **wage price index** (WPI) terms — BIS Oxford Economics is forecasting an average of 3.9% per annum (0.4 percentage points higher than the national 'All Industries' WPI average of 3.5% per annum) over the five years to 2024/25.

Our AWOTE forecasts are higher due to compositional effects. Apprentices, trainees and numbers of new staff have increased markedly over recent years, across the electricity, gas and water sector generally. Given slower growth in employment numbers over the next decade, it is likely that there will be overall up skilling of the existing workforce, which will see a commensurate movement by much of the workforce into higher grades (i.e. on higher pay), resulting in higher earnings per employee.

Total EGWWS wages growth understates wages growth in the Electricity sub-sector

Related to the above point, we also believe the overall wage growth forecasts for the total EGWWS sector (presented in the accompanying tables) will understate wages growth in the electricity sub-sector, particularly as the labour market tightens for workers with higher skills. Independent studies have shown that the electricity and gas sub-sectors have a larger number of specialised roles, such as electrical engineers, structural engineers, electricians and gas fitters – who have skills that are transferable across other industries such as mining, construction and manufacturing, and are often in high demand. On the other hand, the water supply, sewerage and drainage services and waste collection, treatment and disposal services sub-sectors have relatively more non-specialised occupations with lower skill levels, e.g. truck drivers, forklift drivers (Source: Victorian Department of Education and Early Childhood Development, Victorian Electricity and Gas Industry Skills & Training Needs 2013; Victorian Waste and Waste Services Skills & Training Needs 2013. May 2014). This is supported by Industry wage data for 2016/17 from the ABS, shows that average wage levels in the electricity sub-sector are over 50% higher than employees in the waste sub-sector, and 40% higher than those in the water and sewerage sub-sector. In effect, the overall EGWWS average wage level is dragged down by the water and (particularly) waste sub-sectors. Therefore, it is likely that future labour escalation rates for electricity and gas workers will exceed those of other workers in the overall EGWWS sector, particularly in the tighter labour market predicted for the early 2020s.

EGWWS sector has high levels of productivity, compared to the national average, which underpins higher wages

The EGWWS sector has one of the highest levels of sectoral productivity – as measured by real Gross Value Added (GVA) per employed person – among the 18 industry sectors, with only Mining and Finance & Insurance Services having higher productivity. Utilities' productivity is more than double the national average according to ABS data for Australia and 2.7 times average state productivity levels in South Australia (see figure 10). High productivity levels and commensurate skill levels are the key reasons why wage levels are much higher in the utilities sector than most other industries (in terms of average weekly earnings measures – see table 7).

However, over the past 18 years, the growth in productivity in the sector has not been a driver of higher wages growth in the utilities sector. Productivity suffered a steep decline over 2001 to 2014 due to a combination of strong employment growth (mainly due to rising investment, as previously discussed) and weak growth in GVA, both in Australia and South Australia (see figures 7 and 8). Meanwhile, utilities wages growth was relatively strong over this same period (see table7). In effect, there is no clear relationship between wages growth and the traditional productivity measures (i.e. GVA/Employment) in the utilities sector. Low productivity is set to continue in part because GVA (output) growth is expected to remain low, with low output a function of low demand caused both by high prices and energy-saving (and water-saving) measures. However, employment levels are expected to remain relatively stable due to the need to maintain a skilled workforce to ensure reliability and undertake capital works to cater for population and economic growth and for capital replacement.

4.1.1 Outlook for utilities wages growth in South Australia

The ABS does not provide WPI data for the Utilities sector in South Australia, providing state utilities data only for NSW and Victoria. These two states collectively account for 51% of total Australian utilities employment, with Queensland accounting for 22%, then Western Australia and South Australia at 13.5% and 7.3% respectively. Historical data and forecasts of WPI for the EGWWS sector in South Australia is therefore based on national EGWWS WPI forecasts, as well as movements in the 'unknown residual' for the utilities wage price index and recent differences in outcomes in collective bargaining in South Australia compared to the national average for the utilities sector.

Wages in the South Australia utilities sector are expected to grow in line with the national utilities sector average over SA Power Networks' upcoming regulatory period (see table 10). Over 2015/16 and 2016/17, overall WPI growth in the EGWWS sector in South Australia is estimated to have been slightly lower than the national EGWWS increase. However, we estimate it was on par with the national EGWWS increase in 2017/18, although the national average was dragged down by a surprising low outcome in NSW, the largest state employer. Over the next four years, wage increases are again expected to be slightly lower than the national average – due to relative weaker utilities construction. South Australian EGWWS WPI growth is expected to rise from recent lows, and pick up to 3% (nominal terms) by 2019/20.

However, a marked pick-up in economic growth in the state from early next decade is expected to see employment growth and the labour market tighten (see section 2.2). This is expected to be accompanied by increases in utilities related construction in the state, mining-related investment and construction activity generally (fig. 9). The overall strengthening in the labour market, and particularly in the Construction and Mining sectors – which are key competitors to the utilities sector in terms of 'similarly' skilled workers - is expected to result in utilities WPI growth accelerating significantly over the 2021 to 2023 period, and subsequently remain elevated over the following two years to 2024/25.

WPI growth is forecast to average 3.9% per annum in nominal terms over the five years to 2024/25 inclusive (i.e. over the SA Power Networks next regulatory period; see table 10) – or 1.5% in real (inflation adjusted) terms (see Table 1 and Table 10).

4.2 CONSTRUCTION WPI FORECASTS

This section provides forecasts of SA Power Networks' contract or 'out-sourced' labour escalation. Given utility service providers outsourced labour is mostly supplied by firms in the construction industry, we proxy SA Power Networks' contract labour cost escalation by wages growth (as measured by the WPI) in the state's construction industry.

Our research has shown that construction activity (ie work done in the sector) normally has a strong influence on construction wages, although changes in wages tend to lag construction (in work done terms) by around one to two years. Hence, our wage forecasts are based on BIS Oxford Economics forecasts of construction activity by state (which includes residential and non-residential building, plus engineering construction) as well as predicted movements in the construction wages at the national level. Forecasts of overall construction activity in Australia and South Australia are detailed in Table 2 and figure 9. The Construction sector wage forecasts for Australia are set out in Table 9, while the South Australian Construction WPI forecasts are set out in Table 10.

Similar to the utilities WPI data, the ABS does not provide WPI data for the Construction sector in South Australia, providing state Construction WPI data only for NSW, Victoria, Queensland and Western Australia. These four states collectively account for almost 90% of total Australian construction employment, with South Australia accounting for 5.6%. Historical data and forecasts of WPI for the Construction sector in South Australia therefore is based on national Construction WPI forecasts, as well as movements in the 'unknown residual' for the Construction wage price index and recent differences in outcomes in collective bargaining in South Australia compared to the national average for the Construction sector; plus relative movements in overall construction activity at the state level, compared to the national average.

Construction wages at the national and South Australian level have weakened dramatically since 2011/12 and are well below the robust increases during the construction boom of the latter half of last decade. While collective agreements in the sector have maintained their relative high increases over the past 4 years, wages growth in the individual agreements segment (which at almost 63% of construction employees, dominate the method of pay-setting within the sector). However, with the overall labour market beginning to tighten, and the fall in construction activity reaching a plateau in 2017/18, we expect wages growth in the sector to begin to improve. Nevertheless, construction activity is set to again weaken over 2018/19 and 2019/20, and this will limit the improvement in construction wages growth over the next three years.

Construction wages growth is expected to pick up pace over 2020/21 to 2022/23, driven by a synchronised upturn in the three construction segments. Our forecast is for the Construction WPI to average 3.7% over the five-year period to 2024/25 at both the national and South Australian level – or 1.3% per annum on average in real (inflation adjusted) terms (see Table1 and Table 12). While this is a marked improvement on the past five years, it is still well down on the 4.3% annual average (nominal) of the decade to 2011/12.

Table 9. Total Australia (All Industries) and Construction Average Weekly Ordinary Time Earnings and Wage Price Index (Year Average Growth)

Year Ended June	Average Weekly Ordinary Time Earnings ([1])				Wage Price Index ([2])			
	All Industries		Construction		All Industries		Construction	
	$	%CH	$	%CH	Index	%CH	Index	%CH
2000	765	3.2	722	-0.4	71.7	3.0	68.5	2.9
2001	804	5.1	731	1.2	74.2	3.5	71.3	4.1
2002	847	5.4	770	5.3	76.7	3.3	73.6	3.3
2003	890	5.0	832	8.2	79.3	3.5	76.1	3.3
2004	932	4.7	875	5.1	82.2	3.6	78.9	3.7
2005	973	4.4	925	5.7	85.3	3.7	83.0	5.2
2006	1 018	4.6	942	1.9	88.7	4.1	87.0	4.9
2007	1 054	3.6	988	4.9	92.2	3.9	91.3	4.9
2008	1 106	4.9	1,078	9.2	96.1	4.1	95.6	4.7
2009	1 166	5.5	1,162	7.8	100.0	4.1	100.0	4.7
2010	1 231	5.6	1,251	7.7	103.1	3.1	103.3	3.3
2011	1 283	4.2	1,314	5.0	107.0	3.8	107.4	4.0
2012	1 338	4.3	1,360	3.5	110.9	3.6	111.7	4.1
2013	1 400	4.6	1,418	4.3	114.6	3.3	115.5	3.3
2014	1 442	3.0	1,448	2.1	117.6	2.6	118.9	2.9
2015	1 477	2.4	1,480	2.2	120.4	2.4	121.4	2.1
2016	1 505	1.9	1,501	1.4	123.0	2.1	123.3	1.6
2017	1 536	2.0	1,534	2.2	125.4	2.0	125.5	1.7
2018	1 573	2.4	1,550	1.0	127.9	2.1	127.8	1.9
Forecasts								
2019	1 617	2.8	1,581	2.0	131.0	2.4	130.9	2.4
2020	1 669	3.2	1,633	3.3	134.4	2.6	134.3	2.6
2021	1 731	3.7	1,695	3.8	138.8	3.3	138.8	3.4
2022	1 806	4.3	1,771	4.5	143.9	3.7	144.2	3.9
2023	1 884	4.3	1,854	4.7	149.3	3.8	150.1	4.1
2024	1 958	3.9	1,927	4.0	154.6	3.5	155.5	3.6
2025	2 031	3.8	2,003	3.9	159.7	3.3	160.6	3.3
Compound Annual Growth Rates ([2])								
2000-2010	4.9		5.6		3.7		4.2	
2010-2018	3.1		2.7		2.7		2.7	
2018-2025	3.7		3.7		3.2		3.3	
2020-2025	4.0		4.2		3.5		3.6	

Source: BIS Oxford Economics, ABS

(1) Earnings per person for full-time adults. Data is year ended May (available only mid month of quarter).
(2) CAGR (Compound Annual Growth Rates) for 2020-2025 is the annual growth for 2020/21 to 2024/25 inclusive i.e. next Revenue Determination period.

Table 10. South Australia Electricity, Gas, Water & Waste Services and Construction Wage Price Indices (Year Average Growth)

Year Ended June	EGWWS Wage Price Index			Construction Wage Price Index		
	South Australia (a)			South Australia (b)		
	Nominal Index	%CH	Real growth %CH (c)	Nominal Index	%CH	Real growth %CH (c)
2009	100.0			100.0		
2010	104.5	4.5	2.2	102.6	2.6	0.3
2011	109.0	4.3	1.2	106.1	3.4	0.3
2012	113.0	3.7	1.3	110.2	3.9	1.6
2013	117.5	3.9	1.7	113.4	2.9	0.6
2014	121.6	3.5	0.8	115.9	2.2	-0.5
2015	125.1	2.9	1.2	118.1	1.9	0.2
2016	127.9	2.2	0.8	119.7	1.4	0.0
2017	130.5	2.0	0.3	121.4	1.4	-0.3
2018	133.1	2.0	0.1	123.0	1.3	-0.6
Forecasts						
2019	136.6	2.6	0.7	125.5	2.0	0.1
2020	140.7	3.0	0.8	128.6	2.4	0.2
2021	145.6	3.5	1.2	132.5	3.1	0.7
2022	151.3	3.9	1.5	137.5	3.8	1.4
2023	157.6	4.1	1.7	143.1	4.1	1.7
2024	163.9	4.0	1.6	148.3	3.7	1.3
2025	170.1	3.8	1.4	153.2	3.3	0.9
Compound Annual Growth Rates						
2009-2018	3.2		1.9	2.3		0.4
2018-2025	3.6		1.1	3.2		0.7
2020-2025	3.9		1.5	3.6		1.2

Source: BIS Oxford Economics, ABS

(a) historical data unavailable from ABS, so estimated from Australian WPI, less NSW and Victorian data (only states that are published for EGWWS WPI), with the residual further adjusted for differences in movements in collective agreements for South Australia compared to Australia.

(b) historical WPI data unavailable for South Australia, so estimated from Australian Construction WPI, less NSW, Vic, Qld and WA Construction WPI (the only states published by ABS for Construction WPI),with adjustments for collective agreements and construction activity.

(c) Real price changes are calculated by deducting the inflation rate from nominal price changes.

Fig. 7. Australia – Utilities Employment, Output and Investment

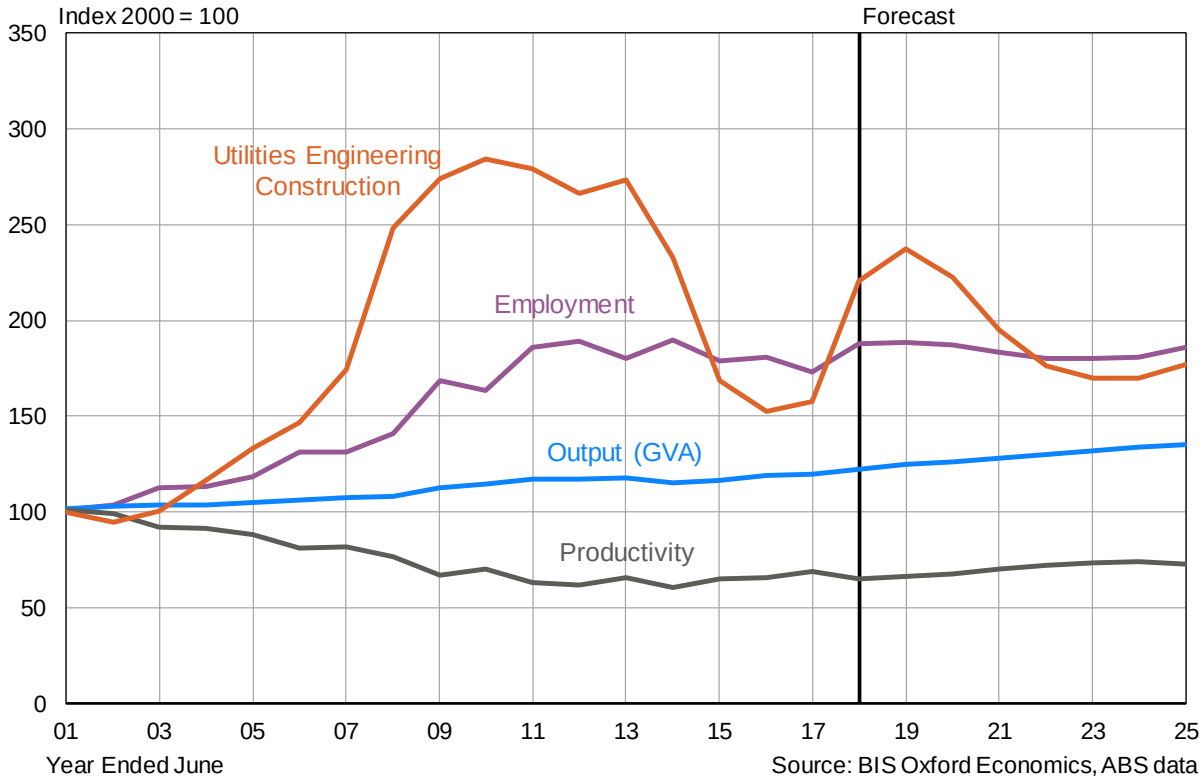


Fig. 8. South Australia – Utilities Employment, Output & Investment

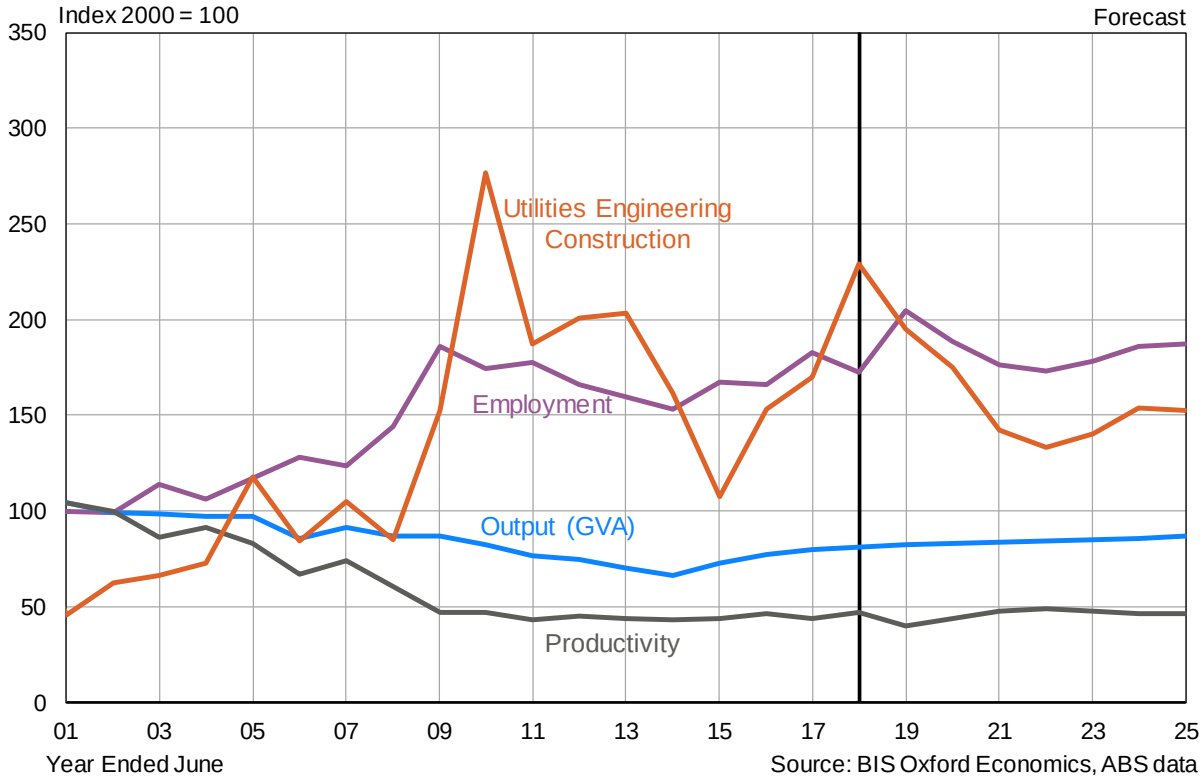


Fig. 9. Construction Activity in South Australia

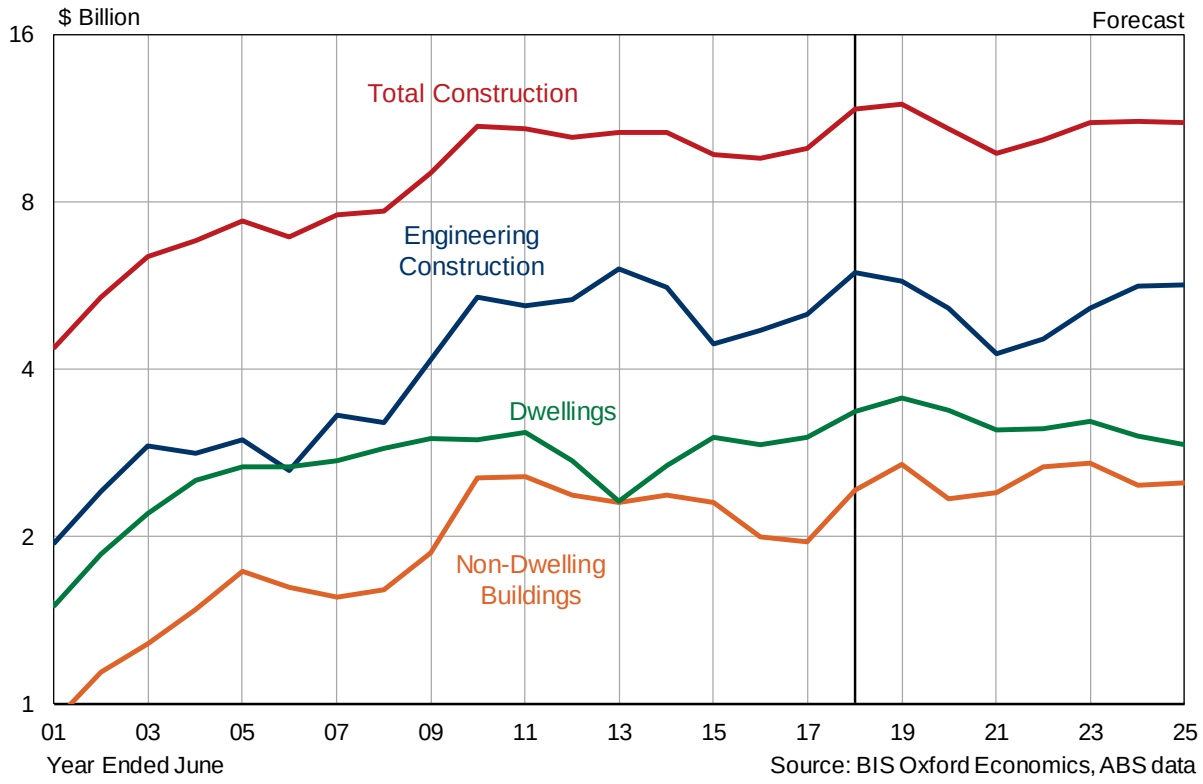
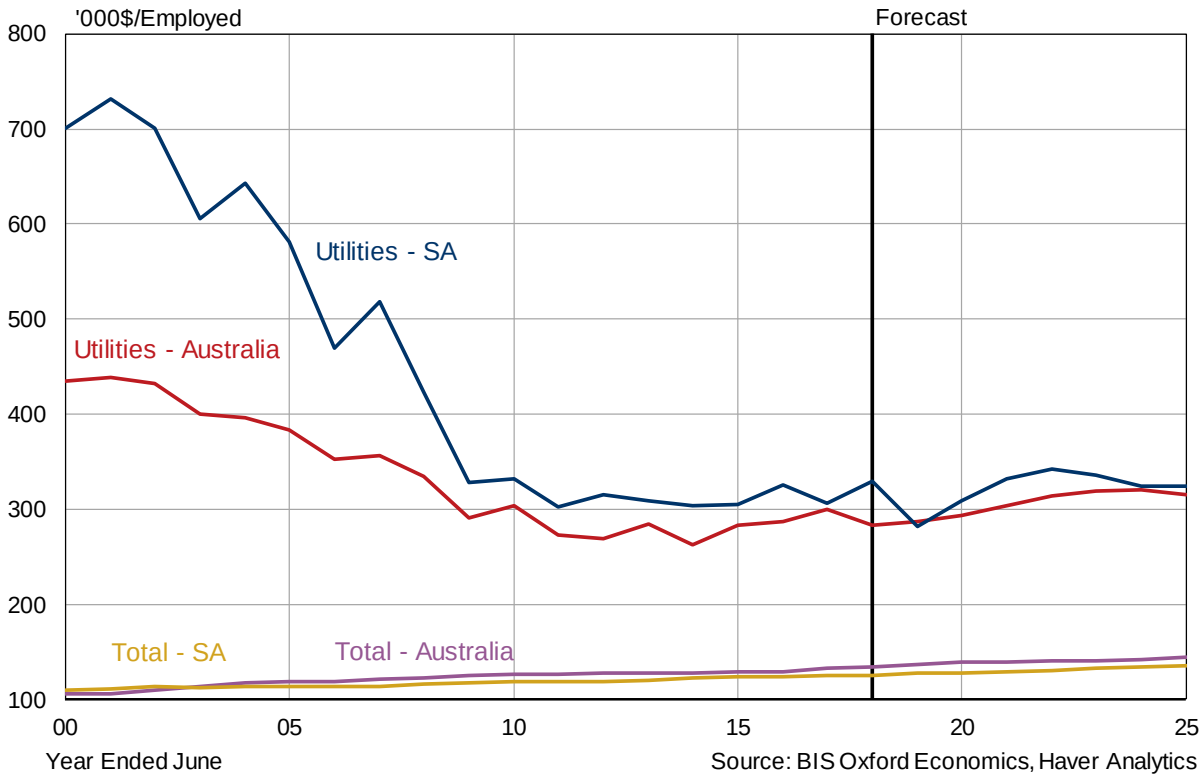


Fig. 10. Utilities Productivity in Australia and South Australia



APPENDIX A: A Note on Different Wage Measures

Several different measures of wages growth are referred to in this report, each differing slightly both in terms of their construction and appropriateness for measuring different aspects of labour costs. The following provides a brief summary of the main measures, what they are used for and why.

The main wage measures are:

• Average Weekly Ordinary Time Earnings (AWOTE) — earnings gained from working the standard number of hours per week. It includes agreed base rates of pay, over-award payments, penalty rates and other allowances, commissions and retainers; bonuses and incentive payments (including profit share schemes), leave pay and salary payments made to directors. AWOTE excludes overtime payments, termination payments and other payments not related to the reference period. The AWOTE measures used in this report refer to full-time adult AWOTE and are sourced from the Australian Bureau of Statistics (ABS) catalogue number 6302.0, with BIS Shrapnel forecasts.

• The Wage Price Index (WPI) — a CPI-style measure of changes in wage and salary costs based on a weighted combination of a surveyed 'basket' of jobs. The WPI used in this report excludes bonuses. The WPI also excludes the effect of changes in the quality or quantity of work performed and most importantly, the compositional effects of shifts within the labour market, such as shifts between sectors and within firms. The WPI figures quoted in this report are sourced from ABS catalogue number 6345.0, with BIS Shrapnel forecasts.

Each measure provides a slightly different gauge of labour costs. However, the main distinction between average earnings measures and the wage price index relate to the influence of compositional shifts in employment. The compositional effects include changes in the distribution of occupations within the same industry and across industries, and the distribution of employment between industries. For example, a large fall in the number of lower paid employees, or in employment in an industry with lower average wages, will increase average weekly earnings (all else being equal). While this is a true reflection of the average cost of labour to businesses, it is not necessarily the best measure of ongoing wage inflation (ie trends in wage-setting behaviour in the labour market). Another compositional problem with using the 'all persons' AWOTE is variations in the proportion of male and female employees (particularly as average female AWOTE is lower than average male AWOTE). However, in practice, the data shows only minor differences in the AWOTE growth rates between male and females (or males and all persons) — between -0.2 and +0.2 per cent — since the 1980s or basically since the equal pay legislation was enacted through the 1970s.

The wage price index was specifically designed to get around these compositional problems. It uses a weighted average of wage inflation across a range of closely specified jobs. As it measures the collective variations in wage rates made to the current occupants of the same set of specified jobs, the WPI reflects pure price changes, and does not measure variations in quality or

quantity of work performed. However, like the CPI (Consumer Price Index), the weights are fixed in a base year, so that the further away from that base and the more the composition of the labour market changes over time, the more 'out of date' the measure becomes.

Importantly, the WPI does not reflect changes in the skill levels of employees within industries or for the overall workforce, and will therefore understate (or overstate) wage inflation if the overall skill levels increase (or decrease). The wage price index is also likely to understate true wage inflationary pressures as it does not capture situations where promotions are given in order to achieve a higher salary for a given individual, often to retain them in a tight labour market. Average weekly earnings would be boosted by employers promoting employees (with an associated wage increase), but promoting employees to a higher occupation category would not necessarily show up in the wage price index. However, the employer's total wages bill (and unit labour costs) would be higher.

For this reason, BIS Shrapnel prefers using AWOTE as the measure that best reflects the increase in wage cost changes (or unit labour costs ie net of productivity increases) for business and the public sector across the economy. On the other hand, wage price index can be used as a measure of underlying wage inflation in the economy. The WPI is preferred by the AER.

APPENDIX B: STATEMENT OF COMPLIANCE WITH EXPERT WITNESS GUIDELINES

I have read the Guidelines for Expert Witnesses in Proceedings of the Federal Court of Australia and confirm that I have made all inquiries that I believe are desirable and appropriate and that no matters of significance that I regard as relevant have, to my knowledge, been withheld from the Court from this report.

APPENDIX C: CURRICULUM VITAES OF KEY PERSONNEL

Richard Robinson – Senior Economist and Associate Director - Economics

Richard Robinson has been employed with BIS Oxford Economics since 1986.

Richard is the company's principal economic forecaster, being largely responsible for the short term economic forecasts presented at BIS Economics' half yearly conferences in March and September. He contributes forecasts and analysis to the regular subscription services, Australian Macro Service and Long Term Forecasts.

Richard regularly analyses and forecasts resources investment and civil engineering construction activity, and production of manufactures, consumer goods and commodities. In this work, he has developed considerable industry expertise in the construction, manufacturing, agriculture, services, commodity and resources sectors of the Australian and state economies.

Richard has also been involved in a wide range of consultancy and private client projects including formulating end-use sector demand models for forecasting product demand, project evaluation studies, cost-benefit analysis, assessments of individual property markets and analysing the consistency of escalators in contracts. Some other projects have included analysing and forecasting freight tonnages; a study of the repair and maintenance market; the preparation of economic arguments for the National Wage Case for a private industry group; regular analysis and detailed short and long term forecasts of economic variables in a number of overseas countries; and contributing discussion papers to CEDA (Committee for Economic Development of Australia).

Richard holds a Bachelor's Degree in Commerce with Honours from the University of Wollongong.

Tyson Goddard – Research Assistant

Tyson Goddard is a research assistant in the Economics and Infrastructure & Mining units at BIS Oxford Economics. Tyson is responsible for monthly updates regarding monetary policy in Australia and is involved in economic forecasting, modelling and macroeconomic-related consultancy projects.

Tyson joined BIS Oxford Economics as a graduate from the University of Sydney with first class honours in Economics. Prior to graduating, he worked as a research assistant for Colliers International, contributing to a diverse portfolio of advisory projects regarding property investment and development.

APPENDIX D: TERMS OF REFERENCE

SA Power Networks – Updating EGWWS and construction labour escalators for South Australia to 2024/25 – Terms of Reference

16 May 2017

1 OVERVIEW

SA Power Networks seeks to engage BIS Oxford Economics to provide forecasts of the Electricity, Gas, Water and Waste Services (**EGWWS**) and Construction sector wages price index (**WPI**), for South Australia, to be included in our Regulatory Proposal submission for the 2020-25 regulatory control period (**RCP**).

2 BACKGROUND AND CONTEXT

SA Power Networks seeks to engage BIS Oxford Economics to provide an expert opinion on the outlook for labour cost escalators relevant to electricity distribution networks in South Australia over an eight-year period from 2017/18 to 2024/25 inclusive.

The labour cost escalators are used by SA Power Networks for internal business planning and modelling. In recent determinations by the Australian Energy Regulator (**AER**), annual real price increases for labour have reflected the average of two independent sources. SA Power Networks will utilise the labour price growth forecasts provided by BIS Oxford Economic for the 2020-25 RCP and average them with the South Australian industry forecast by Deloitte Access Economics (DAE).

3 SCOPE OF ENGAGEMENT

SA Power Networks wishes to engage BIS Oxford Economics to provide a forecast of the WPI for the EGWWS and Construction sectors for South Australia to 2024/25, considering the most recent economic and wages data.

4 CONTACT DETAILS

If you have any questions or queries in relation to this RFP document, please contact Kelly Bernhardt from SA Power Networks via the contact details below:

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