BIS OXFORD ECONOMICS

LABOUR COST ESCALATION FORECASTS TO 2023/24

PREPARED BY BIS OXFORD ECONOMICS FOR NT POWER & WATER CORPORATION

NOVEMBER 2018

BIS Oxford Economics

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9 November 2018

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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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+3.6 %

Annual wage increases expected for employees in the national utilities industry over the next 6 years

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REAL COST ESCALATION FORECASTS TO 2023/24

In 2018, BIS Oxford Economics was engaged by NT Power and Water Corporation (NTPaWC) to provide price forecasts of labour costs that are relevant to the Northern Territory electricity, gas and water distribution industry for the period 2018/19 to 2023/24. Forecasts for wage escalation will be used by NTPaWC to develop the real price changes over its upcoming regulatory period, which, in turn, will be used by the business to construct its operating and capital expenditure forecasts.

BIS Oxford Economics expects total wage costs for the Australian Electricity, Gas, Water and Waste Services (EGWWS or 'Utilities) sector — as measured in the Wage Price Index — will grow (escalate) by an average of 3.6% per annum over the six years to 2023/24, 0.4% higher than the national 'All Industries' average over the same six-year period.

National utilities wages are forecast to increase by more than the national all industries 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 faster overall wage rises in the EGWWS sector.

- Increases in individual agreements (or non-EBA wages) are expected to strengthen from current weak pace as the labour market tightens and labour productivity growth builds from early next decade.

- Demand for 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 five years, we estimate that the growth in the NT utilities WPI has been close to the national utilities WPI. Going forward, we expect utilities wages growth in the NT to be slightly weaker than the national average over the forecast period. The weaker forecast outcomes are partly due to initially

weaker outcomes in the collective agreements in the NT compared to Australia, caused by pressure from the NT government on the public sector businesses to contain increases in EBAs to below 3%. We also expect lower wage increases to be the result of weaker utilities and other construction activity in the NT compared to the rest of Australia. The latter will act to constrain the demand for utilities and construction-related labour, with the latter a competitor for utilities labour in high demand periods.

Nevertheless, the higher wages across Australia for utilities workers (and the workforce in general) will force employers in the Territory to follow wage trends in other states. Indeed by 2020/21 we expect wage pressures to accelerate, in the Territory and nationally. In the Territory, a strengthening in building activity from 2020/21 in particular will push up the demand for construction workers. We also expect a strengthening in utilities-related construction from around 2022 - due in part to the need to cater for the increase in dwellings and other buildings and other facilities as the NT population and economic activity increases – will push up the demand for both utilities-related and construction workers.

The NT utilities businesses will also find they need to offer higher wages to local workers and keep pace with interstate utilities wages growth to both avoid losing workers interstate and attracting workers from interstate. This will see a marked strengthening in wages growth in the NT utilities sector over the 2021/22 to 2023/24 period. Overall, WPI growth in the NT is forecast to average 3.5% over the five years to 2023/24 inclusive (i.e. the NT Power and Water Corporation's next regulatory period), or 1.2% in real (inflation adjusted) terms (see table 1.1).

Table 1.1 Summary – Labour Costs Escalation Forecasts for Northern Territory and Australia
(per cent change, year average, year ended June)

	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	5 yr Avg (f)
					Forecasts	*Next Regulatory Period*					
NOMINAL PRICE CHANGES											
1. Internal Network-Related Labour											
EGWWS WPI - Northern Territory (a)	**2.9**	**2.5**	**2.1**	**2.0**	**2.5**	**2.9**	**3.4**	**3.7**	**3.9**	**3.8**	**3.5**
EGWWS WPI - Australia (b)	2.8	2.4	2.2	2.0	2.7	3.1	3.6	4.0	4.2	4.0	3.8
EGWWS AWOTE - Australia (b)	0.7	3.5	4.3	2.3	2.8	3.5	4.0	4.4	4.5	4.3	4.2
2. Total Territory/National Average											
Northern Territory WPI (c)	**2.6**	**2.2**	**2.2**	**1.3**	**2.3**	**2.5**	**3.1**	**3.5**	**3.7**	**3.5**	**3.3**
Australia All Industries - WPI (b)	2.4	2.1	2.0	2.1	2.4	2.6	3.3	3.7	3.8	3.5	3.4
Australia All Industries - AWOTE (b)	2.4	1.9	2.0	2.4	2.8	3.2	3.7	4.3	4.4	4.0	3.9
Consumer Price Index (headline) (d)	1.7	1.4	1.7	1.9	1.9	2.2	2.3	2.4	2.4	2.4	2.3
REAL PRICE CHANGES (e)											
1. Internal Network-Related Labour											
EGWWS WPI - Northern Territory (a)	**1.2**	**1.1**	**0.4**	**0.0**	**0.7**	**0.7**	**1.1**	**1.3**	**1.5**	**1.4**	**1.2**
EGWWS WPI - Australia (b)	1.1	1.0	0.5	0.0	0.8	0.9	1.3	1.6	1.8	1.6	1.4
EGWWS AWOTE - Australia (b)	-1.0	2.2	2.6	0.4	0.9	1.3	1.7	2.0	2.1	1.9	1.8
2. Total Territory/National Average											
Northern Territory WPI (c)	**0.9**	**0.8**	**0.4**	**-0.6**	**0.4**	**0.3**	**0.8**	**1.1**	**1.3**	**1.1**	**0.9**
Australia All Industries - WPI (b)	0.7	0.7	0.2	0.1	0.5	0.4	1.0	1.3	1.4	1.1	1.0
Australia All Industries - AWOTE (b)	0.7	0.5	0.3	0.5	0.9	1.0	1.4	1.9	2.0	1.6	1.6

source: ABS, RBA, Department of Employment, BIS Oxford Economics

(a) Electricity, Gas, Water and Waste Services (EGWWS) for Wage Price Index (WPI) for Northern Territory. Historical data for the EGWWS WPI are BISOE estimates, as the ABS does not publish the EGWWS sector WPI for the Northern Territory.

(b) Australian sector wage forecasts provided for comparison. AWOTE is average weekly ordinary time earnings for full itme adult persons, where overtime payments are excluded, but bonus payments are included

(c) Northern Territory WPI are total or "All Industries' wage movements. Provided for comparison.

(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) Average Annual Growth Rate for 2019/20 to 2023/24 inclusive ie for next regulatory period.

1. INTRODUCTION

On 17 September 2018, BIS Oxford Economics was engaged by NT Power and Water Corporation (NTPaWC) to provide price forecasts of labour costs relevant to electricity, gas and water distribution networks in the Northern Territory from 2018/19 to 2023/24. Forecasts of wages will be used by NTPaWC to develop the real price changes over its upcoming regulatory period, which, in turn, will be used by the business to construct its operating and capital expenditure forecasts. Over the next regulatory period forecasts of both nominal and real price growth of the relevant inputs are provided.

In keeping with my instructions, I (Richard Robinson, Associate Director, 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 1. I have been assisted in the preparation of this report by Dr Sarah Hunter (Head of Australian Macroeconomics) and Joshua Blick (Economic Analyst) at BIS Oxford Economics. Notwithstanding the assistance from the other economists, 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. The data used in the projections is the latest available as at mid October 2018, and includes the June quarter 2018 WPI data release. Other inflation and interest rate data were sourced from the Reserve Bank of Australia.

Forecasts of the economic variables in this report were mostly sourced from BIS Oxford Economics reports, including *Australian Macro Service*, *Long Term Forecasts: 2017 – 2032 update, Engineering Construction in Australia 2018* and *Building in Australia 2018-2033*, along with other unpublished forecasts and from BIS Oxford Economics internal research and modelling.

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 the Northern Territory. This Section also has forecasts of key economic variables plus a discussion of the drivers and logic underpinning the projections, to provide context for the labour market outlook.

Section 3 discusses BIS Oxford Economics' national projections and discusses the use of the Reserve Bank of Australia forecasts of the Consumer Price Index (CPI) for the deflation of nominal wages. Note that most of the references to historical data and forecasts of wages in Sections 3, 4 and 5 are in nominal terms unless specifically stated that the data/forecasts are in real (inflation adjusted) terms.

Sections 4 and 5 provides the forecasts and rationale of the wage projections for the Electricity, Gas, Water and Waste Services (EGWSS) and construction sectors of both Australia and the Northern Territory, as measured by the Wage

Price Index (WPI).

Appendices include an explanation of different wage measures, CV's of key personnel and the statement of compliance with expert witness guidelines.

2. MACROECONOMIC OUTLOOK

2.1 AUSTRALIA OUTLOOK

Australia's economic growth has bounced back over the past year, with GDP 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.

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

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 supported by a more competitive Australian dollar (A$). 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 since the end of the mining investment boom

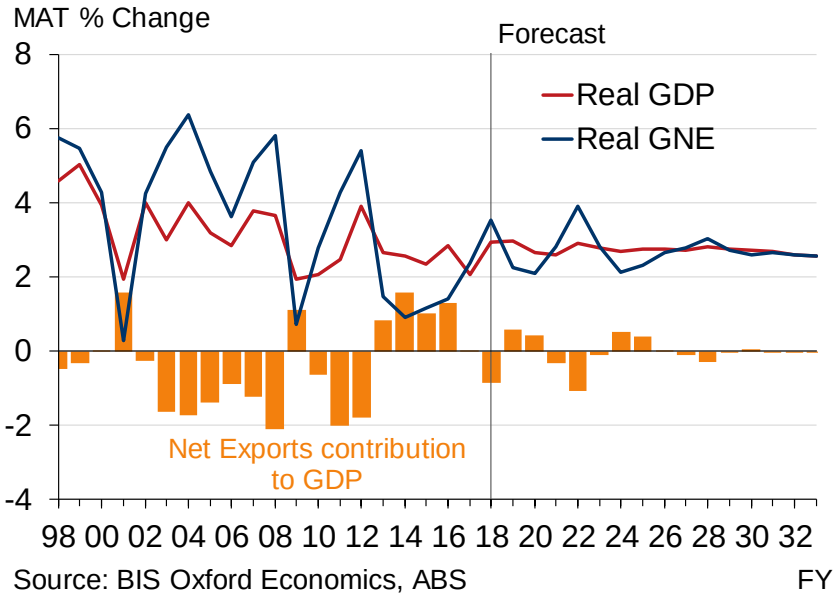
Australia moved from broad-based growth in the early 2000s and into an unprecedented mining investment boom over the decade to 2013. This shift was driven largely by the industrialisation and urbanisation of China (where annual GDP growth averaged over 10%), which lifted the Australian dollar to over US$1.00 – a level not seen since the previous commodity boom of the early 1980s. The economy shifted resources toward servicing the mining investment boom and away from the (other) tradeables sector, which were negatively impacted by the appreciation of the A$.

The end of the mining boom precipated a sharp slowdown in the pace of growth of domestic demand. The main drag has been a substantial decline in the level of mining investment, which has coincided with (and contributed to) weakness in non-mining business investment. Net exports have acted as a partial offset during this period, with resource exports booming following the substantial increase in capacity, services exports recovering (driven by the depreciation of the A$) and weak growth in import volumes.

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

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.

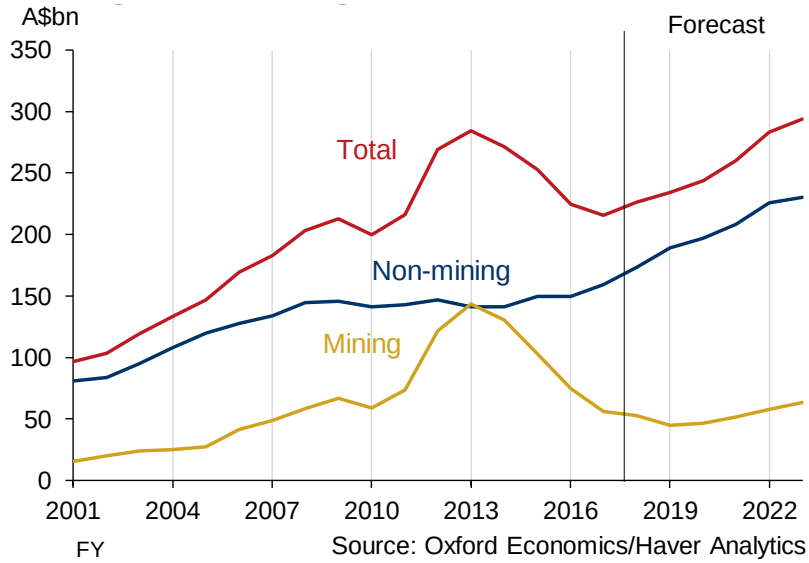
Figure 2.1 Australia – Basic Economic Indicators



Source: BIS Oxford Economics, ABS

The lower A$, which has weakened steadily over the last twelve months and currently sits around US71 cents, has been fundamental in facilitating the return of broad-based growth. Together with rising capacity utilisation and the recovery in profits, it has facilitated a turnaround in non-mining investment, which has become a key driver of domestic demand over the last year. Businesses in the agriculture, mining, tourism, international education and some other services have seen their competitiveness improve markedly, enabling them to compete on the international stage. And with all the major industry shutdowns now complete (the last being car production last year), the manufacturing sector is now poised to take advantage of the weaker A$.

Figure 2.2 Mining and Non-Mining Business Investment



Source: Oxford Economics/Haver Analytics

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 this year's fiscal boost 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 Japan), which augers well for Australian exports. Nevertheless, rising US interest rates will pose a risk for a number of emerging economies.

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

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 for next two years, following 2017/18 rebound

The recovery in domestic demand, which grew 3.5% in 2017/18, drove Australia's GDP last year, but we expect it to weaken again over the next two years. Momentum in household spending is expected to slow, 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) put 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-sync – are all expected to move into upswing, although there will be differences in the strength and timing across the residential, business and public investment components. The strengthening in investment will lead to an increase in the 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 put a small drag on growth. Nevertheless, GDP growth is forecast to lift and average around 3% over 2021/22 to 2022/23.

Table 2.1 Australia – Key Economic Indicators, Financial Years

Year Ended June					Forecasts					
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Total New Private Investment (+)	**-2.2**	**-4.9**	**-1.6**	**3.6**	**0.8**	**1.5**	**3.9**	**7.4**	**2.4**	**-1.9**
New Public Investment (+)	**-7.6**	**6.7**	**10.5**	**6.9**	**4.2**	**-3.2**	**0.7**	**2.6**	**3.8**	**0.8**
Gross National Expenditure (GNE)	**1.1**	**1.4**	**2.4**	**3.5**	**2.4**	**2.1**	**3.2**	**4.1**	**2.9**	**1.6**
GDP	**2.4**	**2.8**	**2.1**	**2.9**	**3.1**	**2.7**	**2.9**	**3.1**	**2.9**	**2.4**
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
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
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
Average Weekly Earnings (Yr Avg)(^)	2.4	1.9	2.0	2.4	2.8	3.2	3.7	4.3	4.4	4.0
Employment										
– Employment Growth (Yr Avg)	1.3	2.3	1.5	3.0	1.9	1.1	1.4	2.0	1.9	1.0
– Employment Growth (May on May) (%)	2.0	1.8	2.1	2.6	1.6	1.1	1.6	2.2	1.5	1.0
– Unemployment Rate (May) (%)	5.9	5.7	5.5	5.4	5.5	5.4	5.3	4.7	4.6	4.8
Labour Productivity Growth										
– Total	1.1	0.6	0.6	-0.1	1.2	1.6	1.5	1.1	0.9	1.4
– Non-farm	1.1	0.8	0.3	0.2	1.3	1.6	1.5	1.2	0.9	1.4

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

With wages growth well below historical averages, domestic cost push pressures are expected to remain limited in the near term (cost push inflation is caused by an increase in the prices of inputs, such as labour, raw materials, etc). 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 slightly above) historical averages, and the unemployment rate falls below 5%. 10-year government bond rates will also gradually rise to over 4% by 2022, from around 2.7% now. Australian long term bond rates are expected to track the rise in US bond rates over the next few years, with US bond rates expected to rise as a result of monetary tightening. Meanwhile, the 1.25%pt 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.

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

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 NORTHERN TERRITORY ECONOMIC OUTLOOK

The Northern Territory economy is highly cyclical, with wild swings in the growth rates of State Final Demand (SFD) driven by large variations in work done on large investment projects. Recent history is no exception, with growth in SFD tracking the colossal $37 billion Ichthys LNG project. SFD fell by 3.8% and 6.2% in 2014/15 and 2015/16 respectively, then jumped 7.6% in 2016/17, before falling 2.8% in 2017/18. Employment creation has been similarly erratic, declining 0.2% in 2014/15, increasing 1.5% and 3.0% in 2015/16 and 2016/17, and then falling 1.1% in 2017/18. There has continued to be volatility over the past year, with a weakening in the monthly employment figures since May 2018, which followed a steady improvement over the previous eight months. Employment growth through the year to September eased to 1.2%, compared to a 2.3% increase Australia-wide. The Territory's unemployment rate was 4.1% in September, a marked improvement on the 4.5% in late 2017.

Gross State Product (GSP) has shown a less volatile profile than SFD and employment in recent years, rising 3.9% in 2016/17 after around 1.9% growth in the previous 2 years. As the Ichthys project winds down over the second half of 2018, translating to further massive falls in engineering construction activity, SFD will suffer another serious decline in 2018/19. There is no strong compensating growth from other sectors of the domestic state economy to replace this project, with the next largest project - the $800 million Northern Gas Link (connecting Northern Territory to the east coast gas network) – now recently completed.

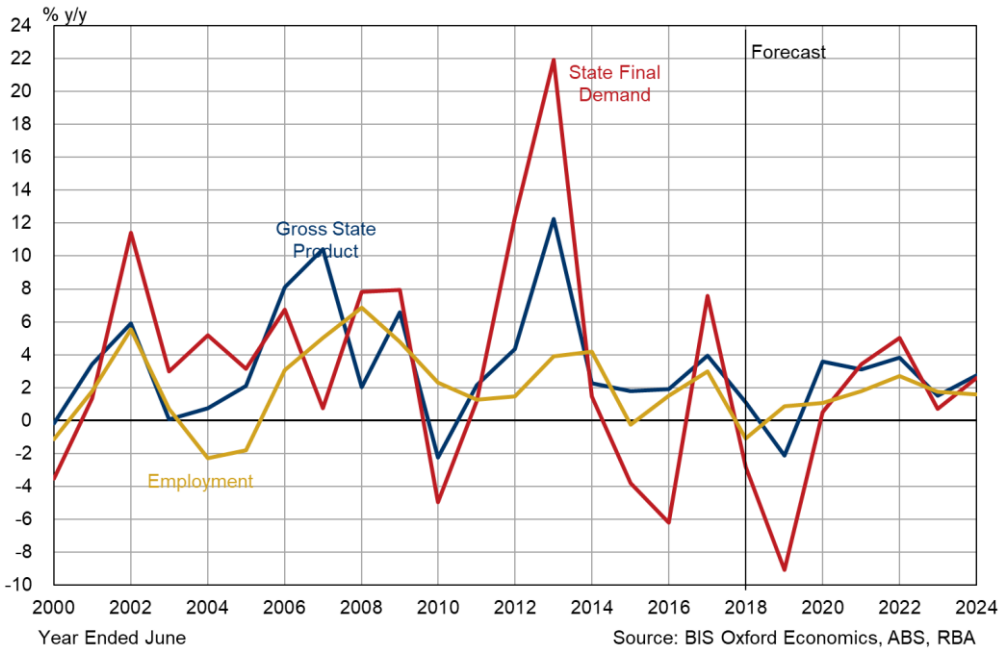
Residential building has effectively reached its trough after falling almost 40% over the past four years, but little growth is expected over the next two years due to a significant oversupply of dwelling stock. The sharp slowdown in population growth since the 2.9% increase in 2012/13 – population growth has averaged 0.4% over the past 5 years, with the Territory actually seeing interstate outflows – has reduced the demand for houses and goods and services, which has kept consumer demand contained. New public investment

is also expected to decline over the next two years, as the NBN and other telecommunications projects are completed and as road construction declines, although work on large defence related building projects will provide a partial offset.

Private non-residential building activity is estimated to have collapsed to just over a quarter of its 2013 peak level but a strong rebound off the new low base is expected to see growth of around 30% over the next 2 years, with further increases projected after that. Meanwhile, government recurrent expenditure is forecast to provide a somewhat stronger underpinning to growth over the next few years.

Overall, while SFD in the Northern Territory contracts again over the next year, GSP will get a (strong initially but diminishing) boost as LNG and oil production from Ichthys comes on stream from late 2018, and as the lower A$ boosts tourism and food exports. However, given the severity of the decline in SFD, we believe these positives will not be sufficient to keep GSP growth positive over the next year. SFD is expected to return to positive, albeit weak, growth in 2019/20, which, with the LNG and tourism-boosted exports, will see GSP lift in 2019/20. An expected upturn in dwelling investment from 2020/21 and a rebound in public investment, combined with further improvement in non-residential building, is forecast to lead to a pick-up in employment and an acceleration in population growth from early next decade (interstate inflows are expected to turn positive). In turn, this is expected to drive stronger household spending and an overall strengthening in SFD from 2020/21. Mining investment is also expected to provide support to the NT economy in the early 2020's, although the increases will be off a much smaller base following the completion of the Ichthys LNG plant.

Figure 2.3 Northern Territory Key Economic Indicators



3. WAGES AND INFLATION OUTLOOK

3.1 CPI OUTLOOK

Limited inflationary pressures in recent years

Consumer price inflation has been subdued for the past four years, with the substantial depreciation of the A$ (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 - virtually non-existent since the June quarter 2014. Stagnant world prices for manufactured goods, reduced transport costs, margin compression by exporters globally, 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 reduced import prices, although the A$ depreciation over the past 9 months has partially reversed this trend. High levels of retail and supermarket competition domestically have also limited price growth. However, in the recent September quarter, tradeables inflation jumped to 1.4% (through-the-year or annual growth), due to higher petrol and food prices, and some depreciation effects.

Meanwhile, non-tradeables inflation – which now constitutes almost two-thirds of the CPI – has doubled over the past 2 years, from a low of 1.6% (annual growth) through-the-year to June 2016 to 3.0% in the 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. However, annual non-tradeables inflation fell back in the recent September quarter, due largely to a large one-off plunge in child care costs due to the introduction of Child Care Subsidy.

Price pressures set to remain subdued in the near term

Overall, the headline CPI inflation rate increased from to 1.9% in the March quarter, 2018, to 2.1% in the June quarter 2018 before easing back to 1.9% in the recent September quarter, while underlying (or core) inflation – the average of the RBA's trimmed mean and weighted median inflation measures – eased slightly to 1.8% 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

Building on the recent increase in energy prices, further above average price increases are expected over the next one to two years as higher wholesale prices are passed on to consumers, despite optimism as expressed by the RBA and competition regulators that competition among electricity retailers will limit any further increases. 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, before oil prices fall back as supply constraints ease. 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.

Oversupply of housing and weak wage growth will keep a lid on residential rent increases

In addition to goods and services provided by producers, the CPI basket also includes residential property rent (with a weigh of 7.2%). In addition to low wage growth and the retail environment, residential property 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. Rental price growth is likely to stay low until the early-to-mid 2020's, when currently oversupplied markets become more balanced.

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.

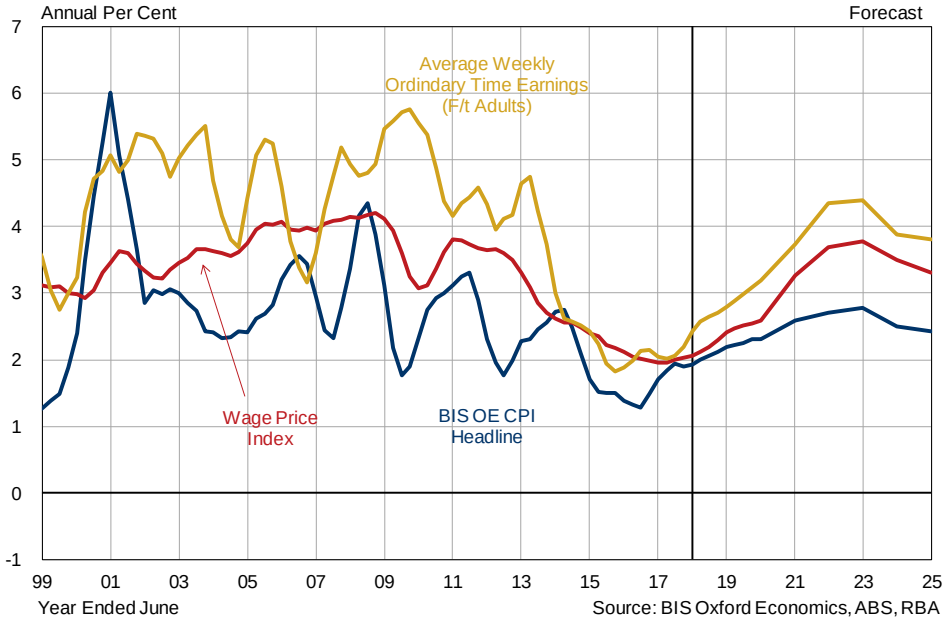
It is our view that inflation will subsequently accelerate from early next decade, and rise above the 2.5% mid-point of the RBA's band, by early 2022 as economic growth increases, profits, employment and wage growth strengthen, and inflationary pressures begin to build. The rise in the A$ toward US80 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. Limited movements in the A$, steady (but subdued) increases in global manufacturing costs and some commodity price increases underpin this projection.
- 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. The main driver of this is the projected acceleration in wage growth.

Figure 3.1 Australia: Wages and Prices



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 CPI forecasts from the Reserve Bank of Australia (RBA). 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 2.22% for 2019/20), holding at 2¼% in the December quarter 2020. We then impose the mid-point of the RBA's target band, 2.5%, as the projection for the June quarter 2021, giving a year average CPI rate of 2.3% 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 mid-point of the RBA's inflation target band (i.e. 2 to 3%) used for the remaining 7 years. The geometric mean for the next ten years is calculated at 2.39% using this methodology. This methodology has been adopted by the AER (Australian Energy Regulator) in their recent revenue decisions. For example, see Power and Water Corporations Draft Determination 2019-24, Attachment 3, section 3.5, page 17.

3.2 WHOLE ECONOMY WAGE OUTLOOK

3.2.1 National Wages

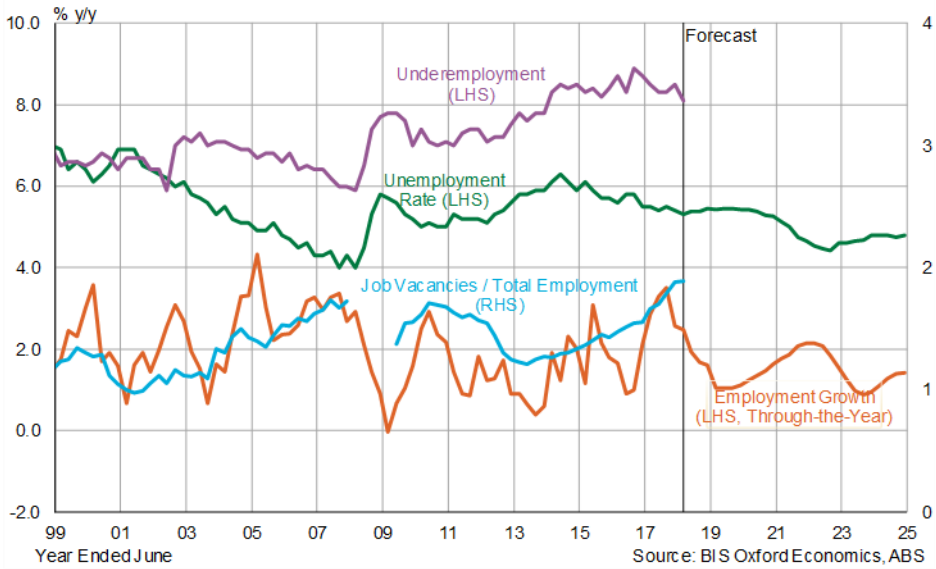
The key determinants of nominal wages growth are consumer price inflation, productivity, the relative tightness of the labour market (i.e. the demand for labour compared to the supply of labour), and compositional (structural) changes in the labour market following the end of the mining investment boom.

Wages growth has slowed markedly over the past 5 years, primarily due to weaker demand for labour, caused by both cyclical and structural factors. 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.

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, falling to 5% in September 2018. Historically this rate was seen as close to the NAIRU, (the Non-Accelerating Inflationary Rate of Unemployment or the `natural rate of unemployment'), but our latest research suggests that the natural rate has declined in recent years, as a result of falling rates of unionisation and increasing casualisation. Given this, we still see spare capacity in the labour market. Compounding this, Australia's underemployment rate[1] remains 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.

Figure 3.2 Employment and Unemployment



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

[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.

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 near all-time lows, 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 cases 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 took effect from the 1st 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.

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 wage outcomes 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 number of agreements negotiated last year, overall wage agreements in the collective bargaining segment – which cover 37% of the workforce – are likely to see limited increases on the 2.8% recorded in the latest data.

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. 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 linked to recent higher profits (see Appendix 1 for a discussion of the different wage measures).

Wage growth is then predicted to accelerate from 2020/21, as tighter conditions in the labour market feed through. 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.

Table 3.1 Wages Growth by Workforce Segmented by Pay Setting Method

Year Ended June	% of Workforce in 2016	Year Average % change													
									Forecasts						Average
		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2019-24
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	3.3
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	3.3
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	3.1
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**	**3.2**
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	0.5	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	4.0	3.7

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).

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%. In terms of the wage price index, long run growth in the WPI is expected to be around 0.3% less than AWE, in line with the average historical trends over the past two decades since the introduction of the WPI.

3.2.2 Northern Territory 'All Industries' Wage Outlook

Growth in total 'all industries' wages at the state (or territory) level usually depends on the relative strength of the state economy and labour markets, compared to the national average. Over the decade to 2016/17, overall wages growth in the Northern Territory was slightly above the national average (0.2%pts above). However, total wages growth in terms of the WPI in the Territory slowed sharply in 2017/18 to 1.3%, compared to 2.1% for the Australian equivalent (see summary table in the Executive Summary). This weakening was in line with the weaker Territory economy and particularly the decline in the labour demand (ie. employment) in 2017/18.

However, the relatively strong June quarter result and momentum from the Fair Work decision in award wages is likely to see the gap between the national average and overall Territory wages narrow over the next year, despite growth in state final demand lagging national domestic demand growth. Thereafter, we expect Northern Territory wage growth to pick up in line with the national average, but slightly underperform the national average over most of the forecast period. The strength of building construction in the Territory and mining investment across Australia in 2021/22 and 2022/23 will be key factors pushing up the demand for labour and wages - leading to wages growth in the Territory matching the national average late in the forecast period.

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 3.1). 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 uses 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 an important influence

Note in Table 3.1, 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).

The 'bottom-up' approach to wage forecasting is complemented by a more formalised 'top-down' macroeconomic modelling framework – to ensure an overall macroeconomic consistency with output, employment, productivity and price variables. The top down macroeconomic modelling methodology becomes more relevant beyond the next 2-3 years.

4. UTILITY WAGES OUTLOOK

4.1 CHOICE OF THE WAGE PRICE INDEX AS THE MEASURE OF LABOUR COSTS

BIS Oxford Economics chose to use the Wage Price Index (WPI) as the key measure of labour costs for the forecasts of Electricity, Gas, Water and Waste Services (EGWWS) sector. The key motivations for this are:

(a) Greater data availability: the EGWWS WPI is available at the national level and for some key states (NSW and Victoria), both on quarterly and annual basis. Average Weekly Earnings (AWE) and Average Weekly Ordinary Time (AWOTE) are not available by industry by state, and at the national level are only published every 6 months; and

(b) The Australian Energy Regulator (AER) prefers the WPI as it has less volatility than AWOTE and is a better measure of underlying trends.

4.2 NATIONAL EGWWS WPI FORECASTS

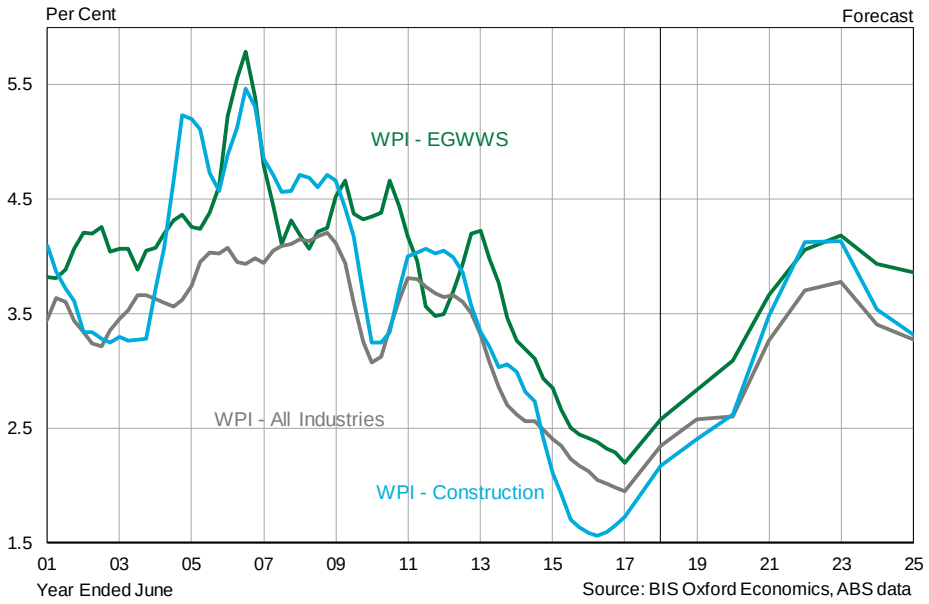
The EGWWS wage price index growth has consistently been above the national average since the index's inception in 1997 and averaged 0.6% higher over the past 17 years (see Table 4.3 and Fig 4.1). While growth in average weekly ordinary time earnings (AWOTE) of the electricity, gas, water and waste services 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 4.3).

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

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. 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.

Figure 4.1 Wage Price Index - Australia All Industries, Electricity, Gas, Water and Waste Services and Construction

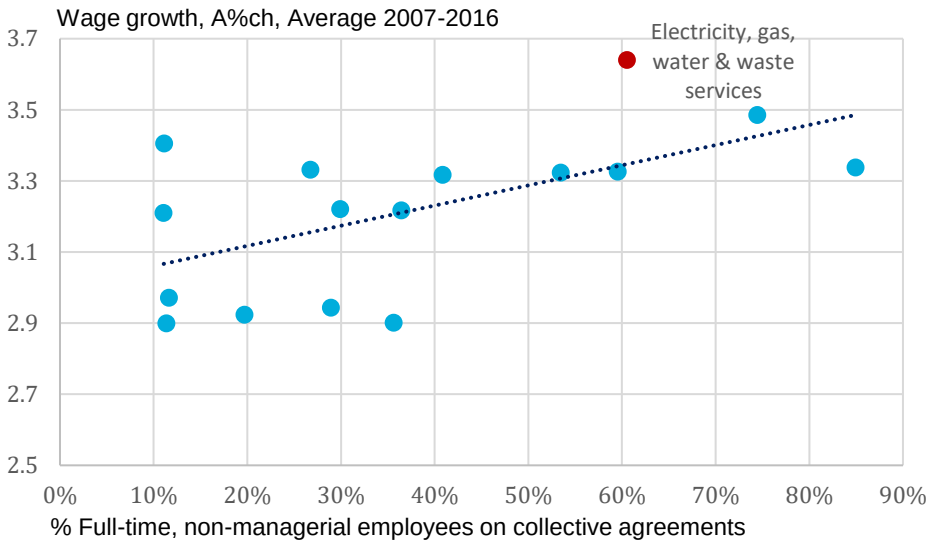


Strong Union presence in the industry have seen collective agreements outcomes above the All Industry average.

Trade unions are typically able to negotiate higher-than-average wage outcomes for their members through collective bargaining, resulting in stronger wage growth than the all-industry average. Across the EGWWS sector, there are a number of 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).

As at May 2016, 60.6% of full-time non-managerial employees in the EGWWS industry have their wages set by collective agreements, considerably higher than the national average of 37.1%. Over the past 10 years, a higher proportion of workers on collective agreements is associated with higher wage growth, with a correlation coefficient of +0.6 (see Figure 4.2). As we expect that the EGWWS industry will continue to have higher levels of unionisation than the national average, we expect that unions in the EGWWS industry will continue to be able to negotiate for higher wages for a substantial proportion of EGWWS employees, resulting in EGWWS wages growing faster than the national average.

Figure 4.2 Average wage growth and unionisation rates by industry, 2007-2016



Year Ended June

Source: BIS Oxford Economics, ABS data

The key elements of the utilities wage forecast are set out in Table 4.2. 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 level of total utilities wages (in A$ terms) will generally be higher than the all industries average. Over the past five years, the outcomes from collective agreements in the EGWWs sector have been 0.2%pts higher, on average, than the all industries collective agreements average (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, a still strong demand for skilled labour and tight labour market conditions going forward, collective agreements are forecast to remain around 1.3% above the 'official' CPI over the forecast period - which we note, is lower than previous periods, when similar tight labour market conditions prevailed.

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 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.

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. 4.2 illustrates this relationship, and shows employment has a stronger relationship with utilities engineering construction rather than utilities output.

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 4.2% per annum over the five years to 2023/24, 0.3% higher than the national All Industries AWOTE average of 4.0% per annum over the same five-year period (see Table 4.3). 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 3.8% per annum (0.4 percentage points higher than the national ll Industries WPI average of 3.4% per annum) over the five years to 2023/24.

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.

Table 4.1 Wages Growth by Workforce Segmented by Pay Setting: Electricity, Gas, Water & Waste Services (Australia)

Year Ended June	% of Workforce in 2016	Year Average Per Cent Change (a)										
						Forecast						Average
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2019-24
Awards Only	5.7%	3.0	2.5	2.4	3.3	3.5	3.0	3.1	3.4	3.5	3.3	3.3
Collective Agreements	60.6%	3.3	3.2	3.0	2.9	3.1	3.2	3.5	3.8	4.1	4.1	3.6
Individual Arrangements	33.6%	1.9	0.9	0.6	0.0	1.7	2.9	4.1	4.5	4.4	3.9	3.6
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**	**3.6**
Compositional Effects + Bonuses,etc		-2.2	1.1	2.1	0.3	0.1	0.5	0.4	0.4	0.3	0.4	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	3.9

(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).

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 a higher proportion of 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). With the supply of lower skilled workers growing relatively

quickly, wage increases for this group are subdued compared to higher skilled workers.

This is supported by Industry wage data for 2016/17 from the ABS, which 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.

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 well above the average for the Northern Territory (see figure 4.5). 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 4.2).

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 the Northern Territory (see figure 4.3). Meanwhile, utilities wages growth was relatively strong over this same period (see table 4.2). 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.

Table 4.2 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	1 885	4.4	2,197	4.5	149.3	3.8	158.0	4.2
2024	1 960	4.0	2,292	4.3	154.6	3.5	164.2	4.0
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	
2019-2024	3.9		4.2		3.4		3.8	

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 2019-2024 is the annual growth for 2019/20 to 2023/24 inclusive i.e. next Revenue Determination period.

4.2.1 Northern Territory Utilities Wages Outlook

The ABS does not provide WPI data for the Utilities sector in the Northern Territory, 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. The Northern Territory only accounts for 1.6% of national utilities employment. Historical data and forecasts of WPI for the EGWWS sector in the Northern Territory is therefore based on national EGWWS WPI forecasts, as well as movements in the 'unknown residual' (see box in section 3.2.2) for the utilities wage price index and recent differences in outcomes in collective bargaining in the Northern Territory compared to the national average for the utilities sector.

Over the past five years, we estimate that the growth in the NT utilities WPI has been close to the national utilities WPI (see Table 1.1 in the Executive

Summary). From 20110/11 to 2015/16 the NT utilities WPI were estimated to be above the national utilities WPI, based on the higher outcomes (compared to the Australian average) for collective agreements in terms of AAWIs (average annual wage increases) for the agreements current as at each June quarter in each year. The data on collective agreements comes from the Department of Jobs (formerly Department of Employment).

We have also analysed recent EBAs (enterprise bargain agreements) in the dominant public sector businesses in the Territory – NT Power and Water Corporation, Territory Generation and the (much smaller) Jacana Energy. These businesses account for over 56% of employment in the NT utilities sector. Our analysis shows that around 92% of their staff are on EBAs, which equates to 52% of the utilities workforce. Over the past three years, the weighted average of the increases in their negotiated agreements was almost 3%. Assuming there are other businesses with employees on individual agreements in the NT utilities sector and based on the national increases for individual agreements, we estimate that the overall NT utilities WPI has been around 2% for the past 2 years (see Table 1.1).

Going forward, we expect utilities wages growth in the NT to be slightly weaker than the national average over the forecast period. The weaker forecast outcomes are partly due to initially weaker outcomes in the collective agreements in the NT compared to the Australian average, caused by pressure from the NT government on the public sector businesses to contain increases in EBAs to below 3%. We also expect lower wage increases to be the result of weaker utilities and other construction activity in the NT compared to the rest of Australia. The latter will act to constrain the demand for utilities and construction-related labour, with the latter a competitor for utilities labour in high demand periods.

Nevertheless, the higher wages across Australia for utilities workers (and the workforce in general) will force employers in the Territory to follow wage trends in other states. Indeed by 2020/21 we expect wage pressures to accelerate, in the Territory and nationally. In the Territory, a strengthening in building activity from 2020/21 in particular (which uses mainly local labour, as opposed to large mining and infrastructure projects, which uses more fly-in/fly-out workers from interstate) will push up the demand for construction workers. BIS Oxford Economics is forecasting a solid upturn in both dwelling building and non-residential building forecast for 2020/21 to 2023/24 (see figure 4.6). Increases in public infrastructure spending and areas of mining investment will also add to labour demand. It is also in line with the broader acceleration in national construction sector wages growth, and across the economy generally. The acceleration in construction sector wages growth in particular - and indeed all industries (total) wages growth – will put upward pressure on utilities wages (see figure 4.1). The construction sector, along with the mining and manufacturing sectors, tend to compete with the utilities sector for similarly skilled labour. We also expect a strengthening in utilities-related construction from around 2022 in the Territory, due in part to the need to cater for the increase in dwellings and other buildings and other facilities as the NT population and economic activity increases (see figure 4.4).

The NT utilities businesses will also find they need to offer higher wages to local workers and keep pace with interstate utilities wages growth to both avoid losing workers interstate and attracting workers from interstate. This will see a marked strengthening in wages growth in the NT utilities sector over the 2021/22 to 2023/24 period. Overall, WPI growth in the NT is forecast to average 3.5% over the five years to 2023/24 inclusive (i.e. the NT Power and Water Corporation's next regulatory period), or 1.2% in real (inflation adjusted) terms (see Summary, Table 1.1).

Figure 4.3 Australia – Utilities Employment, Output and Investment

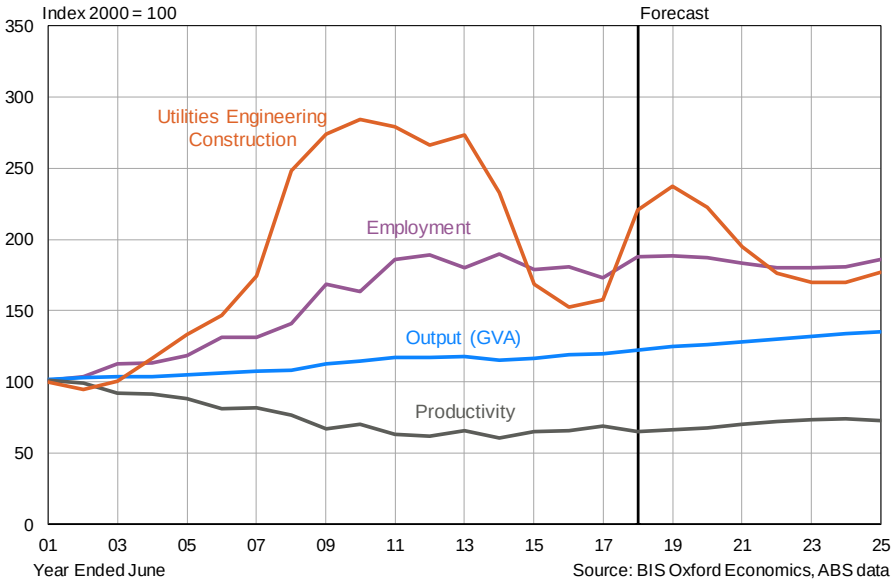


Figure 4.4 Northern Territory – Utilities Employment, Output and Investment

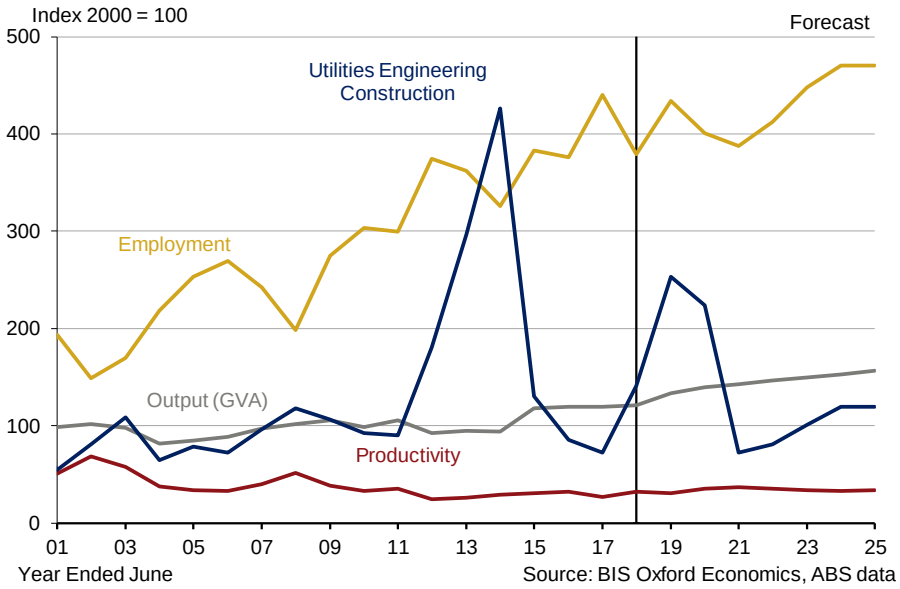


Figure 4.5 Utilities Productivity in Australia and the Northern Territory

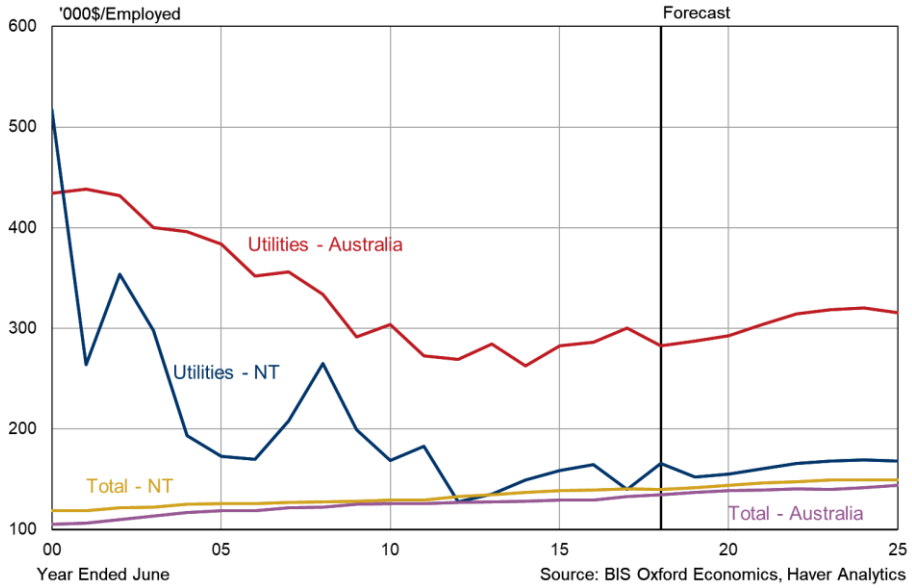
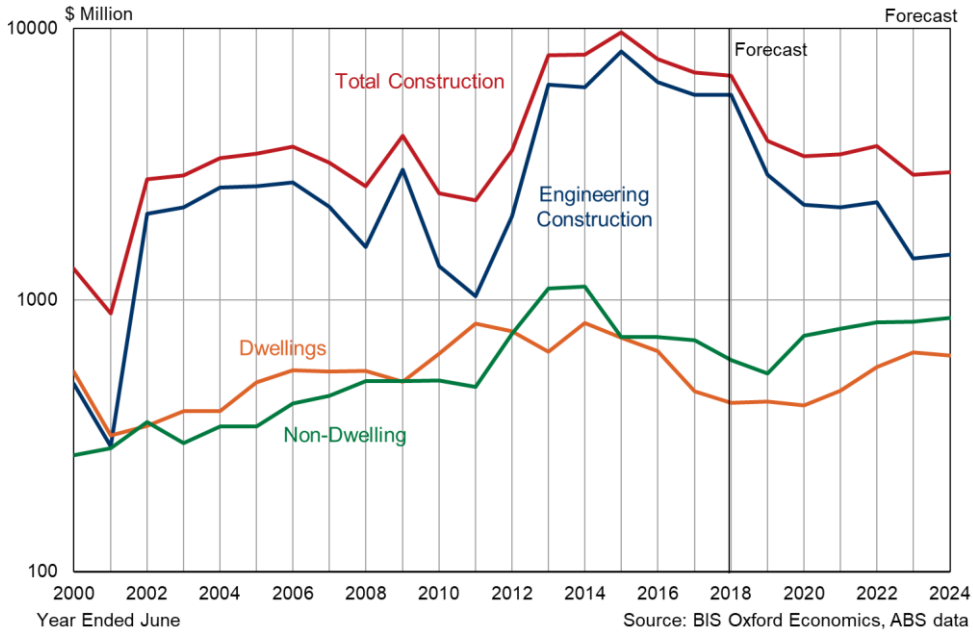


Figure 4.6 Construction Activity in the Northern Territory



APPENDIX 1: 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 Oxford Economics forecasts.

• Average Weekly Earnings (AWE) — represents average total gross earnings (before tax) of all employees (including full-time and part-time workers). They include weekly ordinary time earnings plus over-time payments.

• 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 Oxford Economics 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.

APPENDIX 2: 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 3: CURRICULUM VIRTUES OF 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 Oxford 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.

Sarah Hunter – Head of Australian Macroeconomics

Sarah runs the Economics unit within BIS Oxford Economics and is responsible for delivery of the Australia Macro Service, which provides extensive coverage of the outlook for Australia's economy at the national, industry and state level. She also has extensive experience producing bespoke analysis for clients, including developing commodity price forecast models and assessing the outlook for wages and household incomes. Sarah holds an undergraduate degree from the University of Cambridge, an MSc from the London School of Economics and a DPhil from the University of Oxford, all in Economics.

Josh Blick – Economic Analyst

Josh works across the Economics and Transaction & Infrastructure units on both subscription services and consulting engagements. Josh studied both a

Bachelor of Economics and a Bachelor of Civil Engineering with First-class honours at the University of Sydney. During his studies, he gained over 4 years of experience as a civil engineer within Transport for NSW. After finishing university, he worked as a consultant in infrastructure advisory before joining BIS Oxford Economics in 2018.

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