Appendix 2.3

Labour cost escalation forecasts to 2025/26

BIS Oxford Economics

Access arrangement information

ACT and Queanbeyan-Palerang gas network 2021–26

Submission to the Australian Energy Regulator

June 2020

evoenergy

BIS OXFORD ECONOMICS

LABOUR COST ESCALATION FORECASTS TO 2025/26

PREPARED BY BIS OXFORD ECONOMICS FOR EVOENERGY

FINAL - MARCH 2020

BIS Oxford Economics

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March 2019

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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+1.2%

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REAL COST ESCALATION FORECASTS TO FY26

In August 2019, BIS Oxford Economics was engaged by Evoenergy to provide updated price forecasts of labour costs that are relevant to the Australian Capital Territory gas distribution industry for the period 2019/20 to 2025/26 (FY20 to FY26). Forecasts for wage escalation will be used by Evoenergy 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 real 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 1.3% per annum over the five years to FY26, 0.3% higher than the national 'All Industries' average over the same five-year period. Over the same 5-year period to 2026, the ACT EGWWS WPI is forecast to average 1.2% p.a., 0.3% higher than the ACT all industries WPI average of 0.9% p.a. (all in real terms).

National and ACT utilities wages are forecast to increase by more than the national and state all industries averages 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 65% 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 (38%), 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 the current weak pace as the labour market tightens and labour productivity growth builds towards the middle of the decade.

- Demand for skilled labour has picked up markedly over FY18 to FY20 due to high levels of utilities investment. With utilities investment levels expected to remain elevated over the medium term, this will also be a key driver of wages going forward.

- Demand for skilled labour will also increase markedly over the next four years, due to a significant increase in mining investment from recent lows and from increases in non-residential building and civil engineering construction, the latter as a large program of transport infrastructure projects ramp up. The mining and construction sectors are competitors for similar skilled workers, and with skilled labour shortages already starting to be reported, we expect wages in the mining and construction sectors to accelerate from here, particularly over FY23 and FY24. This will force companies in the utilities sector to push up wages to 'meet the market', in order to attract and retain skilled workers.

• The overall national average tends to be dragged down by the lower wage and lower skilled sectors such as 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, such as is now occurring in the wake of the COVID-19 impacts. The EGWWS sector is not impacted in the same way due to its obligation to provide essential services and thus retain skilled labour.

The ABS does not provide WPI data for the Utilities sector in the ACT, providing state utilities data only for NSW, Victoria and Queensland (the latter since early 2019 only). These two states collectively account for 73% of total Australian utilities employment, with the ACT accounting for less than 2%. Historical data and forecasts of WPI for the EGWWS sector in the ACT 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 the ACT compared to the national average for the utilities sector.

Wages in the ACT utilities sector are expected to grow in line with the national utilities sector average over the next two years. However, over the following five years to FY26, wage increases are expected to be slightly lower than the national average – due to relative weaker growth in construction activity in the ACT over the next 7 years, compared to the national average. Nevertheless, ACT utilities wages will still need to keep pace with increases in utilities and construction wages in other states (especially NSW and Victoria) in order to attract and retain staff. In addition, BIS Oxford Economics analysis of utilities-related civil engineering construction in the ACT forecasts solid growth over the next 7 years, with the increased labour demand underpinning this increased investment also expected to push up utilities wages in the ACT.

Overall, we are forecasting EGWWS WPI growth in the ACT to average 3.4% (in nominal terms) over the five years to FY26 inclusive (i.e. Evoenergy's next regulatory period) – just below the Australian average of 3.5%. for the ACT, this equates to 1.2% in real (inflation adjusted) terms (see Summary table 1).

The 'all industries' WPI for ACT is used to escalate Evoenergy's general labour (i.e. non-network and non-external professional labour) costs. Growth in total or 'all industries' wages at the state level usually depends on the relative strength of the state economy and labour markets, compared to the national average.

Over the past five years, the ACT all industries state average WPI growth has been much weaker than the national average, averaging -0.3% lower than the national average. This is despite economic growth largely out-pacing growth in the national economy, in terms of state final demand (SFD) and Gross State Product (GSP), for most of the past five years; and despite the ACT having a lower unemployment rate than the national average.

Over the next seven years, we expect the ACT all industries WPI to continue track the movements in the Australian average, but with the relativities vis-à-vis the national average more in line with the growth differentials between the ACT and Australian economy. In FY19 the gap between the Australian total and ACT total widened slightly to -0.2%, from -0.1% over the previous two years.

Our economic forecasts in section 3.2 show that ACT SFD and GSP will outpace Australian domestic demand and GDP growth over FY20 and FY21, which will see ACT wages growth outperform the national average over these two years by 0.3% in each of these two years. Economic growth in the ACT then slips below the national average over FY22 to FY24, which leads to slower wages growth in the Territory over FY23 to FY26, but it is only 0.1% less than the national average over this latter period.

In the five years to FY26, we are forecasting the total state (all industries) WPI in the ACT to average 3.1% in nominal terms, slightly below the 3.2% national average. In real (inflation-adjusted) terms, the average annual increase is forecast to be 0.9% (see Summary Table below).

Table 1. Summary - Labour Costs Escalation Forecasts: ACT and Australia, Financial Years
(per cent change, year average, year ended June)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Average (h)
	Actuals				Forecasts		Next Regulatory Period					
NOMINAL WAGE CHANGES												
Australian Capital Territory Wages: All Industries												
Wage Price Index (a)	**1.7**	**1.8**	**2.0**	**2.1**	**2.5**	**2.5**	**2.7**	**3.1**	**3.3**	**3.3**	**3.1**	**3.1**
Australian Wages: All Industries (b)												
Wage Price Index (a)	2.1	2.0	2.1	2.3	2.2	2.2	2.7	3.2	3.4	3.4	3.2	3.2
Average Weekly Earnings (c)	1.7	1.6	2.3	2.7	2.8	3.0	3.3	3.6	3.7	3.7	3.4	3.5
Average Weekly Ordinary Time Earnings (d)	1.9	2.0	2.4	2.7	3.2	3.2	3.4	3.8	3.9	3.9	3.7	3.7
Electricity, Gas, Water and Waste Services Wages												
Australian Capital Territory - Wage Price Index (e)	**2.3**	**2.3**	**2.2**	**2.8**	**2.9**	**2.8**	**3.0**	**3.3**	**3.6**	**3.7**	**3.5**	**3.4**
Australia - Wage Price Index (a,b)	2.4	2.2	2.0	2.8	2.9	2.8	3.1	3.5	3.8	3.8	3.6	3.5
Consumer Price Index (headline) (f)	1.4	1.7	1.9	1.6	1.8	1.7	2.0	2.3	2.3	2.3	2.3	2.2
REAL WAGE CHANGES (g)												
Australian Capital Territory Wages: All Industries												
Wage Price Index (a)	**0.4**	**0.1**	**0.0**	**0.4**	**0.7**	**0.7**	**0.7**	**0.8**	**1.1**	**1.1**	**0.9**	**0.9**
Australian Wages: All Industries (b)												
Wage Price Index (a)	0.7	0.2	0.1	0.7	0.4	0.5	0.7	0.9	1.1	1.1	0.9	1.0
Average Weekly Earnings (c)	0.3	-0.1	0.4	1.0	1.0	1.2	1.3	1.4	1.4	1.4	1.1	1.3
Average Weekly Ordinary Time Earnings (d)	0.5	0.3	0.5	1.0	1.4	1.4	1.4	1.5	1.6	1.6	1.4	1.5
Electricity, Gas, Water and Waste Services Wages												
Australian Capital Territory - Wage Price Index (e)	**0.9**	**0.6**	**0.3**	**1.2**	**1.0**	**1.1**	**1.0**	**1.0**	**1.3**	**1.4**	**1.2**	**1.2**
Australia - Wage Price Index (a,b)	1.0	0.5	0.0	1.1	1.0	1.1	1.1	1.2	1.5	1.5	1.3	1.3

Source: ABS, RBA, BIS Oxford Economics

(a) Wage price index. Ordinary time hourly rates of pay excluding bonuses.
(b) Australian wages provided for comparison.
(c) Average Weekly Total Earnings for adult persons. It is the sum of full-time and part-time employee earnings including overtime earnings. However, it excludes bonus payments. It is derived by dividing weekly total earnings by number of employees.
(d) Average Weekly Ordinary Time Earnings for full-time adult persons. That is, it excludes over-time earnings. Nevertheless, bonuses are included.
(c) Wage price index. Ordinary time hourly rates of pay excluding bonuses.
(d) Australian wages provided for comparison.

(e) Wage price index for ACT. Historical data are estimates.
(f) Inflation forecasts are RBA forecasts for the next 2 years from latest 'Statement of Monetary Policy'. Beyond that, inflation forecasts are based on mid-point of RBA inflation target, but overall forecasts are calculated as a geometric mean of the 'official' RBA inflation forecasts over the next 10 years. This methodology has

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

(h) Average for the next revenue determination period i.e. from 2021/22 to 2025/26 inclusive.

2. INTRODUCTION

In August 2019, BIS Oxford Economics was engaged by Evoenergy to provide a report on expected real labour escalators relevant to their gas networks business in the Australian Capital Territory from 2019/20 to 2025/26 (FY20 to FY26). Forecasts of wages will be used by Evoenergy to estimate their real price growth in order to develop their operating and capital expenditure forecasts. This, in turn, will be included in Evoenergy's next regulatory proposal to be submitted to the Australian Energy Regulator (AER) by June 2020. Although Evoenergy's next revenue proposal covers the five-year period from 2021/22 to 2025/26 (inclusive), BIS Oxford Economics has provided seven-year forecasts covering financial years 2019/20 to 2025/26 to allow for escalation over the full outlook period. Forecasts of both nominal and real cost growth are provided. The wage forecasts in this updated report were finalised on 19th March 2020.

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 early-mid March 2020 and includes the December quarter 2019 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: 2020 – 2034, Engineering Construction in Australia 2020-2034* and *Building in Australia 2020-2034*, 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 presented in a summary table.

Section 2 provides a macroeconomic outlook for Australia and the ACT. 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, which has a material influence on wages.

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 and 4 are in nominal terms unless specifically stated that the data/forecasts are in real terms.

Sections 4 provides the forecasts and rationale of the wage projections for the Electricity, Gas, Water and Waste Services (EGWSS) sector for both Australia and the ACT, as measured by the Wage Price Index (WPI).

Appendices include an explanation of different wage measures and wage models, plus CV's of key personnel.

3. MACROECONOMIC OUTLOOK

3.1 AUSTRALIAN MACROECONOMIC OUTLOOK

The Australian economy has experienced 27 years of uninterrupted growth since the FY91 recession. Population growth is among the highest of the developed economies, which has helped underpin household consumption and demand for dwelling and infrastructure construction. Government debt is comparatively low by global standards, with the national (Commonwealth) government and the larger state economies of New South Wales and Victoria maintaining AAA credit ratings. Overall, economic risks are low and the Australian economy is situated in the fast growing Asia Pacific region.

Activity restrictions expected to cause a recession

Momentum in domestic demand was subdued over 2019. GDP growth over the year was steady at 1.8%, with strength in net exports and public demand working to offset weakness in household consumption and the downturn in dwelling investment. Business investment was also subdued. Conditions had been expected to gradually improve, but the COVID-19 outbreak and associated policy responses to limit its spread have caused a drastic re-evaluation of the outlook.

Coronavirus pandemic has created major global socioeconomic disruptions & uncertainty

COVID-19, the disease caused by SARS-CoV-2, was first identified in Wuhan (China) in December 2019 and was recognized as an international pandemic by the World Health Organisation on 11 March 2020. The pandemic has led to major global socioeconomic disruptions, including national lockdowns, and has driven governments and central banks to rollout major stimulus packages. The unprecedented nature of both the pandemic and the response, and the speed at which governments and individuals are reacting, create a higher than normal level of uncertainty to the forecasts in this report.

Deep Recession in 2020

The economic impacts of the COVID-19 outbreak and the required mitigation strategies have increased dramatically over the past month (March-early April). The implementation of stricter social distancing measures has led to the partial or complete shutdown of some sectors, which will sharply curtail activity in 2020. We expect the prevailing lockdown conditions will remain in place through most of Q2 (June quarter). But there is significant uncertainty around this assumption, and lockdowns may be extended. Moreover, when restrictions are eventually relaxed, it will be done gradually to ensure community safety, which will slow the speed of the recovery. We are assuming a gradual relaxation of assumptions through Q3, with most of the restrictions lifted by Q4, 2020. A further key assumption is a successful vaccine to COVID-19 is likely to be widely available around Q2 in 2021 – based on recent reports which suggests a development timeline of 12-18months - and this will allow the lifting of restrictions and aid the normalisation of travel and trade.

While the government have announced substantial support to help firms stay in business and maintain employment, softening the blow for those affected, there will still be a massive dislocation of labour in H1 2020, concentrated in casual employees and consumer-facing service sectors. Assuming most of these workers remain in the labour force, the effective unemployment rate is likely to climb well into double figures, which will weigh heavily on household consumption. The sharp reduction in household consumption and service exports will have flow-on effects on business investment.

The outlook for the economy will largely be determined by the scale and duration of industry shutdowns, and it is too early to know definitively how long the disruption will last, and whether containment measures need to be ramped up further. But at the very least, it's almost-certain that the Australian economy will tip into a deep recession in the first half of 2020.

We expect a relatively sharp recovery to take place from the end of 2020 and into 2021, but there is heightened uncertainty around this outlook as it will be determined by government decisions on community welfare around the resumption of business activity. Australian GDP is expected to decline -2.5% in FY20 and a further -1.3% in FY21, with the calendar year measure seeing a larger decline of over -7% in 2020.

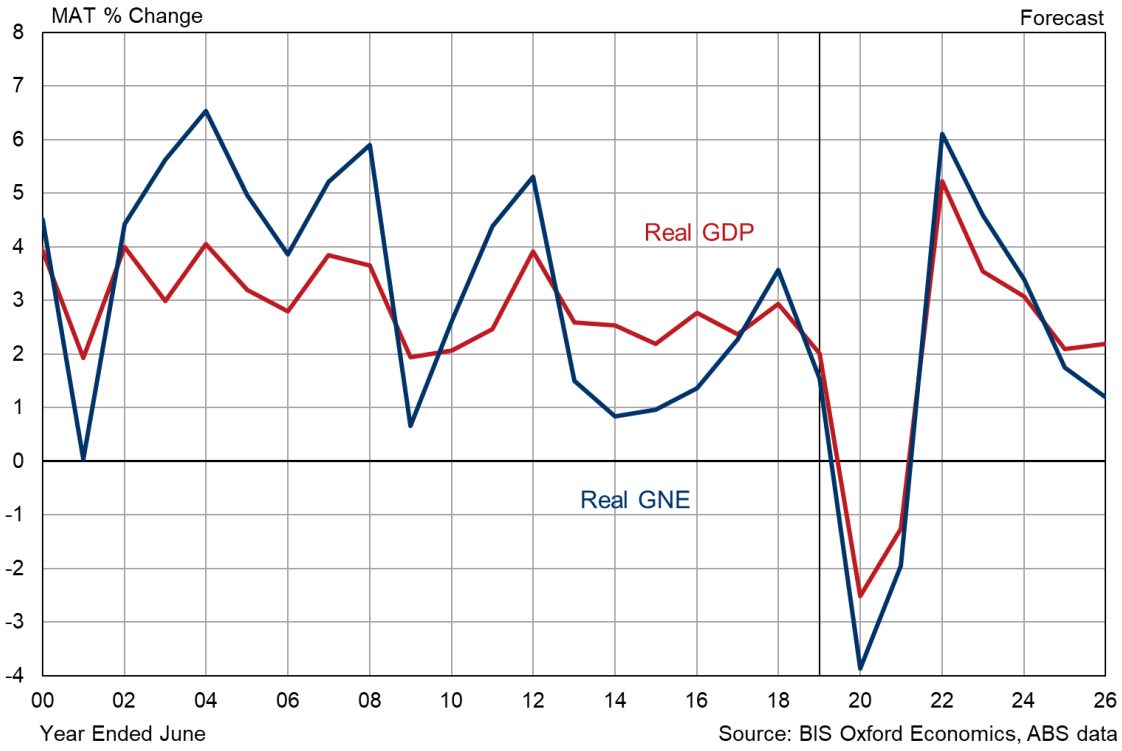
Discretionary consumption expenditure set to plummet

Household spending will be one of the primary channels through which GDP is affected. Some components of retail spending have seen increases – most notably sales at supermarkets. But this spending has either come at the expense of other retail categories (such as cafes, restaurants & take away food), or represents a pull forward of future spending as cautious households stock up on groceries. The largest hit to consumption will be to discretionary goods and services purchases. Many discretionary services, such as travel and other recreation activities are simply no longer available to consumers. Moreover, in such an uncertain environment, discretionary goods purchases are likely to be deferred; for instance, vehicle sales fell sharply in March. Household consumption is now expected to contract sharply in 2020 (by -15%) before recovering over 2021, but for FY20 we are forecasting a 6% contraction and a -3.1% decline in FY21 (in year-average terms).

Government and RBA policies will support household income and employment

The Federal and state governments have announced a number of stimulus packages, that are collectively valued at around 11% of GDP. The first two packages were aimed at shoring up business investment and cash flow and supporting displaced workers. For households, a range of additional payments for those already receiving government benefits have been announced to assist cash flow. The first stimulus package included a one-off $750 payment to pensioners, newstart recipients, family tax beneficiaries and other social security recipients.

Figure 3.1 Australia – Basic Economic Indicators



As the growing scale of the pandemic became obvious, these measures were bolstered in a second package. An additional $750 payment will be given to a slightly narrower set of recipients, while a range of social security payments will be increased by $550 a fortnight for a six-month period. Around 1.3 million Australians are currently eligible for this increased payment. However, with at least 1 million (and likely more) Australians expected to join the ranks of the unemployed through the crisis, this scheme will broaden out markedly. Older Australians have been offered additional support, including a reduction in deeming rates for pensioners – making more people eligible for support. Those in financial stress can also access up to $10,000 of their superannuation tax-free for the next two years.

The most substantial measure is the Federal JobKeeper program (the third package), which is expected to provide support payments to employers for up to 6 million workers (45% of total employment). This program will provide wage subsidies to firms for full- and part-time workers, as well as casual employees with a tenure greater than 12 months. Payments are roughly equal to minimum wage and must go to the employees in full. The program has been designed to support household income and keep workers and firms attached through the crisis, to enable a relatively rapid recovery in activity once restrictions can be lifted. Further, it will mitigate the expected increase in the unemployment rate. Workers that are stood down will not count as unemployed, but they will be severely impacted by the loss of income. This will prevent the unemployment rate from going even higher and take pressure off the social security system. Nevertheless, with many casual workers and temporary visa holders not currently covered we expect unemployment to jump by over 1 million, resulting

in an unemployment rate of 11.5% to 13.5% in Q2 2020 (depending on how many workers officially drop out of the workforce, i.e. how far the participation rate falls). So far, these packages present limited upside to public demand, although this could become the focus of future stimulus.

Monetary policy has also moved to provide support, but its effectiveness in dealing with the simultaneous supply and demand shocks is limited. The cash rate has been cut to its lower bound (0.25%), and the RBA has commenced asset purchases in an effort to target borrowing rates at a three-year horizon - government bond purchases have commenced, targeting a 3-year treasury bond yield of 0.25%. The aim is to lower risk-free rates along the yield curve, lowering corporate borrowing costs (which are closely related to the 3-year yield). Further, they have established relatively generous term funding for banks, with further incentives to extend this credit to businesses, in particular, small- and medium sized enterprises. The RBA's response to the crisis has focused on providing ample liquidity to the banking system, with the explicit aim of providing cheap credit to business.

Dwelling and business investment will suffer, upside for Public demand

The coronavirus disruption will stall the recovery in property prices. Buyer demand is expected to fall sharply, while vendors are likely to pull their properties from the market where they can. Sales that are taking place are likely to be due to budget constrained vendors; prices are expected to fall sharply in the near term. Turnover will also fall dramatically, which has implications for retail sales, transfer costs and state budget revenues. Residential construction is still expected to be a drag on growth in 2020, but the size of the headwind will be small relative to the other shocks faced by the economy. Some supply bottlenecks are emerging, which will stall the flow of completions in the near term.

Business investment will also take a large step down, with the uncertainty around the outlook and the strain placed on business revenue leading to the deferral or cancellation of capital expenditure. However, the mining sector is expected to remain relatively insulated from this shock, although there are expected to be deferrals of oil and LNG investments. The Federal government's stimulus packages have aimed to assist businesses with cash flow and have made borrowing conditions significantly cheaper. Moreover, business investment has been incentivised through increased asset deductions. These measures will aid the speed of the eventual recovery. However, investment will be a low priority for most firms in the near term, and we expect business investment will fall by 7% in FY20 and a further 8% in FY21.

The Federal government stimulus announcements to date have centred around transfers to businesses and households. There has been little change to the outlook for public demand, notwithstanding some increases in employment for the provision of public services. Future stimulus aimed at kickstarting the economy may present upside for public investment.

COVID-19 outbreak expected to plunge the world into a recession

The global economy was showing signs of stabilisation toward the end of 2019. But the coronavirus outbreak will see a number of advanced and emerging

economies plunged into recession. Most notably, the US is headed for recession in 2020 despite aggressive fiscal and monetary policy responses. Oxford Economics is forecasting a -4% contraction for the US economy in 2020. Similarly, in the Eurozone, restrictions on movement of citizens will see large falls in consumer spending, business investment and industrial activity, and severe recessions are expected in 2020 in most countries. Trade disruptions will also weigh on growth and considerable increases in unemployment rates are expected, which will weigh on the economic recovery over 2021 and 2022.

The Chinese economy is a little ahead of others in the process toward recovery. Industrial activity appears to be headed toward a resumption, although this process has been more protracted than expected. GDP growth is forecast to be close to zero in 2020, weighed down by lingering domestic weakness and softer global demand. Neighbouring Asian economies will also slow markedly due to industry shutdowns, with supply chain disruption further complicating the path toward recovery. Coupled with the ongoing global demand shock, a dispute between OPEC nations (most notably Saudi Arabia) and Russia over production limits has seen oil prices plunge. While this will aid the path to recovery for net oil importers, higher-cost producers elsewhere, such as the US, will be adversely affected. Overall, global GDP growth is forecast to contract by -2.8% in calendar 2020 (in US$ terms) – worse than the -1.1% in 2009 in the aftermath of the GFC. But a relatively sharp recovery is expected in 2021, as restrictions are eased. Dissemination of a successful vaccine to COVID-19 is likely sometime in 2021, and this will aid the normalisation of travel and trade and boost the global recovery.

Beyond the near-term disruptions, we expect global growth will return to its trend pace of around 3% by 2023. Australia's trading partner growth (weighted by export proportions) is forecast to grow at a faster pace over the next 7 years, due to the high weights of China, East Asia and India (all of which are expected to outpace the average pace of global growth) in Australia's export mix.

Net exports positive in the near term

Overall, net exports are expected to make a strong, positive contribution to GDP growth over the next two years, with import volumes expected to fall much more than export volumes. Commodity demand, although declining, is still expected to be reasonably firm, with the gradual normalisation of industrial activity in China putting a floor under commodity shipments. Rural exports will also bounce back over FY21 with the end of the drought in the eastern states boosting grain, other crops and dairy exports. Meanwhile, with Gross National Expenditure (i.e. domestic demand and stock changes) forecast to decline -3.9% and -1.9% in FY20 and FY21 respectively, merchandise imports will fall significantly. Imports only account for around 12% of food and beverages retailing - the strongest sector of consumer spending – while the import shares of discretionary consumer goods and business equipment spending range from 43% to over 80%, and these categories of domestic spending will fall the most, with a commensurate fall in imports.

Services trade will fall markedly, with tourism and education exports severely curtailed. Australian outbound travel will all but stop in Q2, weighing heavily on services imports. However, services exports will fare better than services

imports. Education exports were worth $37.6 billion in FY19, or almost 39% of overall services exports (compared to only $461m for outbound education import 'debits'). Although still impacted, education exports will suffer less and recover quicker than 'tourism' flows – partly because of online teaching and partly because many overseas students returned before travel restrictions. On the other hand, tourism exports (including 'business travel') were worth $25.3 bn in FY19 (26% of overall services exports), compared to $50.6 billion for outbound services 'imports' – which accounted for almost 50% of overall services imports. As such, the import side of services will suffer far more than the export side in the near-term. And even after travel restrictions are lifted, tourism flows are unlikely to recover back to their previous levels for a number of years, keeping services debits relatively weaker than services exports.

GDP to lift in FY22 and remain buoyant over FY23 and FY24.

Assuming trade and travel restrictions are lifted through FY21, with a 'return to normalisation' aided by the widespread dissemination of a vaccine by mid-2021, then we expect economic growth to bounce back in FY22, both in Australia and overseas. However, an early return to the previous path or levels previously expected (pre-coronavirus) is unlikely. Nevertheless, we expect household spending to bounce back strongly as pent-up demand is released and as employment growth recovers markedly. However, employment levels are not expected to return to the pre-coronavirus levels until early 2022, and this will restrain consumer spending somewhat. Housing and business investment are also forecast to lift over FY22 and FY23 as deferred investment is undertaken. However, some sectors, such as hotel construction and other tourism-related investment, will take longer to recover. Meanwhile, public investment is expected to strengthen as a large pipeline of transport infrastructure and social and institutional buildings projects come through, although government recurrent expenditure is expected to weaken sharply.

Overall, we are forecasting GNE to increase by 6.1% in FY22 and a further 4.6% in FY23, before easing to (a still healthy) 3.4% in FY24. GDP is forecast to rise 5.2% in FY22, with net exports detracting from growth as a sharp lift in imports outpaces the strong increase in exports. GDP is then forecast to increase 3.5% in FY23 and 3.1% in FY24. Over the five years to FY24, domestic demand growth is forecast to average 1.5% per annum, while GDP is forecast to average 1.6% p.a.

Inflation and interest rates to remain low over the next 3 years, before gradually rising

The sharp increase in unemployment coupled with many firms struggling to generate near-term cashflow will stall the nascent progress toward faster wage growth. Weakness in wage growth will put further downward pressure on headline inflation. Further, the sharp fall in oil prices and weaker consumer demand will also weigh on prices. Against this, supply disruptions and the very low level of the Australian dollar with provide some impetus to inflation. But overall, inflation will remain below the RBA's target range for some time - our forecast for headline CPI inflation is 1.5% in FY20 and 0.9% in FY21.

A lack of inflation and continuing slack in the labour market is expected to keep the RBA on hold for a long time, with the cash rate forecast to remain at 0.25%

until mid-2023, before rising to 1.25% by late 2024 as wages and CPI inflation rise back toward historical averages, and the unemployment rate falls below 5%. Meanwhile, the 1% rise in the cash rate in Australia means the benchmark housing variable rate will rise to 5.1% by late 2024, which will be enough to slow consumer spending and impact housing and business investment over FY25 and FY26, with annual GDP growth easing to around 2.2% over those years

Table 3.1 Australia – Key Economic Indicators, Financial Years

Year Ended June					Forecasts						
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Total New Private Investment (+)	**-5.3**	**-1.8**	**3.6**	**-1.9**	**-8.2**	**-7.2**	**14.7**	**10.2**	**5.3**	**-1.8**	**-2.5**
New Public Investment (+)	**8.1**	**8.5**	**11.5**	**3.1**	**1.0**	**2.7**	**7.5**	**5.7**	**2.3**	**-1.0**	**-1.1**
Gross National Expenditure (GNE)	**1.4**	**2.3**	**3.6**	**1.5**	**-3.9**	**-1.9**	**6.1**	**4.6**	**3.4**	**1.7**	**1.2**
GDP	**2.8**	**2.4**	**2.9**	**2.0**	**-2.5**	**-1.3**	**5.2**	**3.5**	**3.1**	**2.1**	**2.2**
Inflation and Wages											
CPI (Yr Avg) - RBA forecasts (*)	1.4	1.7	1.9	1.6	1.8	1.7	2.0	2.3	2.3	2.3	2.3
Wage Price Index (Jun on Jun)(**)	2.1	1.9	2.1	2.4	2.2	2.3	2.7	3.2	3.4	3.4	3.2
Wage Price Index (Yr Avg)(**)	2.1	2.0	2.1	2.3	2.2	2.2	2.7	3.2	3.4	3.4	3.2
Average Weekly Earnings (Yr Avg)(^)	1.9	2.0	2.4	2.7	3.2	3.1	3.4	3.8	3.9	3.9	3.7
Employment											
– Employment Growth (Yr Avg)	2.3	1.5	3.0	2.4	-0.7	-3.1	5.8	3.4	2.8	1.8	1.0
– Employment Growth (May on May) (%)	1.9	2.1	2.6	2.8	-8.6	7.0	4.4	3.1	2.6	1.2	1.2
– Unemployment Rate (May) (%)	5.7	5.5	5.4	5.2	12.5	8.6	6.7	5.7	4.8	5.3	5.5
Labour Productivity Growth											
– Total	0.5	0.8	-0.1	-0.4	-1.8	2.0	-0.5	0.1	0.3	0.3	1.2
– Non-farm	0.7	0.7	0.0	-0.1	-1.8	1.7	-0.5	0.1	0.4	0.2	1.1

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 2021 quarter. Beyond this, we've used the arithmetic mean of near term forecasts and then 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

3.2 ACT ECONOMIC OUTLOOK

The Australian Capital Territory economy has experienced strong growth over the past 4 years, with Gross State Product (GSP) averaging 3.5% per annum and State Final Demand (SFD) averaging 2.5% p.a. The key driver of growth has been the reversal of the Commonwealth government's earlier austerity drive. In addition, output (i.e. GSP) has also been helped by an apparent increase in the Territory's 'self-sufficiency', as evidenced by declines in net interstate imports of goods and services. By both measures of economic growth (SFD and GSP), the ACT has outperformed against the national average over the past four years. SFD growth remained solid in the first half of FY20, with an increase of 2.4% in the 6 months to December 2019 compared to the same six-month period in 2018. Employment growth has bounced back over FY20 after being flat in FY19 (-0.1%), with annual growth averaging 3.2% over the 8-month period to February 2020. This saw the Territory's

unemployment rate tumble to 2.9% in February (trend measure), the lowest of all the states and territories. This compares with 5.1% Australia-wide in February (the month before coronavirus impacts started hitting).

The ACT economy is expected to display its usual counter-cyclical behaviour over the next 5 years. Indeed, the Territory will fare the best of all the states over FY20 and FY21. The key reason is the dominance of government spending in the Territory and the expectation that public demand will remain buoyant during the COVI-19 crisis, with SFD only expected to decline -0.4% in FY20 and actually increase by a small 0.3% in FY21. Meanwhile, GSP is forecast to remain positive over both FY20 (+0.6%) and FY21 (+1.0%), compared to contractions for Australia. This is due to positive contributions to GSP growth from lower net interstate and net international imports. Although the ACT's international services exports decline (mostly education and tourism), this is more than offset by the larger decline in international services imports due to the virtual cessation of travel.

Government expenditure dominates the economy of the ACT, unlike the other states (except the Northern Territory). In FY19, government recurrent spending and public investment constituted 51% of State Final Demand (SFD) – compared to the more usual figure of around 22% for other states. Many other sectors are indirectly tied to the public sector, such as professional services, which has seen large increases in both GVA and employment over recent years, although this may be been linked to the NDIS rollout.

Government consumption expenditure (GCE) is forecast to rise 4.4% and 6% respectively in FY20 and FY21, as the Commonwealth and (to a lesser degree) the ACT government ramp up expenditure on employees to administer stimulus programs and cater for increased national unemployment due to COVI-19. The rise in GCE is expected to offset the sharp declines in private (household) consumption expenditure (PCE) over FY20 and FY21 – PCE only accounts for 38% of SFD, compared to almost 45% for GCE in the Territory. Conversely, the rebound in PCE over FY22 and FY23 is expected to largely offset the forecast declines in GCE over those two years, as governments reverse the COVID-19 measures.

Investment declines over FY20 and FY21 will also contribute to the weakness of SFD over the next two years, although stronger investment will contribute to higher economic and growth over the subsequent 3 years. Very strong growth in dwelling building in FY19 has seen the residential market move into oversupply recently and this, combined with some COVID-19 impacts, will see a decline in dwelling investment over FY20 and FY21, before a moderate recovery ensues from FY22. Business investment was showing strong growth over the December half of FY20, but is now expected to decline in the June half of FY20 and then fall sharply (-15%) in FY21. However, with the ACT economy expected to hold up relatively well through the next 18 months, business investment is expected to show strong growth over FY22 to FY25 – and average over 10% p.a. – largely driven by non-dwelling building and equipment purchases.

New public investment lifted strongly (by 1%) in FY17 and a further 6% in FY18, due to a strong increase in public non-dwelling building led by higher schools and university building activity, the $110 million University of Canberra

Hospital and the $100 million ACT Supreme Court redevelopment. Public engineering construction also lifted over these 2 years due to the NBN roll-out, water and sewerage projects and $700 million Canberra Light Rail project (stage 1). With these projects finishing and road construction falling, public engineering construction plummeted in FY19 (-11%) and further declines are expected in FY20 and FY21. Another round of public non-dwelling building projects, increased road construction and the second stage of the Light Rail project will then see public investment bounce back from FY22 to FY25.

While the ACT economy is expected to recover over FY22 to FY24, the scale of the recovery will be much more subdued than other states (and the national average). This is because, firstly, the ACT economy doesn't experience a steep downturn over FY20 and FY21, and secondly, because the key government recurrent expenditure component declines in FY22 and FY23 and only shows weak growth in FY24. Nevertheless, both SFD and GSP are still expected to average solid 2.7% annual increases over these three years.

Table 3.2 Australian Capital Territory – Key Economic Indicators, Financial years

					Forecast						
Year Ended June	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Australian Capital Territory											
Total Construction Activity(*)	1.3	17.4	5.0	3.7	-14.3	-9.0	12.0	5.9	5.7	-1.1	-9.2
State Final Demand	1.5	3.1	2.6	2.9	-0.4	0.3	2.4	2.5	3.1	3.2	2.2
Gross State Product (GSP)(**)	**3.9**	**3.3**	**3.7**	**3.0**	**0.6**	**1.0**	**2.6**	**2.2**	**3.3**	**3.2**	**2.5**
Employment Growth (Year Average)	1.5	2.8	3.4	-0.2	1.9	1.7	0.8	1.2	2.2	2.3	1.7
Australia											
Total Construction Activity(*)	-5.0	-3.2	12.0	-9.0	-9.1	-2.4	17.0	8.7	2.9	-3.0	-3.5
Australian Domestic Demand	1.4	2.2	3.5	1.7	-3.8	-2.0	5.8	4.6	3.5	1.8	1.2
Gross Domestic Product (GDP)	2.8	2.4	2.9	2.0	-2.5	-1.3	5.2	3.5	3.1	2.1	2.2
Employment Growth (Year Average)	2.3	1.5	3.0	2.4	-0.7	-3.1	5.8	3.4	2.8	1.8	1.0

Source: BIS Oxford Economics and ABS

* Total construction work done in constant 2016/17 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.

** FY2019 values are estimates

In FY25 and FY26, SFD, GSP and employment are expected to out-pace the relevant Australian averages over FY25 and FY26, with SFD and GSP forecast to both increase by 3.2% in FY25, defying the national slowdown, before ACT economic growth eases in FY26. Still healthy business and public investment boosts growth in FY25, but we expect stronger growth in GCE - in response to slower national growth – to bolster overall economic growth in the Territory in those two years. Overall, over the five years to FY26, SFD and GSP are forecast to average 2.7% and 2.8% p.a. respectively.

4. WAGES AND INFLATION OUTLOOK

4.1 CPI OUTLOOK

Limited inflationary pressures in recent years

Consumer price inflation has been subdued for the past five years, with annual (through-the-year) headline CPI inflation ranging between 1.0% and 2.1%; averaging 1.7%. Meanwhile, underlying inflation fell below the Reserve Bank's target 2-3% band in March 2016 and has stayed there.

Over the past year, the CPI rose from a low of 1.3% in the March quarter 2019 to 1.8% in the December quarter 2019. The rise was underpinned by the rise in 'tradeables' inflation, which increased from 0.4% in the March quarter to 1.7% in the December quarter, driven mainly by relatively strong increases in food – due mainly to drought and high global meat prices – and by the depreciation of the A$ over the past 2 years pushing up the prices of imports and overseas holidays and travel. The A$ has declined from US78 cents in December 2017 (US72cents in December 2018) to US68 cents in the December quarter 2019.

Meanwhile, non-tradeables inflation – which now constitutes almost two-thirds of the CPI – rose from 1.8% to 2.0% in the December 2019 quarter. Driving non-tradeables inflation in 2019 were rises in cigarettes and tobacco (due to hikes in excise taxes), child care, health services, education, hairdressing, motor vehicle repairs and servicing and housing-related costs such as property rates and charges, repairs and maintenance and water and sewerage charges. However, over the past year, non-tradeables inflation has been contained by lower-than-usual rises in insurance services and electricity prices, while dismal wages growth (which has kept down unit labour costs) has helped limit cost-push inflationary pressures. Non-tradeables inflation has also been subdued over recent years by low increases in residential property rents (which constitute 7% of the CPI basket), with year-ended rent inflation in the Consumer Price Index in December 2019 only 0.2%, the lowest since 1994. Rental price growth is likely to stay low over short-to-medium term, until currently oversupplied markets become more balanced. Meanwhile, costs related to 'new dwelling purchases by owner occupiers' (which constitutes 7.9% of the CPI basket) were neglible over the past year.

Recession to mute price and wage inflation over next 2 years

The recent upward momentum in price and wage inflation is expected to be reversed by the current economic slump. The sharp increase in unemployment coupled with many firms struggling to generate near-term cashflow will stall the nascent progress toward faster wage growth. Weakness in wage growth will put further downward pressure on headline inflation. Further, the sharp fall in global oil prices and weaker consumer demand will also weigh on prices. The declines in fuel prices expected in the March and June quarters 2020 will collectively slice around 0.9% off the headline rate. This will see the headline CPI record a negative in the June quarter, with the annual rate falling to 0.5%.

Against this, supply disruptions and the further sharp fall in the Australian dollar with provide some impetus to inflation. Also putting upward pressure on the

headline rate will be further planned increases in tobacco excise duty. 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.

The drought, higher food import prices (from the lower $A) and strong demand at supermarkets are also expected to push up food prices over the near term, 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). 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 1.2% p.a.), due to intense competition between the major supermarkets and falling or weak global agricultural prices. 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.

But overall, inflation will remain below the RBA's target range for some time - our forecast for headline CPI inflation is 1.5% in FY20 and 0.9% in FY21. Meanwhile, underlying (or core) inflation – which excludes the extreme price movements, such as the 'usual' petrol price volatility - is expected to move lower in the near-term, averaging 1.4% in FY20 and 1.1% in FY21.

Underlying and headline CPI inflation are subsequently expected to gradually pick up over FY22 to FY24 as economic growth increases, profits, employment and wage growth strengthen, the unemployment rate declines and inflationary pressures re-build. Wages growth will accelerate as the unemployment rate declines back toward and below 6%, which is expected to occur in 2023, with the rate expected to push below 5% in 2024. The recovery in the global economy will also see global inflationary pressures rebuild and manufacturing costs and prices increase over the medium term. The rise in the A$ toward US77 cents in FY25 will provide some offsetting pressures between FY22 and FY24, but fuel prices will add to the CPI. Global oil prices are projected to increase over the next 5 years, with Brent crude oil price forecast to gradually rise from US$26/barrel in the (current) June quarter 2020 to US$70/brl by early 2024 (note that this price is still lower than the recent high of over US$75/brl in September quarter 2018). Although the gradual rise in the A$ back toward US$0.76 over the same period will partially mute some of the increase in local fuel prices, the near trebling of oil prices will add to the CPI over the next few years, particularly in FY22 and FY23.

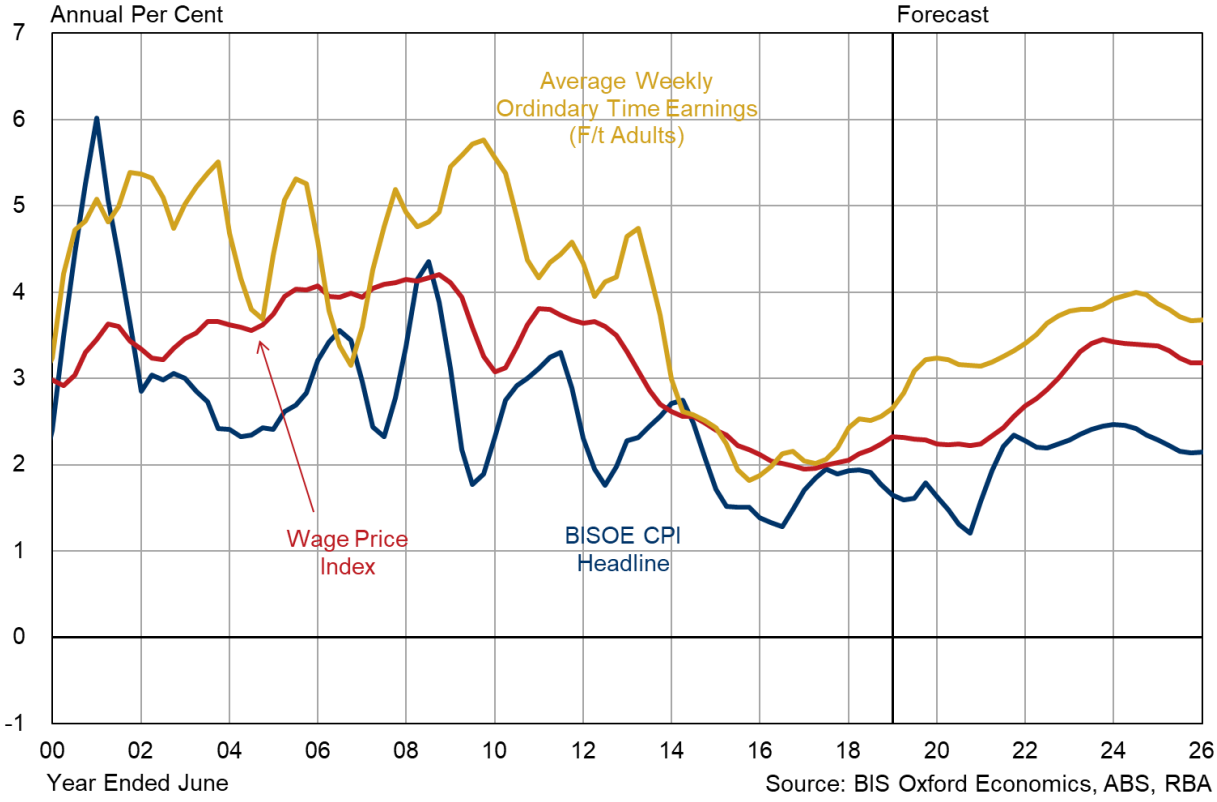
Overall, underlying inflation is forecast to rise to 1.8% in FY22, 2.1% in FY23 and 2.4% in FY24. Headline CPI inflation is forecast to increase a bit faster largely due to fuel prices and average 2.2% over FY22 and FY23 and then rise to 2.5% in FY24. The expected softening in the economy around mid-decade will see price and wage pressures weaken back toward 2%, before again rising to 2.5% over the latter years of the 2020s.

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% per annum contributing roughly 2% to headline inflation. The main driver of this is the projected acceleration in wage growth.

Figure 4.1 Australia: Wages and Prices



4.1.1 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 February 2020 'Statement on Monetary Policy' forecast the headline CPI rate at "1¾ per cent" in the June quarter 2020 – giving an average of 1.8% for FY20. The RBA then forecasts headline CPI to ease to 1.75% in December 2020 and remain at 1.75% in the June 2021 quarter (giving a year average of 1.75% for FY21), before rising to 2% in the December quarter 2021 and remaining at 2% in June 2022, giving a year average CPI rate of 2.0% for FY22.

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 – to give an

average of 2.3% for FY23 to FY26. 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.
Whole Economy Wage Outlook

4.1.2 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.

Low wages growth over recent years

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.

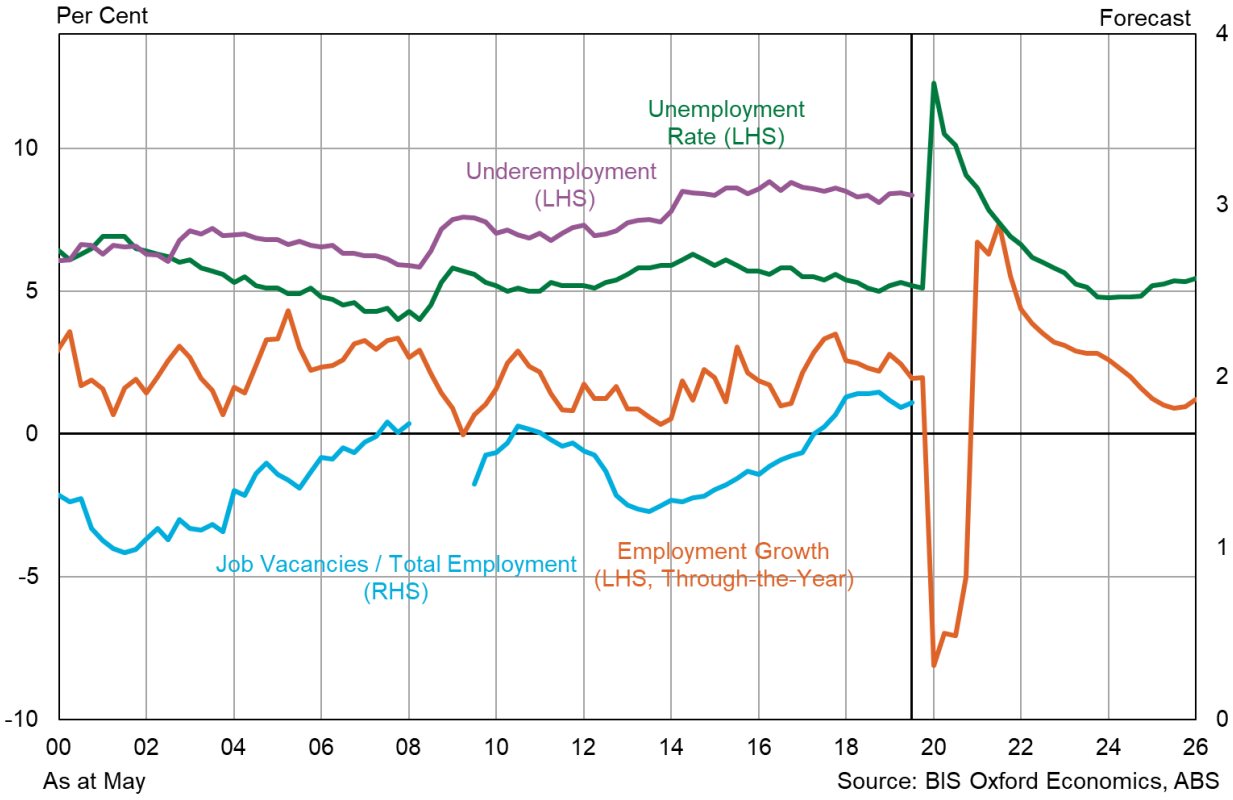
The unemployment rate and underemployment rate are key indicators of the amount of slack in the labour market. The unemployment rate has been just above 5% recently. Historically this rate was seen as close to the NAIRU, (the Non-Accelerating Inflationary Rate of Unemployment or the `natural rate of 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 remains at historic highs – averaging 8.5% over the past year to February 2020. 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.

Wages growth to stall over next 2 years

Wages growth in terms of the wage price index (WPI) and average weekly earnings measures had been showing signs of improvement over the past 2 ½ years, although the improvement in WPI appeared to have stalled in the second half of calendar 2019 at 2.2% in terms of annual increases. These increases may have been helped by higher increases in the minimum wage decisions and collective bargaining outcomes over the past 3 years, with increases in the dominant 'individual arrangements' segment also improving.

However, the impact of COVID-19 pandemic is now expected to see employment plummet and dramatically lift the unemployment rate. This will stall and probably reverse the nascent improvement in wages that had been building.

Figure 4.2 Employment and Unemployment



With the serious impacts from the coronavirus not really becoming apparent until late March, it is likely that the momentum in wage rises in the second half of 2019 will carry into the March quarter 2020. However, we expect that the COVID-19 impacts and employers' reactions to the weakening economy will become apparent over the June quarter and particularly the September and following 2 quarters of FY21. Widespread wage freezes will see WPI growth weaken over FY21. AWE (average weekly earnings, including part-time and full-time workers) and AWOTE (average weekly ordinary time earnings – for full time adults) are also likely to show weaker growth, but compositional effects in these measures may mask the true picture. The National Accounts average earnings measure is more likely to reflect the actual fall in overall wage incomes and take-home pay, as this will take account the lower hours worked.

Some upside is expected to come from an increase in the National Minimum Wage (NMW), which will be awarded by the Fair Work Commission at its Annual Wage Review in June 2020 – to be effective 1st July 2020. Given the current circumstances, we predict that the FWC will award a 1.9% increase – down from the 3.1% to 3.5% increases of the past 3 years, but which the FWC may deem prudent to provide the poorer paid workers with an adequate wage.

With a strong rebound in the economy forecast for FY22 – with GDP to increase 5.2% and employment to rebound 5.8%, with the unemployment rate falling back below 7% (see section 3) – we expect wage growth to resume and pick up sharply as deferred pay rises are given. As the economy and labour market continue to improve over FY23 to FY25, we expect that increases in

profits, combined with rising price inflation and declines in unemployment, will push up wages. Wage growth is predicted to accelerate from FY23, as tighter conditions in the labour market feed through, particularly when the unemployment rate falls below 5% in 2024. The WPI is projected to increase 3.2% in FY23 and peak at 3.4% in both FY24 and FY25, before subsequently easing as economic growth slows around the mid-2020s.

4.1.3 ACT 'All Industries' Wage Outlook

The 'all industries' WPI for ACT is used to escalate Evoenergy's general labour (i.e. non-network and non-external professional labour) costs. Growth in total or 'all industries' wages at the state level usually depends on the relative strength of the state economy and labour markets, compared to the national average.

Over the past five years, the ACT all industries state average WPI growth has been much weaker than the national average, averaging -0.3% lower than the national average. This is despite economic growth largely out-pacing growth in the national economy, in terms of state final demand (SFD) and Gross State Product (GSP), for most of the past five years; and despite the ACT having a lower unemployment rate than the national average.

Over the next seven years, we expect the ACT all industries WPI to continue track the movements in the Australian average, with the relativities vis-à-vis the national average more in line with the growth differentials between the ACT and Australian economy. In FY19 the gap between the Australian total and ACT total widened slightly to -0.2%, from -0.1% over the previous two years. Our economic forecasts in section 3.2 show that ACT SFD and GSP will outpace Australian domestic demand and GDP growth over FY20 and FY21, which will see ACT wages growth outperform the national average over these two years by 0.3% in each of these two years. Economic growth in the ACT then slips below the national average over FY22 to FY24, which leads to slower wages growth in the Territory over FY23 to FY26, but is only 0.1% less than the national average over this latter period.

In the five years to FY26, we are forecasting the total state (all industries) WPI in the ACT to average 3.1% in nominal terms, slightly below the 3.2% national average. In real (inflation-adjusted) terms, the average annual increase is forecast to be 0.9% (see Summary Table in the Executive Summary).

5. UTILITIES WAGES OUTLOOK

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

The WPI (wage price index) for the EGWWS (Electricity, Gas, Water & Waste Services or "Utilities") sector in the ACT is used as a proxy for all of Evoenergy's 'network' labour costs. Network labour costs includes all internal labour (i.e. all head office staff including professional and admin employees plus field employees) as well as any external labour hired to provide field services such as 'asset management' services. Businesses providing these field services are usually classified to the utilities sector. Hence, including their labour costs as part of Evoenergy's opex 'network' labour and escalating it with the WPI for the state utilities sector will be consistent with the AER's framework. That being said, some of Evoenergy's internal staff may be involved in project delivery such as replacement and/or augmentation capital projects. Their labour cost can be included in the capex calculations. If they are included in the capex, they should be excluded from the opex in order to avoid double counting of costs.

BISOE 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. The key motivations for this are:

(a) Greater data availability: the EGWWS WPI is available at the national level and for the key states (NSW, Victoria and Queensland), 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.

5.2 NATIONAL EGWWS WPI FORECASTS

The EGWWS wage price index growth has consistently been above the national (all industries) average since the index's inception in 1997 and averaged 0.6% higher over the past 17 years (see Table 5.2 and Fig 5.1). Since the collapse in wages growth following the end of the mining boom, the EGWWS WPI has continued to outpace the all industries average, increasing by an average of 2.6% over the past 6 years, 0.4% higher than the 2.2% national average. 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 5.2).

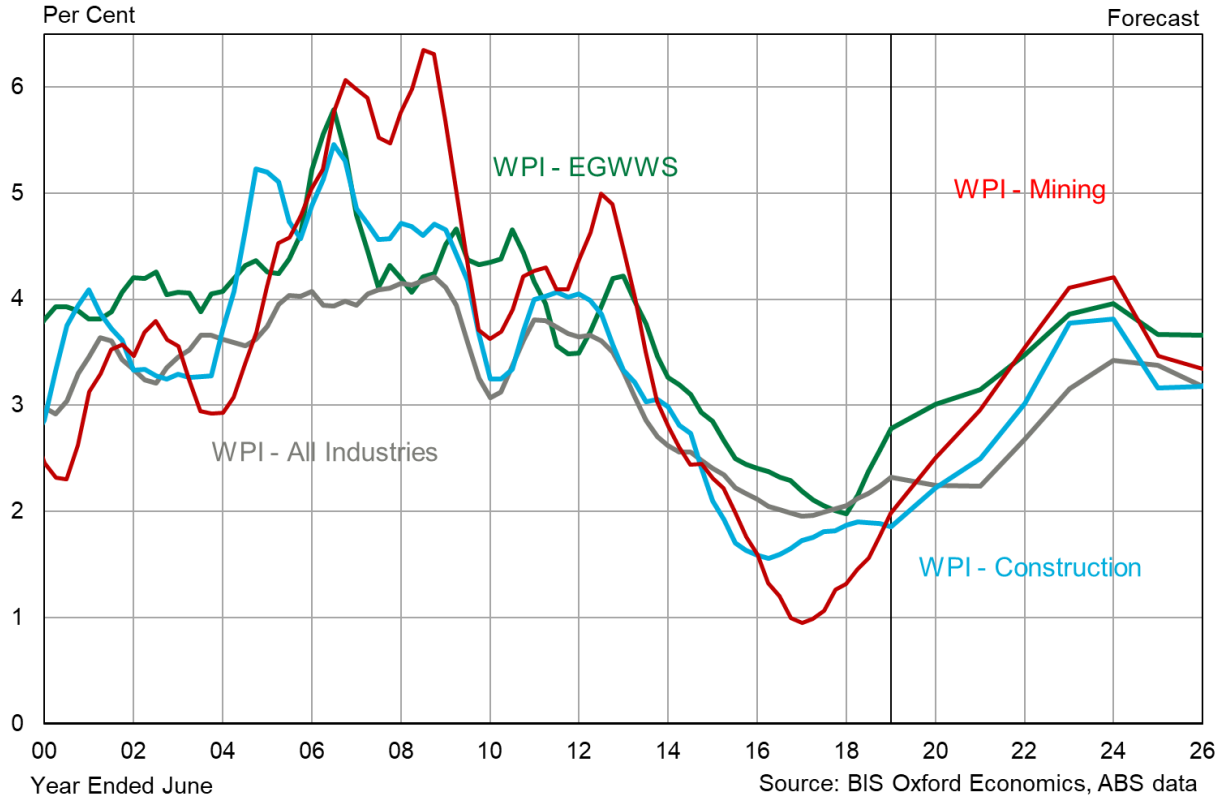
Wages growth in the EGWWS sector is invariably higher than the total Australian national (all industry) average.

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 (such as the current COVID-19 inspired downturn) 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 5.1 Wage Price Index - Australia All Industries, Electricity, Gas, Water and Waste Services, Mining and Construction



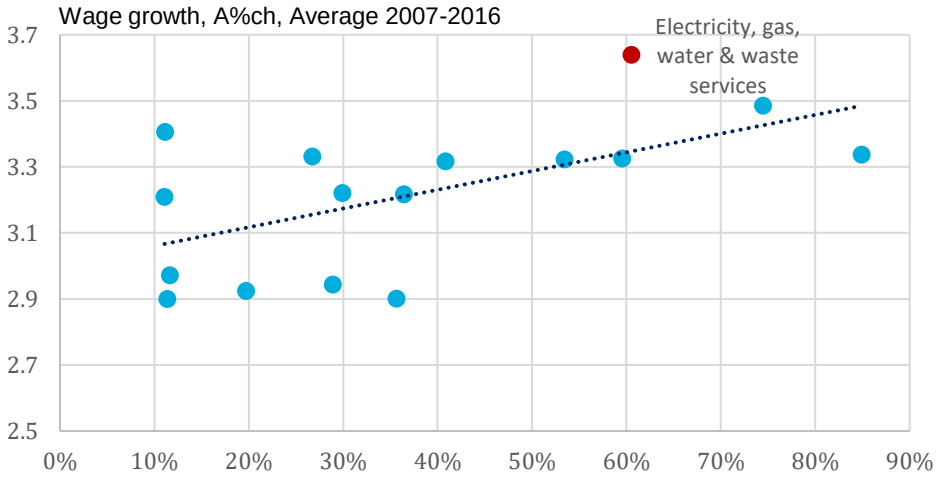
Strong Union presence in the utilities industry and higher collective agreements outcomes pushes utilities wages above the All Industry average.

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 2018, 64.6% of full-time non-managerial employees in the EGWWS industry have their wages set by collective agreements, considerably higher than the national average of 38.4%. 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 5.2). 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 5.2 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 5.1. 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 outlook period, we expect collective agreements in the EGWWs sector to achieve average increases of 3.5%, compared to 3.2% 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 15 years to FY2014 (excluding the effects of GST introduction in 2000/01). In the five years to FY19, collective agreements were on average 1.4% 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 1.1% above the 'official' CPI over the forecast period, which is lower than previous periods.

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 two decades. Figures 5.5 and 5.6 illustrate this relationship, and shows employment has a stronger relationship with utilities engineering construction rather than utilities output.

Table 5.1 Electricity, Gas, Water & Waste Services, Australia - Wages Growth by Workforce, Segmented by Pay Setting Method (full-time adult persons)

Year Ended June	% of Workforce in 2018	Year Average Per Cent Change (a)												
						Forecast							Average	Average
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2020-26	2022-26
Wage Price Index														
Awards Only	1.5%	2.5	2.4	3.3	3.5	3.1	1.9	2.5	3.2	3.5	3.5	3.1	3.0	3.2
Collective Agreements	64.6%	3.2	3.0	2.9	2.8	2.9	3.0	3.2	3.6	3.9	3.9	3.7	3.5	3.7
Individual Arrangements	33.9%	0.9	0.6	0.5	2.7	2.7	2.4	2.8	3.1	3.6	3.4	3.2	3.0	3.2
Wage Price Index (a)	**100%**	**2.4**	**2.2**	**2.0**	**2.8**	**2.9**	**2.8**	**3.1**	**3.5**	**3.8**	**3.8**	**3.6**	**3.3**	**3.5**
Compositional Effects + Bonuses,etc		1.1	2.1	0.3	-1.5	0.4	0.6	0.4	0.4	0.3	0.3	0.3	0.4	0.3
AWOTE (b)	100%	3.5	4.3	2.3	1.3	3.3	3.4	3.5	3.8	4.1	4.0	3.8	3.7	3.9

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 & incentives).

Wage increases under Individual agreements rebounded in FY19 and these and EBAs will strengthen due to stronger demand for skilled labour from Mining and Construction sectors.

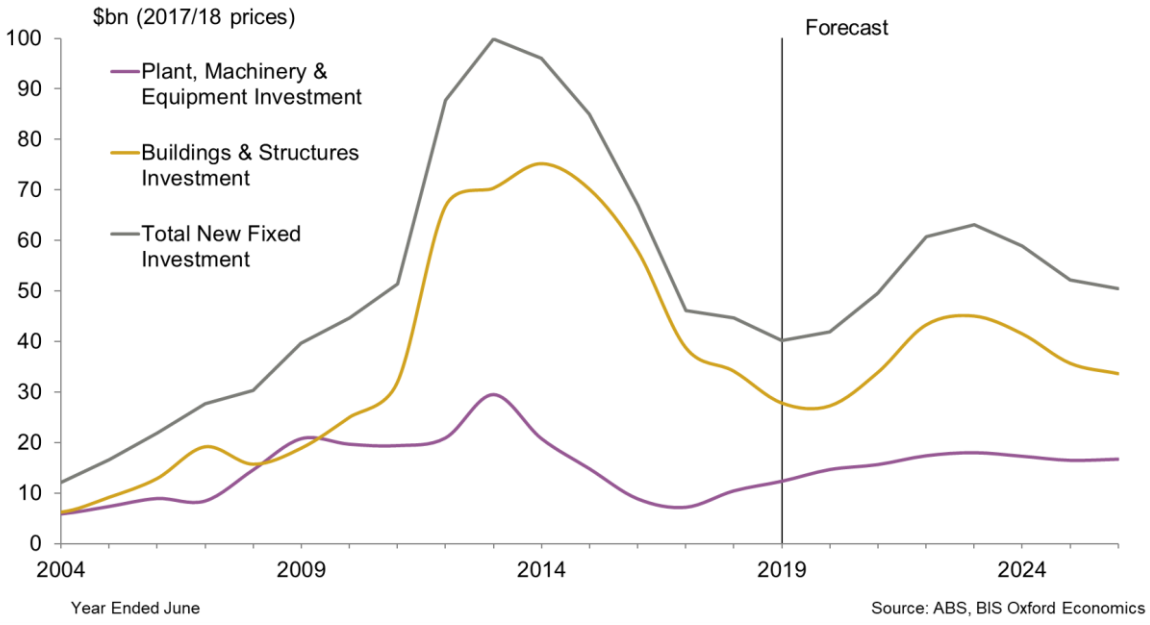
Increases in individual agreements (or non-EBA wages) are primarily influenced by the strength of the labour market (especially the demand-supply balance of skilled labour), inflationary expectations, the recent profitability of relevant enterprises (which influences bonuses and incentives, etc.), current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

Wage growth from individual agreements is estimated to have slowed appreciably over the three years to FY18, although we believe there were compositional effects that negatively impacted the estimation for this segment. Nevertheless, some of this reflected the general weakness in the economy and the full-time labour market at that time. However, we estimate that wage

increases in the individual agreements segment rebounded in FY19 to around 2.5% as skilled labour shortages began to manifest. Indeed, recent vacancies data from the ABS has shown a marked increase in job vacancies in the utilities sector over the past three years (to February 2020), with vacancies also lifting significantly in the Mining and Construction sectors over the past two years. Skilled labour pressures have building over the past two years: an August 2018 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. BIS Oxford Economics research shows this is being compounded by new graduates in the trades stream in particular not increasing fast enough to replace retiring workers, with some numbers actually falling.

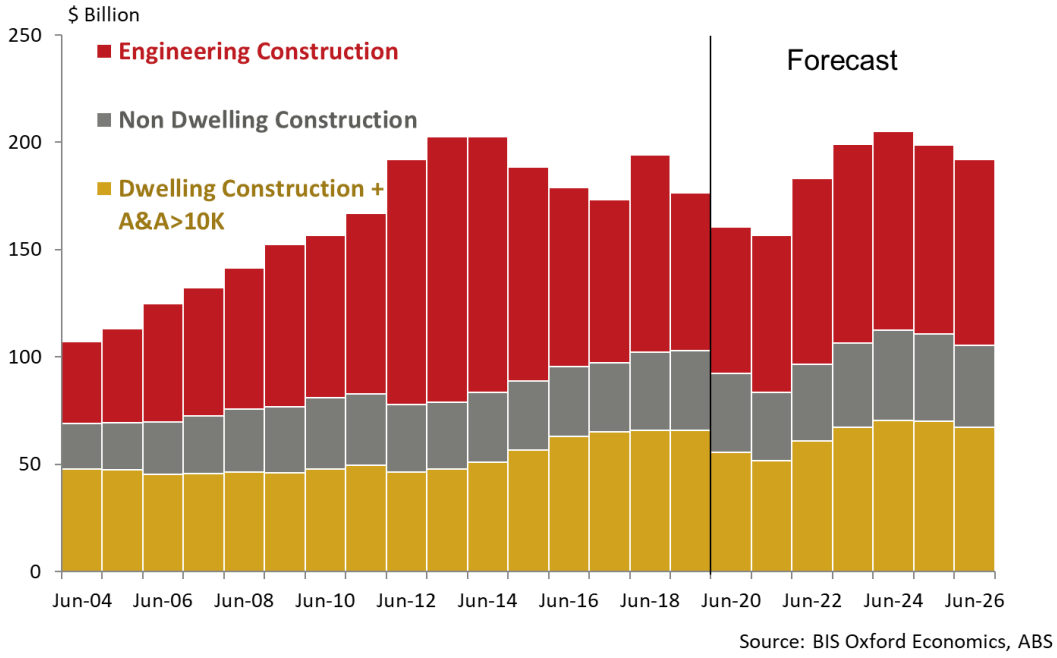
Although we expect the overall labour market to weaken over the next year, we subsequently expect an acceleration of employment growth through FY22, which will outpace population and labour force growth and see the unemployment rate drop back appreciably. Hence, we expect to again witness the re-emergence of skilled labour shortages and competition for scarce labour particularly from the mining and construction sectors, which will push up wage demands in the utilities sector. Mining investment is now picking up and is forecast to see significant increases over the next 3 years to FY23, before easing (see figure 5.3). Meanwhile, there is similar strong growth coming through in in the Construction sector, which, after a short-term set-back due to COVID-19, we expect to see a synchronised upswing across all segments of the overall construction sector (residential construction, non-residential building and civil engineering & infrastructure construction) over FY22 and FY24, leading to strong labour demand in that sector (see figure 5.4).

Figure 5.3 Australia – Mining Investment



With strong competition for similarly skilled labour from the mining and construction industries, firms in the utilities sector will need to raise wages to attract and retain workers. In other words, the mobility of workers between the EGWWS, mining and construction industries means that demand for workers in those industries will influence employment, the unemployment rate and hence spare capacity in the EGWWS labour market. Businesses will find they must 'meet the market' on remuneration in order to attract and retain staff and we expect wages under both individual arrangements and collective agreements to increase markedly over the FY23 to FY25 period.

Figure 5.4 Australia – Construction Activity (real work done)



Source: BIS Oxford Economics, ABS

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

Overall, 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 3.5% per annum (0.3 percentage points higher than the national all Industries WPI average of 3.2% per annum) over the five years to FY26. In real (inflation-adjusted) terms, this equates to 1.3% p.a. (see table 1.1). 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 3.9% per annum over the five years to FY26, 0.2% higher than the national All Industries AWOTE average of 3.7% per annum over the same five-year period (see Table 5.2).

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 5.2 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
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
2019	1 615	2.7	1,842	1.3	130.9	2.3	136.6	2.8
Forecasts								
2020	1 667	3.2	1,903	3.3	133.8	2.2	140.5	2.9
2021	1 720	3.1	1,969	3.4	136.8	2.2	144.5	2.8
2022	1 778	3.4	2,038	3.5	140.5	2.7	148.9	3.1
2023	1 844	3.7	2,116	3.8	144.9	3.2	154.1	3.5
2024	1 917	3.9	2,203	4.1	149.9	3.4	159.9	3.8
2025	1 991	3.9	2,292	4.0	155.0	3.4	165.9	3.8
2026	2 065	3.7	2 380	3.8	159.9	3.2	171.8	3.6
Compound Annual Growth Rates (2)								
2000-2010	4.9		4.5		3.7		4.3	
2010-2019	3.1		3.5		2.7		3.0	
2019-2026	3.6		3.7		2.9		3.3	
2021-2026	3.7		3.9		3.2		3.5	

Source: BIS Oxford Economics, ABS

(1) Earnings per person for full-time adults. Data is year ended May (available only at November and May).
(3) CAGR (Compound Annual Growth Rates) for 2022-2026 is CAGR for 2021/22 to 2025/26 inclusive (ie next Revenue Determination period).

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 ACT (see figure 4.8). 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 ACT (see figure 4.6). 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.

Figure 5.5 Australia – Utilities Employment, Output and Investment

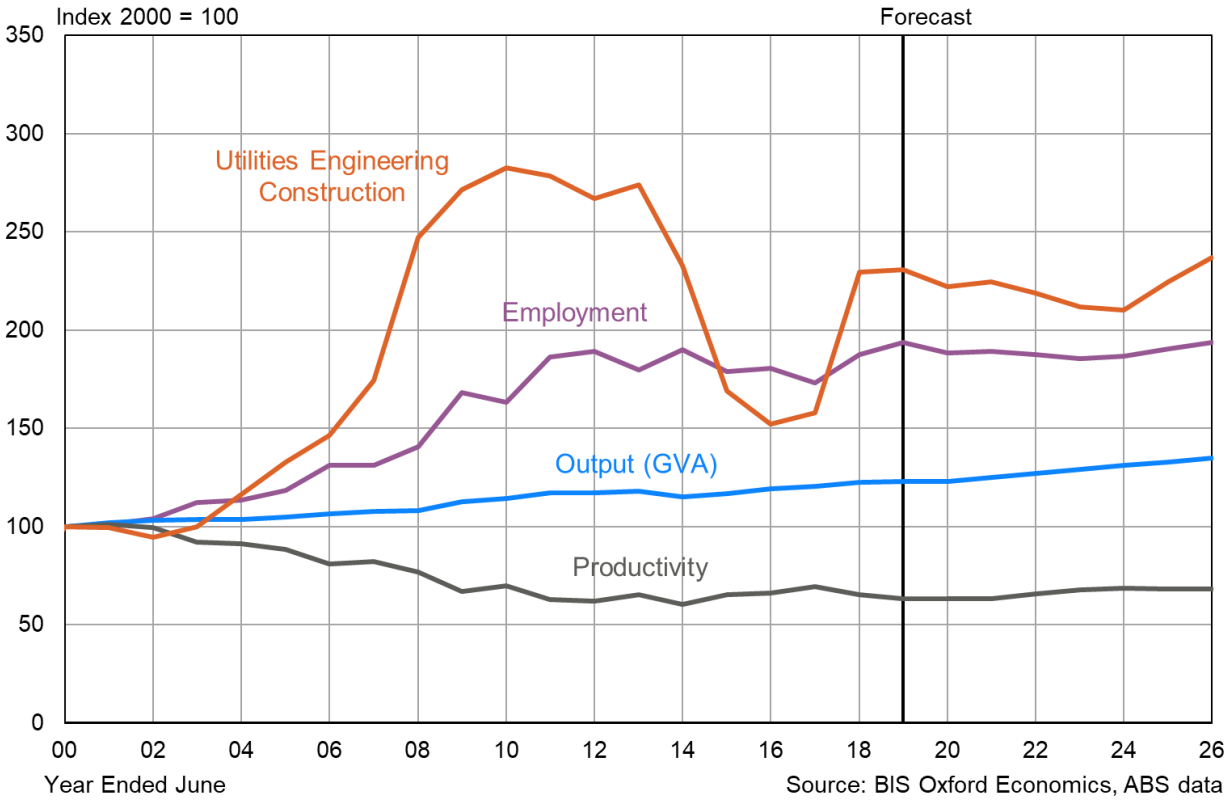


Figure 5.6 ACT – Utilities Employment, Output and Investment

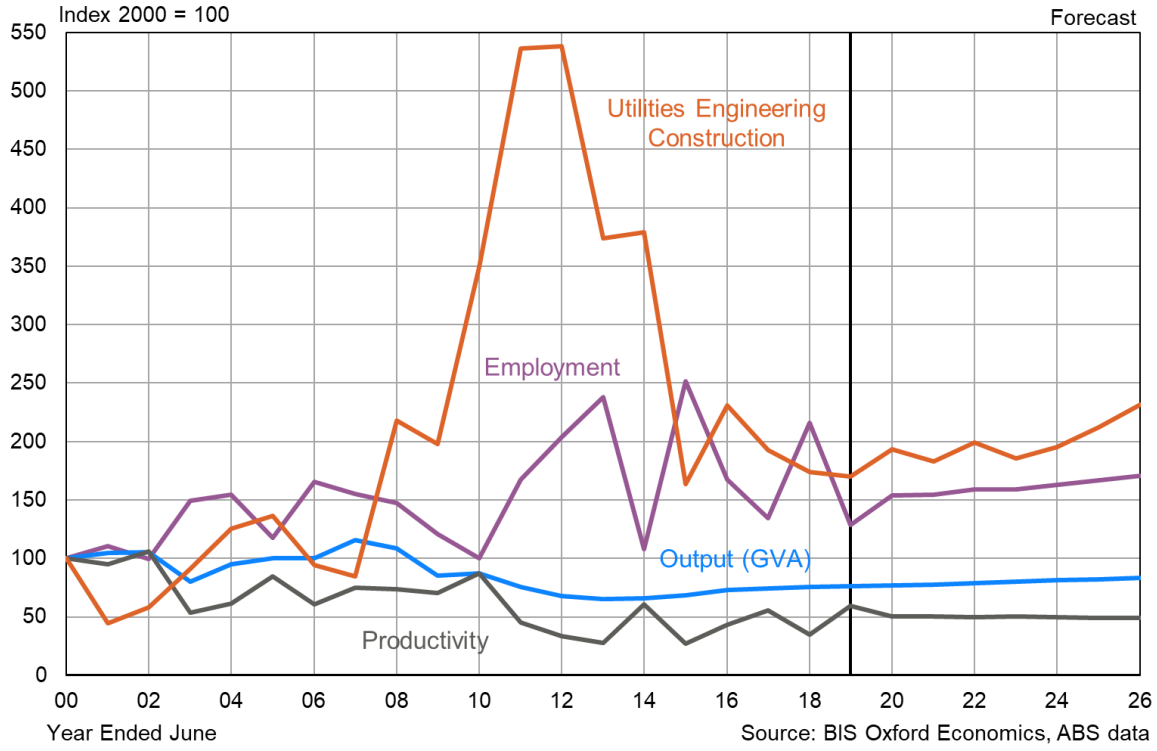
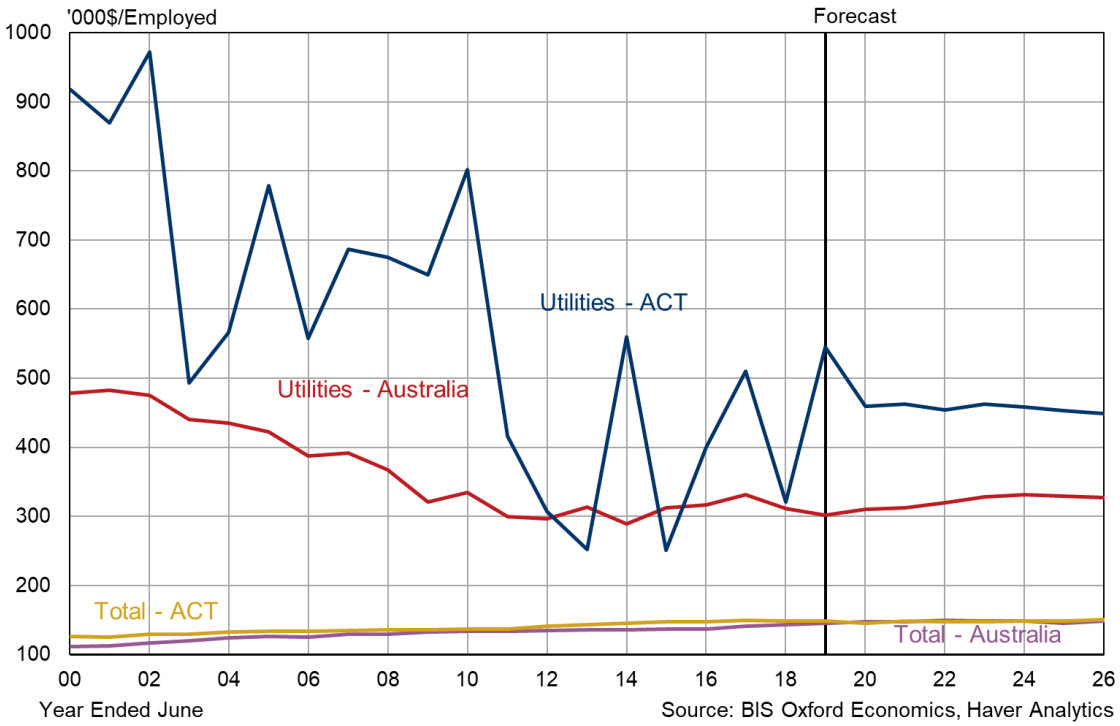


Figure 5.7 Utilities Productivity in Australia and the ACT



5.2.1 ACT Utilities Wages Outlook

The ABS does not provide WPI data for the Utilities sector in the ACT, providing state utilities data only for NSW, Victoria and Queensland (the latter since early 2019 only). These two states collectively account for 73% of total Australian utilities employment, with Western Australia accounting for 13.5%, and South Australia for 7.3% and the ACT less than 2%. Historical data and forecasts of WPI for the EGWWS sector in the ACT 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 the ACT compared to the national average for the utilities sector.

Over FY17 and FY18, overall WPI growth in the EGWWS sector in the ACT is estimated to have been slightly higher than the national EGWWS increase, with the national average dragged down by surprising low outcomes in NSW, the largest state employer. However, we estimate it was on par with the national EGWWS increase in FY19, based on information available regarding EBA outcomes in the ACT over recent years.

Wages in the ACT utilities sector are expected to grow in line with the national utilities sector average over the next two years. However, over the following five years to FY26, wage increases are expected to be slightly lower than the national average – due to relative weaker growth in construction activity in the ACT over the next 7 years, compared to the national average. Nevertheless, ACT utilities wages will still need to keep pace with increases in utilities and construction wages in other states (especially NSW and Victoria) in order to

attract and retain staff. In addition, BIS Oxford Economics analysis of utilities-related civil engineering construction in the ACT forecasts solid growth over the next 7 years (see figure 5.6), with the increased labour demand underpinning this increased investment also expected to push up utilities wages in the ACT.

Overall, we are forecasting EGWWS WPI growth in the ACT to average 3.4% over the five years to FY26 inclusive (i.e. Evoenergy's next regulatory period) – just below the Australian average of 3.5% - or 1.2% in real (inflation adjusted) terms (see Summary table 1).

APPENDIX 1: DIFFERENT WAGE MEASURES & WAGE MODELS

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.

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 5.1). 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 2019, the minimum wage was increased by 3.1%. This followed rises of 3.5%, 3.3% and 2.4% respectively in July 1 of 2018, 2017 and 2016. At the all industries level, 13% of all non-managerial full-time employees (data excludes those in agriculture, forestry and fishing) have their pay rises determined by this method, but only 1.5% of Electricity, Gas, Water & Waste Services' (EGWWS) employees.

- For employees under collective agreements (representing 38% of all employees; 64.5% of EGWWS), 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 48% of employees (or 33.9% of EGWWS 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 5.1, 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.

APPENDIX 2: CURRICULUM VITAES OF PERSONNEL

Richard Robinson – Senior Economist and Associate Director – Economics & Construction

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.

Nicholas Ng – Economist – Building and Construction

Nicholas has contributed to numerous studies and projects in infrastructure and mining & heavy industry. With a developed understanding of the trends and drivers impacting investment, production, and contracting, Nicholas been a project manager and key contributor to several editions of Mining in Australia, Engineering Construction in Australia, and Road Maintenance in Australia. His experience in the consulting realm includes an audit of capital projects for the Western Australian Department of Mines, cost escalation studies, and detailed investigations into resource investment and supply chain from ground to consumer. A track record of bespoke work has also exposed Nicholas to forecasts of domestic versus foreign engineering work, regional activity analysis, and state level coverage of residential, non-residential, and civil construction.

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