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Labour Price Growth Forecasts

Prepared for the Australian Energy Regulator

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Access Economics

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Dear Claire and Esther,

Report on labour price growth forecasts

I enclose Deloitte Access Economics' report on the Wage Price Index for Australia, New South Wales, Tasmania, the Northern Territory and the Australian Capital Territory prepared for the Australian Energy Regulator.

This report has been drafted on the basis of the forecasts that underpin the March 2018 quarter *Business Outlook* and *Investment Monitor* publications that rely on the December 2017 quarter Australian Bureau of Statistics (ABS) National Accounts. However, the March 2018 quarter ABS Wage Price Index release has been reported on in this report.

Yours sincerely

Stephen Smith
Lead Partner
Deloitte Access Economics Pty Ltd

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Glossary

AAWI	Average Annualised Wage Increase
ABS	Australian Bureau of Statistics
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
ANZSIC	Australia and New Zealand Standard Industry Classification
ARENA	Australian Renewable Energy Agency
AWE	Average Weekly Earnings
AWOTE	Average Weekly Ordinary Time Earnings
CPI	Consumer Price Index
DAE	Deloitte Access Economics
EBA	Enterprise Bargaining Agreement
EEBTUM	Survey of Employee Earnings, Benefits and Trade Union Membership
EEH	Survey of Employee Earnings and Hours
GDP	Gross Domestic Product
GSP	Gross State Product
GVA	Gross Value Added
ICRC	Independent Competition and Regulatory Commission
LNG	Liquefied Natural Gas
NEG	National Energy Guarantee
NEM	National Electricity Market
PV	Photovoltaics
RBA	Reserve Bank of Australia
WPI	Wage Price Index

Executive Summary

For the States covered in this report, the Australian Bureau of Statistics (ABS) only releases Wage Price Index (WPI) estimates in the utilities sector for New South Wales. For those States where the ABS does not release WPI estimates, Deloitte Access Economics uses a range of related data to estimate the utilities sector WPI.

Australian wage growth set to lift from near record lows

Wage growth in Australia – as in most advanced economies – remains relatively subdued. The Wage Price Index (WPI) grew by 0.5% in the March quarter of 2018, to be 2.0% higher over the year.

Wage gains are faster in the public sector (2.4% over the year to March 2018) compared to the private sector (1.9%). The fastest wage gains are also in industries in which the public sector plays a greater role, with year to gains of 2.7% in healthcare, 2.5% in arts and recreation and 2.4% in education. At the other end of the scale, wage gains are weakest in mining (1.3%); rental, hiring and real estate services (1.5%); and retail trade (1.6%). At the State level, wage gains are growing the fastest in Victoria and Tasmania (at 2.2%), closely followed by New South Wales and Queensland (2.1%). Wages grew the slowest in Western Australia and the Northern Territory (1.4%).

There are both cyclical and structural factors that are limiting wage gains in Australia. From a cyclical perspective, a number of measures indicate that there is a degree of spare capacity in the labour market. Structural factors such as automation of work processes, an increase in contract work, and competitive pressures from the internationalisation of services trade have all combined to restrain worker's bargaining power. A strong focus on cost control from many businesses is also limiting wage gains.

Although these structural trends will continue to weigh on wage gains for some time the traditional drivers of wage growth have not disappeared. For example, wage gains are currently faster in sectors and States that are experiencing stronger growth. In fact, the two necessary pre-conditions to a boost in wage gains are already in place:

- Business profits have increased; and
- Businesses are hiring people at near record rates.

Looking ahead, continued gains in employment are expected to absorb remaining spare capacity in the labour market. This will place downwards pressure on the unemployment rate and lead to gradual improvements in wage growth.

Faster growth in inflation outcomes is also set to place upwards pressure on wages. Research conducted by the Reserve Bank of Australia (RBA) found that the Consumer Price Index (CPI) was a primary determinant of wage setting for around two-fifths of firms. CPI is forecast to grow by 1.9% in 2017-18, lifting to 2.3% in 2018-19 before reaching around 2.4% by the end of the forecast period in 2023-24.

The recent strong gains in national income – driven largely by elevated commodity prices – is expected to flow through to wages. To date much of the gain has been directed towards profits, however this was partly due to the fact that many businesses were recovering profits lost during the last financial crisis and rewarding shareholders. As the labour market tightens the share of national income directed towards wages will lift.

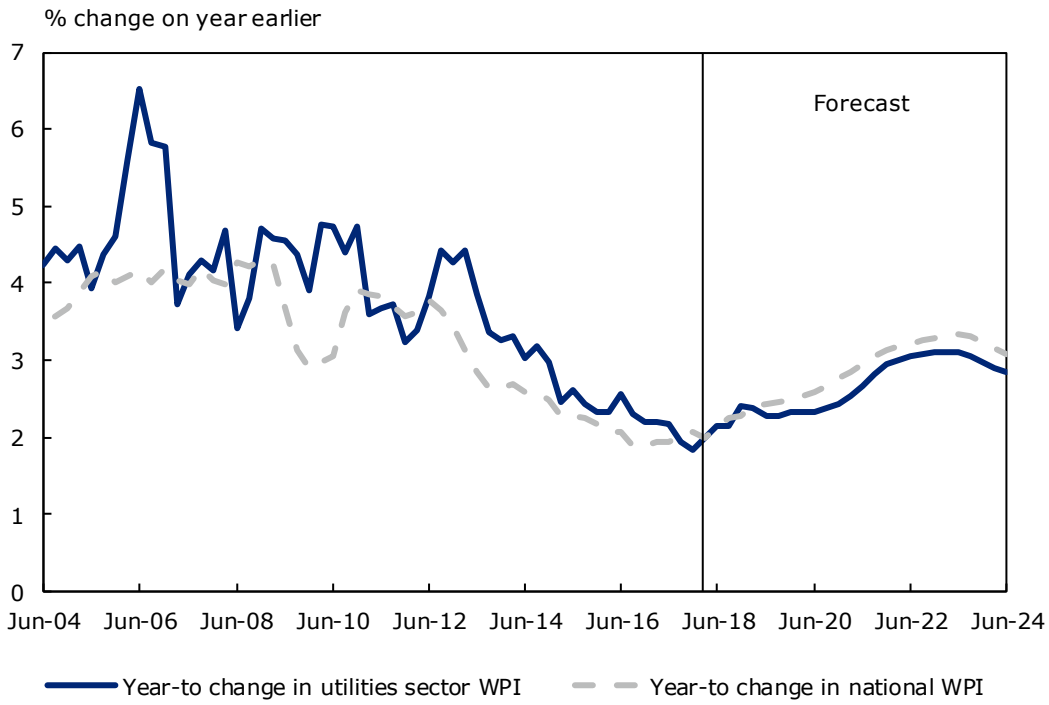
In the long run, demographic factors are also expected to add to wage pressures. The increasing retirement among baby boomers is set to restrain growth in the number of potential workers. This should hand employees back some bargaining power in wage negotiations, contributing to higher wage outcomes.

Deloitte Access Economics forecasts a gradual lift in wage growth. Nominal wages are forecast to grow 2.1% in 2017-18 before lifting to 2.3% in 2018-19. The pace of wage gains is then expected to reach 3.2% by 2023-24.

Utilities wage growth to gradually recover

Utilities sector wages grew by 2.0% over the year to March 2018, the slowest increase since the WPI series began in 1997. The pace of wage gains has more than halved from a recent peak of 4.2% growth in early 2013.

Chart i Utilities Wage Price Index forecasts



Note: % change on year earlier refers to output growth between a quarter and the same quarter a year earlier

Source: Australian Bureau of Statistics, Deloitte Access Economics

Part of this moderation has been due to slower wage gains in the broader Australian economy. Yet there are a number of industry-specific factors at play as well. The slowdown is partly driven by lower output growth in the utilities sector, low productivity growth and subdued demand in competing sectors such as manufacturing and construction.

Despite this, utilities sector wages largely outperformed gains across the wider economy from early 2013 to mid-2017. Neither this sector's own fundamentals nor pressures placed on it by competitor sectors could readily explain the earlier gap in relative wages.

Since September 2017, wages in the utilities sector have grown at a slower rate than those in the wider economy. Looking ahead, wage gains in the utilities sector are forecast to fall from 2.2% growth in 2016-17 to 2.0% growth in 2017-18. Utilities wages are then expected to grow by 2.3% in 2018-19, before reaching 2.9% growth in 2023-24.

- The gradual recovery in wage growth in the utilities sector is in line with the gradual recovery in national income growth over the next few years, supported by higher inflation, better news on national income, and a relative tightening in the availability of workers.
- Wage gains in the utilities sector are expected to be more modest than improvements across all industries. This is partly due to the fact that output in the utilities sector is forecast to grow more slowly than the average across all sectors. Although, utilities wages are expected to grow

on par with the wider economy in 2018-19. This is partly driven by EBA data for the December quarter of 2017 which showed stronger wage growth in the sector relative to the wider economy. New EBAs grew 2.9% in the national utilities sector relative to 2.5% for all industries, and current EBAs grew 2.9% in the national utilities sector relative to 2.8% for all industries. EBA data feeds into Deloitte Access Economics' forecasts for wage gains in the short term only.

Utilities wage growth at the State level will largely mirror national trends

The dominant drivers of State level utilities wage outcomes are a range of national trends. Yet State influences are also relevant.

Wage growth for the utilities sector in **New South Wales** was relatively low over the year to March 2018 at 1.2%.

- New South Wales utilities sector WPI relative to the national average for the sector has been in decline since early 2009. This fall began at a time when resource-intensive States in Australia's north and west were growing strongly during the mining boom, leading to higher wage growth when compared to south-eastern States.
- Utilities sector wage growth typically fluctuates much more than overall New South Wales wage growth. Wage growth for the New South Wales utilities sector has remained below the gains in the wider State economy since mid-2015, partly due to the relatively strong performance of sectors such as entertainment and recreation and healthcare.
- Wage growth for utilities in New South Wales is expected to lift from 1.4% in 2017-18 to 2.2% in 2018-19. By 2023-24, wages in the News South Wales utilities sector are expected to grow by 3.0%

Deloitte Access Economics estimates that the **Tasmanian** utilities WPI grew by 2.3% over the year to March 2018. During this time, estimated utilities wages in Tasmania increased above wage growth in the overall Tasmanian economy, the national utilities sector, and in the broader Australian economy.

- Deloitte Access Economics forecasts Tasmanian utilities wages to remain slightly above the nation's level to 2020-21, before slowing down to be below the national level for the remainder of the forecast period. By 2023-24, utilities wages in Tasmania are expected to grow by 2.8%, relative to 2.9% nationally.
- Tasmania's utilities WPI is expected to grow at moderate rates, to be roughly in line with broader WPI growth in the Tasmanian economy by 2023-24 at 2.8% and 2.9% respectively.

Deloitte Access Economics estimates that the **Northern Territory** utilities WPI grew by 1.2% over the year to March 2018. This is lower than the average wage growth for the Australian utilities sector (at 2.0%), and below wage growth across all industries in the Northern Territory (1.4%) and nationally (2.0%), over the same period.

- Deloitte Access Economics expects a continued relative fall in the Northern Territory's WPI compared to the national utilities WPI. By 2023-24, utilities wages in the Territory is expected to grow by 2.8% compared to 2.9% nationally.
- Wage growth in the utilities sector is expected to be lower than wage growth in the wider Territory over the forecast period. Utilities wage growth is forecast to reach 2.8% in 2023-24 (compared to Territory-wide growth of 3.1%).

Deloitte Access Economics estimates that the **Australian Capital Territory**'s utilities WPI grew by 2.4% over the year to March 2018. This is slightly above average wage growth for the Australian utilities sector (at 2.0%), and above wage growth across all industries in the Australian Capital Territory (1.9%) and nationally (2.0%), over the same period.

- Wage growth in the utilities sector for the Territory and Australia is expected to be largely in line over the forecast period, at 2.9% by 2023-24.
- Wage growth in the utilities sector is forecast to continue but fall below broader wage growth in the Territory by 2023-24 (growing at 2.9% and 3.2% respectively).

Both the negatives and the positives affecting Australia's economy are strengthening

Australian real gross domestic product (GDP) increased by 1.0% in the March quarter 2018, to be 3.1% higher over the same quarter a year earlier. Growth has been driven by a stronger global economy, higher public spending, record low interest rates, and an improvement in private business investment. This combination has supported the labour market with more than 300,000 jobs being created in the year to May 2018.

The past year has seen a trend of strengthening positives and strengthening negatives for the Australian economy. The parts of the Australian economy that depend on global conditions (such as exports, tourism and education) remain supported by accelerating global economic growth, while parts of the economy more reliant on credit growth (such as housing and retail) continue to be weighed down by higher global interest rates and tighter lending standards.

Strong growth in the global economy has continued to support Australia's national income. Improved momentum in the Chinese economy prompted a lift in commodity prices in early 2017, which has subsequently flowed through to higher national income. And while commodity prices have since moderated somewhat, they remain elevated. National income increased by approximately $100 billion in 2017, the largest such increase since 2011.

Following the large investment in additional capacity during the mining boom, Australia's minerals and energy exports are continuing to increase. This provides a powerful combination for the Australian economy: larger volumes of commodities being sold at relatively high prices. Adding to this, services exports – led by education and tourism – have continued to strengthen. Australian exports grew by 3.8% over the year to March 2018.

Yet at the same time as the global positives for Australia continue to strengthen, the impact of tighter lending conditions (due in part to the rising cost of global credit and tighter macro-prudential lending standards) is weighing on the economy. The tighter credit market is particularly important for house prices, which are partly driven by how much people can borrow. In fact, following strong gains from 2013-14 to 2016-17 the value of private housing investment is forecast to fall by 3.4% in 2017-18.

Despite the tighter lending conditions, domestic demand continues to be supported by an upswing in private investment, which increased at the fastest rate in almost five years. And although the outlook remains positive, recent data suggests that the pace of future gains is likely to be slower than expected. The public sector has also been contributing to growth, with public final demand forecast to grow by 4.6% in 2017-18. This has been supported by continued growth in public consumption and a sharp lift in public investment.

Overall, output is expected to grow solidly in the short-term, supported by the ongoing recovery in the global economy, an improved outlook for private business investment and continued strength in public sector investment and consumption. Real GDP is forecast to lift from 2.6% growth in 2017-18 to a gain of 3.0% in 2018-19.

Utilities output growth to increase, but remain below the average across all sectors

Output in the utilities sector grew by 1.1% in the year to March 2018, below the 2.6% growth in the wider economy. This continues a long-running trend which has seen the utilities sector decline as a share of Australia's economy for the past 25 years. In part this is due to the expansion of other sectors such as mining, health and finance. But it is also driven by the structural change underway among energy users due to new technologies and policy priorities that have been increasing energy efficiency and the take up of distributed generation.

Demand for water and waste services has been strong compared to that for electricity and gas. This is largely due to the fact that higher prices for electricity and gas are encouraging households and businesses to cut back on their consumption. According to the latest inflation data from the ABS electricity prices have increased by 20% in the past two years, while gas prices grew by 13%. Prices have also increased off a relatively high base following strong gains in electricity prices from late 2007 to mid-2014 and strong gains in gas prices from late 2000 to late 2014.

The Australian Energy Market Operator (AEMO) forecasts that consumption of grid-supplied electricity in Australia is expected to remain relatively flat for the next two decades, despite a projected 30% increase in the population and greater industrial demand related to rising LNG output. Households and businesses are expected to increasingly control their electricity use and costs by:

- Adopting rooftop photovoltaics (PV), cogeneration, and other small scale technologies to generate their own electricity;
- Using more energy-efficient appliances, buildings and machinery; and
- Modifying behaviour to reduce electricity use where possible.

There are also a number of developments in the National Electricity Market (NEM) that may impact on output over the coming years. These include the change from a 30-minute to a 5-minute settlement period in the wholesale market from 1 July 2021, the continued rollout of 'smart' meters, greater use of demand management, as well as the proposed National Energy Guarantee (NEG).

Utilities sector output is expected to lift from 0.4% growth in 2016-17 to 1.4% in 2017-18, followed by 1.7% growth per annum on average over the forecast period. Growth in utilities is expected to remain weaker than growth in the Australian economy as a whole over the forecast period to 2023-24. As a result, the utilities sector will continue to shrink as a share of national activity.

Productivity adjustments

In previous reports, Deloitte Access Economics has presented a productivity adjusted WPI estimates. This series has not been used in past determinations by the AER. Based on new information provided by the ABS, Deloitte Access Economics no longer incorporates a productivity adjusted WPI estimates for reports prepared for the AER, but separately provide labour productivity estimates. The ABS has advised that the WPI does not measure labour productivity nor compositional changes in the workforce. Movements in these factors will result in changes to overall wages, but are not strictly measured by the WPI. There may be an insubstantial portion of productivity that creeps into WPI due to the difficulties in measurement. This insubstantial portion does not warrant the provision of productivity adjusted WPI estimates. Please see Appendix B.2 for a more detailed explanation.

Summary results

Table i State WPI forecasts, all sectors

Yearly changes in nominal WPI

	History	Forecast						
Annual % change	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
National	1.9	2.1	2.3	2.5	2.8	3.1	3.3	3.2
New South Wales	2.1	2.1	2.3	2.4	2.7	3.0	3.3	3.2
Tasmania	2.2	2.3	2.4	2.4	2.6	2.8	3.0	2.9
Northern Territory	2.1	1.3	1.5	2.1	2.5	3.0	3.2	3.1
Australian Capital Territory	1.9	2.0	2.2	2.4	2.8	3.1	3.3	3.2

Yearly changes in real WPI

	History	Forecast						
Annual % change	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
National	0.2	0.1	0.1	0.3	0.4	0.7	0.9	1.0
New South Wales	0.1	-0.1	-0.1	0.1	0.3	0.6	0.9	1.0
Tasmania	0.4	0.4	0.2	0.0	0.1	0.2	0.4	0.6
Northern Territory	2.0	0.0	-0.7	0.0	0.1	0.6	0.8	0.9
Australian Capital Territory	0.0	-0.2	-0.2	0.1	0.3	0.6	0.8	0.9

Source: Australian Bureau of Statistics, Deloitte Access Economics

Table ii Summary results – key variables, Australia

Financial year changes in key variables	History	Forecast						
Annual % change	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Output	2.1	2.6	3.0	2.9	2.9	3.0	2.8	2.5
Consumer price index	1.7	1.9	2.3	2.2	2.4	2.4	2.4	2.2
Wage Price index	1.9	2.1	2.3	2.5	2.8	3.1	3.3	3.2
Ave. weekly earnings	1.6	2.2	2.2	2.5	2.8	3.1	3.1	2.9
Ave. weekly ordinary time earnings	2.0	2.6	3.2	3.1	3.3	3.5	3.7	3.6

Source: Australian Bureau of Statistics, Deloitte Access Economics

Table iii Summary results – economic variables, Australia

Financial year changes in key economic variables - annual % change (unless noted)	History	Forecast						
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Consumption								
Private sector	2.6	2.7	2.6	2.5	2.4	2.6	2.7	2.7
Public sector	3.9	3.5	3.2	2.9	2.7	2.8	2.7	2.6
Private sector investment								
Non-business housing	2.8	-3.6	-3.0	0.3	7.4	6.2	-0.6	-4.5
Non-business real estate	0.5	-0.4	-2.4	0.0	6.2	4.9	-1.4	-4.9
Non-residential building	-6.3	9.0	9.8	9.6	6.4	3.3	2.0	1.4
Engineering construction	-16.5	0.6	-3.2	-2.5	2.6	2.1	0.8	0.3
Machinery and equipment	1.7	5.4	5.3	5.0	6.9	5.1	3.9	4.0
IP and livestock	9.6	5.1	7.6	5.9	9.7	7.9	6.4	5.4
Public investment								
General Government	17.6	9.2	7.1	6.0	5.7	5.4	5.1	4.8
Public enterprises	12.5	-5.4	-0.9	-3.0	-0.2	0.3	0.6	1.2
Domestic final demand	2.3	3.0	2.6	2.7	3.4	3.2	2.6	2.3
Private sector	1.1	2.7	2.3	2.6	3.5	3.3	2.5	2.1
Public sector	6.3	3.8	3.6	3.1	3.0	3.1	3.0	3.0
Gross national expenditure	2.4	2.8	2.6	2.8	3.4	3.3	2.6	2.3
International trade								
Exports	5.5	3.6	3.3	4.3	3.0	3.4	4.6	6.4
Imports	4.9	5.6	1.8	3.5	5.2	4.6	3.9	5.0
Net (% additon to growth)	-0.4	-0.2	0.2	-0.2	-0.6	-0.2	0.1	0.2
Total output (GDP)	2.1	2.6	3.0	2.9	2.9	3.0	2.8	2.5
Non farm output	1.7	2.8	3.1	2.8	3.0	3.0	2.8	2.6
Employment	1.3	3.0	1.4	1.2	1.3	1.4	1.4	1.3
Unemployment rate (%)	5.7	5.5	5.4	5.5	5.3	5.1	5.1	5.3

Source: Australian Bureau of Statistics, Deloitte Access Economics. All variables (except for population, employment and unemployment) expressed in inflation-adjusted terms

Table iv Summary results – wages and prices, Australia

Financial year changes in national wage and prices variables

	History	Forecast						
Annual % change	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Consumer price index (CPI)	1.7	1.9	2.3	2.2	2.4	2.4	2.4	2.2
Wage price index (WPI)								
Nominal	1.9	2.1	2.3	2.5	2.8	3.1	3.3	3.2
Real	0.2	0.1	0.1	0.3	0.4	0.7	0.9	1.0
Average weekly earnings (AWE)								
Nominal	1.6	2.2	2.2	2.5	2.8	3.1	3.1	2.9
Real	-0.1	0.2	-0.1	0.2	0.4	0.6	0.7	0.7
Average weekly ordinary time earnings (AWOTE)								
Nominal	2.0	2.6	3.2	3.1	3.3	3.5	3.7	3.6
Real	0.4	0.6	0.9	0.8	0.8	1.1	1.3	1.4
Unit labour costs								
Nominal	0.0	1.6	0.3	0.7	1.1	1.9	2.3	2.4
Real	-1.7	-0.3	-1.9	-1.5	-1.3	-0.5	-0.1	0.2

Source: Australian Bureau of Statistics, Deloitte Access Economics

Table v Summary results – sectoral wages, Australia

Financial year changes in nominal national industry sector WPI

	History	Forecast						
Annual % change	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**
All industries	1.9	2.1	2.3	2.5	2.8	3.1	3.3	3.2
Utilities	2.2	2.0	2.3	2.3	2.5	3.0	3.1	2.9

Financial year changes in real national industry sector Wage Prices

	History	Forecast						
Annual % change	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**
All industries	0.2	0.1	0.1	0.3	0.4	0.7	0.9	1.0
Utilities	0.5	0.0	0.0	0.1	0.1	0.5	0.7	0.7

Source: Australian Bureau of Statistics, Deloitte Access Economics

Table vi Summary results – State utilities sector nominal wages

Yearly changes in nominal utilities sector WPI

	History	Forecast						
Annual % change	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**
National	2.2	2.0	2.3	2.3	2.5	3.0	3.1	2.9
New South Wales	1.3	1.4	2.2	2.3	2.5	3.0	3.2	3.0
Tasmania*	2.9	2.1	2.4	2.4	2.5	2.8	2.9	2.8
Northern Territory*	2.3	1.0	1.8	1.9	2.2	2.7	2.9	2.8
Australian Capital Territory*	2.6	2.4	2.4	2.2	2.4	2.8	3.0	2.9

*Historical data estimated using Deloitte Access Economics' wage price model. Unavailable from the Australian Bureau of Statistics

Source: Australian Bureau of Statistics, Deloitte Access Economics

Table vii Summary results – State utilities sector real wages

Yearly changes in real utilities sector WPI

Annual % change	History 2016-17	Forecast 2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
National	0.5	0.0	0.0	0.1	0.1	0.5	0.7	0.7
New South Wales	-0.7	-0.8	-0.1	0.0	0.1	0.6	0.8	0.8
Tasmania*	1.1	0.2	0.1	0.1	0.0	0.2	0.4	0.5
Northern Territory*	2.1	-0.2	-0.4	-0.2	-0.2	0.3	0.5	0.6
Australian Capital Territory*	0.7	0.2	0.0	-0.1	-0.1	0.3	0.5	0.7

*Historical data estimated using Deloitte Access Economics' wage price model. Unavailable from the Australian Bureau of Statistics

Source: Australian Bureau of Statistics, Deloitte Access Economics

1 Background

The Australian Energy Regulator (AER) commissioned Deloitte Access Economics to provide forecasts for wage price growth for the electricity, gas, water and waste services (utilities) industry for the following States:

- New South Wales to 2023-24;
- Tasmania to 2023-24;
- Northern Territory to 2023-24;
- Australian Capital Territory to 2023-24; and
- Australia (national) to 2023-24.

Specifically, AER has requested:

- Annual WPI forecasts for Australia and relevant States;
- A brief analysis of the key influences on the forecast changes in the WPI, including:
    - An overview of the national and State economic outlook, including a discussion of the outlook for the utilities sector;
    - An analysis of the national and State outlook for wages for all industries and the utilities sector; and
    - A discussion of the key drivers for wage growth including inflationary trends, productivity trends, Enterprise Bargaining data, and relevant cyclical factors.
- A description of the methodology and assumptions used to forecast WPI.

The report is organised as follows:

- **Discussion of the national economic outlook,** including a discussion of the utilities sector.
- The report then presents the **outlook for wages at the national level** followed by analysis at the industry level. This section includes **forecasts of wage growth and labour productivity in the utilities sector** at the national level.
- **The discussion of the State economic outlooks** includes commentary on the utilities sector within the given State.
- The report then provides an overview of the **outlook for wages at the State and industry level.** This section includes **detailed forecasts at the State level of wage growth in the utilities sector.** This section also presents forecasts of **labour productivity.**
- **The Appendices** cover regional and sectoral wage data availability, an outline of the methodology used in the Deloitte Access Economics macroeconomic model and the Deloitte Access Economics wage price model, and a discussion of different wage measures.

2 Australia

2.1 Economic outlook

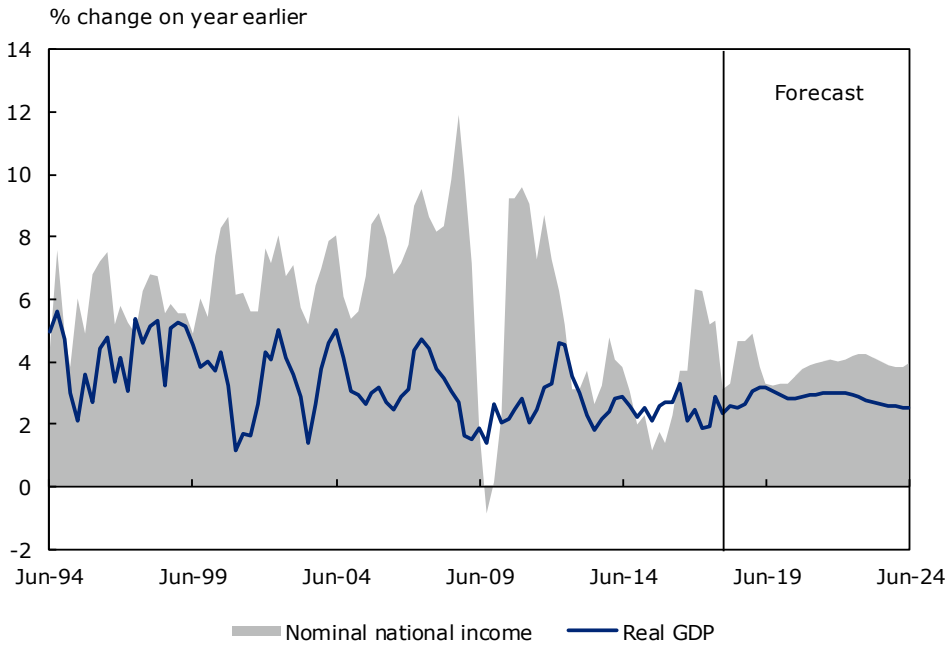
2.1.1 Overview

Australian real gross domestic product (GDP) increased by 1.0% in the March quarter 2018, to be 3.1% higher over the same quarter a year earlier. Growth has been driven by a stronger global economy, higher public spending, record low interest rates, and an improvement in private business investment. This combination has supported the labour market with more than 300,000 jobs being created in the year to May 2018.

The past year has seen a trend of strengthening positives and strengthening negatives for the Australian economy. The parts of the Australian economy that depend on global conditions (such as exports, tourism and education) remain supported by accelerating global economic growth, while parts of the economy more reliant on credit growth (such as housing and retail) continue to be weighed down by higher global interest rates and tighter lending standards.

Strong growth in the global economy has continued to support Australia's national income. Improved momentum in the Chinese economy prompted a lift in commodity prices in early 2017, which has subsequently flowed through to higher national income. And while commodity prices have since moderated somewhat, they remain elevated. National income increased by approximately $100 billion in 2017, the largest such increase since 2011 (see Chart 2.1).

Chart 2.1 Australian production and national income growth



Note: % change on year earlier refers to output growth between a quarter and the same quarter a year earlier
Source: Australian Bureau of Statistics, Deloitte Access Economics

Following the large investment in additional capacity during the mining boom, Australia's minerals and energy exports are continuing to increase. According to the Department of Industry, Innovation and Science the volume of liquefied natural gas (LNG) is expected to reach 62 million tonnes, up from 14 million tonnes a decade prior (a 355% increase). The volume of iron ore exports is expected to have increased by 192% over the same period, while coal exports are forecast to have increased by 54%. This provides a powerful combination for the Australian economy: larger volumes of commodities being sold at relatively high prices. Adding to this, services exports have continued to strengthen. Tourism remains supported by the record nine million international visitors that travelled to Australia in the year to April 2018, a gain of 6%. The education sector has also benefitted from a 13% increase in international student enrolments in the year to March 2018. As a result, Australian exports grew by 3.8% over the year to March 2018.

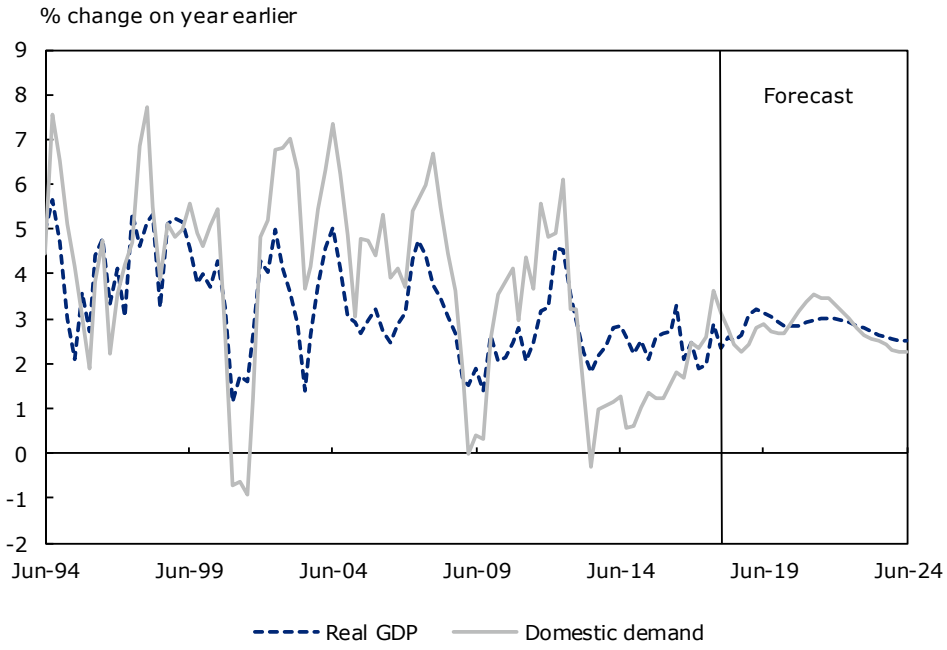
Yet at the same time as the global positives for Australia continue to strengthen, the impact of tighter lending conditions is weighing on the economy:

- The cost of global credit is increasing, due in part to rising interest rates in the United States.
- Higher global interest rates have increased the cost of wholesale funding for Australian banks. This has prompted a number of smaller institutions to deliver out-of-cycle rate increases in recent months.
- The Royal Commission into Misconduct in the Banking, Superannuation and Financial Services Industry has uncovered a range of wrongs in the sector, but has also prompted a degree of caution among major banks.

The tighter credit market is particularly important for house prices. According to data from the ABS, the value of Australian residential property fell by 0.7% in March 2018. Although prices remain 2.0% higher from March 2018 to March 2017, this is the slowest rate of growth since September 2012. The softer property market conditions are also due to a forecast increase in interest rates, tighter macro-prudential lending standards that are weighing on investor activity, and the fact that housing supply has increased notably over recent years. Following strong gains from 2013-14 to 2016-17 the value of private housing investment is forecast to fall by 3.4% in 2017-18.

The contrast between strengthening positives and strengthening negatives can be seen in Chart 2.2, which captures both output growth in the Australian economy (GDP) as well as the narrower measure of spending growth (domestic demand). Recent years have seen the growth in domestic demand accelerate back from below to above the overall growth rate in the economy. But that acceleration is now fading as credit conditions tighten, weighing on both consumers and businesses, at the same time as strong global growth is providing a healthy environment for Australian exporters.

Chart 2.2 Domestic demand and GDP



Note: % change on year earlier refers to output growth between a quarter and the same quarter a year earlier
Source: Australian Bureau of Statistics, Deloitte Access Economics

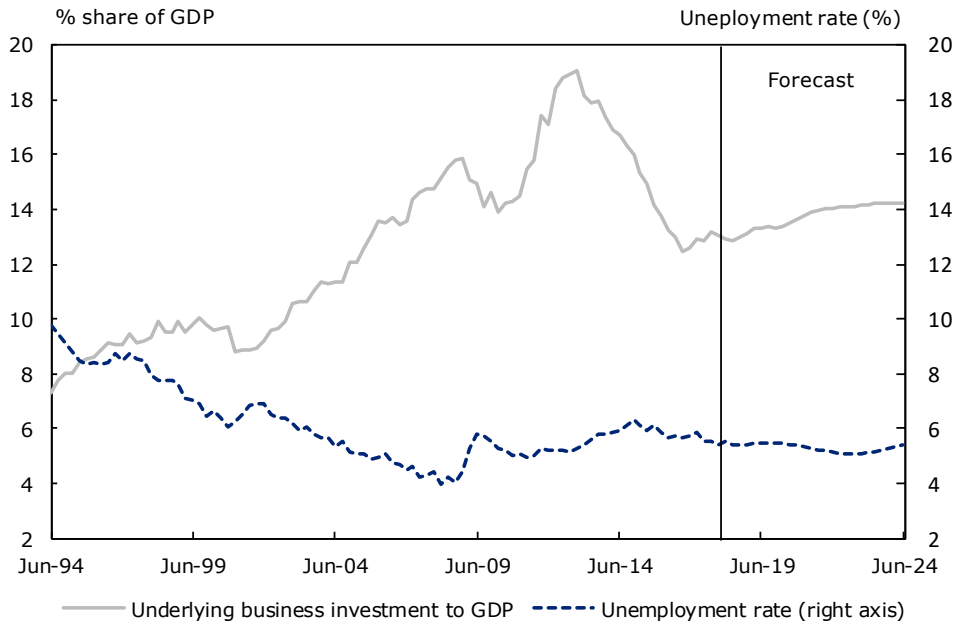
Despite the tighter lending conditions, domestic demand continues to be supported by an upswing in investment. Private investment increased by 2.5% over the year to March 2018, the largest increase since June 2013. The improvement has partly been due to the fact that the overhang of engineering work that commenced construction during the mining boom has finally passed, but it is also being driven by an acceleration in commercial construction as firms show a greater willingness to spend money on expanding capacity and maintaining existing capacity.

However, the recent ABS capital expenditure survey indicated that there is likely to be little growth in private capital expenditure in 2018-19, while recent months have seen falls in non-residential building approvals. So although investment is set to continue improving, recent data suggests that the pace of this gain is likely to be slower than initially expected.

The public sector has also been contributing to growth, with public final demand forecast to grow by 4.6% in 2017-18. This has been supported by continued growth in public consumption and a sharp lift in public investment. General government investment is expected to increase by 9.2% in 2017-18, following a 17.6% gain in 2016-17. Much of this increase has been due to investment in transport infrastructure in the nation's south and east. In 2017, a total of $44 billion worth of engineering and non-residential construction work was done for the public sector, more than one quarter of which was in the transport sector in New South Wales and Victoria.

The continued growth of the Australian economy is forecast to increase demand for both capital and labour. As demand for capital increases this leads to an increase in business investment as a share of the economy, while an increase in demand for labour places downward pressure on the unemployment rate (see Chart 2.3). Demand for capital is expected to increase due to the fact that the effective life of business investments has become shorter and Australia has a much larger capital stock now compared to before the mining boom (the task of maintaining this capital stock is likely to involve a significant amount of investment). Demand for labour is expected to increase alongside gains in employment, reducing spare capacity in the labour market and weighing on the unemployment rate.

Chart 2.3 Business investment as a share of GDP and the unemployment rate



Source: Australian Bureau of Statistics, Deloitte Access Economics

Overall, output is expected to grow solidly in the short-term, supported by the ongoing recovery in the global economy, an improved outlook for private business investment and continued strength in public sector investment and consumption. Real GDP is forecast to lift from 2.6% growth in 2017-18 to a gain of 3.0% in 2018-19.

2.1.2 Utilities sector

The 'utilities' sector is the broad term applying to the electricity, gas, water and waste services industry, which is Division D of the Australian and New Zealand Standard Industrial Classification (ANZSIC). The sector covers activity in the provision of electricity; gas through mains systems; water; drainage; and sewage services. Electricity (across the supply chain from generation to retail) accounts for around half the industry's employment, while water and waste services accounts for the second greatest share, and gas accounts for a minor share of the industry.

Output in the utilities sector grew by 1.1% in the year to March 2018, below the 2.6% growth in the wider economy. This continues a long-running trend which has seen the utilities sector decline as a share of Australia's economy for the past 25 years. In part this is due to the expansion of other sectors such as mining, health and finance. But it is also driven by the structural change underway among energy users due to new technologies and policy priorities that have been increasing energy efficiency and the take up of distributed generation.

Demand for water and waste services has been strong compared to that for electricity and gas. This is largely due to the fact that higher prices for electricity and gas are encouraging households and businesses to cut back on their consumption. According to the latest inflation data from the ABS, electricity prices have increased by 20% in the past two years, while gas prices grew by 13%. Prices have also increased off a relatively high base following strong gains in electricity prices from late 2007 to mid-2014 and strong gains in gas prices from late 2000 to late 2014.

The Australian Energy Market Operator (AEMO) forecasts that consumption of grid-supplied electricity in Australia is expected to remain relatively flat for the next two decades, despite a projected 30% increase in the population and greater industrial demand related to rising LNG output. Households and businesses are expected to increasingly control their electricity use and costs by:

- Adopting rooftop photovoltaics (PV), cogeneration, and other small scale technologies to generate their own electricity;
- Using more energy-efficient appliances, buildings and machinery; and
- Modifying behaviour to reduce electricity use where possible.

There are also a number of developments in the National Electricity Market (NEM) that may impact on output over the coming years.

The settlement period in the wholesale electricity market is slated to move from 30 minutes to 5 minutes from 1 July 2021. A shorter settlement period is expected to provide a better price signal for investment in fast response technologies such as batteries, gas peaking power plants and demand management.

The rollout of 'smart' meters is also expected to increase. These are meters that digitally measure energy use, sending information back to the energy retailer without the need to be manually read. From 1 December 2017 any new meters installed were required to be 'smart'. The installation of new 'smart' meters and the increased utilisation of existing 'smart' meters is likely to accelerate the development of better products for consumers and more efficient use of energy.

Electricity distribution businesses also have access to the recently announced demand management incentive scheme and innovation allowance mechanism. This provides incentives for distribution businesses to undertake expenditure on non-network options relating to demand management. It also provides funding for the development of demand management projects which have the potential to reduce long term network costs.

The Commonwealth Government has adopted 49 of the 50 recommendations from the 2017 Finkel Review into the Future Security of that NEM. It remains unclear whether State and Territory governments will support the National Energy Guarantee (NEG) – a reform proposed by the Energy Security Board. The NEG is designed to maintain reliability of the system, address affordability concerns and meet emissions reduction targets. Retailers are required to contract with or invest in generators in order to meet a minimum level of dispatchable electricity. Retailers must also keep their emissions below an agreed level.

In response to concerns around high gas prices and potential shortfalls on Australia's east coast, the Australian Government implemented the Australian Domestic Gas Security Mechanism (AGDSM) in 2017. In the event that there is insufficient natural gas to meet the needs of Australian consumers, LNG exporters can be required to limit exports or find offsetting sources of new gas. The AGDSM, among other factors such as lower demand, new pipeline interconnectors and changing international market dynamics, have seen the outlook for Australia's gas market improve of late. AEMO are now forecasting no gas supply shortfalls in the short term.

Looking ahead, there are potential positives with continued innovation in electricity markets which are not reflected in Deloitte Access Economics' forecasts:

- As noted previously the roll out of smart meters around Australia will facilitate the **development of new products for consumers and more efficient use of energy.** The exact nature of these new developments and their impact remains unclear.
- Demand response initiatives and changes to cost reflective pricing from 2017 are likely to see **growth in peak demand slow.** In the long run, this will lead to more efficient use of existing network infrastructure.
- The continued decline in the cost of renewable energy will require the **integration of larger amounts of intermittent generation into the grid**. In the short term, new generators will be required to ensure adequate dispatchable capacity is present in all regions. This is likely to see increased investment in technologies such as gas-fired generation, battery storage and pumped hydroelectricity. In the long run, this will assist to reduce emissions.

- **The greater uptake of electric vehicles is also likely to increase demand for electricity** over the long run.

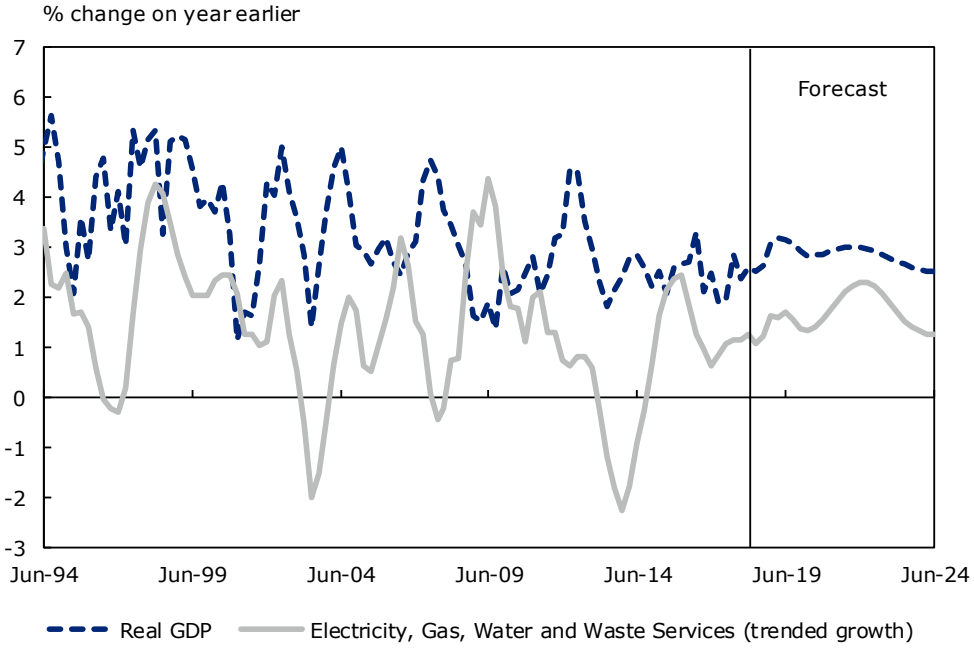
It is also true that these technologies are disruptive for utility businesses, and a number of negatives remain for the sector:

- Demand for energy will remain flat or decline as Australia's shift toward services led growth and **cost pressure on manufacturers and households continues**. Energy efficient appliances and take up of distributed generation with storage capacity will contribute to declining energy demand from the grid and possible deferral of network expansion.
- **Policy uncertainty continues to weigh on commercial investment in new generation.** Additional generation capacity is likely to be needed in order to replace ageing generators such as the Liddell Power Station which is slated to close in 2022.

Utilities sector output is expected to lift from 0.4% growth in 2016-17 to 1.4% in 2017-18, followed by modest growth over the forecast period.

Growth in utilities is expected to remain weaker than growth in the Australian economy as a whole over the forecast period to 2023-24 (see Chart 2.4).

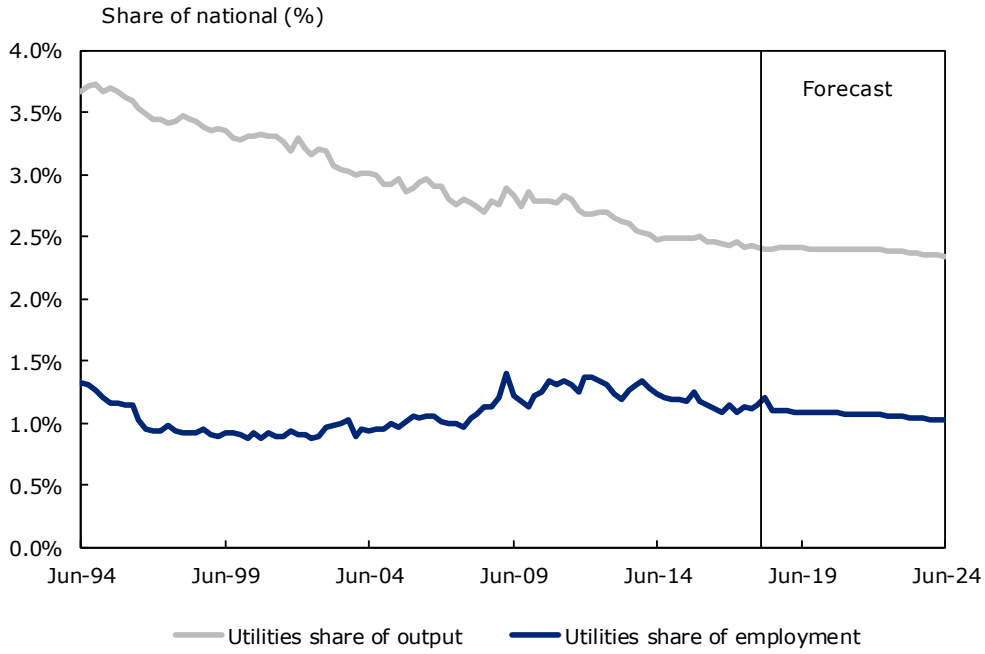
Chart 2.4 Utilities sector output and GDP



Note: % change on year earlier refers to output growth between a quarter and the same quarter a year earlier
Source: Australian Bureau of Statistics, Deloitte Access Economics

Chart 2.5 indicates that the utilities sector is forecast to fall as a share of national output and employment. As noted above this is due to the fact that utilities sector output is expected to grow at a slower rate than the wider economy over the forecast period.

Chart 2.5 Utilities share of national output and employment



Source: Australian Bureau of Statistics, Deloitte Access Economics

2.2 The outlook for wages

2.2.1 All industries

Wage growth in Australia – as in most advanced economies – remains relatively subdued. The WPI grew by 0.5% in the March quarter of 2018, to be 2.0% higher over the year.

Wage gains are faster in the public sector (2.4% over the year to March 2018) compared to the private sector (1.9%). The fastest wage gains are also in industries in which the public sector plays a greater role, with year to gains of 2.7% in healthcare, 2.5% in arts and recreation and 2.4% in education. At the other end of the scale, wage gains were weakest in mining (1.3%); rental, hiring and real estate services (1.5%); and retail trade (1.6%). At the State level, wage gains are growing the fastest in Victoria and Tasmania (at 2.2%), closely flowed by New South Wales and Queensland (2.1%). Wages grew the slowest in Western Australia and the Northern Territory (1.4%).

While wages are expected to pick up, there are both cyclical and structural factors that are limiting wage gains in Australia. From a cyclical perspective, there is a degree of spare capacity in the labour market. The unemployment rate has remained around 5½% since mid-2017, above the 5% estimate of full employment in Australia (the point at which employers are required to raise wages in order to attract and retain employees). The rate of underutilisation is also elevated, with analysis by the Reserve Bank of Australia (RBA) indicating that around one-quarter of part-time workers would like to work more hours – on average seeking two additional days of work per week. Participation rates have also risen notably since late 2016 increasing the labour supply and limiting potential wage gains. And lastly, the decline in high paid jobs in the resources sector has also weighed on wages over recent years, although much of this adjustment has now occurred.

Although cyclical factors go some way to explaining recent low wage growth, there are also a number of structural factors limiting wage gains:

- Trends such as automation of work processes, an increase in contract work, and competitive pressures from the internationalisation of services trade have all combined to restrain workers' bargaining power. It is possible that these trends are making workers feel less secure about their future employment and are less likely to push for larger pay rises.

- The nature of recent technological progress is also affecting wage dynamics. Technological developments are increasingly focussed on intangible capital (such as software and IT), rather than physical capital. The returns to these developments are often highly concentrated in a few firms across a small number of sectors. Firms that are unable to innovate and take advantage of new technologies are often opting to control costs as a way of remaining competitive. This cost-control approach is likely to sit at odds with paying employees higher wages.

Although these structural trends will continue to weigh on wage gains for some time the traditional drivers of wage growth have not disappeared. For example, wage gains are currently faster in sectors and States that are experiencing stronger growth. In fact, the two necessary pre-conditions to a boost in wage gains are already in place:

- Business profits have increased; and
- Businesses are hiring people at near record rates.

Looking ahead, continued gains in employment are expected to absorb remaining spare capacity in the labour market. This will place downwards pressure on the unemployment rate and lead to gradual improvements in wage growth.

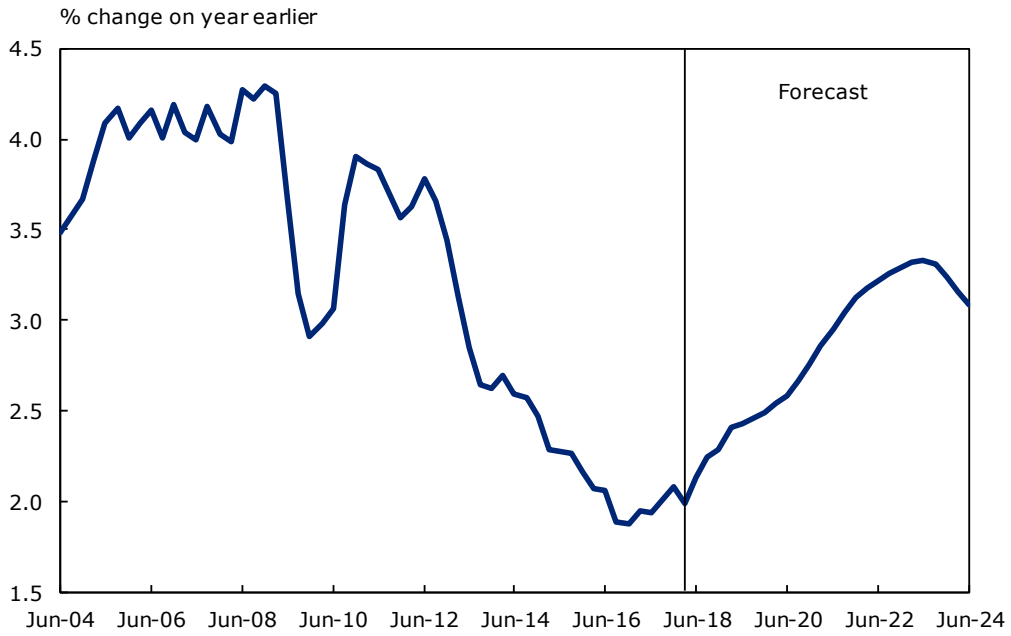
Faster growth in inflation outcomes is also set to place upwards pressure on wages. Research conducted by the RBA found that CPI was a primary determinant of wage setting for around two-fifths of firms. CPI is forecast to grow by 1.9% in 2017-18, lifting to 2.3% in 2018-19 before reaching around 2.4% by the end of the forecast period in 2023-24.

The recent strong gains in national income – driven largely by elevated commodity prices – is expected to flow through to wages. To date much of the gain has been directed towards profits, however this was partly due to the fact that many businesses were recovering profits lost during the last financial crisis and rewarding shareholders. As the labour market tightens the share of national income directed towards wages will lift.

In the long run, demographic factors are also expected to add to wage pressures. The increasing retirement among baby boomers is set to restrain growth in the number of potential workers. This should hand employees back some bargaining power in wage negotiations, contributing to higher wage outcomes.

Deloitte Access Economics forecasts a gradual lift in wage growth. Nominal wages are forecast to grow 2.1% in 2017-18 before lifting to 2.3% in 2018-19. The pace of wage gains is then expected to reach 3.2% by 2023-24.

Chart 2.6 National WPI forecasts



Note: % change on year earlier refers to output growth between a quarter and the same quarter a year earlier
Source: Australian Bureau of Statistics, Deloitte Access Economics

Table 2.1 National wage forecasts

Financial year nominal wages forecasts

	History	Forecast						
Annual % change	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Wage price index	1.9	2.1	2.3	2.5	2.8	3.1	3.3	3.2
Average weekly earnings	1.6	2.2	2.2	2.5	2.8	3.1	3.1	2.9
Ordinary time earnings	2.0	2.6	3.2	3.1	3.3	3.5	3.7	3.6
Unit labour costs	0.0	1.6	0.3	0.7	1.1	1.9	2.3	2.4

Financial year real wages forecasts

	History	Forecast						
Annual % change	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Wage price index	0.2	0.1	0.1	0.3	0.4	0.7	0.9	1.0
Average weekly earnings	-0.1	0.2	-0.1	0.2	0.4	0.6	0.7	0.7
Ordinary time earnings	0.4	0.6	0.9	0.8	0.8	1.1	1.3	1.4
Unit labour costs	-1.7	-0.3	-1.9	-1.5	-1.3	-0.5	-0.1	0.2

Source: Australian Bureau of Statistics, Deloitte Access Economics

2.2.2 Utilities sector wages

Utilities sector wages grew by 2.0% over the year to March 2018[1], the slowest increase since the WPI series began in 1997. The pace of wage gains has more than halved from a recent peak of 4.2% growth in early 2013.

Part of this moderation has been due to slower wage gains in the broader Australian economy. Yet there are a number of industry-specific factors at play as well. The slowdown is partly driven by lower output growth in the utilities sector, low productivity growth and subdued demand in competing sectors such as manufacturing and construction.

[1] Australian Bureau of Statistics (2018), Cat. No. 6345.0, *Wage Price Index*

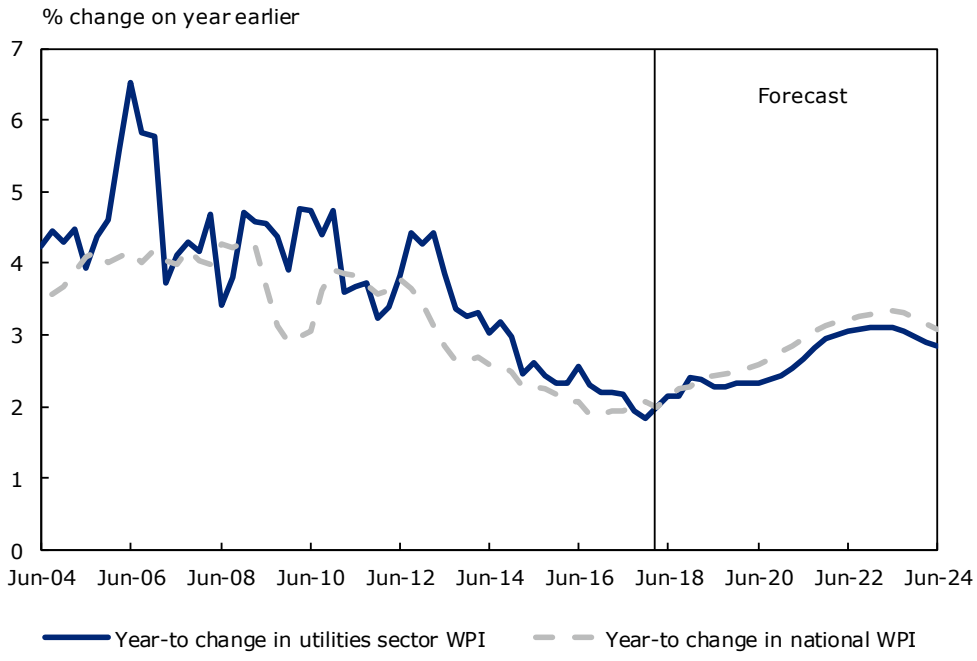
Utilities sector output grew by 1.1% in the year to March 2018, below the 2.6% growth across all industries. This was largely driven by a 0.5% fall in the electricity sector, which accounts for more than half of total utilities output. In fact, weak growth in the electricity sector has weighed on total utilities output for a number of years. This has seen utilities sector output largely grow at rates below the Australian average from mid-2010.

Labour productivity in the utilities sector has largely grown at a slower rate than productivity across the wider economy over the last two decades. And although there has been a recovery since mid-2014, the fact that utilities wages outperformed the average across all sectors while productivity growth underperformed suggests that there is little linkage between changes in the overall productivity level and wages in the utilities sector.

There has also been a slowdown in sectors that compete with utilities for workers. The construction sector has been shrinking as a share of the Australian economy since mid-2014, with recent falls driven by declines in building construction following the peak of the housing boom. That said, stronger activity in heavy and civil engineering has partly offset this decline. The transition from the construction to the export phase of the mining boom means that the mining sector employment is around a fifth lower than during the peak in 2012. And lastly, despite a recent improvement, the manufacturing sector has been falling as a share of the Australian economy for a number of decades. As recently as the mid-1980s, one in every six workers in Australia was employed in manufacturing. Now that ratio is at one in every fourteen workers.

But despite this backdrop, utilities sector wages largely outperformed gains across the wider economy from early 2013 to mid-2017. Faster wage gains do not appear to have been driven by particularly strong growth in utilities sector output or pressures from competitor sectors. The growth in wages relative to output may be driven by a number of other factors. For example, it is possible that wages have increased because requisite skills have lifted, but better skilled workers have yet to boost sector output.

Chart 2.7 National utilities sector Wage Price Index forecasts

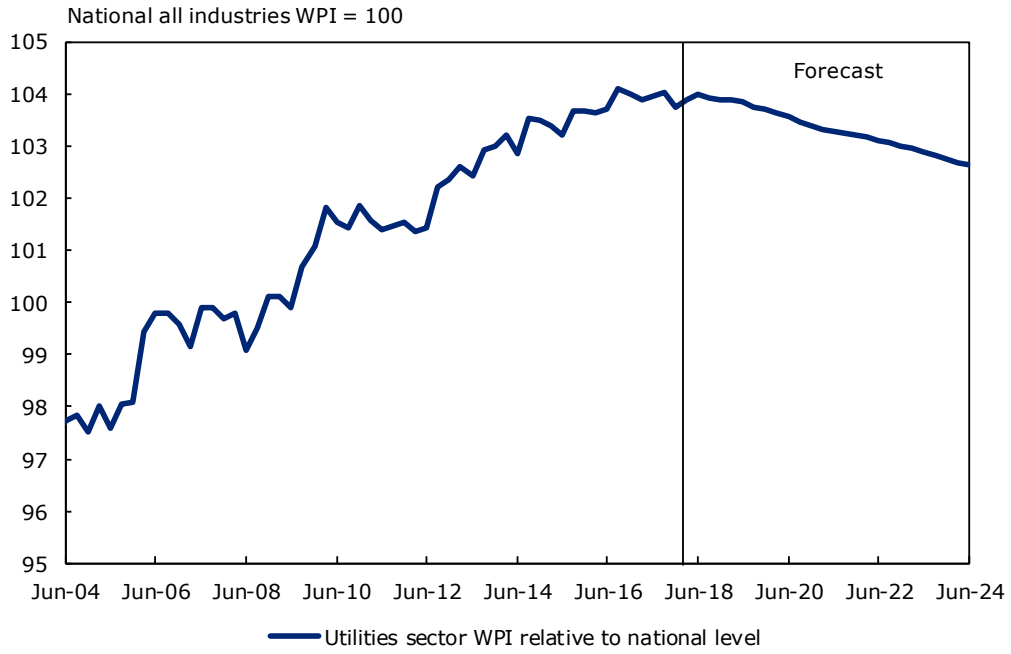


Note: % change on year earlier refers to output growth between a quarter and the same quarter a year earlier
Source: Australian Bureau of Statistics, Deloitte Access Economics

That said, since September 2017 wages in the utilities sector have grown at a slower rate than those in the wider economy. Looking ahead, wages gains in the utilities sector are forecast to fall from 2.2% growth in 2016-17 to 2.0% growth in 2017-18. Utilities wages are then expected to grow by 2.3% in 2018-19, before reaching 2.9% growth in 2023-24.

- The gradual recovery in wage growth in the utilities sector is in line with the gradual recovery in national income growth over the next few years, supported by higher inflation, better news on national income, and a relative tightening in the availability of workers.
- Wage gains in the utilities sector are expected to be more modest than improvements across all industries. In part this represents a reversion of the current trend. This is also partly due to the fact that output in the utilities sector is forecast to grow more slowly than the average across all sectors.

Chart 2.8 Utilities Wage Price Index relative to National Wage Price Index



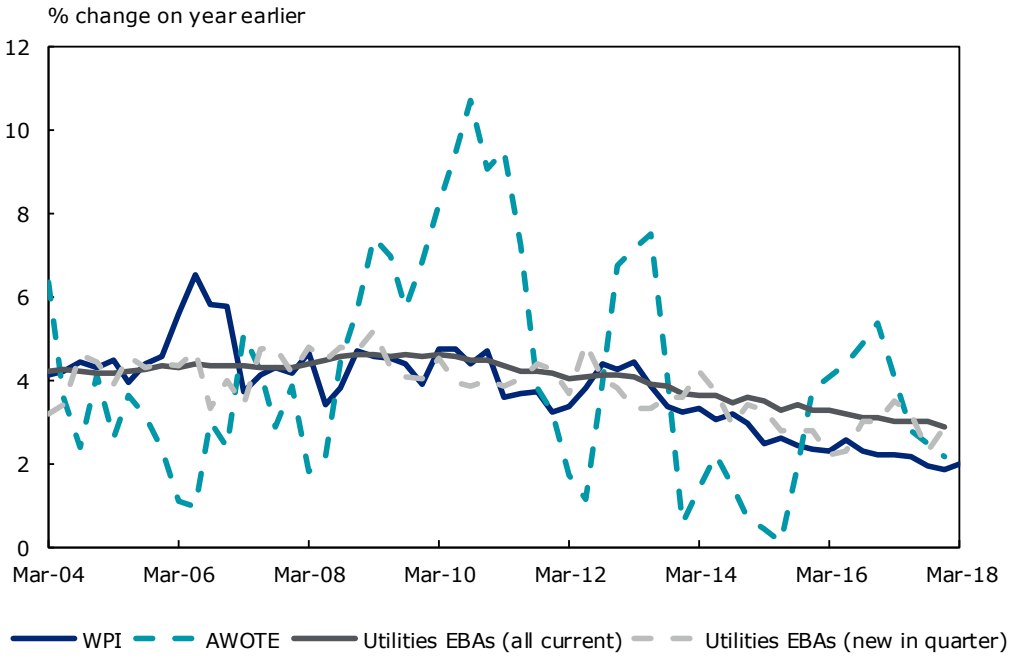
Source: Australian Bureau of Statistics, Deloitte Access Economics

2.2.2.2 Comparison with results from other wage growth measures

A number of wage growth measures have signalled lower wage growth in the utilities sector. Chart 2.9 shows that, despite volatility in Average Weekly Ordinary Time Earnings (AWOTE – the least informative of the wage measures considered below), the downward trend in utilities WPI is mirrored by several other wage growth measures that are produced on a regular basis.

These include Enterprise Bargaining Agreements (EBAs) sourced from the *Trends in Federal Enterprise Bargaining* publication produced by the Department of Jobs and Small Business.

Chart 2.9 Measures of utilities sector wage growth



Note: % change on year earlier refers to output growth between a quarter and the same quarter a year earlier
Source: Australian Bureau of Statistics, Department of Jobs and Small Business

The AWOTE series fluctuates considerably and is consequently limited in its use in forecasting wage growth. In the latest Average Weekly Earnings publication released in November 2017, the ABS indicated that the biannual survey was *'designed to provide estimates of the level of average earnings at a point in time and, while not designed for movements in earnings, the frequency of collection supports a time series of these level estimates'.* Data on the average level of earnings is useful for comparing what an individual earns relative to the average. It is therefore used in the Deloitte Access Economics wage price model as an indicator only.

The utilities EBA data provides a good partial indicator of the future trend growth in the utilities WPI measure.[2]

As at the December quarter of 2017, there were 364 EBAs active in the utilities sector, covering some 47,000 employees. In brief:

- Wages in 'all current EBAs' grew at 2.9% for the utilities sector in the December quarter of 2017, the slowest rate of increase since March 1993. That said, the average annualised wage increase (AAWI) in the utilities sector was above that across other sectors in the year to December 2017.
- Wage growth in new utilities sector EBAs was 2.9% in the December quarter of 2017, above the 2.3% gain in September 2017. That said, it remains below the 3.0% gain seen in December 2016 as well as the five-year average (3.2%).

2.2.2.3 Forecasting wages – the role of EBAs

Although EBAs feed into Deloitte Access Economics' short term forecasts for wage gains, there are important reasons why EBA data is not the sole driver of utilities wage movements going forward:

[2] Deloitte Access Economics' forecasts are developed using a more formal modelling approach rather than a more 'institution-based' approach which is based on increases in minimum wages and collective agreements. As such, while EBA data is taken into account, it is not the primary driver of our model.

- **Coverage issues** – EBA data includes only those employees who are covered under an agreement. While the percentage of those covered by EBAs will vary from State to State, the EBA database indicates that 47,000 utilities employees were covered by an EBA in December 2017. According to the latest labour force data there are approximately 151,400 individuals employed in the utilities industry nationwide, meaning that approximately one third of workers in the utilities sector are employed under EBAs.
- The 'all current' EBA series depicts wage growth under all EBAs current during the quarter – this series broadly follows the WPI. The 'new in quarter' EBA series shows annual wage growth under any agreements commencing in the quarter. Thus, this series is a fairly good predictor of future trends in the 'all current' EBA series, although, depending on the number of new EBAs struck in the quarter, the number of employees covered by new agreements can be quite small.
- **Circularity issues** – There is a risk that relying too heavily on EBA data to forecast wage growth could result in a level of 'circularity'. Wage costs of businesses whose employees are covered by the enterprise bargaining system will rise at a similar rate to EBAs, particularly those that have been negotiated more recently (as a result, in the short term our expected rate of overall EBA growth will move towards the rates seen in more recent agreements). However, newer EBAs themselves will be affected by economic developments over the forecast period, as well as trends in competitor industries and demand for utilities services.
- **Forward looking inputs** – More broadly, Deloitte Access Economics' forecasts – of the Australian and global economies, of the utilities sector, and of factors affecting wage trends – are important inputs to our forecasts of wage growth in the utilities sector. To rely too much on EBAs would be to miss the benefits of those forward looking inputs.

2.2.3 Labour productivity

Labour productivity measures the number of units of output an individual employee can produce in a given time period. The more units of output each worker can produce, the fewer workers are required to create a given level of industry output.

In this report, Deloitte Access Economics provides estimates of labour productivity at the national, State and industry level.

In the methodology used here the volatility in the underlying productivity data is minimised by creating a composite productivity measure based on national, industry and State-specific productivity movements – where the relative impact of movements in the smaller and more volatile States and industries is lessened.

Labour productivity for all industries is calculated as:

- GDP / employed persons in Australia – for national labour productivity; and
- GSP / employed persons in a given State – for State labour productivity.

Labour productivity estimates for an industry in a State and at the national level are based on a combination of:

- GDP / employed persons in Australia;
- GSP / employed persons in a given State;
- National sectoral GVA / employed persons in industry in Australia.

These three values are weighted based on factors reflecting the volatility of the various data. Larger States give a larger weight to their overall State estimates as they are less likely to be volatile from quarter to quarter.

Movements within sub-industries are also considered when estimating labour productivity for a particular industry. For example, the utilities sector comprises electricity, gas, water and waste services. As the utilities sector not only sees very volatile trends in measured productivity, but also because these trends may be caused by changing importance of the three sub-industries, the weight on utilities for the productivity calculation is lower than for some other industries.

The methodology adopted to estimate sectoral labour productivity is not equivalent to national sectoral GVA divided by employed persons due to the weighting of the measures listed above.

Table 2.2 compares labour productivity growth across the Australian economy with labour productivity growth in the Australian utilities sector.

As noted in section 2.2.2, labour productivity in the utilities sector has largely grown at a slower rate than productivity across the wider economy over the last two decades. Research conducted by the Productivity Commission found that growth in multifactor productivity (a wider measure of productivity that captures the difference in the growth of outputs and inputs such as capital and labour) was strongly negative between 1997-98 and 2009-10 (falling by an average of 3.2% per annum).

Falling multifactor productivity growth was due to an increase in the ratio of peak to average electricity demand (which lowered rates of capacity utilisation), investment in capital assets (which temporarily increased inputs prior to growth in output), undergrounding electricity cabling (which raised costs and quality of service but not the volume of output) and a policy shift in favour of cleaner energy generation (which were initially higher-cost forms of generation). This fall in multifactor productivity also appears to have weighed on labour productivity in the utilities sector from the late 1990s to the late 2000s. More recently, the impact of these factors has largely passed, leading to more settled gains in labour productivity in the utilities sector.

In 2016-17 labour productivity grew by 1.1% in the utilities sector, compared to 0.8% growth across all industries. Utilities sector labour productivity is forecast to fall by 0.7% in 2017-18, returning to positive growth in 2018-19. This is largely due to the fact that strong gains in employment in 2017-18 are expected to outweigh growth in output (for both the utilities sector and the wider economy), before easing thereafter. The moderation of employment gains from 2018-19 is likely to add upwards pressure to labour productivity. Utilities sector labour productivity is expected to closely track productivity in the wider economy over the medium term.

Table 2.2 Australian labour productivity forecasts

Financial year changes in productivity forecasts

	History	Forecast						
Annual % change	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**
All industries	0.8	-0.4	1.6	1.7	1.6	1.5	1.3	1.2
Utilities	1.1	-0.7	1.5	1.7	1.6	1.6	1.4	1.2

Source: Australian Bureau of Statistics, Deloitte Access Economics

2.2.4 Summary results

Forecasts for national and sectoral wage growth are shown in Table 2.3. Forecast components include real (inflation-adjusted) and nominal WPI, and productivity.

Table 2.3 National sectoral wage forecasts

Financial year changes in nominal national industry sector WPI

	History	Forecast						
Annual % change	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
All industries	1.9	2.1	2.3	2.5	2.8	3.1	3.3	3.2
Utilities	2.2	2.0	2.3	2.3	2.5	3.0	3.1	2.9

Financial year changes in real national industry sector Wage Prices

	History	Forecast						
Annual % change	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
All industries	0.2	0.1	0.1	0.3	0.4	0.7	0.9	1.0
Utilities	0.5	0.0	0.0	0.1	0.1	0.5	0.7	0.7

Financial year changes in productivity forecasts

	History	Forecast						
Annual % change	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
All industries	0.8	-0.4	1.6	1.7	1.6	1.5	1.3	1.2
Utilities	1.1	-0.7	1.5	1.7	1.6	1.6	1.4	1.2

Source: Australian Bureau of Statistics, Deloitte Access Economics

3 New South Wales

3.1 Economic outlook

3.1.1 Overview

New South Wales has remained one of the best performing States in recent years, assisted by high levels of public infrastructure investment, a relatively low exchange rate and interest rates still at record lows. The New South Wales economy grew by 2.9% in 2016-17, compared to the national average of 2.0%. More recently, state final demand increased 3.1% over the year to March 2018, slightly above the growth rate in Australian final demand (3.0%).

The housing market has been a major driver of growth in the State. However, with house prices starting to drift downwards and approvals falling from their peak, housing construction has started to decline. Falls in construction activity will likely continue over the next year as the slowdown in demand in the established housing market causes developers to ease back on supplying new stock. The high level of overseas migrants should continue to provide support to the market, offsetting negative interstate migration as people leave New South Wales, keeping population growth relatively strong.

With housing prices in New South Wales falling from their recent record highs, the Australian Prudential Regulation Authority (APRA) announced it would relax its cap on housing investor loans, which could see interest rates for investment loans fall. This comes as investment lending has fallen to its lowest level since January 2016, the royal commission has increased scrutiny on bank lending practices and Chinese investors have faced new taxes and tougher capital controls.

Elevated house prices have forced New South Wales households to take out larger mortgages, pushing household debt to record levels. High household debt increases vulnerability to interest rate rises, though the RBA is unlikely to increase rates this year. Inflation is still very low, and wage growth remains relatively low. With high household debt and little income growth, households are likely to remain cautious about spending.

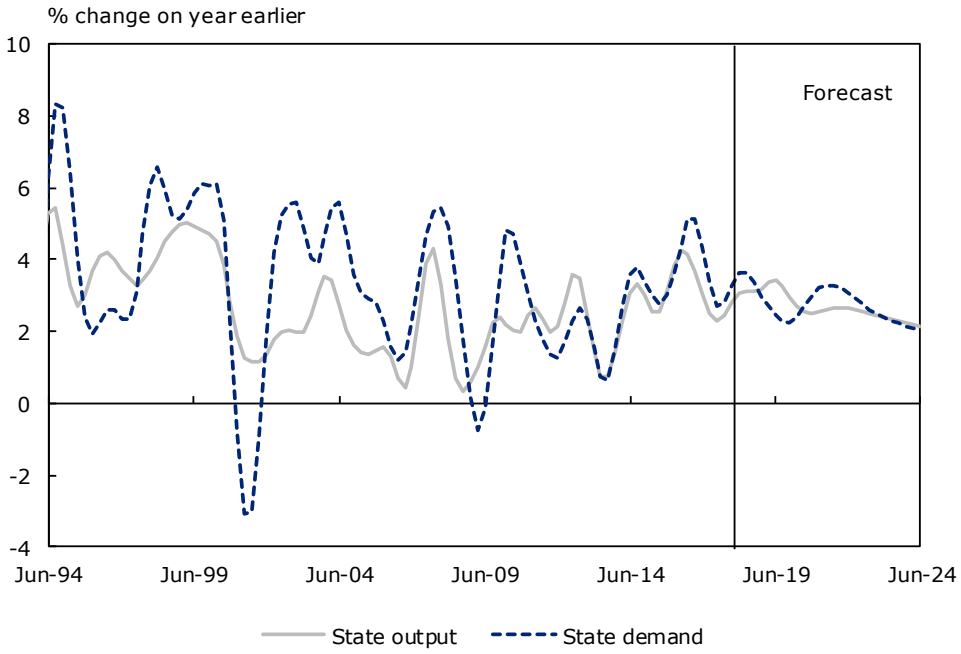
Surging stamp duty and proceeds from privatisations (or long-term leases) of assets including Transgrid ($10 billion), AusGrid ($16 billion) and Endeavour Energy ($8 billion) have led to Budget surpluses and helped enable major public infrastructure investment. Most of this has gone into road and rail investment, with road projects under construction including the $16.8 billion WestConnex and the $3 billion NorthConnex, as well as rail projects under construction including the $12 billion Sydney Metro City and Southwest, the $10.4 billion Sydney Metro West, and the $8.3 billion Sydney Metro Northwest. Looking forward, the largest project in the pipeline is the $5.3 billion Western Sydney Airport at Badgerys Creek. The recent New South Wales Budget allocated $87.2 billion to infrastructure investment over the next four years.

New South Wales has benefited from the drop in the Australian dollar since its peak in 2012. Services including the tourism and education sectors have been the main beneficiaries, though manufacturing and agriculture have benefited from the increased competitiveness of exports. International visitors increased 7.4% over the 2017 calendar year and international visitor expenditure was up 9.5%. The number of international students increased 13.8%, above the national figure of 11.9% over the same period.

The labour market continues to be among the strongest in Australia with an unemployment rate in March 2018 of 5.0%, below the national rate of 5.5%. Deloitte Access Economics expects the unemployment rate to stay at or below 5.0% in the next few years.

Deloitte Access Economics expects the broad economic strength in the New South Wales economy to continue with economic growth to average 2.9% over the five years to 2023-24 (Chart 3.1).

Chart 3.1 Output and demand (change on year earlier), New South Wales



Note: % change on year earlier refers to output growth between a quarter and the same quarter a year earlier
Source: Australian Bureau of Statistics, Deloitte Access Economics.

Table 3.1 sets out Deloitte Access Economics' current forecasts for the New South Wales economy between 2016-17 and 2023-24.

Table 3.1 New South Wales output and demand forecasts

Financial year changes in New South Wales key economic variables	History	Forecast						
Annual % change (unless noted)	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Consumption								
Private sector	2.7	2.9	2.3	2.0	1.9	2.2	2.5	2.4
Public sector	4.9	2.3	3.7	2.8	2.7	2.8	2.7	2.6
Private sector investment								
Dwelling investment	9.6	-2.6	-5.2	-4.4	6.1	5.4	-1.3	-4.8
Non-residential building	-3.0	19.9	11.4	7.2	5.9	3.6	1.9	1.3
Engineering construction	25.0	29.8	-5.2	-4.8	1.6	2.8	2.2	1.7
Machinery and equipment	2.8	1.7	14.0	7.8	8.3	5.3	4.1	4.1
IP and livestock	7.5	7.2	10.8	8.7	11.4	8.3	6.5	5.5
Public investment								
General Government	15.6	14.6	3.0	4.9	6.0	4.7	4.1	4.0
Public enterprises	2.2	-1.1	-4.4	-4.7	-0.6	-0.1	0.4	1.0
Real final demand	3.8	3.4	2.9	2.4	3.2	3.0	2.5	2.1
Private sector	3.2	3.2	2.9	2.3	3.2	3.0	2.4	1.9
Public sector	6.2	4.0	3.0	2.7	3.1	3.0	2.8	2.8
Gross State output	2.9	3.0	3.2	2.9	2.6	2.6	2.4	2.2
Employment	0.7	3.2	1.8	1.3	1.4	1.5	1.4	1.3
Unemployment rate (%)	5.0	4.8	4.8	5.0	5.0	4.9	4.9	5.1

Note: All variables (except for jobs and unemployment) expressed in inflation adjusted terms.
Source: Australian Bureau of Statistics, Deloitte Access Economics.

3.1.1 Utilities sector

The utilities sector in New South Wales is undergoing a similar experience to the national utilities sector, namely cost pressures and regulatory uncertainty in an environment of longer-term energy demand reductions. The AEMO estimates that energy consumption in New South Wales fell by 2.8% over 2016-17. Both the large recent increases in electricity prices and the long-term trend towards lower energy usage by households and industry contributed to this fall. Uptake of technologies such as rooftop solar, cogeneration and more energy efficient household appliances have contributed to this decline.

Renewable energy technologies comprised almost a fifth of New South Wales energy mix in 2016. Recent initiatives have committed to increasing the generation capacity of renewable energy. Three priority regional energy zones have been identified with the potential to generate large amounts of wind and solar energy. Projects in these zones would face fewer regulatory and planning constraints to encourage investment. The government also announced a strategy to attract new investment in energy transmission by coordinating planning for new high voltage power lines.

New South Wales has approximately 20,000MW of installed electricity generation capacity with power plant proposals totalling 17,500MW expected to replace coal-fired plants as they come offline. Over half of the proposed capacity comes from renewable energy sources. Snowy 2.0 has been fast tracked for development with the expectation that the power generated from it will replace generation lost by the shutdown of coal-fired power plants.

Regulatory uncertainty has reduced investment in new fossil fuel generation assets, constraining future growth of the sector. With an outlook of lower demand and peak demand over the longer term, employment and wage growth in the utilities sector may be relatively modest.

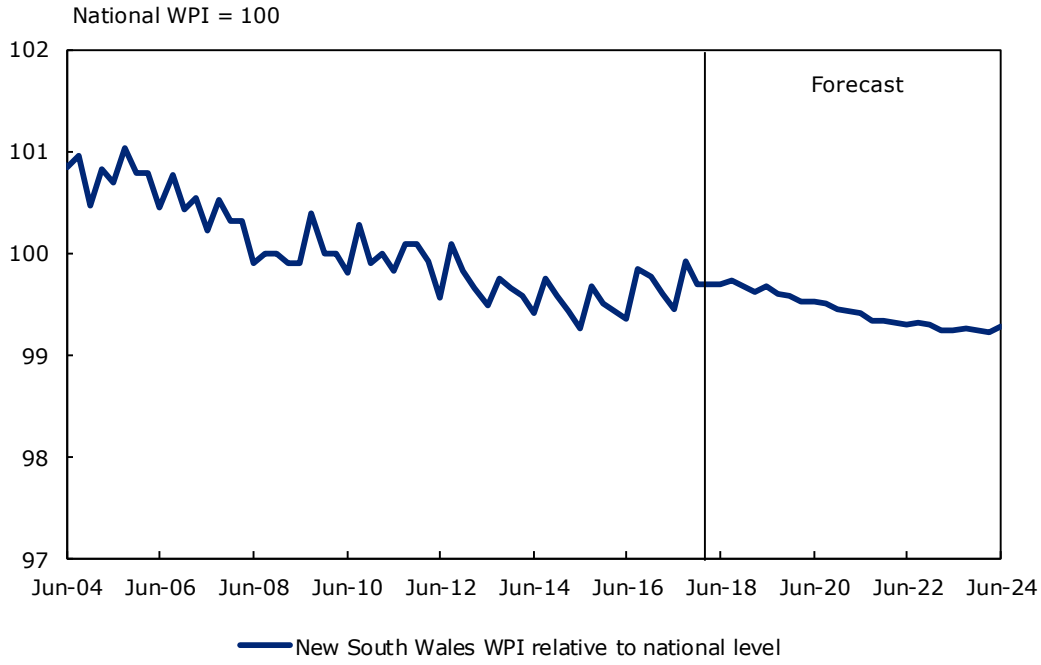
3.2 Outlook for wages

3.2.1 All industries

New South Wales WPI growth was 2.1% in the year to March 2018, slightly above the national figure. Wage growth has been below historical levels at both the State and national level for several years.

Chart 3.2 shows movements in New South Wales' WPI relative to the national equivalent. The decline in the State's WPI relative to the national equivalent beginning around 2005 partly reflects rising wages in the resource rich States during the mining boom. New South Wales' WPI has shown signs of improvement in recent years, with the WPI expected to remain slightly below the national average.

Chart 3.2 New South Wales WPI relative to national WPI



Source: Australian Bureau of Statistics, Deloitte Access Economics.

New South Wales has seen a stabilisation of its wages relative to the national average due to positive developments in the New South Wales economy and broader weakness in other States. Employment growth in New South Wales was 2.9% over the year to May 2018, in-line with the national average.

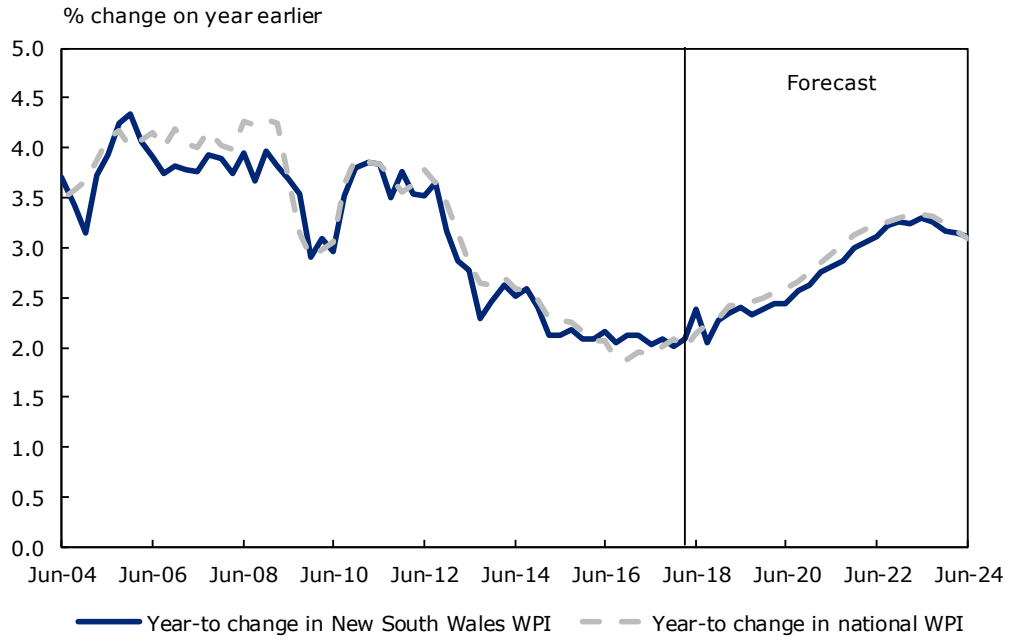
In recent years, weak wage growth in resource intensive States has also contributed to New South Wales improving its WPI relative to the national average. Falls in commodity prices have led to significant cutbacks in mining investment, resulting in slower economic activity and wage gains in these States.

Despite New South Wales experiencing above average economic growth and employment gains, wage growth remains relatively low and upward pressure remains limited.

- **Despite strong recent and expected future growth, there are still significant downside risks.** There is still the possibility of a hard landing for the housing market and housing construction which would weigh on activity. The peak of public infrastructure investment appears imminent with any drop off to cut growth.
- **Low wage growth appears entrenched across Australia.** Despite a falling unemployment rate, spare capacity in the labour market and structural factors are preventing significant wage gains. Moving forward, wage gains are likely to remain relatively low compared with historical levels.

Wage growth in New South Wales is expected to roughly match the national growth rate over the forecast horizon. Deloitte Access Economic expects the State's annual wage growth to return to 3.2% by 2023-24, in line with the national figure.

Chart 3.3 New South Wales general WPI growth



Note: % change on year earlier refers to output growth between a quarter and the same quarter a year earlier
Source: Australian Bureau of Statistics, Deloitte Access Economics.

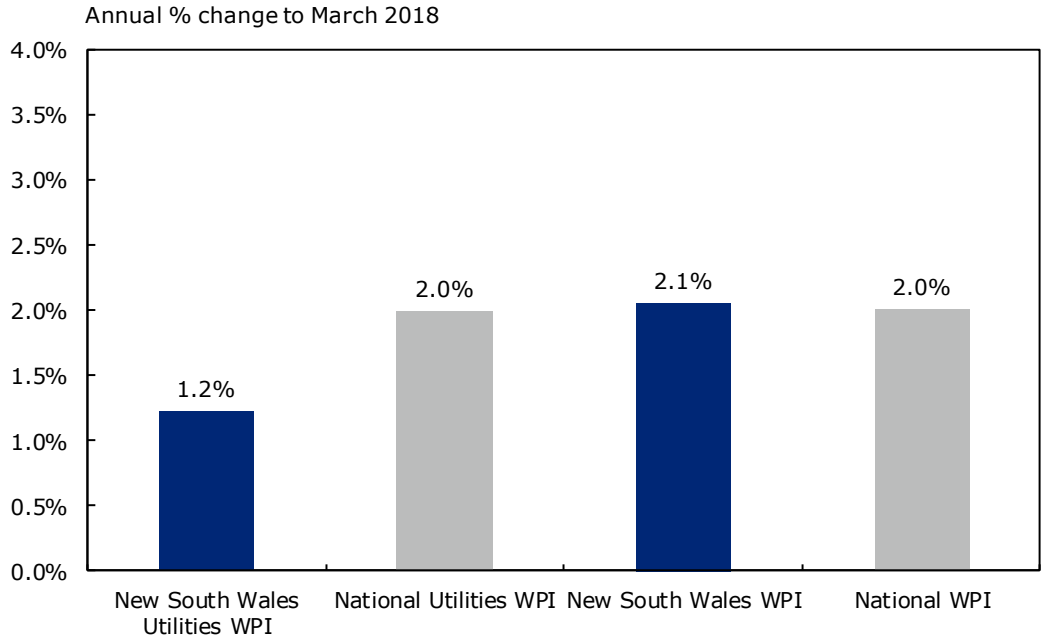
3.2.2 Utilities sector wages

Both the New South Wales and national utilities sector wages follow similar trends. This is because New South Wales makes up a relatively large share of national utilities output. However, at the State level there may be greater volatility in utilities output relative to the nation, particularly over short time periods. Recent years have seen slower wage growth for New South Wales.

Chart 3.4 shows wage growth for the utilities sector in New South Wales was relatively low over the year to March 2018 at 1.2%. This compares to the national average for the sector of 2.0% and the State's all industry average of 2.1%.[3]

[3] Australian Bureau of Statistics (2018), Cat. No. 6345.0, *Wage Price Index*, special request

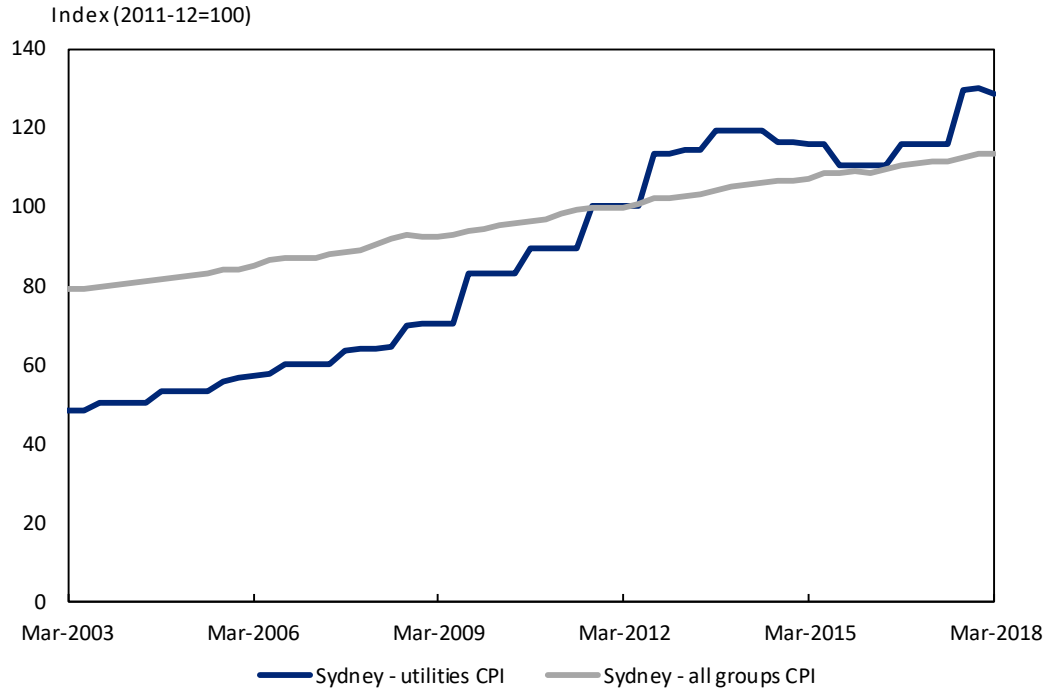
Chart 3.4 Comparative WPI annual growth rates in year to March 2018



Source: Australian Bureau of Statistics, Deloitte Access Economics.

Growth in utility prices have accelerated in the past year after moderate growth since early 2012 (Chart 3.5). Average annual growth in CPI over the five years to March 2018 was 2.7% for utilities and 2.0% in Sydney. Over the year to March 2018, CPI for utilities rose by 10.0% compared to 2.1% across all groups.[4]

Chart 3.5 Sydney utilities prices

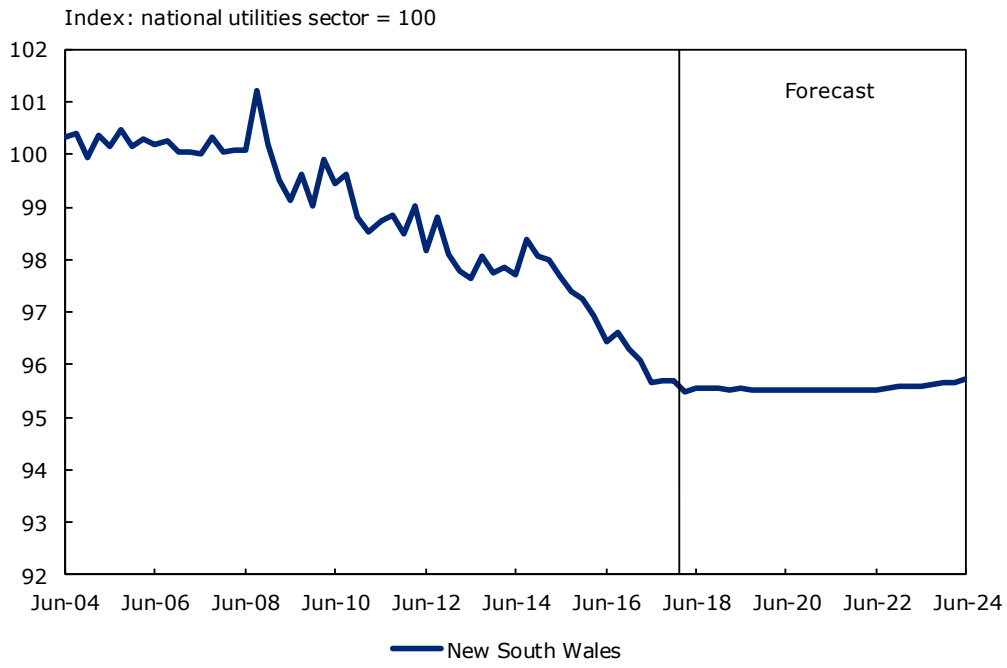


[4] Australian Bureau of Statistics (2018), Cat. No. 6401.0, *Consumer Price Index*

Source: Australian Bureau of Statistics.

New South Wales utilities sector WPI relative to the national average for the sectors has been in decline since early 2009 (Chart 3.6). This fall began at a time when resource-intensive States were growing strongly relative to south-eastern States and experiencing higher wage growth. More recently, the utilities sector has experienced relatively poor performance in New South Wales.

Chart 3.6 New South Wales utilities WPI relative to national utilities WPI

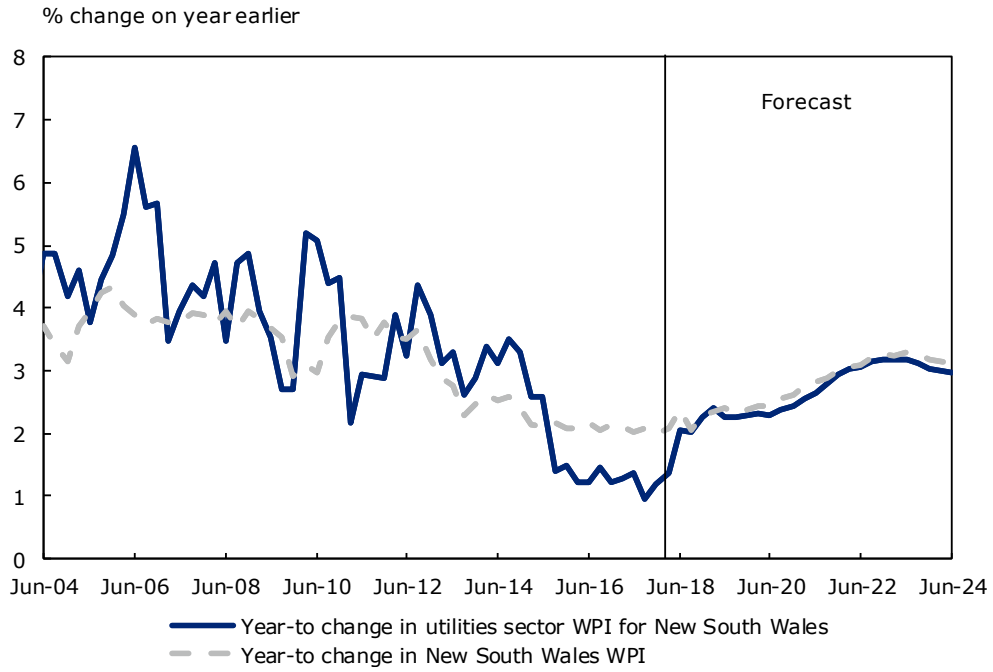


Source: Australian Bureau of Statistics, Deloitte Access Economics.

Utilities sector wage growth typically fluctuates much more than overall New South Wales wage growth (Chart 3.7). Wage growth for the New South Wales utilities sector has remained below the gains in the wider State economy since mid-2015, partly due to the relatively strong performance of sectors such as entertainment and recreation and healthcare.

Wage growth for utilities in New South Wales is expected to return to a similar growth rate to Australia's over the forecast horizon as utilities output in the State accelerates back towards trend growth. The pick-up in growth is expected to drive demand for jobs and increase wages. Additionally, the higher utilities wage growth in the resource-intensive States during the mining boom (which has now ended) is not expected to continue over the outlook. Both factors are expected to support more aligned wage growth between the New South Wales utilities sector and the national utilities sector over the outlook. By 2023-24, annual wage growth of 3.0% and 2.9% are forecast for the New South Wales and Australian utilities sectors respectively.

Chart 3.7 New South Wales utilities general WPI growth



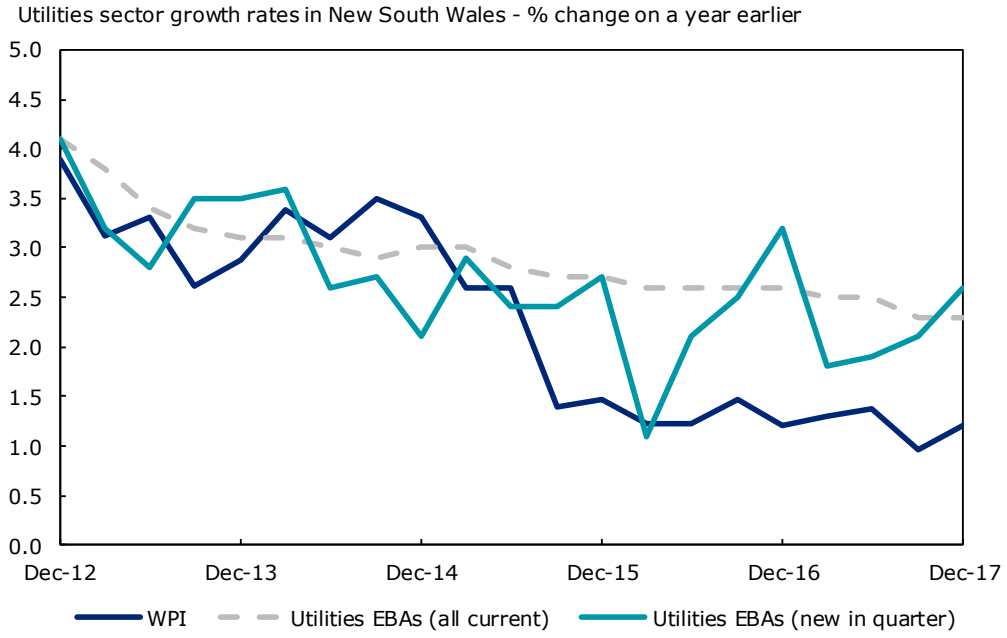
Note: % change on year earlier refers to output growth between a quarter and the same quarter a year earlier
Source: Australian Bureau of Statistics, Deloitte Access Economics.

3.2.2.2 Comparison with EBA outcomes

Chart 3.8 shows growth in the New South Wales utilities sector WPI alongside outcomes in State EBAs for the sector. The following can be concluded:

- The AAWI across all current utilities EBAs in New South Wales has moderated slightly in recent periods.
- After reaching a low of 1.1% in early 2016, the AAWI for new utilities sector EBAs in New South Wales has fluctuated somewhat, reaching its decade average of 3.2% in December 2016 but moderating slightly since then. AAWI for new EBAs was 2.6% in December 2017.
- The AAWI for current utilities sector EBAs in New South Wales typically underperforms the national average. In December 2017, the State's AAWI was 0.5 percentage points lower than the Australian average.

Chart 3.8 Comparative measures of wage growth in the New South Wales utilities sector



Note: % change on year earlier refers to output growth between a quarter and the same quarter a year earlier
Source: Australian Bureau of Statistics, Department of Jobs and Small Business.

3.2.3 Labour productivity

The labour productivity figures in Table 3.2 show a consistent trend between the labour productivity of the utilities sector and all industries in New South Wales. 2017-18 is expected to see a decline in labour productivity for the utilities sector with strong employment growth over the first three quarters of the year.

Contributing to the decline in utilities sector labour productivity has been the relatively slow growth of electricity demand as households and businesses have aimed to reduce energy usage and moved to more energy efficient appliances. This has slowed output growth relative to the growth in employment, and has caused the labour productivity measure to fall.

Across the outlook, forecast labour productivity growth should recover somewhat with utilities sector labour productivity remaining slightly above all industry labour productivity growth. This is largely driven by expectations that utilities sector output growth (although below growth in the wider State economy) will be above utilities employment growth. As a result, output per worker (labour productivity) in the utilities sector is forecast to grow slightly above the average for all industries.

Table 3.2 New South Wales and national labour productivity forecasts

Financial year changes in New South Wales and national labour productivity forecasts

	History	Forecast						
Annual % change	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**
New South Wales - All industries	2.1	-0.2	1.4	1.5	1.1	1.1	1.0	0.9
New South Wales - Utilities	1.6	-0.6	1.4	1.6	1.4	1.4	1.3	1.1
National - All industries	0.8	-0.4	1.6	1.7	1.6	1.5	1.3	1.2
National - Utilities	1.1	-0.7	1.5	1.7	1.6	1.6	1.4	1.2

Source: Australian Bureau of Statistics, Deloitte Access Economics

3.2.4 Summary results

Forecasts for sectoral wage growth in New South Wales are shown in Table 3.3 below. These forecasts include real and nominal WPI aggregates.

Table 3.3 New South Wales and national wage forecasts

Financial year changes in New South Wales and national nominal Wage Price aggregates

	History	Forecast						
Annual % change	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
New South Wales - All industries	2.1	2.1	2.3	2.4	2.7	3.0	3.3	3.2
New South Wales - Utilities	1.3	1.4	2.2	2.3	2.5	3.0	3.2	3.0
National - All industries	1.9	2.1	2.3	2.5	2.8	3.1	3.3	3.2
National - Utilities	2.2	2.0	2.3	2.3	2.5	3.0	3.1	2.9

Financial year changes in New South Wales and national real Wage Price aggregates

	History	Forecast						
Annual % change	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
New South Wales - All industries	0.1	-0.1	-0.1	0.1	0.3	0.6	0.9	1.0
New South Wales - Utilities	-0.7	-0.8	-0.1	0.0	0.1	0.6	0.8	0.8
National - All industries	0.2	0.1	0.1	0.3	0.4	0.7	0.9	1.0
National - Utilities	0.5	0.0	0.0	0.1	0.1	0.5	0.7	0.7

* Historical data estimates using Deloitte Access Economics Wage Price Index forecasting model. Unavailable from the ABS.
Source: Australian Bureau of Statistics, Deloitte Access Economics.

4 Tasmania

4.1 Economic outlook

4.1.1 Overview

Tasmanian State Final Demand grew by 3.7% over the year to March 2018, driven by stronger business investment and tourist arrivals to the State.

A favourable economic backdrop has been supporting Tasmania's key industries – tourism, agriculture, and food and beverage manufacturing. The Australian dollar has remained relatively low, and exports have been supported by demand from a growing Asian market.

Improvements in business sentiment in Tasmania have been broad-based across different industries. The *Sensis Business Index March 2018* reported that business confidence in Tasmania is currently the highest in the nation (on par with the Australian Capital Territory).

Increased tourism has largely contributed to the State's growth. Interstate visitor numbers grew 10.6%, and the number of overseas visitors increased 18.3% over the year to December 2017.[5] Tasmania is now leading the nation in international visitor spending growth, rising by approximately one third over the year to December 2017.

Population growth has improved in Tasmania providing support to the economy. Population is growing at its fastest rates since 2010 supported by positive net interstate migration. Tasmania's population grew 0.7% in 2017, however, still below the national average of 1.6%. Employment growth has strengthened in the State as well with job growth in both full-time and part-time employment.

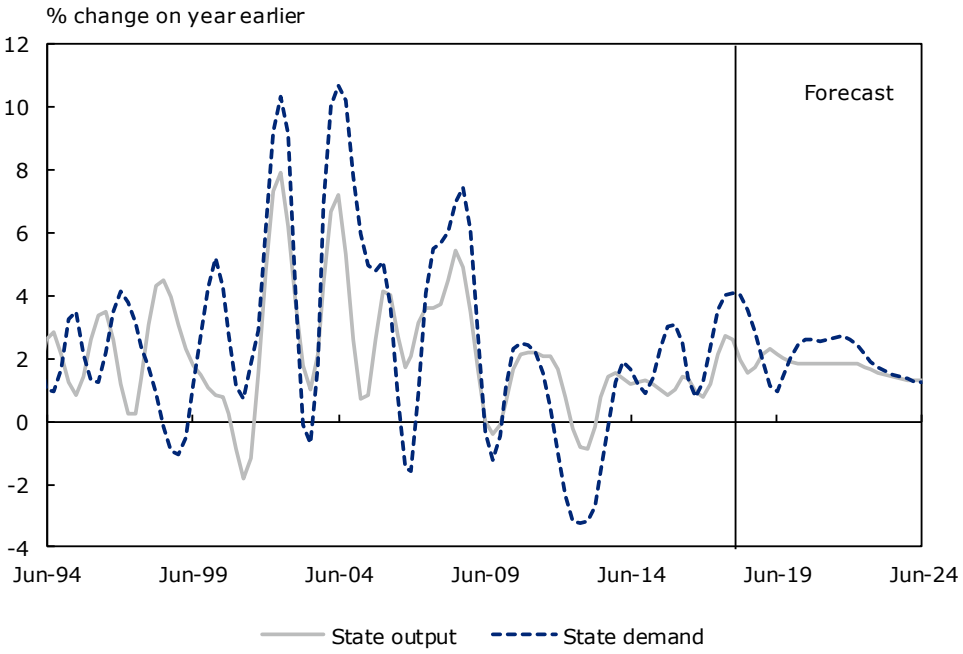
Tasmania's engineering construction sector has continued to strengthen, with a number of large projects underway, including the $535 million Midland Highway upgrade and the $689 million redevelopment of the Royal Hobart Hospital. The pipeline of planned work is also encouraging, with projects that span from the mining, engineering and commercial sectors.

Tasmania has also recorded the highest growth in median house prices in Australia in the year to March 2018 (although from a lower base). House prices have grown faster than in any other State or Territory, while vacancy rates have been at all-time lows causing rents to rise faster than elsewhere in the nation. The stronger performance of the housing market has led to improvements in residential construction, which in September 2017 recorded its largest quarterly growth since 2014. Leading indicators suggest this is likely to continue. Dwelling approvals rose by 23% in 2017 and vacancy rates were 1.4% in the March quarter of 2018. With interest rates remaining at record lows, the residential constructions sector looks set to support the State's economy over coming years.

Overall, Tasmania's economy is expected to grow, albeit below the national average. Deloitte Access Economics is forecasting output growth of 2.1% in 2017-18 and in 2018-19, which is below the forecast for the Australian economic growth rate of 2.6% and 3.0%, respectively.

[5] Tourism Research Australia, *International Visitors in Australia Survey,* year ending December 2017

Chart 4.1 Tasmania output and demand



Note: % change on year earlier refers to output growth between a quarter and the same quarter a year earlier
Source: Australian Bureau of Statistics, Deloitte Access Economics

Table 4.1 sets out Deloitte Access Economics' current forecasts for the Tasmanian economy.

Table 4.1 Tasmania output and demand forecasts, financial year

Financial year changes in Tasmania key economic variables								
Annual % change (unless noted)	History 2016-17	Forecast 2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Consumption								
Private sector	0.6	3.7	1.4	0.8	0.5	1.0	1.2	1.3
Public sector	5.0	1.1	2.1	2.2	1.6	1.7	1.5	1.5
Private sector investment								
Dwelling investment	-17.4	-3.8	5.5	10.4	13.2	9.0	-0.1	-4.8
Non-residential building	4.6	0.2	11.3	9.4	14.8	11.3	3.0	0.5
Engineering construction	16.3	28.5	7.7	-2.5	5.0	7.5	3.0	0.7
Machinery and equipment	-0.2	27.7	-2.1	1.1	6.4	6.2	3.8	3.1
IP and livestock	4.9	7.5	5.6	-0.2	6.8	7.6	7.5	4.9
Public investment								
General Government	19.2	7.3	11.8	20.0	11.5	6.5	5.0	4.3
Public enterprises	0.6	20.7	-15.8	-13.1	-1.8	-1.0	-0.5	0.2
Real final demand	1.8	3.9	1.7	2.2	2.6	2.5	1.7	1.3
Private sector	0.1	4.1	1.7	1.5	2.4	2.5	1.5	1.0
Public sector	6.3	3.4	1.8	3.8	3.1	2.4	2.1	2.0
Gross State output	1.1	2.1	2.1	1.9	1.8	1.8	1.5	1.3
Employment	0.3	2.5	0.3	0.4	0.2	0.0	-0.1	-0.1
Unemployment rate (%)	6.3	5.9	5.9	5.9	5.8	5.7	5.8	6.2

Note: All variables (except for jobs and unemployment) expressed in inflation adjusted terms.
Source: Australian Bureau of Statistics, Deloitte Access Economics

4.1.2 Utilities sector

Tasmania's utilities sector has been through periods of significant reform overs the past two decades. The implementation of national competition policy reforms in the mid-1990s led to the disaggregation of the State's Hydro-Electric Corporation in 1998. Tasmania joined the NEM in 2005, and Basslink (the Bass Strait electricity cable) was commissioned in 2006, connecting Tasmania with the national electricity grid.

Energy generation within Tasmania comprises; hydro, wind and gas, and imported energy through the Basslink. Over 70% of the State has its energy provided by hydro generation. Through 2017, hydro and wind generation alone were sufficient to meet Tasmanian electricity demand.[6]

Tasmania's Government-owned hydroelectricity monopoly, Hydro Tasmania, is the nation's largest generator of clean renewable energy. The generator currently produces more than a third of the renewable energy traded on NEM.

Hydro Tasmania has a *Battery of the Nation* initiative, which aims to set up a blueprint for how Tasmania's renewable resources are developed over the next few decades. The initiative has received support from the Australian Renewable Energy Agency (ARENA), and aims to turn the State's abundant hydro and wind power resources (that exceed Tasmanians' needs) into an export earner.[7]

The Tasmanian Government's 2018-19 Budget allocated funding to support initiatives in the utilities sector, and has a commitment to renewable energy. The Cattle Hill Wind Farm project is currently underway and will consist of 48 turbines.

Since the Basslink was activated, the State's energy pricing has been affected by volatility in the mainland electricity market, particularly Victoria's (due to its relatively close proximity). Last year, the Tasmanian State Government proposed the *Tasmania First* energy policy in response to volatility in the market. The energy policy proposes to break Tasmania from mainland electricity contract pricing under NEM by July 2021, and to cap power prices at CPI until this break occurs.[8]

4.2 Outlook for wages

4.2.1 All industries

Tasmania (and Victoria) recorded the highest wage growth over the year to March 2018 at 2.3%. The Tasmanian labour market has strengthened over the past year with increased employment due to its stronger economic performance. This has placed some upward pressure on wages.

Chart 4.2 shows that the Tasmanian WPI has moved largely in line with the national average since mid-2004. However, over the past few years Tasmania's WPI growth has been slightly above the nation's. Both the State and the national labour markets have been strengthening. But, Australia has been seeing slightly less wage growth relative to Tasmania. This is largely due to Australia's labour participation growth remaining above employment growth, which has weighed on the national labour market's ability to lift wages.

Despite stronger growth in the State's wages this year, wage growth is still substantially below rates recorded in earlier years. Moreover, looking ahead, Tasmania's wage growth may be limited by the following risks to the State's outlook:

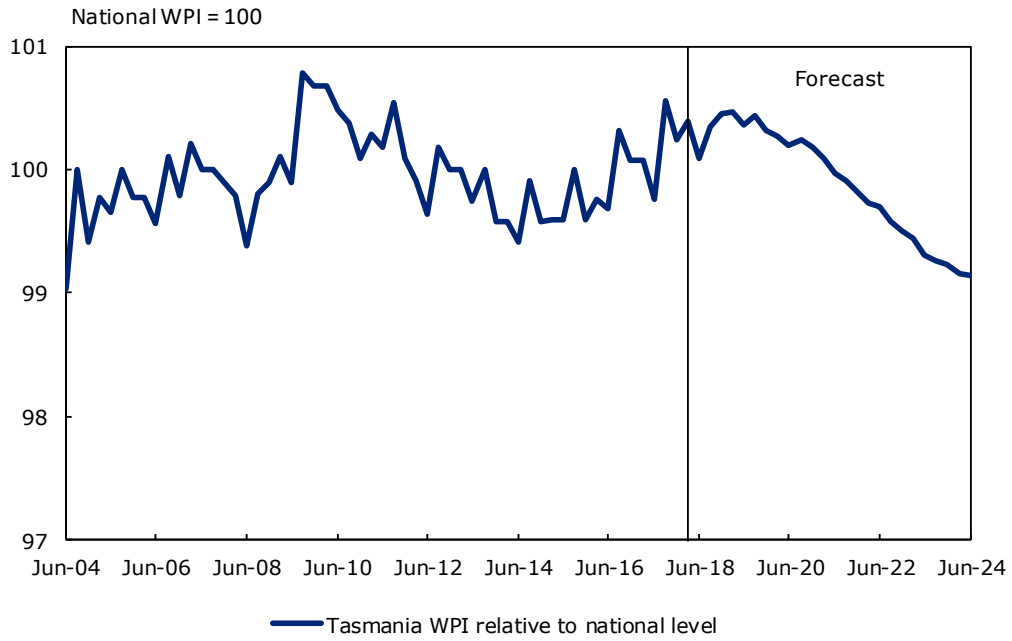
- **National wage growth is still low.** While improvements have been made in the labour market recently, a degree of spare capacity in the labour market is likely to see Australian wage growth remain relatively modest. This would have an impact on mainland households' demand for travel, including to Tasmania.
- **Business investment growth may not sustain.** High levels of business investment drives sustained economic growth. In Tasmania, investment levels can be volatile due to the timing of major projects. A slowdown in business investment growth would have a contractionary effect on economic growth on the States' labour market, businesses and demand for labour. This would cap any wage growth pressure.
- **China's future growth prospects, and its impact on Tasmania's export market.** China is the State's principal export market, and an important source of the State's tourism and international students. Tasmania has been performing well of late, largely due to its

[6] Tasmanian Economic Regulator, *Annual Energy Security Review*, November 2017
[7] Hydro Tasmania, 'Battery of the Nation', 2018
[8] Minister for Energy, 'Government gets to work on Tasmania First energy policy', 23 March 2018

strengthening tourism industry. Any slowdown in the Chinese economy would have direct impacts on a range of Tasmanian businesses, and keep pressure on employers to limit wage gains.

However, the above are merely risks to the State's outlook. Deloitte Access Economics forecasts Tasmania's WPI to grow above the national average in the near term, as recent positive economic conditions continue. However, from mid-2020, Tasmania's WPI is forecast to grow below the national average (see Chart 4.2). This is in line with expectations for economic growth in Tasmania to be below the national average over the longer run.

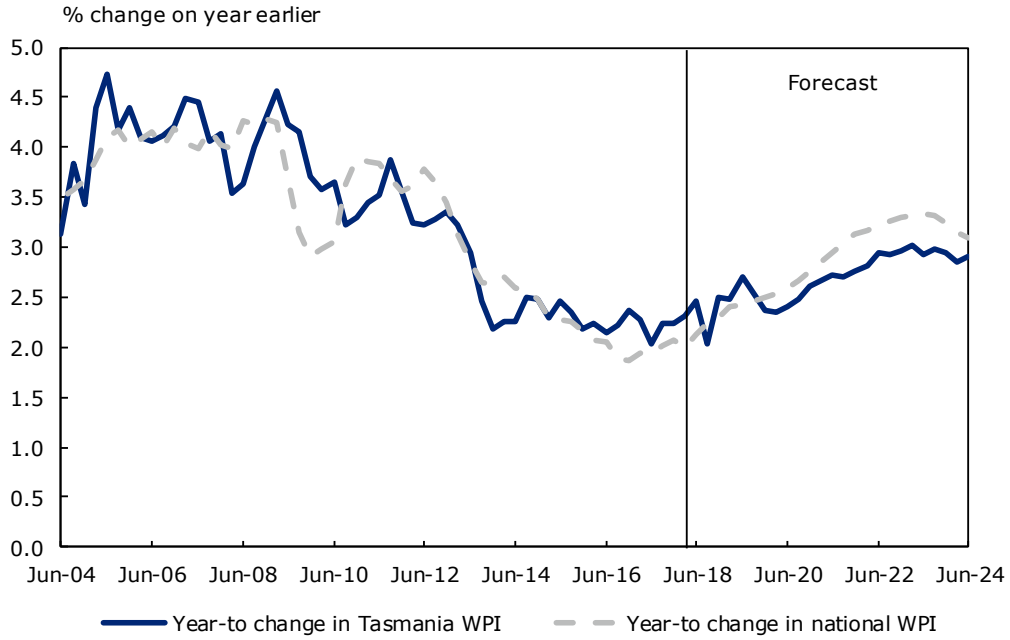
Chart 4.2 Tasmania WPI relative to national WPI



Source: Australian Bureau of Statistics, Deloitte Access Economics

Looking ahead, Tasmania's WPI growth is expected to pick up from 2.3% in 2017-18 to 2.4% in 2018-19. Chart 4.3 shows that the recovery of wage growth in Tasmania is set to outpace the national average at first, before falling below national growth rates. Tasmania's WPI is still expected to trend upwards to 2023-24, growing 2.6% per annum on average over the forecast period. Whereas Australia's WPI is expected to rise 2.8% per annum on average. This is expected to occur as Tasmania's economic growth is forecast to trend below the national average, driving lower wage growth in the State too. WPI growth in Tasmania is forecast to reach 2.9% by the end of the forecast period in 2023-24.

Chart 4.3 Tasmania general WPI growth

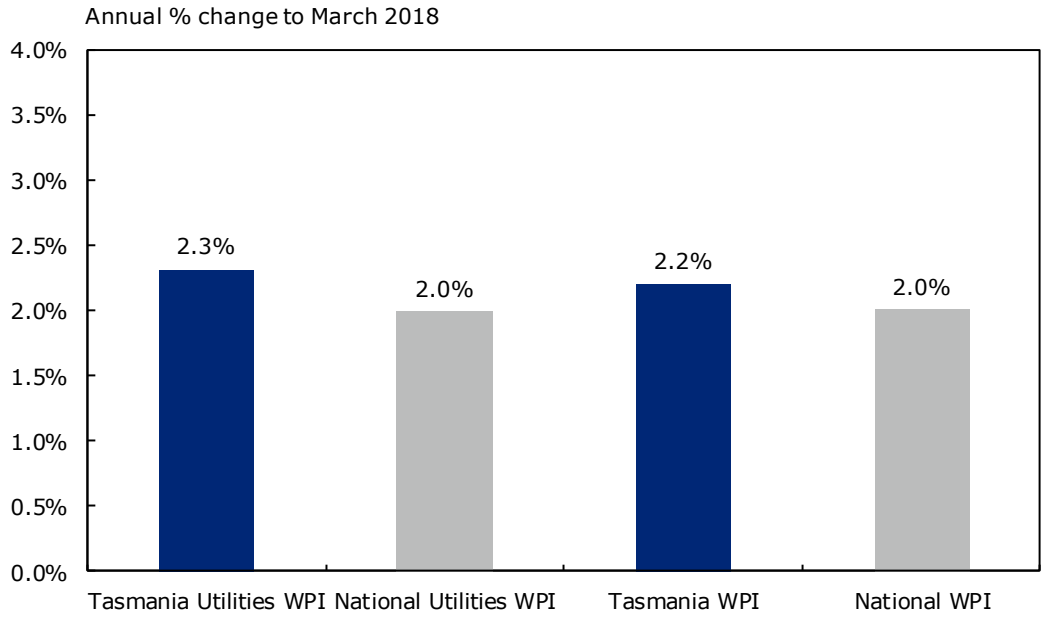


Note: % change on year earlier refers to output growth between a quarter and the same quarter a year earlier
Source: Australian Bureau of Statistics, Deloitte Access Economics

4.2.2 Utilities sector wages

In the absence of ABS data for the Tasmanian utilities sector, Deloitte Access Economics estimates that the Tasmanian utilities WPI grew by 2.3% over the year to March 2018 (see Chart 4.4). Over the past year, estimated utilities wages in Tasmania increased above wage growth in the overall Tasmanian economy, national utilities sector, and in the broader Australian economy. Tasmania's wage growth for utilities is estimated to be above all industries, in line with the national trend (discussed in section 2.2.2). And, Tasmania's wage growth is estimated to be above the nation's during this period, driven by stronger employment growth (3.4%) relative to labour participation growth (2.8%) in the State economy. This has placed some upward pressure on Tasmanian wages.

Chart 4.4 Comparative WPI annual growth rates in the year to March 2018

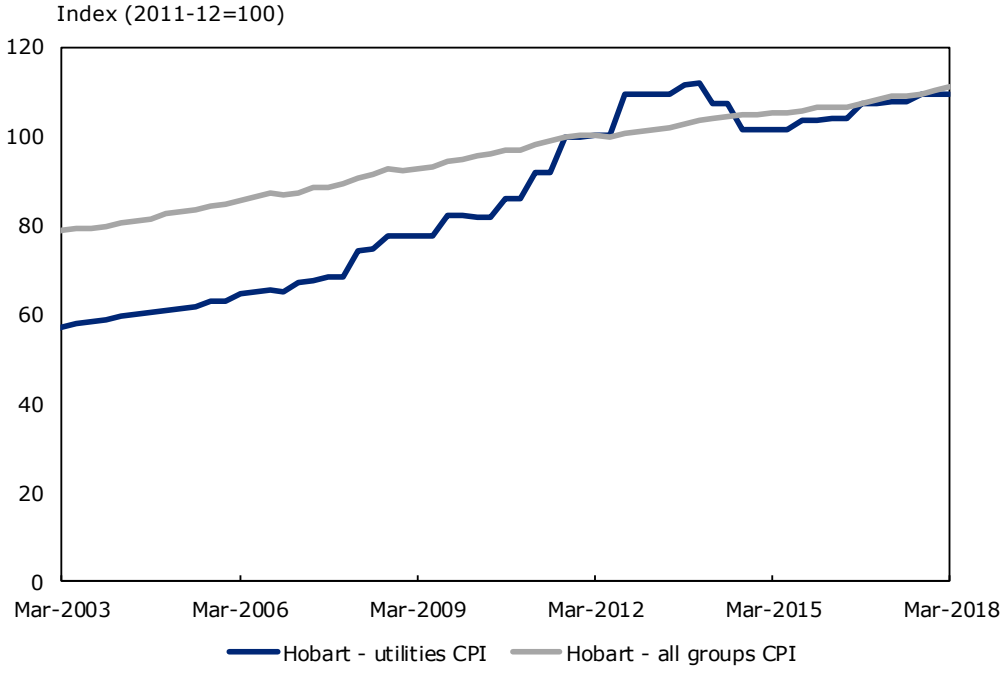


*Historical data estimated using Deloitte Access Economics' wage price model. Unavailable from the Australian Bureau of Statistics.

Source: Australian Bureau of Statistics, Deloitte Access Economics

Chart 4.5 shows that estimated utilities prices increased by 2.3% over the year to March 2018 in Hobart. This is slightly above growth in prices for the overall economy, which increased by 2.1% during this time.[9] However, utilities CPI remains slightly below the overall State economy's CPI.

Chart 4.5 Hobart utilities prices

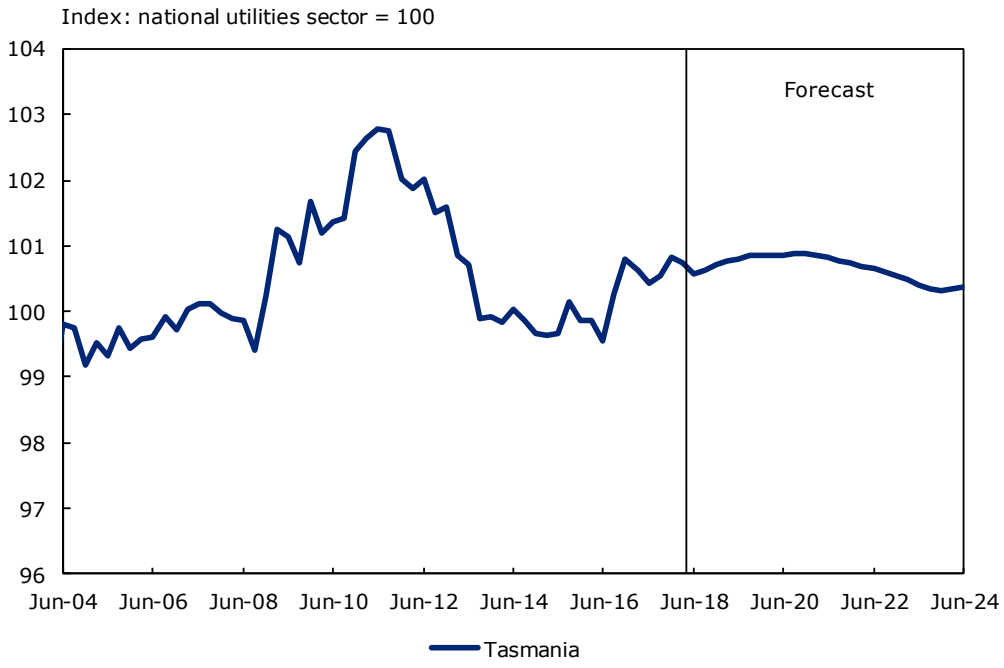


Source: Australian Bureau of Statistics, Deloitte Access Economics

[9] Australian Bureau of Statistics (2018), Cat. No. 6401.0, *Consumer Price Index*

Chart 4.6 shows that estimated wage gains in the Tasmanian utilities sector have outpaced those in the national utilities sector since mid-2016.

Chart 4.6 Relative utilities WPI forecasts for Tasmania



Source: Australian Bureau of Statistics, Deloitte Access Economics

Estimated utilities wage growth in Tasmania slowed over the year to March 2018 at 2.3% compared to 2.7% in the year prior. This trend is in line with the national utilities sector, which also saw WPI growth soften. National utilities WPI growth was 2.0% over the year to March 2018, down from 2.3% in the previous year.

As Chart 4.6 shows, Deloitte Access Economics forecasts Tasmanian utilities wages to remain slightly above the nation's level in the near term, before shifting closer in-line with the national utilities sector.

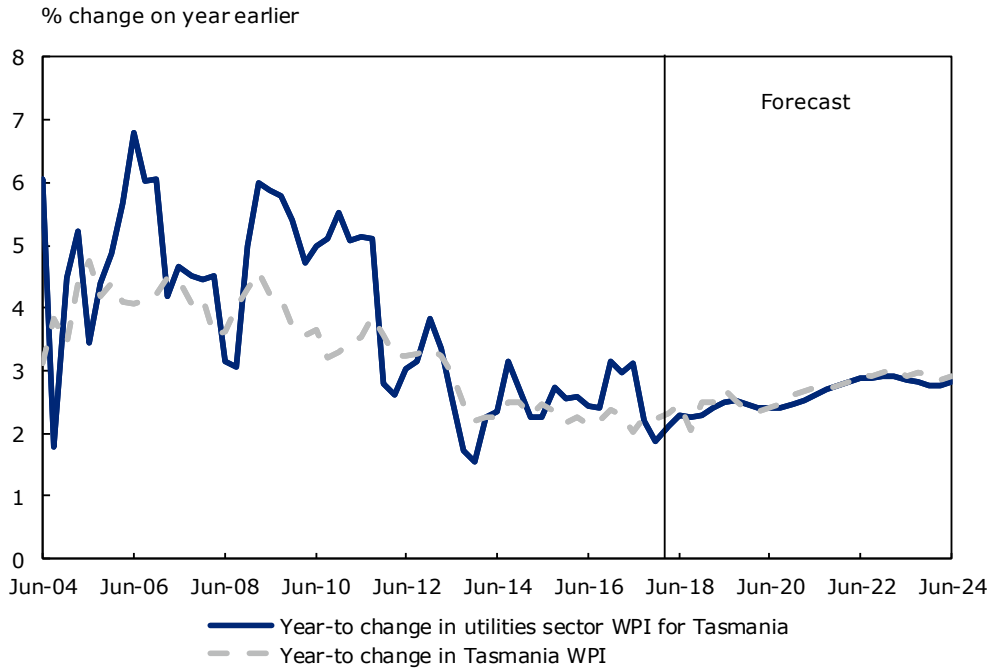
There are also some sector-specific factors in play. Given that over half of all utilities sector employees work in the electricity supply industry in Tasmania, the following factors are likely to have an impact on wages:

- Electricity demand has been fairly stable.[10] There has been downward pressure on consumer demand for energy given rising energy prices. Largely stagnant demand will weigh on output in the sector and therefore the amount firms are willing to pay to employees.
- Tasmania is expected to continue its shift towards renewables. There are renewable projects underway that is expected to require workers. This is likely to place some upward pressure on jobs and wages in the utilities sector.

Against that backdrop, Tasmania's utilities WPI is expected to grow at moderate rates, to be in line with broader WPI growth in the Tasmanian economy. In the long-run, the average employee in the utilities sector is unlikely to be in short supply and relatively stagnant demand for energy will place pressure on utilities sector wage growth to be more in line with all-industry averages.

[10] Tasmanian Economic Regulator, *Annual Energy Security Review,* November 2017

Chart 4.7 Tasmania utilities forecast comparison

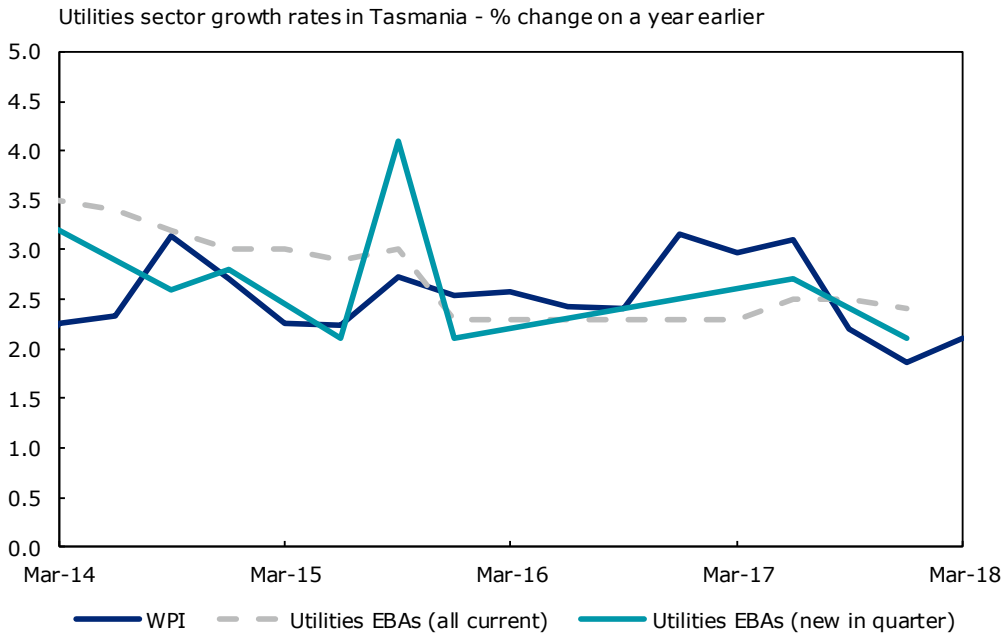


Note: % change on year earlier refers to output growth between a quarter and the same quarter a year earlier
Source: Australian Bureau of Statistics, Deloitte Access Economics

4.2.2.2 Comparison with EBA outcomes

This section compares growth in estimated utilities sector WPI against outcomes in EBAs. Chart 4.8 shows that annual wage growth in current utilities sector EBAs grew by 2.4% in the December quarter of 2017, 0.5 percentage points above the growth rate of the utilities WPI.

Chart 4.8 Comparative measures of wage growth in the Tasmanian utilities sector



Note: % change on year earlier refers to output growth between a quarter and the same quarter a year earlier
Source: Australian Bureau of Statistics, Department of Jobs and Small Business

After accelerating to 4.1% in September 2015, the AAWI for new EBAs fell to 2.1% in the December quarter of 2017, below the AAWI for current EBAs (2.4%). This indicates that although wage growth is expected in the short term, it is likely to be slower compared to recent years. However, EBAs cover only around half[11] of the Tasmanian utilities market with 1,800 employees in the utilities sector in Tasmania covered by EBAs.

4.2.3 Labour productivity

Labour productivity is the efficiency with which an economy transforms its labour and inputs to produce goods and services. Labour productivity for the utilities sector in Tasmania is expected to underperform labour productivity in the State's overall economy. Labour productivity in the utilities sector is forecast to fall by 0.8% in 2017-18, before rebounding to 1.4% growth to 2018-19. Whereas, labour productivity in the State's overall economy is forecast to fall by 0.4%, before rising 1.8% in 2018-19 (see Chart 4.2).

Labour productivity in the State is expected to fall in 2017-18, as the State's output slows down at a faster rate than employment. This is expected to result in less output produced per worker. These effects are expected to be greater in the State's utilities sector, relative to the State's broader economy. This is largely due to expectations that utilities sector output will grow below total State output, combined with expectations that utilities sector employment will grow above total State employment in the wider State economy. For example, workers in the utilities sector may be employed for administrative roles, which do not typically add to significant increases in output. This drives down the expected output per worker in the utilities sector, and therefore utilities sector labour productivity. Over the outlook, output growth in Tasmania is expected to grow faster than employment growth. Labour productivity is expected to improve in both the utilities sector, and the broader State economy.

Movements forecasts for labour productivity in Tasmania are broadly in line with what is expected for the nation. However, Tasmania's labour productivity in the utilities sector is expected to underperform the national utilities sector over the next three years. This is partly due to growth in the State utilities sector falling below the national rate in 2017-18. The difference is expected to linger into the near term, before labour productivity in the Tasmanian utilities sector converges in line with national growth by 2020-21.

Table 4.2 Tasmania and national labour productivity forecasts

Financial year changes in Tasmania and national labour productivity forecasts

	History	Forecast						
Annual % change	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Tasmania - All industries	0.8	-0.4	1.8	1.5	1.6	1.8	1.6	1.4
Tasmania - Utilities	1.3	-0.8	1.4	1.6	1.6	1.6	1.4	1.3
National - All industries	0.8	-0.4	1.6	1.7	1.6	1.5	1.3	1.2
National - Utilities	1.1	-0.7	1.5	1.7	1.6	1.6	1.4	1.2

Source: Australian Bureau of Statistics, Deloitte Access Economics

4.2.4 Summary results

Forecasts for sectoral wage growth in Tasmania are shown in Table 4.3. The forecasts include real and nominal WPI.

[11] Estimated by dividing the number of EBAs in the utilities sector in Tasmania at December 2017 (Department of Jobs and Small Businesses, *Trends in Federal Enterprise Bargaining December 2017*), by total employment in the utilities sector at May 2018 (Australian Bureau of Statistics, *Cat. 6291.0 Labour Force, Australia, Detailed, Quarterly, May 2018*).

Table 4.3 Tasmania and national wage forecasts

Financial year changes in Tasmania and national nominal Wage Price aggregates

	History	Forecast						
Annual % change	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Tasmania - All industries	2.2	2.3	2.4	2.4	2.6	2.8	3.0	2.9
Tasmania - Utilities*	2.9	2.1	2.4	2.4	2.5	2.8	2.9	2.8
National - All industries	1.9	2.1	2.3	2.5	2.8	3.1	3.3	3.2
National - Utilities	2.2	2.0	2.3	2.3	2.5	3.0	3.1	2.9

Financial year changes in Tasmania and national real Wage Price aggregates

	History	Forecast						
Annual % change	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Tasmania - All industries	0.4	0.4	0.2	0.0	0.1	0.2	0.4	0.6
Tasmania - Utilities*	1.1	0.2	0.1	0.1	0.0	0.2	0.4	0.5
National - All industries	0.2	0.1	0.1	0.3	0.4	0.7	0.9	1.0
National - Utilities	0.5	0.0	0.0	0.1	0.1	0.5	0.7	0.7

*Historical data estimated using Deloitte Access Economics' wage price model. Unavailable from the Australian Bureau of Statistics.

Source: Australian Bureau of Statistics, Deloitte Access Economics

5 Northern Territory

5.1 Economic outlook

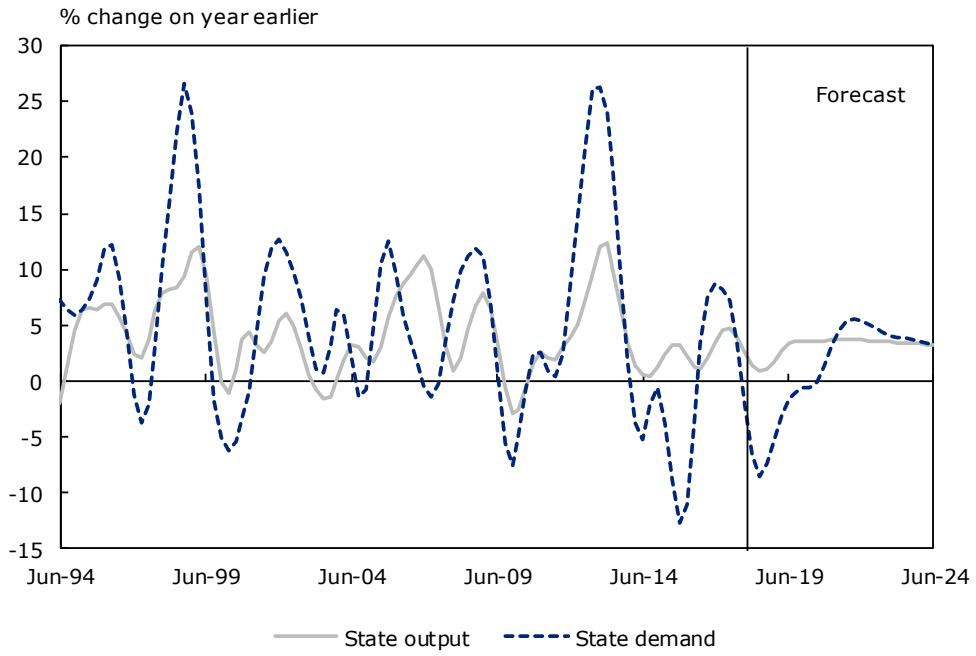
5.1.1 Overview

Economic growth in the Northern Territory has been strong since 2011-12, with an annual average growth rate of 4.2% over the five years to 2016-17. Record levels of private business investment occurred over this time as a direct result of the construction of the $45 billion Ichthys LNG plant. Construction of the plant has also supported employment growth for the Territory. Construction is now complete, resulting in a drop in demand of workers and private sector investment. While this will be partly offset via a lift in LNG exports, recent experience in Western Australia and Queensland show the number of workers required in the construction phase far exceeds that required for production.

There are other indicators pointing to poor conditions in the Northern Territory economy:

- The completion of construction on the Ichthys LNG plant has significantly reduced the number of job opportunities. Employment has fallen from its cyclical peak a year ago, with the fall in full-time jobs even larger.
- Population growth has slowed, with the share of overseas migrants far below previous highs and the number of interstate migrants moving from the Northern Territory having risen.
- House prices fell over the year to March 2018, with a fall of 16% since the peak in mid-2014. Housing credit growth remains negative, suggesting the potential for prices to fall slightly further.
- The downturn in population growth and a relatively weak housing market have had negative implications for the Territory's retail sector.
- Small business confidence remains the lowest of any State or Territory.

Chart 5.1 Northern Territory output and demand



Note: % change on year earlier refers to output growth between a quarter and the same quarter a year earlier
Source: Australian Bureau of Statistics; Deloitte Access Economics.

While the expected increase in LNG exports is a welcome positive for the Territory, the ongoing effect on the onshore economy will be small. The increase in LNG exports is expected to lift the

Northern Territory's share of national output, however there is little reason to expect its national population share will increase alongside it. This explains why Chart 5.1 shows continued output growth (which includes exports), but a prolonged contraction in State demand (which does not).

Table 5.1 below sets out Deloitte Access Economics' current forecasts for the Northern Territory economy from 2016-17 to 2023-24. Deloitte Access Economics expects economic growth to pull back in 2017-18 to 2.1% from relatively high growth of 3.9% in 2016-17. The slower growth is accompanied by significant falls in private sector investment and lower employment levels in 2017-18. Falling private sector investment is expected to persist until 2021-22, while employment growth is expected to pick back up slowly from 2018-19. Falls in government investment in 2017-18 are not expected to persist, with the 2018-19 Budget announcing $1.45 billion in public infrastructure investment in 2018-19.

Table 5.1 Northern Territory output and demand forecasts

Financial year changes in Northern Territory key economic variables

Annual % change (unless noted)	History 2016-17	Forecast 2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Consumption								
Private sector	0.9	0.2	3.2	3.6	3.8	3.4	3.1	3.0
Public sector	-0.4	4.8	3.8	3.4	3.0	3.1	2.9	2.8
Private sector investment								
Dwelling investment	-23.3	-12.6	-1.7	12.4	17.0	12.2	2.6	1.2
Non-residential building	33.7	-15.7	-34.8	-28.6	-7.9	7.3	5.1	2.9
Engineering construction	38.7	-16.9	-36.8	-32.6	-8.0	6.4	3.9	1.9
Machinery and equipment	-9.1	4.0	-4.0	1.2	15.4	23.9	12.5	9.9
IP and livestock	56.6	-5.2	-2.8	-13.1	-6.4	7.6	19.3	13.1
Public investment								
General Government	12.1	-4.2	23.9	22.2	19.9	11.4	5.8	5.2
Public enterprises	-2.8	-2.4	-1.0	-1.5	1.1	0.9	1.2	1.8
Real final demand	7.6	-3.2	-4.6	-0.6	3.7	5.2	4.0	3.5
Private sector	10.6	-5.9	-9.5	-4.0	2.6	5.6	4.4	3.6
Public sector	1.0	3.3	6.1	5.9	5.6	4.5	3.4	3.3
Gross State output	3.9	2.1	2.4	3.5	3.6	3.6	3.5	3.3
Employment	2.8	-1.8	0.2	0.7	1.3	1.5	1.7	1.6
Unemployment rate (%)	3.4	4.3	4.3	4.3	4.1	3.8	3.8	3.9

Note: All variables (except for jobs and unemployment) expressed in inflation adjusted terms

Source: Australian Bureau of Statistics, Deloitte Access Economics.

5.1.2 Utilities sector

Utilities are not operated by AEMO in the Northern Territory, and are instead operated by the Territory's Utilities Commission System Controller. Data for energy consumption within the Northern Territory is not as readily available as for States operated by the AEMO, and is provided by the Commonwealth Department of the Environment and Energy.

Energy consumption in the Northern Territory increased by 0.2% in 2015-16, after falling for two consecutive years in 2013-14 and 2014-15 (falls of 0.2% and 9.1% respectively). These falls in energy consumption occurred despite population growth of 0.4% and 0.5% in 2013-14 and 2014-15 respectively. While the increase in 2015-16 is broadly in line with population growth of 0.3%, falling energy consumption per capita was still observed in the Territory. This follows the broader trend happening across the nation, with residential energy consumption growth being relatively flat or negative due to higher electricity prices and the increasing dominance of more energy efficient appliances, housing and practices.

Territory Generation, the Territory's Government-owned power generator, has made significant losses in recent years and required additional funding of $20 million from the Territory Government to cover capital works in 2017. The proposition of increased electricity prices by Territory Generation

has been opposed by the Government, who have committed to not increasing utilities prices past CPI in its first term (which runs to 2020).[12]

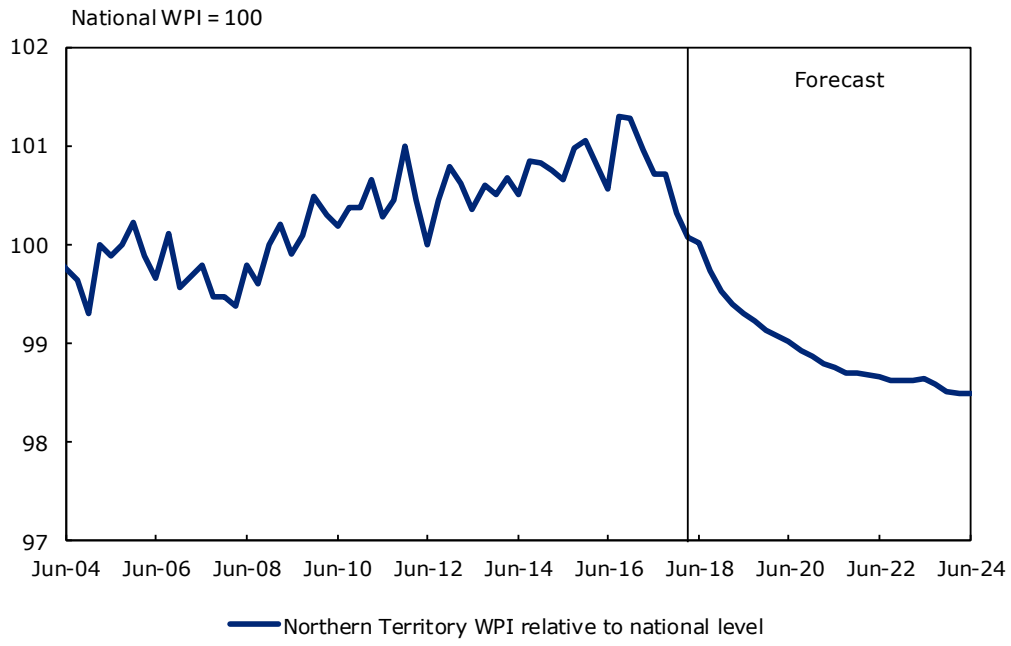
In addition, the Northern Territory Government has committed to a target of 50% renewable energy by 2030, an increase of 46 percentage points from its level of four per cent of total energy generation in 2017. A business model for Territory Generation to provide the services this renewables target would require has not yet been developed, and the path to 50% renewable energy may give rise to significant challenges for the government-owned corporation.[12]

5.2 Outlook for wages

5.2.1 All industries

The past year has seen wage growth in the Northern Territory fall behind that of Australia as a whole, following several years of Northern Territory wage growth slightly outpacing the national level. This has given rise to the downwards trajectory seen in Chart 5.2. This performance is reflective of the positive effect of construction of the Ichthys LNG project in the Northern Territory, followed by the more recent negatives spurred by its completion.

Chart 5.2 Northern Territory WPI relative to national WPI



Source: Australian Bureau of Statistics, Deloitte Access Economics.

Wage growth in Northern Territory is expected to be 1.3% in 2017-18, behind the national figure of 2.1%. While lower growth is expected for the next few years, the longer term outlook is for wage growth to return to be close to the national average (Chart 5.3). In 2023-24 Northern Territory wage growth is forecast to be 3.2%, while the national level is slightly higher at 3.3%.

[12] ABC News, *Territory Generation broke, will push for power price increases to cover costs*

Chart 5.3 Northern Territory general WPI growth

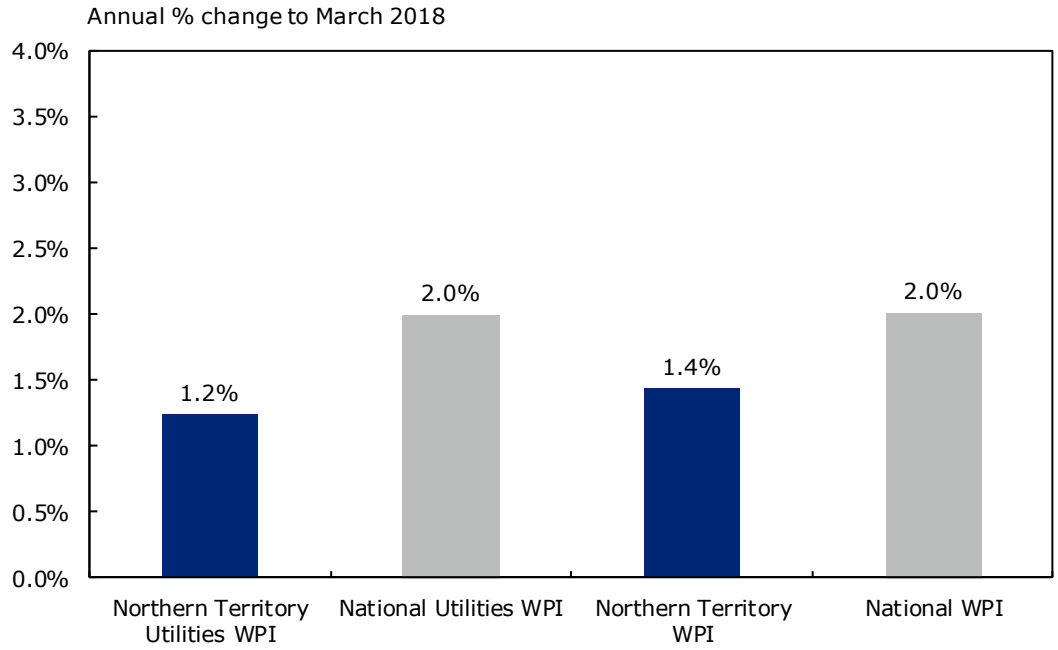
Note: % change on year earlier refers to output growth between a quarter and the same quarter a year earlier
Source: Australian Bureau of Statistics, Deloitte Access Economics.

While the challenges the completion of the construction of Ichthys left behind are not insignificant, employment growth is expected to return from 2018-19. Gradually improving economic conditions over the outlook, and a return to positive employment growth, will see the Territory's WPI reach to 3.0% by 2021-22.

5.2.2 Utilities sector wages

In the absence of ABS data for the Northern Territory utilities sector, Deloitte Access Economics estimates that the Northern Territory utilities WPI grew by 1.2% over the year to March 2018. As shown in Chart 5.4, this is lower than the average wage growth for the Australian utilities sector (at 2.0%), and below wage growth across all industries in the Northern Territory (1.4%) and nationally (2.0%), over the same period.

Chart 5.4 Comparative WPI annual growth rates in the year to March 2018



*Historical data estimated using Deloitte Access Economics' wage price model. Unavailable from the Australian Bureau of Statistics.

Source: Australian Bureau of Statistics, Deloitte Access Economics.

Estimated wage growth in the Northern Territory utilities sector is weaker than wage growth in the national utilities sector, and the overall Northern Territory economy. Utilities output is estimated to have grown by 1.0% over the year to March 2018, lagging behind the Territory's output growth of 3.1% across all industries. And although Northern Territory output growth across all industries was above the matching Australian growth rate (2.4%), Territory final demand grew by 0.1% over the year to March 2018, reflecting the weakness in the Territory's economy described in Section 5.1.1.

Both underperformance in the utilities sector relative to the Territory and Territory-specific factors following the completion of Ichthys construction have played key roles in the relatively low wage growth for the Northern Territory utilities sector. This is exacerbated by broader wage growth in Australia remaining at record lows.

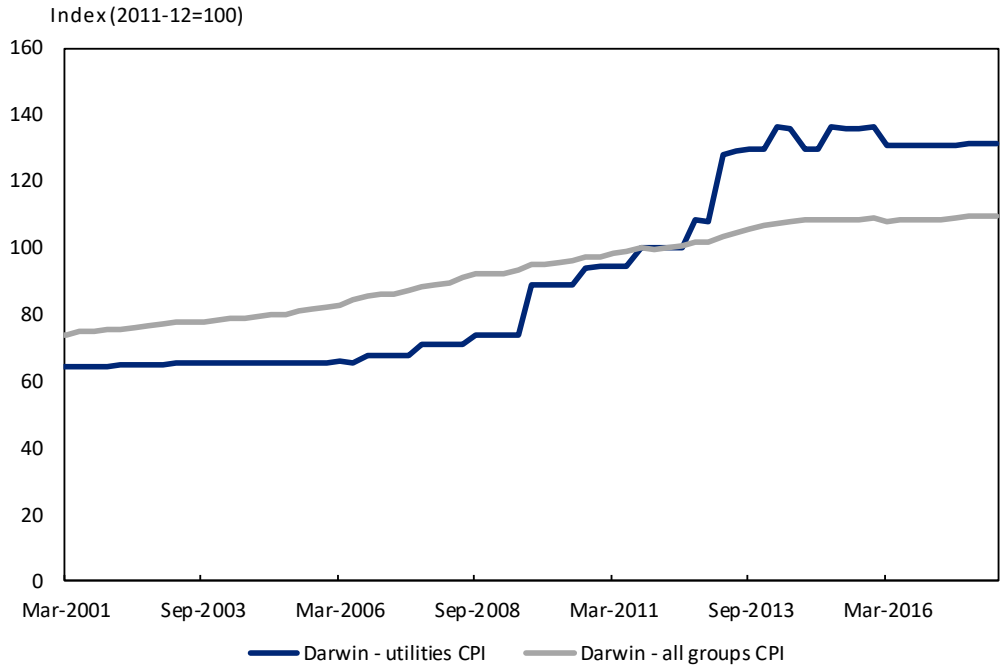
The Northern Territory's commitment to a significant increase in its share of renewable energy will result in increased investment in the sector, as has already been the case in South Australia. If this increase in renewables results in increased demand for qualified technicians and other workers with the right skills, there may be subsequent upwards pressure on wages.

However, this also presents a number of other challenges for existing investments in other power producing assets, as well as the electricity network. This will have implications for employment and wages elsewhere in the sector.

Chart 5.5 shows the increases in utilities prices that occurred in Darwin through to 2013, which have since stabilised.[13] Elevated electricity prices have put a strain on households and businesses in recent years both within the Territory and across the nation.

[13] Australian Bureau of Statistics (2018), Cat. No. 6401.0, *Consumer Price Index*

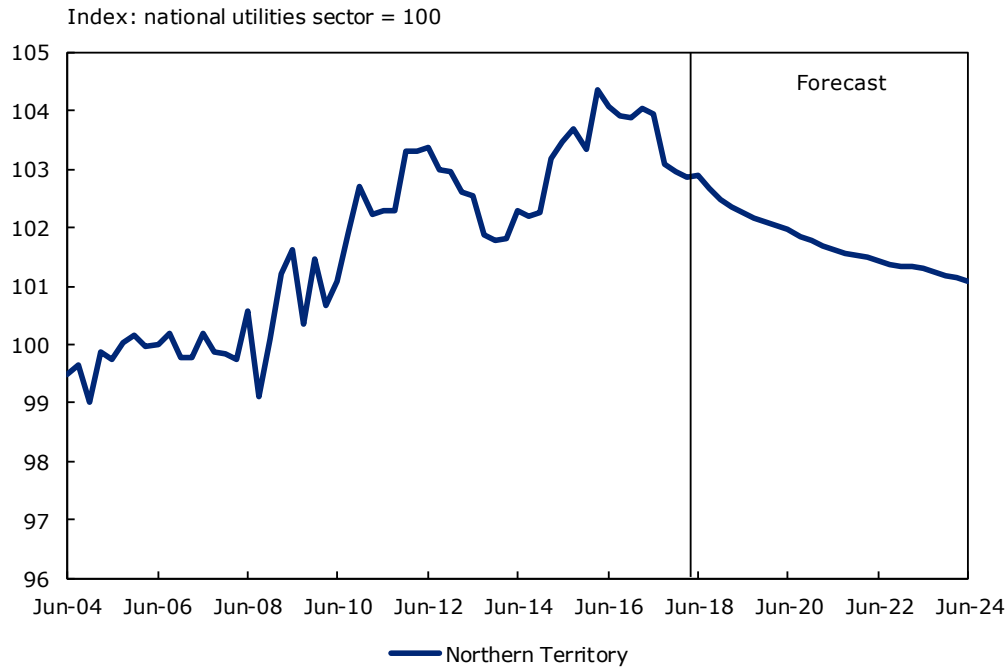
Chart 5.5 Darwin utilities prices



Source: Australian Bureau of Statistics.

While an increase in renewables may result in additional demand for specialist workers within the Territory, we expect a continued relative fall in the Northern Territory's WPI compared to the national utilities WPI (Chart 5.6). This reflects both Territory-wide factors discussed above, and its current high utilities WPI relative to the national utilities sector, although growth has been slowing.

Chart 5.6 Relative utilities WPI forecast for Northern Territory

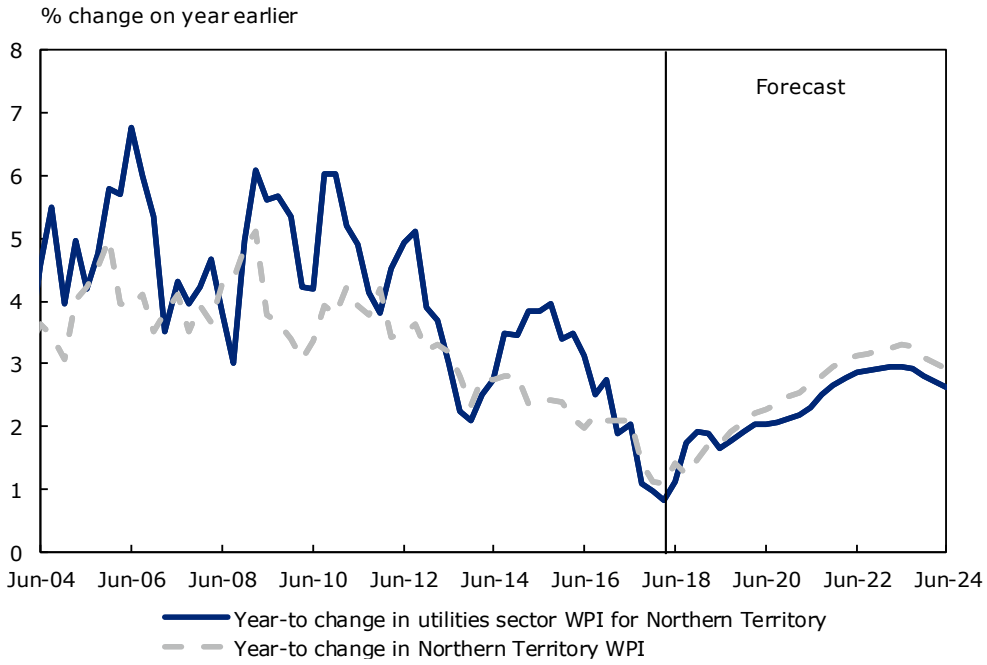


Source: Australian Bureau of Statistics, Deloitte Access Economics.

Chart 5.7 shows that WPI growth in the Northern Territory is expected to recover from its current lows over the forecast period. While utilities wage growth in the Northern Territory has historically

exceeded that of the Territory on a broader level, the past year has seen it fall below Territory-wide wage growth. Slightly lower wage growth than that of the Northern Territory as a whole is expected to persist over the forecast period, with growth reaching 2.8% in 2023-24 (compared to Territory-wide growth of 3.1%).

Chart 5.7 Northern Territory utilities WPI forecast comparison



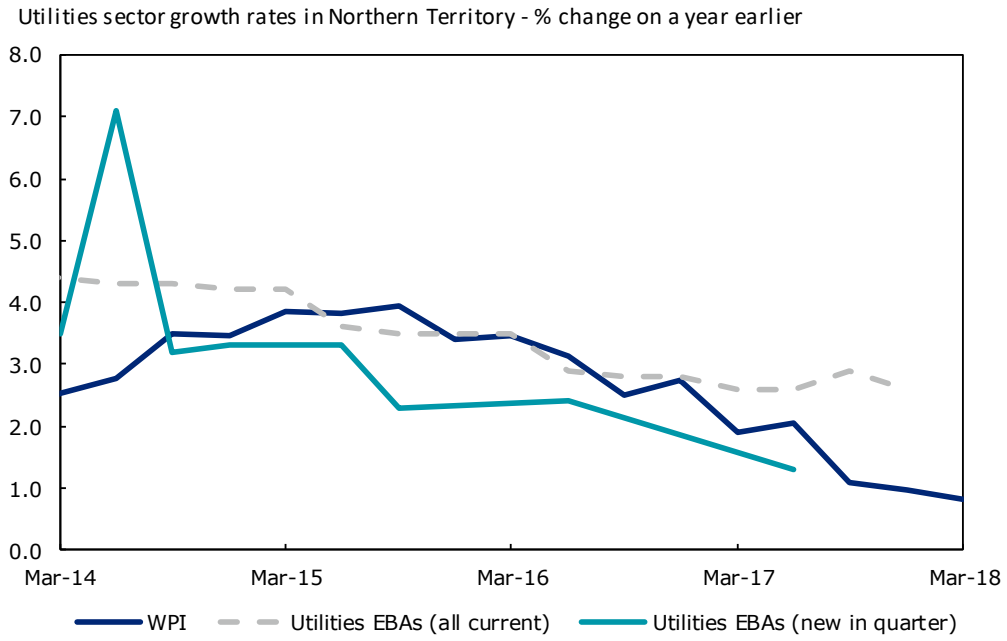
Note: % change on year earlier refers to output growth between a quarter and the same quarter a year earlier
Source: Australian Bureau of Statistics, Deloitte Access Economics.

5.2.2.2 Comparison with EBA outcomes

The following section compares growth in the Northern Territory's utilities sector WPI against outcomes in EBAs. In December 2017, there were three current EBAs for the Northern Territory utilities sector. These agreements have an average annual wage increase of 2.6%, average duration of three years and cover less than 100 people. Chart 5.8 shows that:

- Falls in wage growth in existing utilities sector EBAs have appeared to slow, with growth stabilising at 2.6% over the year to December 2017.
- There have been no new utilities sector EBAs in the Northern Territory since the June quarter of 2017. At that time, growth on a year earlier was 1.3%, below both WPI growth and current EBAs growth.
- WPI for the utilities sector in the Northern Territory has been falling steadily since its peak of 4.0% in September 2015.

Chart 5.8 Comparative measures of wage growth in the Northern Territory utilities sector



Note: % change on year earlier refers to output growth between a quarter and the same quarter a year earlier

Source: Australian Bureau of Statistics, Department of Jobs and Small Business.

5.2.3 Labour productivity

Labour productivity growth forecasts for the Northern Territory (all industries) and the Northern Territory utilities sector are shown in Table 5.2. Labour productivity growth within the Northern Territory outperformed the national average in 2016-17, with growth of 1.2% compared to 0.8%.

In 2017-18, the ABS published number and the measured drop in employment in the Northern Territory results in a spike in the measured labour productivity. The drop in employment occurred while utilities output continued to grow, suggesting some growth in labour productivity. However, while the Northern Territory labour productivity growth exceeds that of Australia's more generally, this is primarily due to the calculation of this measure rather than recent spikes in factors affecting labour productivity within the Territory.

Labour productivity growth for the Northern Territory utilities sector slightly outpaced that for the Northern Territory overall in 2016-17 at 1.3%. However, labour productivity is expected to have fallen by 0.7% in 2017-18. Over the outlook, positive labour productivity growth for the utilities sector in the Territory is expected, reflecting:

- The combination of modest growth in employment and higher growth in output for the Northern Territory's utilities sector; and
- Higher labour productivity for the Territory compared to Australia (all sectors).

Deloitte Access Economics' forecasts for utilities sector labour productivity in the Northern Territory are also a reflection of national and Territory-wide labour productivity trends, and utilities trends at the national level (as discussed in Section 2.2.3). These indicators point towards positive growth in labour productivity over the outlook period.

Table 5.2 Northern Territory and national labour productivity forecasts

Financial year changes in Northern Territory and national labour productivity forecasts								
	History	Forecast						
Annual % change	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Northern Territory - All industries	1.2	4.0	2.1	2.8	2.3	2.1	1.8	1.7
Northern Territory - Utilities	1.3	-0.7	1.4	1.7	1.6	1.6	1.4	1.3
National - All industries	0.8	-0.4	1.6	1.7	1.6	1.5	1.3	1.2
National - Utilities	1.1	-0.7	1.5	1.7	1.6	1.6	1.4	1.2

Note: Productivity forecasts for the Australian Capital Territory and the Northern Territory in the first forecast year should be interpreted with care. This is due to two reasons (a) Data limitations exist to forecast productivity (Gross State Product (GSP) divided by employment); Northern Territory and Australian Capital Territory employment data is a ***trend*** series, but GSP data is ***seasonally adjusted***. (b) Quarterly State Final Demand (SFD) data is used to estimate quarterly GSP, which may not fully capture the impact of interstate trade. This can lead to some volatile movements in the first forecast year for the Northern Territory and the Australian Capital Territory.

Source: Australian Bureau of Statistics, Deloitte Access Economics.

5.2.4 Summary results

Forecasts for sectoral wage growth in South Australia are shown in Table 5.3. Forecasts include real and nominal and real WPI.

Table 5.3 Northern Territory and national wage forecasts

Financial year changes in Northern Territory and national nominal Wage Price aggregates								
	History	Forecast						
Annual % change	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Northern Territory - All industries	2.1	1.3	1.5	2.1	2.5	3.0	3.2	3.1
Northern Territory - Utilities*	2.3	1.0	1.8	1.9	2.2	2.7	2.9	2.8
National - All industries	1.9	2.1	2.3	2.5	2.8	3.1	3.3	3.2
National - Utilities	2.2	2.0	2.3	2.3	2.5	3.0	3.1	2.9

Financial year changes in Northern Territory and national real Wage Price aggregates								
	History	Forecast						
Annual % change	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Northern Territory - All industries	2.0	0.0	-0.7	0.0	0.1	0.6	0.8	0.9
Northern Territory - Utilities*	2.1	-0.2	-0.4	-0.2	-0.2	0.3	0.5	0.6
National - All industries	0.2	0.1	0.1	0.3	0.4	0.7	0.9	1.0
National - Utilities	0.5	0.0	0.0	0.1	0.1	0.5	0.7	0.7

*Historical data estimated using Deloitte Access Economics' wage price model. Unavailable from the Australian Bureau of Statistics.

Source: Australian Bureau of Statistics, Deloitte Access Economics.

6 Australian Capital Territory

6.1 Economic outlook

6.1.1 Overview

The Australian Capital Territory economy recorded the fastest output growth across the nation in 2016-17, at 4.4%. Since then, growth has slowed in the Territory, with State final demand growing by 3.2% over the year to March 2018, in line with the national average. The Australian Capital Territory economy has been driven by favourable macroeconomic conditions that have supported its key industries. In particular, a relatively low Australian dollar, which has boosted demand for international education.

International students in tertiary education contributed over $750 million to the Australian Capital Territory in 2016-17 and grew 24.4% – securing its spot as the Territory's top export.[14] Continued demand for tertiary education services is likely to increase in the years ahead, driven by a growing Asian middle class, particularly in China.

Growth in the Territory has also been supported by strong employment growth in professional services. This sector is expected to continue to remain a key source of employment growth.

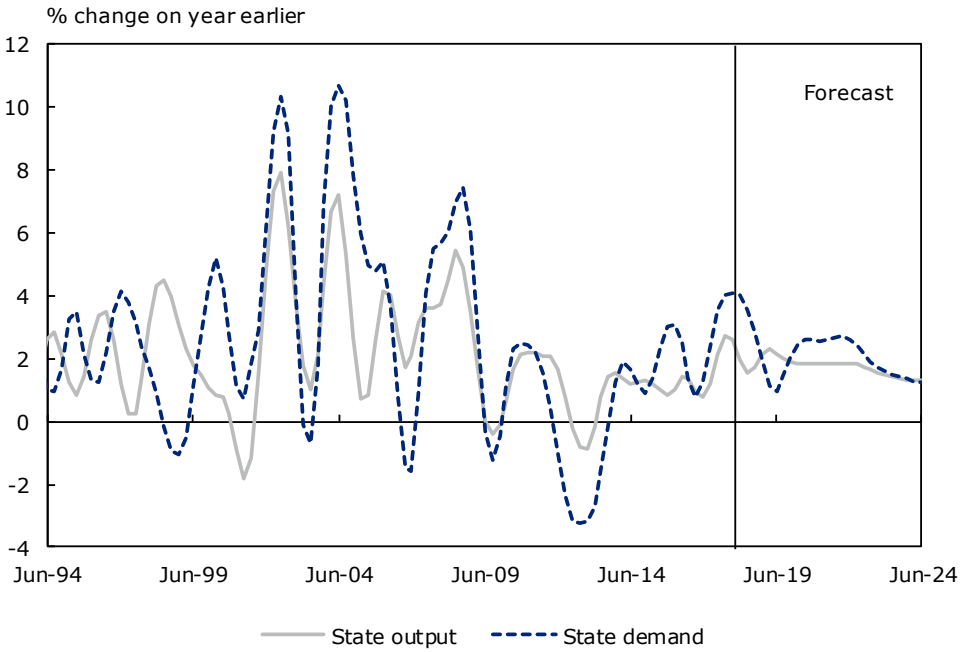
Construction work in the Territory has fuelled stronger economic activity. There is work still underway for the rollout of the Territory's light rail project, as well as a substantial public housing renewal scheme, and future investments in new schools and hospitals. Private residential construction has also been adding to the higher levels of construction activity. In 2016-17, the construction of private dwellings increased by 25%. However, Deloitte Access Economics expects a slowdown in private dwellings construction activity over the near term.

Some risks to continued growth are apparent. The key risk centres on decisions made by the Federal Government. The potential for increased decentralisation of the Australian Public Service, and the relocation of key Government agencies away from the Australian Capital Territory would impact the Territory's employment prospects and output growth. Currently, around 40% of the Federal public services are based in Canberra.

However, overall, the outlook for the Australian Capital Territory is positive. Chart 6.1 shows that the Territory's economy is expected to have solid growth in the forecast period. Territory output is forecast to slow to 2.2% in 2017-18, before increasing slightly to 2.3% in 2018-19.

[14] Australian Capital Territory Government, *Budget 2018-19, Budget Paper 3: Budget Outlook*

Chart 6.1 Australian Capital Territory output and demand



Note: % change on year earlier refers to output growth between a quarter and the same quarter a year earlier
Source: Australian Bureau of Statistics, Deloitte Access Economics

Table 6.1 below sets out Deloitte Access Economics' current forecasts for the Australian Capital Territory economy.

Table 6.1 Australian Capital Territory output and demand forecasts

Financial year changes in Australian Capital Territory key economic variables

	History	Forecast						
Annual % change (unless noted)	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Consumption								
Private sector	2.9	3.9	3.6	2.7	2.3	2.6	2.6	2.6
Public sector	0.4	3.7	1.6	2.5	2.7	2.6	2.3	2.2
Private sector investment								
Dwelling investment	14.8	2.6	7.1	2.2	-5.1	1.5	-1.3	-4.4
Non-residential building	2.5	29.7	-6.4	-2.2	2.4	-0.4	-1.1	-1.3
Engineering construction	16.0	12.7	-5.3	-9.6	-4.9	-3.5	-3.7	-3.2
Machinery and equipment	2.8	18.4	17.0	10.9	5.7	2.8	1.6	2.0
IP and livestock	8.1	4.9	1.2	0.8	3.9	3.7	3.2	3.0
Public investment								
General Government	22.5	4.7	10.0	9.8	8.6	6.7	6.4	5.7
Public enterprises	-3.3	15.6	-1.0	-9.5	0.8	0.3	0.3	0.8
Real final demand	3.5	4.8	3.2	3.0	2.7	2.8	2.4	2.2
Private sector	4.1	5.8	3.6	2.4	1.8	2.3	1.8	1.6
Public sector	3.0	4.0	2.8	3.5	3.6	3.3	3.0	2.8
Gross State output	4.6	1.8	2.4	2.3	2.7	2.7	2.4	2.2
Employment	2.4	4.1	1.9	0.5	0.8	1.1	1.2	1.2
Unemployment rate (%)	3.8	4.0	3.9	3.9	3.8	3.6	3.7	3.9

Note: All variables (except for jobs and unemployment) expressed in inflation adjusted terms.
Source: Australian Bureau of Statistics, Deloitte Access Economics

6.1.2 Utilities sector

The Australian Capital Territory's utilities sector is influenced by both independent pricing tribunals and market forces. The supply of electricity and water and waste services are determined by the Independent Competition and Regulatory Commission (ICRC) for small customers in the Territory. Natural gas prices are not regulated.

Increases in the price of retail electricity in recent years has been driven by substantial increases in wholesale electricity costs in the NEM. However, other drivers such as costs of renewable energy schemes and network costs may impact electricity prices.

The Australian Capital Territory is moving towards increased renewable energy generation. In early 2017, the third solar farm funding by the Territory Government began operation. The new solar farm, along with existing wind and solar generators have moved the Territory towards 35% renewable energy.

The 2018-19 Australian Capital Territory Budget outlined the Territory's clean and efficient energy commitments. This included the Government's commitment to power Canberra with 100% renewable energy by 2020. In addition, the Budget included the Territory's Energy Efficiency Improvement Scheme which aims to help households and small to medium sized businesses reduce their electricity consumption. The Scheme is compulsory for electricity retailers and works by placing a requirement on electricity retailers to achieve energy savings across households and businesses.

6.2 Outlook for wages

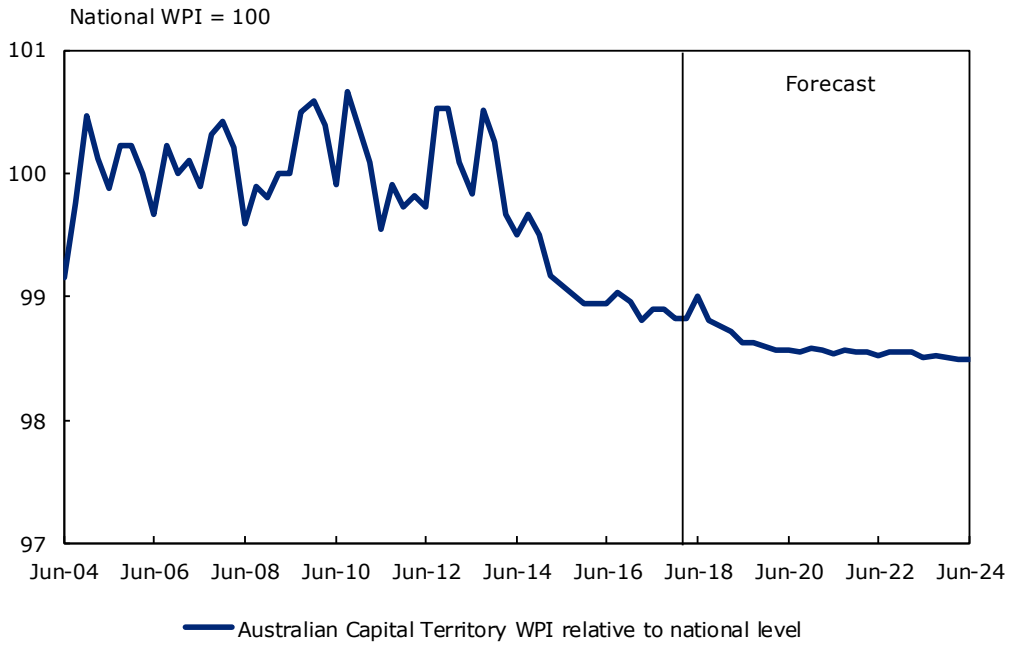
6.2.1 All industries

Since 2014, wage price growth in the Australian Capital Territory has consistently underperformed national wage growth (see Chart 6.2). Wage growth in the Australian Capital Territory is expected to be 2.0% in 2017-18, marginally lower than the national figure of 2.1%. The Australian Capital Territory's wage growth is forecast to remain below the nation's in the short term, before converging to be in line with the broader Australian economy. This is partly driven by expectations that output growth for the Territory will slow from recently high rates (2.7% in the year to March 2018, compared to 2.4% for Australia) to a pace more in line with longer term trends. This reflects a likely moderation in a number of recent drivers of output growth, including the double-digit growth in international student commencements. Further, construction work on the Territory's largest project (the $783 million light rail connecting the Gungahlin to the city centre) is expected to wrap up in late 2018.

Lower wage growth in the near term is also partly driven by the *Workplace Bargaining Policy 2018* which maintained a wage rise cap of 2% per annum for workers in the Australian Public Service.[15]

[15] Australian Public Service Commission, 'Workplace Bargaining Policy 2018'.

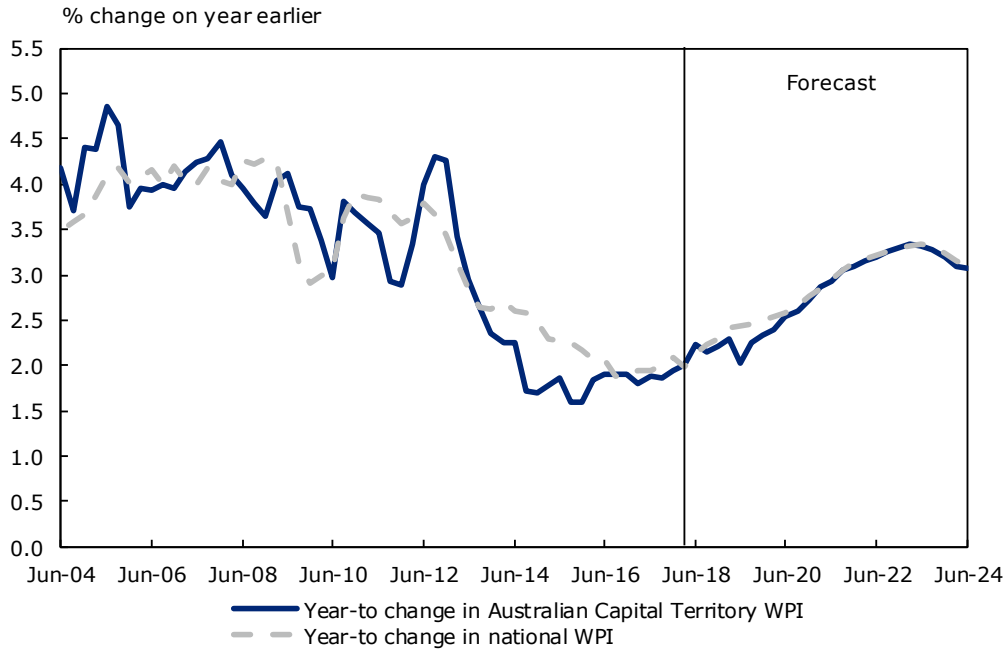
Chart 6.2 Australian Capital Territory WPI relative to national WPI



Source: Australian Bureau of Statistics, Deloitte Access Economics

In early 2018, the Federal Government announced that annual pay rises for public sector workers covered by union enterprise agreements will remain capped at 2% for the three years to 2021 (although more flexible wage increases will be allowed under individual employment arrangements). This is expected to weigh on wage growth in the outlook given the large share of Territory workers in the public sector. However, the private sector is forecast to support average wage growth for the Territory in the near and long term, leading to wage growth of 2.8% per annum on average over the forecast period.

Chart 6.3 Australian Capital Territory general WPI growth

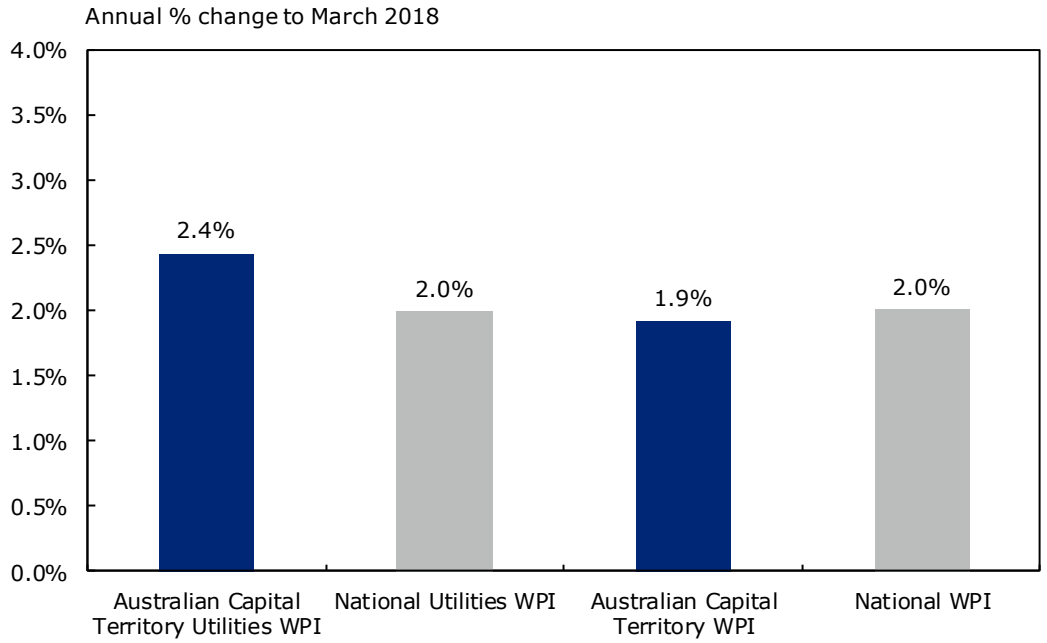


Note: % change on year earlier refers to output growth between a quarter and the same quarter a year earlier
Source: Australian Bureau of Statistics, Deloitte Access Economics

6.2.2 Utilities sector wages

In the absence of ABS data for the Australian Capital Territory's utilities sector, Deloitte Access Economics estimates that the Territory's utilities WPI grew by 2.4% over the year to March 2018. As shown in Chart 6.4, this is above average wage growth for the Australian utilities sector (at 2.0%), and above wage growth across all industries in the Australian Capital Territory (1.9%) and nationally (2.0%), over the same period.

Chart 6.4 Comparative WPI annual growth rates in the year to March 2018



*Historical data estimated using Deloitte Access Economics' wage price model. Unavailable from the Australian Bureau of Statistics

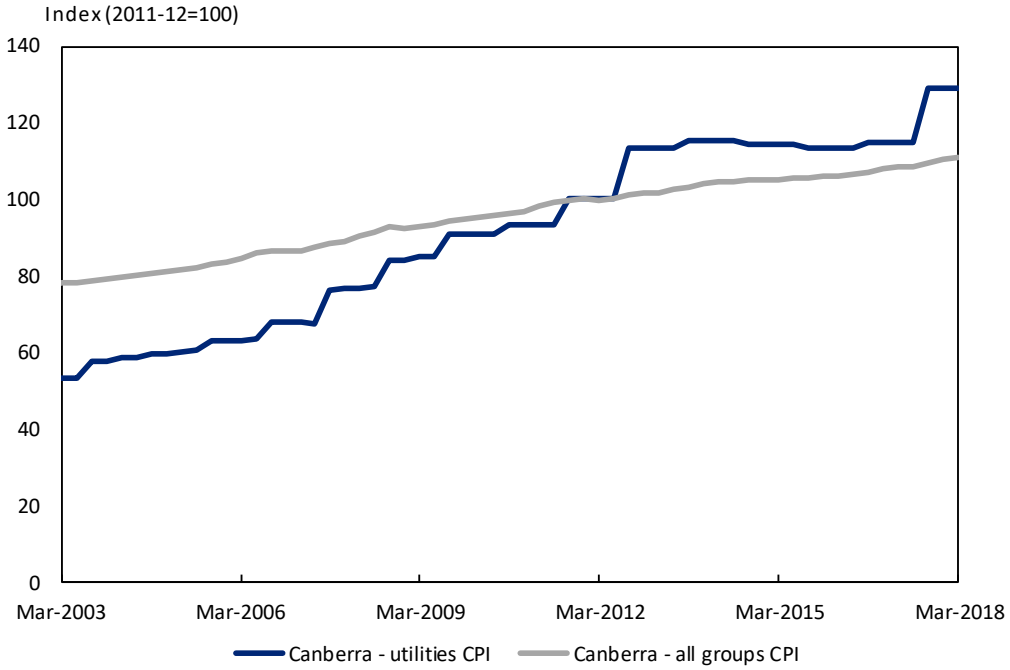
Source: Australian Bureau of Statistics, Deloitte Access Economics

The Australian Capital Territory has been moving towards increased renewable energy generation. The Territory Government has implemented a policy which will see 100% of the Australian Capital Territory's energy requirements come from renewable sources by 2020. This has spurred investment in the sector, increasing demand for qualified technicians and other workers with the right skills, which has placed increased pressure on wages. Wage growth has remained weak in the broader Territory and across Australia.

Chart 6.5 shows that utilities prices in Canberra have recently spiked, driven by rising gas and fuel prices, as well as electricity prices. ActewAGL (the Territory's biggest electricity provider) implemented changes to electricity and gas prices in the Australian Capital Territory that came into effect in July 2016. In addition, ActewAGL announced mid-2017 that it will be passing on its rising costs to consumers, from the first quarter of 2018-19 onwards.[16]

[16] The Canberra Times, 'ActewAGL customers to face full price rise from July', 2018.

Chart 6.5 Canberra utilities prices



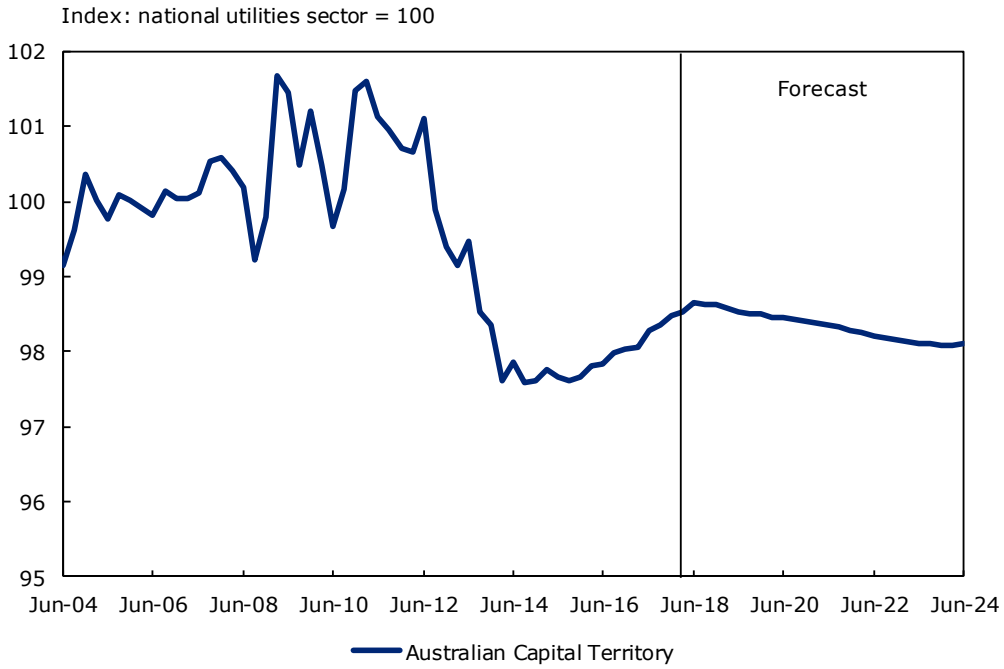
Source: Australian Bureau of Statistics.

The growth rate of the Australian Capital Territory's electricity demand has slowed in recent years, and is consistent with broader trends in NEM. However, peak demand (in summer and winter) continues to increase.[17]

Deloitte Access Economics expect the relative increase in the Australian Capital Territory's utilities WPI to the national utilities WPI to gradually level off (Chart 6.6). This reflects a maturing of the transition to renewables in the Territory.

[17] Australian Capital Territory Government, Environment and Planning Directorate, *Electricity and Natural Gas Consumption Trends in the Australian Capital Territory 2009-2013*.

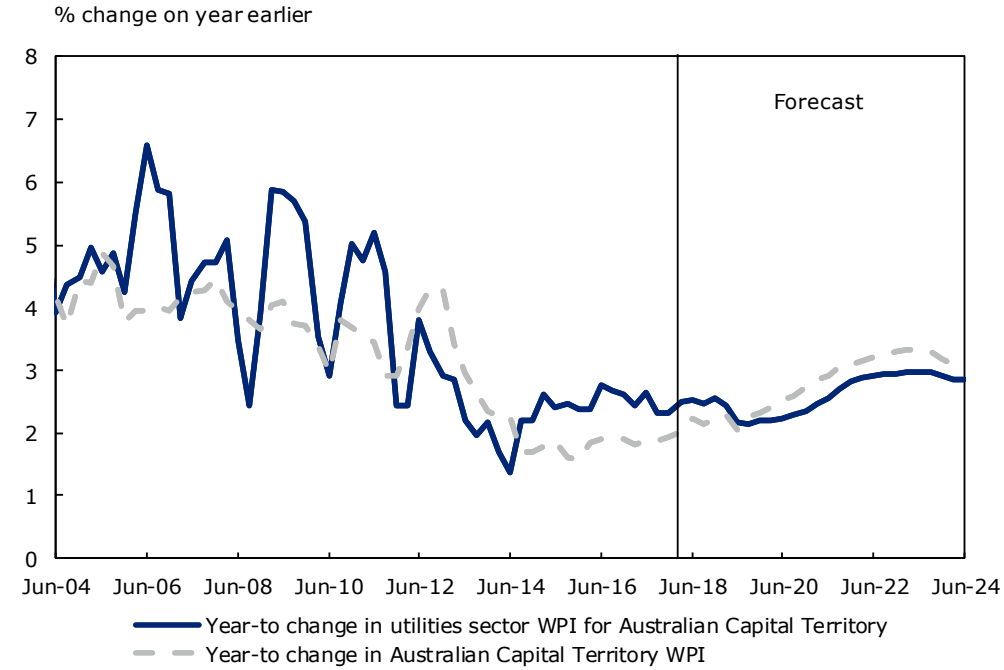
Chart 6.6 Relative utilities WPI forecast for Australian Capital Territory



Source: Australian Bureau of Statistics, Deloitte Access Economics

Chart 6.7 shows that WPI growth in utilities has recovered from a low in mid-2014 to outperform broader WPI growth in the Australia Capital Territory's economy. Looking ahead, wage growth in utilities is forecast to slowdown, and fall below broader wage growth. This is driven by expectations that utilities sector output will grow below all industries output, over the medium to longer term (1.7% compared to 2.9% per annum on average to 2023-24, respectively). Lower output growth in the utilities sector is expected to impose less demand pressure on labour, and therefore less pressure on wages too.

Chart 6.7 Australian Capital Territory utilities WPI forecast comparison



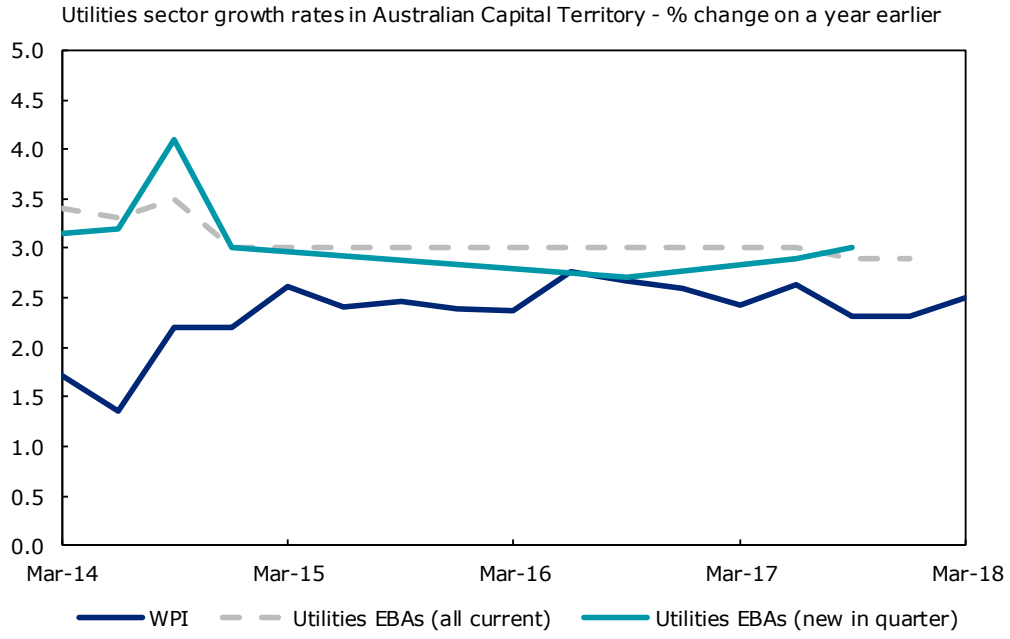
Note: % change on year earlier refers to output growth between a quarter and the same quarter a year earlier
Source: Australian Bureau of Statistics, Deloitte Access Economics

6.2.2.2 Comparison with EBA outcomes

The following section compares growth in the Australian Capital Territory's utilities sector WPI against outcomes in EBAs. The Territory had four EBAs in the utilities sector covering 1,100 employees (around 55.7%[18] of workers in the sector), and a total of 134 EBAs covering 16,600 employees across all industries (around 7.4%[18] of total workers) as of December 2017. Chart 6.8 shows that:

- Wage growth in new utilities sector EBAs has started to rise, reaching 3.0% annual growth in the September quarter of 2017. This is slightly up from 2.7% growth a year prior.
- The AAWI for new EBAs is slightly above the AAWI for all existing utilities EBAs (2.9%), which is another positive sign that utilities wage growth may be solidifying.

Chart 6.8 Comparative measures of wage growth in the Australian Capital Territory utilities sector



Note: % change on year earlier refers to output growth between a quarter and the same quarter a year earlier
Source: Australian Bureau of Statistics, Department of Jobs and Small Business.

6.2.3 Labour productivity

Labour productivity for the utilities sector in the Australian Capital Territory is expected to outperform labour productivity in the Territory's overall economy. Labour productivity in the utilities is forecast to fall by 1.0% in 2017-18, before rising 1.3% in 2018-19. Labour productivity in the Territory's overall economy is forecast to fall by 2.2% in 2017-18, before rising 0.4% in 2018-19 (see Table 6.2).

Labour productivity in the State is expected to fall in 2017-18, as the Territory's output slows down at a faster rate than employment growth. This is expected to lead to less output produced per worker. These effects are expected to be more modest in the Territory's utilities sector, relative to the broader Territory economy. The Territory is expected to have slower employment growth in the utilities sector relative to the wider economy. At the same time, utilities employment growth is expected to be below utilities output growth (more so than what is expected for all industries). As

[18] Estimated by dividing the number of EBAs in the utilities sector in the Australian Capital Territory at December 2017 (Department of Jobs and Small Business, *Trends in Federal Enterprise Bargaining December 2017*), by total employment in the utilities sector and total employment respectively, at May 2018 (Australian Bureau of Statistics, *Cat. 6291.0 Labour Force, Australia, Detailed, Quarterly, May 2018*).

a result, output per worker (labour productivity) in the utilities sector is forecast to be slightly above all industries in the Territory.

Over the outlook, output growth is expected to outpace employment growth, leading to gains in labour productivity in the utilities sector and all industries. For the utilities sector, the trend towards a higher renewable energy generation (particularly wind and solar) is expected to lead to lower labour requirements, slowing down employment growth relative to output. However, more broadly, technological advances, increases in the amount of capital per worker and improved efficiency in how labour and capital work together are expected to drive higher labour productivity over the outlook.

Movements forecast for labour productivity in the Australian Capital Territory are broadly in line with what is expected for the nation. However, the Territory's labour productivity is expected to underperform the national average in both the utilities sector, and the broader economy overall in 2017-18.

Table 6.2 Australian Capital Territory labour productivity forecasts

Financial year changes in Australian Capital Territory labour productivity forecasts

	History	Forecast						
Annual % change	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Australian Capital Territory - All industries	2.2	-2.2	0.4	1.8	1.9	1.6	1.2	0.9
Australian Capital Territory - Utilities	1.4	-1.0	1.3	1.7	1.6	1.6	1.4	1.2
National - All industries	0.8	-0.4	1.6	1.7	1.6	1.5	1.3	1.2
National - Utilities	1.1	-0.7	1.5	1.7	1.6	1.6	1.4	1.2

Note: Productivity forecasts for the Australian Capital Territory and the Northern Territory in the first forecast year should be interpreted with care. This is due to two reasons (a) Data limitations exist to forecast productivity (Gross State Product (GSP) divided by employment); Northern Territory and Australian Capital Territory employment data is a ***trend*** series, but GSP data is ***seasonally adjusted***. (b) Quarterly State Final Demand (SFD) data is used to estimate quarterly GSP, which may not fully capture the impact of interstate trade. This can lead to some volatile movements in the first forecast year for the Northern Territory and the Australian Capital Territory.

Source: Australian Bureau of Statistics, Deloitte Access Economics.

6.2.4 Summary results

Forecasts for sectoral wage growth in the Australian Capital Territory are shown in Table 6.3. Forecasts include real and nominal WPI.

Table 6.3 Australian Capital Territory wage forecasts

Financial year changes in Australian Capital Territory and national nominal Wage Price aggregates

	History	Forecast						
Annual % change	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Australian Capital Territory - All industries	1.9	2.0	2.2	2.4	2.8	3.1	3.3	3.2
Australian Capital Territory - Utilities*	2.6	2.4	2.4	2.2	2.4	2.8	3.0	2.9
National - All industries	1.9	2.1	2.3	2.5	2.8	3.1	3.3	3.2
National - Utilities	2.2	2.0	2.3	2.3	2.5	3.0	3.1	2.9

Financial year changes in Australian Capital Territory and national real Wage Price aggregates

	History	Forecast						
Annual % change	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**
Australian Capital Territory - All industries	0.0	-0.2	-0.2	0.1	0.3	0.6	0.8	0.9
Australian Capital Territory - Utilities*	0.7	0.2	0.0	-0.1	-0.1	0.3	0.5	0.7
National - All industries	0.2	0.1	0.1	0.3	0.4	0.7	0.9	1.0
National - Utilities	0.5	0.0	0.0	0.1	0.1	0.5	0.7	0.7

*Historical data estimated using Deloitte Access Economics' wage price model. Unavailable from the Australian Bureau of Statistics

Source: Australian Bureau of Statistics, Deloitte Access Economics

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Appendix A – Technical notes on WPI data

The Australian Bureau of Statistics (ABS) publishes the Wage Price Index (WPI) nationally and for all State and Territory jurisdictions. At the 1-digit industry level, WPIs data are available for all industries nationally.

However, the WPI is not released for each sector by State. This is due to small sample sizes and reasons of confidentiality. This is particularly the case for smaller jurisdictions such as Tasmania, the Northern Territory and the Australian Capital Territory.

Table A.1 shows which data is available in time series for the WPI. These series are provided on the ANZSIC06 basis and have been provided from the September quarter 2008.

In some cases, where a specific WPI series is not available, a comparative series for AWOTE can be obtained. However, all sectoral by State AWOTE estimates were discontinued at the end of 2011. Where AWOTE data is shown as being available, only estimates from May 2009 to November 2011[19] have been calculated by the ABS.

Table A.1 ABS WPI data availability by sector

State	Utilities
New South Wales	Available*
Victoria	Available*
Queensland	Not available*
South Australia	Not available*
Western Australia	Not available*
Tasmania	Not available
Northern Territory	Not available
Australian Capital Territory	Not available

*denotes AWOTE data available to November 2011.

Source: ABS

Where utilities sector WPI is not published, Deloitte Access Economics imputes the value based on a combination of:

- WPI for the national utilities sector, and for the relevant States, as well as relative movements in those industries with the States that do have an official estimated WPI.
- Where previously published, AWOTE for the sector in question; and
- Data on Enterprise Bargaining Agreements (EBAs).

[19] AWE/AWOTE measures are defined for the mid-month of quarter, so the initial AWE/AWOTE data here is from the May 2009 publication. The WPI data is referred to by the entire quarter.

There is no longer any officially released time series estimate for utilities sector WPI outside of New South Wales and Victoria. Therefore, extreme care needs to be taken in analysing these series over time. For States other than New South Wales and Victoria, the modelling used for this report implicitly assumes that overall State WPI growth, overall utilities sector wage movements, data for EBAs, as well as the data published for other States, can be used to create a reasonable estimate of the specific WPI series in history. However, there is no guarantee that the data used matches what the ABS data would show were it to be released. The ABS does estimate these values, but does not release them externally due to the small number of businesses that are included in the sample, and the possibility that individual results could be estimated from the data if it were to be released.

Overall AWOTE data itself is not consistent with the WPI data for Australia. As a result, where AWOTE data is used, rather than using raw AWOTE data to obtain a State by industry WPI, the model uses the deviations in the AWOTE growth from State AWOTE averages and applied a consistent ratio to the known State WPIs. For example, if the Queensland utilities sector AWOTE measure rose faster than the overall State AWOTE measure, then the estimated Queensland utilities sector WPI measure will rise faster than Queensland's overall WPI. Because the AWOTE data was far more volatile than WPI in later years, the deviations that this might imply are limited in the model. This is done by comparing the variations in published AWOTE and WPI measures within each State and adjusting the unknown deviations accordingly.

In addition to the AWOTE methodology (and in the most recent quarters, in place of it) we have also considered that trends from EBAs drive deviations in WPI growth rates.

In all cases where WPI data is not published, the estimated results are normalised to ensure that the totals for the States are consistent with the levels of the industry components.

Appendix B – Macroeconomic and wage forecasting methodology

The model used by Deloitte Access Economics to forecast the WPI by State and by industry has been created as a subsidiary component of our Deloitte Access Economics Macroeconomic (DAEM) model. Key aggregates, including overall wage and productivity movements, and projections for output and employment by State and for Australia, are used to drive WPI measures at more detailed levels.

The following summarises the full model documentation that covers the key drivers of detailed labour costs.

B.1. Macroeconomic forecasting

DAEM is a macroeconometric model of the Australian economy. It is made up of numerous accounting identities and behavioural equations which describe the aggregate actions of households, businesses, government and international entities. The formulation of these behavioural equations is based on mainstream economic theory. The model is best described as a small open economy model in which all foreign (world) prices and interest rates are taken as given (that is, they are exogenous to the model).

In the model, business sector factors of production (capital and labour) produce non-farm business sector output, which is non-farm GDP less the service flow from housing and the value of government services. The level of business sector output is the sum of potential output and the output gap. Fluctuations in the output gap are driven by a number of cyclical factors, including fluctuations in interest rates, foreign GDP and the terms of trade.

Potential business sector output is the level of output that would exist if there were no temporary or cyclical influences. In constructing potential business sector output, considerable attention is paid to the population characteristics which influence labour participation, the growth rate of residual total factor productivity and the expected rate of capital deepening. The output gap is the gap between actual and potential business sector output. Negative output gaps imply the economy is operating below its potential, while positive gaps imply the economy is operating above its potential.

Model parameters are estimated using quarterly data extending from September 1974 to the most recent quarter for which data are available.

DAEM forecasts all components of aggregate demand. To ensure consistency between aggregate expenditure and aggregate output, the model uses adjustment factors which trim individual expenditure components so that aggregate expenditure equals aggregate output.

B.1.1. Domestic production

Domestic production is divided into farm and non-farm. Non-farm production is further divided into household, general government and business sector production. Farm output is an exogenous input to the model.

The household sector produces housing rental services. This is the household sector's only output. The service flow is modelled as a fixed proportion of the housing capital stock.

Public sector production is limited to general government output, which comprises general government services (equal to the wage cost of the general government employees) and general government gross operating surplus (equal to the depreciation of general government capital).

All other non-farm production takes place in the business sector, which incorporates private and public enterprises. Business sector output is produced using capital and labour via a standard constant returns production technology. Business sector production is also influenced by the level of total factor productivity.

Imports are effectively intermediate goods in the DAEM model. They are combined with domestically produced traded goods to produce gross national expenditure on traded goods. Higher domestic demand raises the demand for imports. The level of exports is determined by foreign demand conditions rather than domestic supply conditions. Just as stronger domestic demand raises the demand for imports, stronger foreign demand raises the demand for exports.

B.1.2. Labour market

The size of the labour force is forecast using exogenous assumptions about age specific population growth and labour force participation. There are two measures of employment in the model. There is the potential employment that underlies the estimate of potential output and actual employment. The output gap to a large extent reflects the gap between the actual and potential employment.

Potential employment is the actual labour force less the level of unemployed workers implied by the natural rate of unemployment, where the natural rate of unemployment is the level of unemployment that would exist in the absence of cyclical fluctuations. Actual employment is the actual labour force less the level of unemployed workers implied by the actual rate of unemployment.

Business sector employment is driven by a standard labour demand function that relies on labour productivity, real wages and business sector output growth.

B.1.3. Prices and wages

The model also includes a number of measures of prices, wages and price deflators. Price and wage inflation in DAEM are governed by the behavioural equations of the:

- business sector output gap;
- real exchange rate;
- import prices;
- monetary policy reaction function; and
- average quarterly wages.

The way these equations interact is best observed through some examples.

A positive shift in domestic demand that raises the gap between actual and potential output (a positive output gap) will have a direct impact on price inflation by raising the underlying CPI. Wages respond with a lag to changes in underlying CPI inflation, with the long run real wage tied to CPI inflation and labour productivity growth.

A positive output gap also has a direct and indirect effect on real interest rates via the monetary policy reaction function, with the typical reaction to a widening output gap and higher price inflation being higher nominal interest rates. Higher interest rates dampen domestic demand which narrows the output gap and relieves upward pressure on price and wage inflation. Over time this mechanism forces the output gap back to zero, interest rates to a neutral position and inflation to return to the RBA target level.

A change in real wages that exceeded the change in labour productivity raises price inflation in the short run. Since wages increase by more than labour productivity this raises nominal unit labour costs, which in turn raises underlying CPI inflation. Wages in turn respond to changes in underlying CPI inflation. Over time wage inflation will equal price inflation (plus changes in productivity growth).

In the long run, price inflation is governed by the same mechanism at work in the output gap example above, which forces the CPI inflation rate to return to the RBA target level.

While the real exchange rate and import prices do not have an import role in the output gap and real wage scenarios, they are key players in the next foreign price shock example. Holding other things constant, higher world prices raise domestic import prices. Higher import prices have a direct impact on price inflation by raising the underlying CPI. Higher price inflation causes nominal interest rates to rise via the monetary policy reaction function. Higher domestic interest rates and incomplete pass-through of world price changes to domestic prices causes the differential between domestic and world real interest rates to rise.

Ordinarily this would imply an appreciation of the real exchange rate but in the Australian case this is more than offset by a deterioration of the terms of trade due to higher import prices which causes a depreciation of the real exchange rate. Combined with incomplete price pass-through the nominal exchange rate appreciates in the short run, which partly offsets the rise in domestic import prices due to rising world price. Over time there is full pass-through of world prices to domestic prices, which eliminates the gap between domestic and foreign real interest rates and returns the terms of trade to its pre-price shock level. Just as in the domestic inflation example, wages respond with a lag to changes in underlying CPI inflation, with the long run real wage tied to CPI and labour productivity growth.

B.1.4. Industry forecasts

Industry output and employment are forecast following the top down methodology set out above. Industry output is determined through the forecasts of industry final demand. Industry final demand can be thought of as the total value of goods and services that are produced by a specific industry.

For example, if commodity exports increase in response to international demand this will generate an increase in mining output, measured in real gross value added terms. Similarly, if construction investment increases in response to low interest rates, this will generate an increase in construction output.

Industry employment is linked to output through exogenously determined levels of productivity. Considering the mining example from above, if the increase in commodity exports generates a 2% increase in output for the next quarter with no changes to a productivity assumption of 100% mining employment will increase by 2%. A final adjustment is made for both output and employment so that their respective sums equal the national totals.

B.1.5. State forecasts

Gross State Product (GSP) is determined by distributing Gross Domestic Product based on State GSP and population relativities. GSP relativities are influenced by the gross value add of industry within each state. As with other demographic variables, population relativities are exogenously determined. Continuing with the mining example above, the increase in mining output will result in a more than proportionate increase in GSP for the mining intense states such as Western Australia, Queensland and the Northern Territory.

Industry output by State is driven by a combination of industry output at the national level, and a combination of State variables, including GSP, consumption and investment. Industry relativities between the States are also utilised. For example, Victoria has a relatively higher share of manufacturing output when compared to the national manufacturing share of total output. This means that if manufacturing output is forecast to decline nationally, a larger portion of that decline will be felt in Victoria.

The industry output forecasts are then normalised over several iterations, to ensure that State industry output adds to national, and each industry within a State adds to total State GSP.

B.2. WPI forecasts

The WPI measures quarterly changes over time in the price employers pay for labour due to market factors. The ABS notes that "to ensure that the quantity and quality of labour services are held constant, changes in the composition of the labour force, hours worked, or changes in characteristics of employees (e.g. work performance) are all excluded from the index." [20]

There are a number of factors to consider when forecasting WPI:

- WPI captures changes in underlying inflation;
- WPI captures the bargaining power of workers;
- WPI does not capture increases in workforce productivity that are due to changes in the skill composition of the workforce ('composition productivity effects');
- WPI does not capture increases in workforce productivity that are due to increases in the productivity of individual workers ('worker productivity effects');
- Due to the challenges of measuring productivity effects, an insubstantial portion of productivity may creep into WPI; and
- Observed movements in WPI are related to movements in labour underutilisation (the sum of the unemployment rate and the underemployment rate).

B.2.1. State industry WPI forecasts

Modelling of specific State industry WPIs begins with the movements in the total Australian WPI. This measure serves as an anchor to overall wage rates in every part of the economy, in part because it provides a measure of the wage rises that other employees are receiving, making it a common starting point for negotiations.

The modelling of State industry WPIs involves estimation of the deviations between industry and State-specific wage measures and the broadest measures of wages in the Australian economy. The DAEM model sets the outlook for national and State WPIs. The remainder of the modelling determines how industry WPIs and State-industry WPIs will move relative to the all-industry national and State WPI measures.

From the national index, the model adds in deviations from the average. Two key factors will drive these wage differentials:

- **Business cycle factors**: Deviations in industry (or State) performance from the national average. Faster growing industries and States will tend to see faster growth in wages and vice versa. In this model, the key factor is how fast the industry (or State) is growing relative both to the national average, as well as to historical averages. For example, while manufacturing growth in the future may be below the national average, if the gap is relatively less that has been seen in recent years, this is view as an out-performance by the sector and would see some upward pressure on wages. In this model the methodology is forward-looking, with forecast growth across the next six months (as well as the past twelve) used to determine the current performance of an industry.
- **Competition (relative wage) factors**: Depending on the nature of the industry, workers will have skills that are relatively more or less transferable to other sectors where wages may be rising faster than in their own. Indeed, many workers will be performing effectively the same task (or same occupation – effectively their job description) across different industries (as their industry classification is determined by what their employer produces, rather than what they do). This will tend to limit the ability of wage rates to diverge. For example, if wage rates in mining rise higher, companies in the construction sector will be forced to pay higher wages to keep their staff. Similar factors operate across States – although they are likely to be less

[20] Australian Bureau of Statistics, Labour Price Index: Concepts, Sources and Methods, 2012, Cat. no. 6351.0.55.001

significant and react only to relatively larger discrepancies in wages. The modelling here will see wages in competitor industries tend to move more closely together – with industries that are benefiting from the two previous factors tending to be drawn back towards the average, and wages in otherwise slow growing industries boosted.

In addition to these two 'mechanical' factors, there is often the need to use judgement to determine movements in wages – particularly when other data is volatile and when factors not relevant to wage determination are having effects on broader output and employment measures.

Deloitte Access Economics also looks at developments in EBAs in the Department of Jobs and Small Business' Trends in Federal Enterprise Bargaining reports, and takes account of these in its short term forecasting if they appear likely to have a material impact.

It is important to remember that the WPI for an industry is a composite measure and can, in certain situations, behave in the perverse manner. When there is a significant change in the occupational structure of an industry, movements in the WPI may not be reflective of movements in the wages of individual employees.

B.2.2. Labour productivity

In previous reports, Deloitte Access Economics has presented a productivity adjusted WPI forecast. This series has not been used in past determinations by the AER. Based on information provided by the ABS, Deloitte Access Economics no longer incorporates a productivity adjusted WPI forecast into reports prepared for the AER. The ABS has advised that the WPI does not incorporate labour productivity or compositional changes in the workforce.

The WPI is a measure of the price employers pay for labour due to market factors. In constructing the WPI, the ABS aims to ensure that the quantity and quality of labour services measured are held constant. The index excludes changes in the composition of the labour force and hours worked. The index also excludes characteristics of employees and as a result, is not intended to capture changes in labour productivity. Movements in these factors will result in changes to overall wages, but are not strictly measured by the WPI. However, due to the challenges of measuring or excluding productivity effects, an insubstantial portion of productivity may creep into WPI.

Labour productivity measures the number of units of output an individual employee can produce in a given time period. The more units of output each worker can produce, the fewer workers are required to create a given level of output.

In this report, Deloitte Access Economics provides estimates of labour productivity at the national, State and industry level. Because so many factors can influence productivity it is often best measured over an entire economic cycle. For example, during times of rapid expansion in employment, productivity may fall as new workers are often less productive that those who have been working in an industry for longer, but productivity may also rise as 'economies of scale' become available, and workers who may have been underemployed in their workplace increase their effective level of output.

However, in the methodology used here the volatility in the underlying productivity data is minimised by creating a composite productivity measure based on national, industry and State-specific productivity movements – where the relative impact of movements in the smaller and more volatile States and industries is lessened.

Labour productivity for all industries is calculated as:

- GDP / employed persons in Australia (for national labour productivity); and
- GSP / employed persons in a given State (for State labour productivity).

Labour productivity estimates for an industry in a State and at the national level are based on a combination of:

- GDP / employed persons in Australia;
- GSP / employed persons in a given State;
- National sectoral GVA / employed persons in industry in Australia.

These three values are weighted based on factors reflecting the volatility of the various data. Larger States give a larger weight to their overall State estimates as they are less likely to be volatile from quarter to quarter.

Movements within sub-industries are also considered when estimating labour productivity for a particular industry. For example, the utilities sector comprises electricity, gas, water and waste services. As the utilities sector not only sees very volatile trends in measured productivity, but also because these trends may be caused by changing importance of the three sub-industries, the weight on utilities for the productivity calculation is lower than for some other industries.

The methodology adopted to estimate sectoral labour productivity is not equivalent to national sectoral GVA divided by employed persons due to the weighting of the measures listed above.

Appendix C – Different measures of wage growth

The ABS published an article in the October 2005 issue of Australian Labour Market Statistics (catalogue 6105.0) which discussed the comparative features and relative merits of the measures they produce.[21] The following reproduces part of that article, and then adds some observations.

C.1. Introduction

Statistics on employee remuneration are in demand from a wide range of users, including economic analysts, social researchers, policymakers, and employer and employee associations. The ABS publishes a number of measures relating to the remuneration of employees to meet the different needs of users. These measures include average weekly earnings, changes in the price of labour, and compensation of employees.

The variety of measures available can sometimes lead to misunderstanding and misapplication. The choice of measure will depend on what type of analysis is being undertaken. This section explores the differences between the various measures of employee remuneration.

C.2. Measures of employee remuneration

Three distinct measures of employee remuneration are discussed below: earnings; wage price index; and compensation of employees.

C.2.1. Earnings

Estimates of the level of earnings are produced from a number of surveys: the Survey of Average Weekly Earnings (AWE); the Survey of Employee Earnings and Hours (EEH); and the Survey of Employee Earnings, Benefits and Trade Union Membership (EEBTUM).

The AWE survey is one of the major sources of data on earnings, and is designed to provide a quarterly measure of the level of earnings. Three earnings series are produced from AWE:

- average weekly ordinary time earnings for full-time adults;
- average weekly total earnings for full-time adults; and
- average weekly total earnings for all employees.

While the AWE survey provides a frequent time series, data are only available for full-time adult employees and all employees, and can only be cross-classified by a small number of variables, such as sex, state, sector, and industry. The EEH and EEBTUM surveys provide additional detail, although on a less frequent basis. The EEH survey is run every two years and provides a large number of variables important in the analysis of weekly earnings, including: managerial/non-managerial status; state; sector; level of government; industry; occupation; employer size; sex; full-time/part-time status; adult/junior status; and type of employee (e.g. permanent/fixed-term contract or casual). The EEH survey therefore supplements AWE survey data by providing detailed information on the composition and distribution of employee earnings and hours.

The annual EEBTUM survey is a household survey, in contrast to the AWE and EEH surveys which are business surveys. The EEBTUM survey, which is conducted as a supplement to the monthly Labour Force Survey, collects weekly earnings data cross-classified by a range of socio-demographic information, including: sex; age; marital status; relationship in household; geographic region;

[21] ABS 2005.

school attendance; birthplace and year of arrival in Australia. The EEBTUM survey also collects details about the type of employment, including: occupation; industry; hours worked; full-time or part-time status; sector; size of workplace and leave entitlements.

While the EEH and EEBTUM surveys are run less frequently than the AWE survey, they are a valuable source of information as they enable detailed analysis of earnings levels.

C.2.2. Wage Price Index

Information collected on wages is used to produce a quarterly WPI, formerly the labour price index (LPI). The WPI is compiled from information collected from businesses on changes in wage and non-wage costs.

The WPI was first compiled for the September quarter 1997 and is the main ABS measure of changes in wages. The WPI measures quarterly changes over time in the cost to an employer of employing labour, and is unaffected by changes in the quality or quantity of work performed. The WPI does not include the superannuation guarantee levee.

The ABS publishes four WPIs each quarter. The headline WPI series is the index of total hourly rates of pay excluding bonuses. This series excludes bonus payments (which generally relate to the individual performance of the employee or to the organisation's performance), and so represents a pure price measure for combined ordinary time and overtime hourly rates of pay.

In the WPI, index numbers are compiled using information collected from a representative sample of employee jobs within a sample of employing organisations. Price-determining characteristics of the jobs are fixed to ensure that changes in these characteristics do not contribute toward index movements. The following are examples of changes in price-determining characteristics which are not reflected in index movements:

- changes in the nature of work performed (e.g. different tasks or responsibilities)
- changes in the quantity of work performed (e.g. the number of hours worked)
- changes in the characteristics of the job occupant (e.g. age, apprenticeship year, successful completion of training or a qualification, grade or level, experience, length of service, etc.)
- changes in the location where the work is performed.

Changes in the price of wages and salaries resulting from changes in the composition of the labour market are also excluded from index movements. To achieve this, a longitudinal survey methodology is used to measure a similar sample of jobs over time.

C.2.3. Compensation of employees

Compensation of employees (CoE) is a quarterly measure of the total remuneration paid to employees in return for work done and is published as part of the national accounts. CoE is a broader measure than earnings as it includes irregular payments (e.g. annual bonuses) and social contributions paid by the employer (e.g. severance, termination and redundancy payments; employer superannuation contributions; and workers compensation premiums). These payments are excluded from measures of earnings, which have a narrower focus.

A quarterly measure of the average CoE per employee, known as Average Earnings National Accounts (AENA), is produced by dividing the total CoE for the quarter by the total number of employees. The total number of employees is estimated using Labour Force Survey data, calculated as an average of the three months in each quarter. Some adjustments are made to this estimate of employment. Two measures of AENA are produced: average non-farm compensation per employee; and average compensation per employee. The average non-farm compensation per employee estimate is the key series, as it is a more stable estimate. This is because employee earnings in the agricultural sector can fluctuate due to seasonal effects.

C.3. Summary of the surveys and their key series

Table C.1 (found at the end of this chapter) provides a comparison of each of the surveys discussed. It outlines the key series produced, what each survey is designed to measure, the frequency and type of data source, the benefits and limitations of each survey, and the related publication.

C.3.1. Using the WPI measure

While Deloitte Access Economics views the WPI as the best measure for use in the context of this report, 'best measure' is not the same as 'perfect measure', and there are also drawbacks to using the WPI.

The WPI is published by State and by sector separately, but not by State and by sector. That is, the WPI for New South Wales is published, and the mining sector WPI is also published, however the New South Wales mining sector WPI is not. The latter data is only available by special request and, in the case of small sample sizes, the ABS does not release their estimates.

More series were previously available 'by State and by sector' for AWOTE from the ABS 6302.0 release. The ABS ceased producing this information 'by State and by sector' which eliminated one of the remaining arguments in favour of using AWOTE or AWE over the WPI measures.

A key reason was the high standard errors for these series. In the case of the AWE/AWOTE publication, sample selection is stratified across States and across industries, but not both. That means that as the businesses in the sample change from quarter to quarter (and about 8% of the 5,000 do each time) there is no guarantee that the State by industry samples can be readily compared. This led to questionable comparability of detailed AWE/AWOTE results from quarter to quarter as the changes may be driven by changes in the sample, rather than changes in wages.

The WPI, by contrast, suffers as little as possible from this problem because its sample follows specific 'jobs' over an extended period (at least five years). This limits the rotation problems that the AWE/AWOTE series suffered from.

It is possible to 'back out' reasonable estimates of WPI at the 'by State and by sector' level. Appendix A and Appendix B discuss how Deloitte Access Economics does that. The resultant series are rather less volatile than the matching ABS AWOTE series.

One drawback to using the WPI, is that it is sometimes relevant that the composition of the workforce is changing. That is particularly true in analysing the implications of wage developments for the Australian economy as a whole. For example, promotions are easier to get during a sustained expansion, reflecting the strength of cyclical demand rather than pure productivity. Other things equal, that adds to total incomes in the economy, but doesn't show up in the WPI (which does not 'recognise' that people at a certain seniority today are, on average, different to those who were at that level some years past).

C.3.2. EBAs and contract rates

Deloitte Access Economics' forecasts are developed using a more formal modelling approach rather than a more 'institution-based' approach.

The latter focuses on:

- increases in the **Federal Minimum Wage / Fair Pay Commission decisions**,
- increases in **collective agreements** under enterprise bargaining,
- increases in **individual agreements**.

That said, close attention to such institutional factors can assist in short term forecasting (as opposed to longer term forecasts), given that such decisions have lingering effects on wage outcomes.

Accordingly, Deloitte Access Economics notes developments in the Department of Jobs and Small Business' Trends in Federal Enterprise Bargaining reports[22], and takes account of these in its short term forecasting if they appear likely to have a material impact.

Table C.1 National wage surveys

	AWE Survey	EEH Survey	EEBTUM Survey	WPI	CoE
Key series produced	Average weekly total earnings (AWTE) for full-time adult employees and all employees. Average weekly ordinary time earnings (AWOTE) for full-time adult employees.	Average weekly earnings for all employees. Average weekly earnings for full-time adult non-managerial employees.	Median and mean weekly earnings of full-time, part-time and all employees.	Wage Price index of total hourly rates of pay excluding bonuses.	Non-farm Average Earnings National Accounts (AENA).
Designed to measure	Level estimates of weekly earnings and the distribution of earnings.	Level estimates of weekly and hourly earnings and the distribution of earnings.	Level estimates of earnings and the distribution of earnings.	Changes in the price of labour.	Level estimates of average compensation of employees.
Frequency and basis of survey	Quarterly survey of businesses.	Biennial survey of businesses.	Annual survey of households.	Quarterly survey of businesses.	Quarterly national accounts series based on quarterly survey of businesses.
Benefits of the methodology	Quarterly time series. Original, seasonally adjusted and trend estimates available.	Provides detailed job information allowing analysis by industry, occupation, hourly rates etc. Source of distributional data (e.g. quartiles).	Provides detailed demographic and job information. Source of distributional data (e.g. medians).	Provides estimates of wage and non-wage inflation.	Broad measure of remuneration.
Limitations of the methodology	Fe cross-classificatory items	Survey run infrequently (every two years)	Only provides AWE. Includes payments not related to the period of work performed (e.g. back-pay and pay in advance).	No level estimates of in-depth cross-classificatory items.	Few cross-classificatory items.
Publication description and ABS catalogue number	Average Weekly Earnings, Australia (cat. no. 6302.0)	Employee Earnings and Hours, Australia (cat. no. 6310.0)	Employee Earnings, Benefits and Trade Union Membership, Australia (cat. no. 6310.0)	Wage Price Index, Australia (cat. no. 6345.0)	Australian National Accounts: National Income Expenditure and Product (cat. no. 5206.0)

[22] Department of Jobs and Small Business, December 2016.

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