Final Plan Attachment 7.2

Utilities Sector and Construction Industry Wage Forecasts to 2022 – Australia and Victoria

A Report Prepared for Australian Gas Networks, MultiNet Gas and AusNet Services

A Report by BIS Shrapnel

October 2016

UTILITIES SECTOR AND CONSTRUCTION INDUSTRY WAGE FORECASTS TO 2022 – AUSTRALIA AND VICTORIA

Prepared by BIS Shrapnel for Australian Gas Networks, MultiNet Gas and AusNet Services

Final Report

October 2016

BIS Shrapnel welcomes any feedback concerning the forecasts or methodology used in this report as well as any suggestions for future improvement.

Job no: E6428

BIS Shrapnel contact: Kishti Sen
Senior Economist
Richard Robinson
Associate Director - Economics

BIS Shrapnel Pty Limited
Level 8, 99 Walker Street
North Sydney, NSW 2060
Australia
Tel. +61 (02) 8458 4200
Fax +61 (02) 9959 5795
ksen@bis.com.au
rrobinson@bis.com.au

Contents

SUMMARY I

1. INTRODUCTION, OUTLINE OF REPORT & DATA SOURCES 1

2. OVERVIEW OF THE MACROECONOMIC OUTLOOK 3

2.1 World economy: current state of play and outlook 3

2.2 Australia – current state of play and broad economic outlook 4

2.2.2 Key risks to outlook 8

2.3 The Victorian Economy: current conditions and outlook 9

3. INFLATION AND WAGES 12

3.1 Inflation: current state of play and outlook 12

3.2 Australian All Industries Wages: current state of play and outlook 15

3.2.1 A note on different wage measures and BIS Shrapnel's wage model 15

3.2.2 Australian wages: current conditions and outlook 19

4. INTERNAL LABOUR COST ESCALATION FORECASTS 21

4.1 Outlook for utilities wages growth in Victoria 28

5. EXTERNAL LABOUR COST ESCALATION FORECASTS 30

5.1 Construction Sector Wages Growth in Victoria 30

APPENDIX A: TERMS OF REFERENCE A-1

APPENDIX B: STATEMENT OF COMPLIANCE WITH EXPERT WITNESS GUIDELINES A-3

APPENDIX C: CURRICULUM VITAES OF KEY PERSONNEL A-5

Tables

Summary – Labour Cost Escalation Forecasts ii
Table 2.1: Australia – Key Economic Indicators, Financial Years 7
Table 2.3: Victoria – Key Economic Indicators, Financial Years 11
Table 3.1: Wages and Prices – Australia Year Average Growth 14
Table 3.2: Methods of Setting Pay, Industry, May 2010 Proportion of Full-Time Adult Employees (%) ..17
Table 3.3: Wages Growth: All Industries, Australia (by Workforce Segmented by Pay Setting Method) 20
Table 4.1: Wage Price Index Growth by Industry Sector and by State 22
Table 4.2: Australia AWOTE Growth by Industry Sector 22
Table 4.3: Electricity, Gas, Water and Waste Services Forecasts – Australia 23
Table 4.4: Federal Wage Agreements – Collective Agreements by Industry (Average Annualised Wage Increase) 24
Table 4.5: Average Weekly Ordinary Time Earnings and Wage Price Index Total Australia and Electricity, Gas, Water and Waste Services Sector (Year Average Growth) 26
Table 4.6: Electricity, Gas, Water and Waste Services – Victoria and Australia Year Average Growth ..29
Table 5.1: Construction Wages Growth – Victoria and Australia Year Average Growth 31

Charts

Chart 2.1: Underlying demand for dwellings and estimated stock deficiency - Victoria 10
Chart 3.1: Australia – Wages and Prices 18
Chart 3.2: Employment and Unemployment 18
Chart 4.1: Wage Price Index Total Australia (All Industries) and Electricity, Gas, Water and Waste Services 24
Chart 4.2: Australia – Utilities Employment, Output and Investment 25
Chart 4.3: Victoria – Utilities Employment, Output and Investment 28
Chart 5.1: Total Construction – Victoria Value of Work Done, Constant 2013/14 Prices 30

SUMMARY

- In April 2016, BIS Shrapnel was engaged by the Australian Gas Networks, MultiNet Gas and AusNet Services (collectively the Victorian Gas Distributors or the businesses) to provide an expert opinion regarding the outlook for labour cost escalators relevant to gas distribution networks in Victoria. As part of this engagement, BIS Shrapnel was also asked to update the labour cost escalators in October 2016. This report provides our latest labour cost escalator forecasts.

- Falling terms of trade, spare capacity in the labour market, weak inflation and inflation expectations along with a flexible labour market have conspired to slow wages growth over recent years. Year average growth in 2015/16 was 2.1 per cent for the Wage Price Index (WPI) and 1.9 per cent for Average Weekly Ordinary Time Earnings (AWOTE), both down from 2.4 per cent in 2014/15. In through the year terms, wages growth at present is the lowest since 1998 (i.e. since the ABS started recording this data).

- Wage inflation, as measured by the WPI, is expected to remain subdued due to little improvement in the unemployment rate over the next 18 to 24 months. Only a gradual rise over the next two years is forecast largely in response to the lift in the headline CPI rate over 2016/17. Wages growth is then expected to ease over 2018/19 as a lagged response to a weakening in economic growth, lower CPI and a rising unemployment rate. Stronger wages growth is anticipated from 2019/20 as economic growth strengthens and the unemployment rate falls.

- Indeed, a broadening in employment, profits and investment is expected from early next decade as the next set of economic drivers, in particular non-mining business investment, comes through. The increase in profits combined with rising price inflation next decade will push up wages growth over 2019/20 and 2021/22. Wages growth (in year average terms) is expected to rise further and peak at 3.7 per cent for WPI (4.8 per cent for AWOTE) in 2021/22 – which would be the strongest result in WPI terms in a decade.

- Wages within the Australian Electricity, Gas, Water and Waste Services (EGWWS or 'Utilities) sector are forecast to exceed the all industry result. A stronger union presence, a pick-up in employment and a turnaround in wage increases awarded to staff on individual agreements are the key drivers. Overall, BIS Shrapnel expects total wage costs for the Australian Electricity, Gas, Water and Waste Services (EGWWS or 'Utilities) sector — expressed in Average Weekly Ordinary Time Earnings (AWOTE) — will average 4.3 per cent per annum over the five years to 2022, 0.2 per cent higher than the national 'All Industries' AWOTE average of 4.1 per cent per annum over the same five-year period. In terms of *underlying* wages growth in the 'utilities' sector for total Australia — expressed in wage price index (WPI) terms — BIS Shrapnel is forecasting an average of 3.7 per cent per annum (also 0.6 percentage points higher than the national 'All Industries' WPI average of 3.1 per cent per annum) over the five years to 2022.

- The utilities wage forecasts for Victoria are expected to slightly exceed the national average over the five years to December 2022 (i.e. the distributors' next Access Arrangement period). Victorian utilities WPI growth is forecast to average 3.8 per cent per annum compared with Australian utilities industry wage forecast of 3.7 per cent per annum over the same period.

- Construction wages tend to follow construction activity, including residential and non-residential building, and engineering construction. Construction activity in Victoria increased last year and is forecast to cycle around higher levels over the rest of the forecast period. We are forecasting construction wages in Victoria to grow by 3.7 per annum, on average, over the businesses next Access Arrangement period.

Summary – Labour Cost Escalation Forecasts

(per cent change, year average, year ended December)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Average for next AA period
	Actuals					Forecasts		Next Access Arrangement Period					
NOMINAL PRICE CHANGES													
Utilities sector wage forecasst													
EGWWS WPI - Victoria (a)	**3.8**	**3.9**	**4.4**	**3.7**	**3.3**	**3.0**	**2.8**	**3.1**	**3.4**	**3.7**	**4.2**	**4.5**	**3.8**
EGWWS AWOTE - Australia (b)	5.9	3.6	4.3	1.5	1.6	4.0	3.6	3.8	3.9	4.2	4.6	5.0	**4.3**
EGWWS WPI - Australia (b)	3.6	3.9	3.8	3.1	2.5	2.5	2.9	3.1	3.3	3.7	4.1	4.3	**3.7**
Construction industry wage forecasts													
Construction WPI - Victoria (c)	**4.4**	**3.1**	**4.2**	**3.5**	**2.9**	**1.9**	**2.3**	**2.8**	**3.3**	**3.7**	**4.3**	**4.5**	**3.7**
Construction AWOTE - Australia (b)	5.0	2.4	4.2	1.4	2.5	1.1	2.3	2.9	3.5	4.1	4.6	4.8	**4.0**
Construction WPI - Australia (b)	4.1	3.9	3.0	2.7	1.7	1.6	2.5	2.9	3.3	3.5	4.2	4.4	**3.7**
Australian Wages													
All Industries - AWOTE (d)	4.4	4.1	4.2	2.6	1.9	2.3	3.5	3.7	3.3	4.1	4.5	4.8	**4.1**
All Industries - WPI (d)	3.7	3.6	2.9	2.6	2.2	2.1	2.5	2.6	2.5	3.2	3.6	3.8	**3.1**
Consumer Price Index (headline) (e)	3.3	1.8	2.4	2.5	1.5	1.3	2.0	2.0	2.5	2.5	2.5	2.5	**2.4**
REAL PRICE CHANGES (f)													
Utilities sector wage forecasst													
EGWWS WPI - Victoria	**0.5**	**2.1**	**1.9**	**1.2**	**1.8**	**1.7**	**0.8**	**1.1**	**0.9**	**1.2**	**1.7**	**2.0**	**1.4**
EGWWS AWOTE - Australia	2.6	1.8	1.9	-1.0	0.1	2.7	1.6	1.8	1.4	1.7	2.1	2.5	**1.9**
EGWWS WPI - Australia	0.3	2.2	1.3	0.6	1.0	1.2	0.9	1.1	0.8	1.2	1.6	1.8	**1.3**
Construction industry wage forecasts													
Construction WPI - Victoria	**1.1**	**1.4**	**1.8**	**1.0**	**1.4**	**0.6**	**0.3**	**0.8**	**0.8**	**1.2**	**1.8**	**2.0**	**1.3**
Construction AWOTE - Australia	1.7	0.7	1.8	-1.1	1.0	-0.2	0.3	0.9	1.0	1.6	2.1	2.3	**1.6**
Construction WPI - Australia	0.8	2.1	0.6	0.2	0.2	0.3	0.5	0.9	0.8	1.0	1.7	1.9	**1.3**
Australian Wages													
All Industries - AWOTE	1.1	2.3	1.7	0.1	0.4	1.0	1.4	1.7	0.8	1.6	2.0	2.3	**1.7**
All Industries - WPI	0.4	1.8	0.4	0.1	0.7	0.8	0.4	0.5	0.0	0.7	1.1	1.3	**0.7**

(a) Electricity, Gas, Water and Waste Services (EGWWS) Wage Price Index (WPI) for Victoria.
(b) Australian sector forecasts of Average Weekly Ordinary Time Earnings (AWOTE) and WPI provided for comparison.
(c) Construction industry WPI for Victoria.
(d) Australian All Industries AWOTE and WPI provided for comparison.
(e) Headline CPI forecasts based on Reserve Bank of Australia forecasts to December 2018 quarter and then Commonwealth Treasury medium-term projections
(f) Real price changes are calculated by deducting the inflation rate from nominal price changes.

1. INTRODUCTION, OUTLINE OF REPORT & DATA SOURCES

In April 2016, BIS Shrapnel was engaged by the Australian Gas Networks, MultiNet Gas and AusNet Services (collectively the Victorian Gas Distributors or the businesses) to provide an expert opinion regarding the outlook for labour cost escalators relevant to gas distribution networks in Victoria. As part of this engagement, BIS Shrapnel was also asked to update the labour cost escalators in October 2016. This report provides our latest input cost escalator forecasts.

Forecasts of the labour costs will be used by the businesses to escalate the cost of labour included in their base year operating and capital expenditure. Forecasts of the businesses operating and capital expenditure will, in turn, be included in their initial revenue proposal to the Australian Energy Regulator later this year. Although the next revenue proposal period is 1 January 2018 to 31 December 2022, BIS Shrapnel was asked to provide seven year forecasts covering the calendar years 2016 to 2022 (i.e. 1 January 2016 to 31 December 2022).

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

The Australian Bureau of Statistics is the primary data source for the consumer price index, wages, employment, real gross value added and investment (including engineering construction) data, and for a range of other economic variables shown in table 2.1 and table 2.2. The most recent wages data is for the June 2016 quarter and the latest industry employment data is for the month of August 2016. The June 2016 quarter was the latest available data for real gross value added (at the Australian level only), investment and indeed most of the economic variables in table 2.1. The detailed engineering construction data (by state and by category) have data up to June 2016 quarter. The latest data for Gross State Product and real gross value added for state industry sectors was 2014/15. Other inflation and interest rate data were sourced from the Reserve Bank of Australia. Date and information concerning enterprise agreements were obtained from the Department of Employment.

Forecasts of the economic variables in this report were mostly sourced from BIS Shrapnel reports, including *Economic Outlook, Long Term Forecasts: 2016 – 2031* report*, Engineering Construction: 2015/16 to 2029/31 and Long Term Building Work Done Forecasts*, plus other unpublished forecasts and from BIS Shrapnel internal research.

We use a top-down and bottom-up approach to forecasting key economic indicators of the Australian economy. The bottom-up approach fundamentally models the key sectors of the economy at a regional and individual category level, which are then aggregated to national totals. The top-down modelling then reconciles the bottom-up forecasts by ensuring that the forecasts are consistent with prevailing trends, investment and business cycles and assumptions about the general macroeconomic outlook. This approach to the analysis of an economy allows for a richer set of information to influence the macroeconomic outlook.

The structure of this report is as follows:

- The previous **Summary** section presents an overview of the outlook for the labour cost escalators and provides a summary table.

- **Section 2** provides an overview of the world economy as well as a macroeconomic outlook for Australia and Victoria, including a brief commentary of the logic and key drivers, plus forecasts of key economic variables. This provides a context for our Australia level and industry wage forecasts.
- **Section 3** discusses BIS Shrapnel's model of wage determinations and provides forecasts of national ('all industries') wages and CPI inflation. This section also includes the Reserve Bank of Australia projections of CPI inflation which is used to deflate the nominal escalators provided in this report.
- **Section 4** provides an outlook for the distributors' internal labour costs. This is proxied by forecasts of wages growth for the Electricity, Gas, Water and Waste Services industry for Victoria.
- **Section 5** provides forecasts of the distributors' external labour costs included in their capital expenditure. As most of this labour is provided by firms in the construction industry, the businesses external labour costs in capital expenditure is based on the Victorian construction industry wages.
- **Appendices,** which includes CVS of project key personnel.

2. OVERVIEW OF THE MACROECONOMIC OUTLOOK

2.1 World economy: current state of play and outlook

The world economy grew by 3.2 per cent in calendar year 2015, well below its long-run average of 3.6 per cent. Last year was the fourth consecutive year in which the world economy grew by less than its potential growth reflecting a prolonged period of weaker growth following the GFC (global financial crisis). Growth in emerging markets and developing economies — while still accounting for over 70 percent of global growth — stepped down for the fifth consecutive year in 2015, making a marginally smaller contribution to world growth. However, this was partially offset by a modest recovery in advanced economies, keeping overall growth in 2015 just below the rate achieved in the previous year.

Towards the end of 2015, most commentators believed that five key issues would determine the outlook for calendar years 2016 and 2017 including:

- Expectations of how fast the US Federal Reserve (the Fed) would normalise its monetary policy (i.e. return highly stimulative interest rates to its neutral level).
- The difficulties China could face in rebalancing its economy from an investment-led model to one which is driven by domestic demand and whether this would result in a significant slowing in Chinese growth.
- The path commodity prices would take after plummeting in 2015 which sent many net commodity exporting nations including Brazil, Canada and Russia into recession.
- Whether ongoing monetary and fiscal stimulus would stimulate private demand in Japan,
- And the resilience of the recovery in the Euro-area economies.

Everything being equal, our expectation was for a modest pick-up in global growth over the next three years. Our view was that emerging market economies would continue to grow solidly albeit at a slightly slower pace. In addition, we believed that better performance by the advanced countries, particularly the United States, would support world economic activity.

However, 2016 started with a bang with sharp falls in equity prices pretty much around the world as investors put greater weight on downside risks to the global outlook due to a slowing Chinese and other emerging market economies. Concerns about global demand drove oil prices lower in January adding to the bearish sentiment. Fears about emerging market economies' growth prospects also led to net capital outflow from these countries resulting in a tightening of financial conditions. Thankfully, sentiment improved by March and normal business resumed. However, as conditions were returning to normal, the financial markets took another hit.

On 24th June 2016, Britain, via a referendum, voted to leave the European Union (Brexit). This outcome was unexpected and as a result sent panic amongst markets which had priced in the 'Remain' vote wining comfortably. In the immediate aftermath of the Brexit vote, the pound lost more than 15 per cent (trading at its weakest level since 1985) and more than $3 trillion was wiped off share markets globally. As ever, the political fallout within Britain of the Brexit vote was swift. A new Prime Minister has emerged from the ashes of the vote, with many 'Remain' campaigners losing their cabinet positions. Financial market conditions since the vote have settled down and it is more than likely that the actual real economy impact won't be as severe as the initial headlines suggested.

The Brexit vote is expected to be felt primarily within the United Kingdom and the European Union, with some spillovers to the rest of the global economy. Assessing all of these effects is difficult, since many of important elements will be understood as the process unfolds (this is an unprecedented event). We believe, the UK's contribution to global GDP will be reduced, albeit modestly as the UK only has a 2.7% share of the global GDP and a 3.7% share of imports. The impact on Australia's GDP is likely to be insignificant. Australia has a small direct exposure to the UK market as exports to the UK make up only 2.7% of total exports.

Nonetheless, the shocks to financial markets worldwide have altered our growth profile for the UK and the Euro-area slightly. We have shaved growth by around 0.1 per cent per annum over the next two years with the decline in the UK growth marginally larger due to weaker confidence, tighter credit conditions and reduced bilateral trade. That said, most of the impact on GDP is expected to come from the uncertainty surrounding business investment particularly as the timing of Britain's exit is likely to drawn out. Already, the British Prime Minister has announced that the UK will not be activating Article 50 of the Lisbon Treaty (which is the formal application to leave the EU) this year.

We believe global growth will continue to be boosted by emerging markets and developing economies. China, while slowing, is still the world's largest economy and will continue to make significant contributions to growth. India and ASEAN-5 (Indonesia, Philippines, Malaysia, Thailand and Vietnam) GDP growth is expected to pick up pace over the next two years. Meanwhile Russia and Brazil currently in recession are expected to recover, albeit modestly, in 2017 adding to world growth.

Many advanced economies are still in protracted recovery from their GFC induced economic downturns. The United States is the key for global growth going forward. The economy is now 10 per cent larger than its previous peak in 2007. In addition, employment has surpassed its 2008 peak by 5 million workers and the unemployment rate has fallen from 10% to below 5%. Many analysts believe that the United States' economy is close to full employment. However, the problem for the United States is very low levels of price inflation. Hence, the hesitancy of the Federal Reserve to raise rates further. The US central bank is happy for the unemployment rate to fall even further so that wages pick up and pushes price inflation back towards its target of 2%.

For most of the Euro-area economies, it was always going to take a decade, all things being equal, to recover from the ashes of Great Recession following the financial crisis. Nonetheless, stimulatory monetary policy and improvements in competitiveness stemming from falling unit labour costs will support growth in the Euro-area. Japan is expected to benefit from ongoing monetary and fiscal stimulus. including a delay in a sales tax hike in response to ongoing weakness in private demand growth. Meanwhile, Chinese growth is slowing as authorities seek to rebalance the composition of its growth from investment-led to household consumption. But we expect China to continue to make significant contributions to world GDP growth. We forecast the world growth to pause in 2019 due to higher interest rates before returning to stronger (trend) growth next decade.

2.2 Australia – current state of play and broad economic outlook

Australia's real GDP grew by 0.5 per cent in the June 2016 quarter (seasonally adjusted), bringing the through-the-year growth (June 2016 compared to June 2015) to 3.3 per cent — the strongest outcome in four years. While the June result was slightly below market expectations of 0.6 per cent, it was still a solid number considering an already impressive 1 per cent growth in the March quarter. However, the second quarter growth was driven by public demand with very little sign of broadly based growth. Take out the stimulus from government consumption

expenditure and public investment which included a 27.6 per cent spike in defence spending, real GDP would have been flat in the June quarter. Over 2015/16, GDP grew by 2.9 per cent.

There's no doubt that we've had a good run. And it's not over yet.

Certainly, Australian growth will stay soft for the rest of this decade as we absorb the shock of falling mining investment, as the residential cycle turns down and until non-mining growth and business investment recover. But that's a good outcome. There is minimal risk of recession. And other resources exporting countries have gone into recession.

The world economy is staying weaker for longer, still recovering from the GFC. The newspapers are full of doom and gloom as Europe struggles out of rolling recessions in the face of concerns about viability of their banks, as the UK slowly exits the EU, and with concerns about the sustainability of growth in China. Only the US is doing well. It was always going to take a decade to absorb the excess capacity created during the pre-GFC boom until investment came through to boost growth. We think the US will end up driving world recovery. But it will take time.

Australia's main issues are domestic. With the end of the mining boom, we face a protracted and difficult structural change involving rebuilding of dollar-exposed industries and recovery in non-mining growth and investment. That will take time.

Unlike most other advanced economies, we managed to avoid recession in the wake of the GFC. Our last recession was in 1991, a quarter of a century ago, when we had our own financial crisis. Since then, GDP has grown to $1.7 trillion (in 2013/14 prices), 120 per cent larger than in 1991, adding over four million jobs. As a result, Australia has continued to move up the OECD ranking to 10th in terms of GDP per capita (on a purchasing power parity basis), and now sits around 18 per cent below the US, compared with 26 per cent in 1991.

Australia's GDP growth averaged 3.2 per cent per annum over the last 25 years. That's considered our potential growth rate — the sustainable rate at which the economy can grow without adding to inflation.

1990s growth was underpinned, post-recession, by strong labour productivity gains resulting from changes to manning practices and investment in productive assets. This allowed the economy to prosper without the burden of exorbitant cost pressures and much higher interest rates. More recently, growth has been largely driven by a 'once in a generation' mining investment boom which commenced in 2002/03 and lasted for a decade. The resultant increases in capacity are still driving growth in production and exports, and underpinning GDP.

The boom in mining investment (comprising mine construction, plant and equipment and infrastructure investment, exploration spending, investment in computer software and R&D) is now long gone. Coal and iron ore peaked in 2012/13 although the boom in LNG, the largest resources construction sub-sector, lasted longer driven by ongoing works on mammoth LNG plants in WA, Queensland and the NT. Nonetheless, it too has peaked and started to decline.

We're now around half way through the fall in mining construction. And that's a major negative shock to the economy. Growth has been below par, averaging 2.5 per cent per annum.

But it could have been worse. Remember the recession in other resources exporting countries.

Thankfully, nearly all of the negative contribution from falling mining construction has been offset by increased mining production and exports. That's despite sharp falls in commodity prices. Australia's big iron ore producers are some of the world's most efficient and lowest cost producers. They remain profitable and can maintain production even at lower prices. Not so the higher cost producers.

With the shock from falling resources construction offset by increased resources production, strong residential building and resilient consumption expenditure (both households and government) in the face of falling infrastructure spending kept us out of recession. The lower dollar now provides a fillip to tourism and education services directly adding to growth.

Where to from here?

The next three years will be a long and difficult transition towards balanced growth

Growth will remain weak for some years yet with the next stage involving:

- Another three years of falling mining construction taking the total decline to 74% below the peak.
- Working through the structural shift from a mining investment-driven economy back to the balanced growth we had before the mining boom. However, rebuilding non-mining growth and investment will be agonisingly slow.
- Falling residential building, a key driver of growth over the last three years,
- Recovery in infrastructure spending by governments,
- Major regional and industry shifts,
- Recovery in finance and business services as non-mining growth and investment gradually build momentum.

Meanwhile, we expect that:

- The dollar will stay in between US $.70 and $.80, just above Australia's competitive level and a little higher than we would like, but low enough to drive growth in Tourism, Education and the more competitive dollar-exposed industries.
- Inflation will remain contained. And we're not concerned about deflation.
- Interest rates will stay lower for longer as the US Fed will be slow to raise cash rates and bond rates slow to rise, allowing Australian rates to remain lower. Weak growth and investment worldwide means weak demand for funds in a post-QE world awash with funds.

We anticipate weak growth as non-mining business investment on slow road to recovery

Australia's problems are domestic. The structural change from a mining investment-led economy to balanced growth was always going to be slow and painful. A lower Australian dollar around the competitive US 58 – 70 cents range would help speed recovery. But that seems unlikely in a world where investment in Australia remains particularly attractive.

While household consumption expenditure and public spending (both recurrent and investment spending) will make healthy contributions to growth, non-mining business is still recovering from the effects of the GFC.

Business is still in survival mode, containing costs and deferring expenditure. Growth is weak and profits weak, with excess capacity deferring expenditure. They'll invest when demand and profits are improving and capacity tightening, requiring investment to service growth. That will take time, both overseas and in Australia. Reducing interest rates won't help. Businesses aren't ready to invest yet. And that means that non-mining business investment won't pick up momentum for some years yet.

We know the shape of recovery

After a decade of constraint or recession, the dollar-exposed industries will recover first. We are already seeing recovery in tourism, both domestic and inbound, and education services. They'll need to refurbish and then expand to meet demand. Other dollar-exposed industries, too, are benefiting from the improved competitiveness of a lower dollar, showing initial signs of recovery. That will broaden to growth and, eventually, investment in the non-mining service sectors. But it will take time.

Meanwhile, public infrastructure investment is coming out of a prolonged slump. It recorded modest growth last year, but will pick up strongly over the next three years, funded by asset sales. Investment will be led by major road and rail infrastructure, along with rapidly rising telecommunications construction as the NBN rollout is accelerated. They will be joined later by modest recoveries in water, sewerage and electricity infrastructure, required to service rising population and to catch up on deferred capital works. Public non-dwelling building is near the trough of the cycle and will also start to pick up, albeit modestly.

That, too will spread to demand in other non-mining industries. And as growth comes through, businesses will loosen the purse strings and start to invest. But we expect that to take three years to build momentum.

In the meantime, GDP growth will be underwritten by net exports with contributions from consumption expenditure (both households and government) and public investment. We are forecasting net exports to add 1% to growth over the next three years.

Table 2.1: Australia – Key Economic Indicators, Financial Years

Year Ended June							Forecasts					
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Private Investment												
– Dwellings	3.8	-5.9	-1.8	5.1	8.1	9.1	1.0	-7.8	-9.5	-0.2	2.9	2.8
– New Non-Dwelling Construction (+)	18.5	37.6	9.1	-0.7	-11.8	-16.0	-14.1	-6.7	-2.3	2.3	4.9	7.6
– New Non-Dwelling Building (+)	9.0	9.8	5.2	3.5	5.5	-0.2	-4.9	3.8	-1.6	0.0	4.6	7.0
– New Engineering Construction (+)	25.0	54.5	10.8	-2.3	-19.0	-24.6	-20.6	-15.7	-2.9	4.9	5.2	8.2
Total New Private Investment (+)	**5.7**	**14.7**	**3.5**	**-0.8**	**-2.7**	**-5.5**	**-4.0**	**-3.6**	**-2.3**	**5.5**	**7.9**	**6.1**
New Public Investment (+)	**-3.2**	**-4.3**	**-3.9**	**-3.7**	**-6.8**	**2.0**	**7.7**	**8.2**	**3.5**	**1.7**	**0.6**	**1.2**
Gross National Expenditure (GNE)	**4.3**	**5.0**	**1.4**	**1.0**	**1.0**	**1.1**	**1.8**	**1.5**	**1.5**	**3.6**	**4.0**	**3.6**
GDP	**2.4**	**3.6**	**2.4**	**2.5**	**2.3**	**2.9**	**2.9**	**2.6**	**2.2**	**3.2**	**3.3**	**3.3**
Inflation and Wages												
CPI (Yr Avg)- RBA/Treasury forecasts (*)	3.1	2.3	2.3	2.7	1.7	1.4	2.0	2.0	2.5	2.5	2.5	2.5
Wage Price Index (Jun on Jun)(**)	3.8	3.7	2.9	2.6	2.3	2.1	2.4	2.6	2.5	3.1	3.4	3.7
Wage Price Index (Yr Avg)(**)	3.8	3.6	3.3	2.6	2.4	2.1	2.2	2.7	2.4	2.8	3.4	3.7
Average Weekly Earnings (Yr Avg)	4.2	4.3	4.6	3.0	2.4	1.9	2.9	3.7	3.5	3.6	4.2	4.8
Employment												
– Employment Growth (Yr Avg)	2.4	1.2	1.2	0.5	1.2	2.2	1.5	1.1	0.7	1.3	2.1	2.0
– Employment Growth (May on May) (%)	2.2	1.7	0.8	0.5	1.9	1.8	1.4	0.9	0.7	1.7	2.2	1.7
– Unemployment Rate (May) (%)	5.0	5.2	5.6	5.8	5.8	5.6	5.8	6.0	6.0	5.6	5.0	4.8
Labour Productivity Growth												
– Total	0.0	2.4	1.2	1.9	1.1	0.7	1.4	1.5	1.5	1.9	1.1	1.2
– Non-farm	-0.1	2.5	1.3	2.0	1.2	0.8	1.3	1.5	1.6	1.8	1.1	1.3
Exchange Rates												
– US$ per A$ (Yr Avg)	0.99	1.03	1.03	0.92	0.84	0.73	0.75	0.73	0.69	0.73	0.80	0.8288

Source: BIS Shrapnel, ABS and RBA

+Expenditure on new assets (or construction work done). Excludes sales (or purchases) of second hand assets.

*Headline CPI forecasts based on Reserve Bank of Australia's forecasts to Dcember 2018 quarter and then Commonwealth medium term projections.

** Based on Ordinary Time Hourly Rates of Pay

Overall, GDP growth is expected to be below trend, averaging 2.5 per cent per annum for the rest of this decade. The next three years will be challenging times much like the last two years, with major differences across states, regions, towns and capital cities.

Soft growth means that:

- Employment growth will be weak and the unemployment rate will rise.
- Inflation in prices and wages won't be a problem this decade.
- Interest rates should remain low but could go even lower if the dollar appreciates again, or if the economy weakens. We have a large buffer and don't have to follow increases in US cash rates. Bond rates, however are a different story. While bond rates look like staying lower for longer, in the medium term we expect them to rise significantly, starting in the United States with Australia following.

In a weak world economy, Australia looks a haven of security as an investment destination. But we have our own problems. The end of the mining boom and structural change as we emerge from the thrall of the GFC will be a difficult road. But we can see the path to recovery and restructuring of the economy. The lower dollar is a key here. Improved competitiveness will provide a boost that will spread through non-mining and, eventually, underpin a recovery in investment. We are forecasting stronger output and employment growth next decade.

2.2.2 Key risks to outlook

The risk of a sharper slowdown in Chinese growth (and demand for Australian commodities) would put Australia in a particularly vulnerable position; given our commodity exports are significantly dependent on continued robust demand from China, as well as other Asian economies. However, this scenario is unlikely, with the general consensus being that Chinese growth will stabilise around 6.3 per cent over the next three years, particularly given the willingness (and firepower) of authorities there to prevent a serious slowdown.

There is a risk that commodity prices don't improve over the next two years as expected, which would prolong the mining investment downturn, see government revenues remain weak and national income growth remain sluggish for longer. However, this risk is associated with a weaker dollar than forecast, which would encourage sustainable structural change toward balanced growth and an eventual return to stronger economic growth. Similarly, there is a risk that the dollar will fall further or more quickly than currently anticipated. But this would be a positive outcome for many Australian industries, including the perpetually weak manufacturing sector, as well as other trade-exposed industries such as agriculture, tourism and education.

There is a risk that our forecast recovery in non-mining business investment will take longer to come through, which means that the economy will stay softer for longer. If the recovery does not come through, we expect the Reserve Bank to keep interest rates at historically low levels even longer than our current forecast to support economic recovery. Conversely, there is an upside 'risk' that non-mining investment comes through sooner and stronger than anticipated, possibly via the tradeables sectors ramping up investment faster than we expect, which may then flow quickly onto other industries.

Longer term, the main risk to Australia's growth prospects relate to the fundamental drivers of growth – lower population growth and a failure for labour productivity growth to maintain its long-term average. However, we expect Australia's relatively high level of income to continue to attract migrants. Furthermore, as the positive benefits of the terms of trade and increased labour supply of the past decade or two start to wane, we expect both governments and

businesses to make a more concerted effort to invest in productivity – much as it occurred during the 1980s and 1990s.

2.3 The Victorian Economy: current conditions and outlook

Victoria is the strongest performer now, but growth will slow over the next two years.

Key takeaways:

- Performing above the national average for financial year 2015/16, but growth to slow from 2016/17
- Lower Australian dollar has improved competitiveness of non-mining tradeables
- Re-emergence of public investment will be offset be falls in private dwelling and non-dwelling construction
- Over the medium term, growth will be dragged down by fall in building due to housing oversupply and the exit of car manufacturing

The Victorian economy has continued the strength of 2014/15, with State Final Demand (SFD) accelerating to 4.8 per cent through-the-year to December 2015, although SFD growth slowed sharply in the March quarter 2016 (0.1 per cent in the quarter, seasonally adjusted and 3.1 per cent through-the-year). Meanwhile, employment growth has surged to 3.4 per cent growth through-the-year to June 2016.

The recent pick-up in employment growth pushed the state unemployment rate down to 5.7% in June (slightly below the national average of 5.8%), after spending most of the previous two years stubbornly above 6% and above the national average.

For 2015/16, SFD rose by 4 per cent, the highest of all the states and territories, and well above Australian domestic demand growth of just 0.8 per cent. Victoria's GSP growth estimated at around 3.4 per cent is also expected to be above Australian GDP growth of 2.9 per cent. However, headwinds on several fronts are expected to result in weaker growth over the following two years.

- Victoria is a net exporter of goods and services to other states and will be affected by sluggish national growth.
- An emerging housing oversupply will become a major drag on growth from 2016/17
- Private non-residential building is more or less at a peak, although we do not expect a major downturn ahead.
- Private engineering construction has further to fall this year and next and is not expected to recover until 2018/19.
- The end of domestic manufacturing by Ford in 2016, and Holden and Toyota in 2017 will have a significant ongoing negative impact on the entire manufacturing industry.

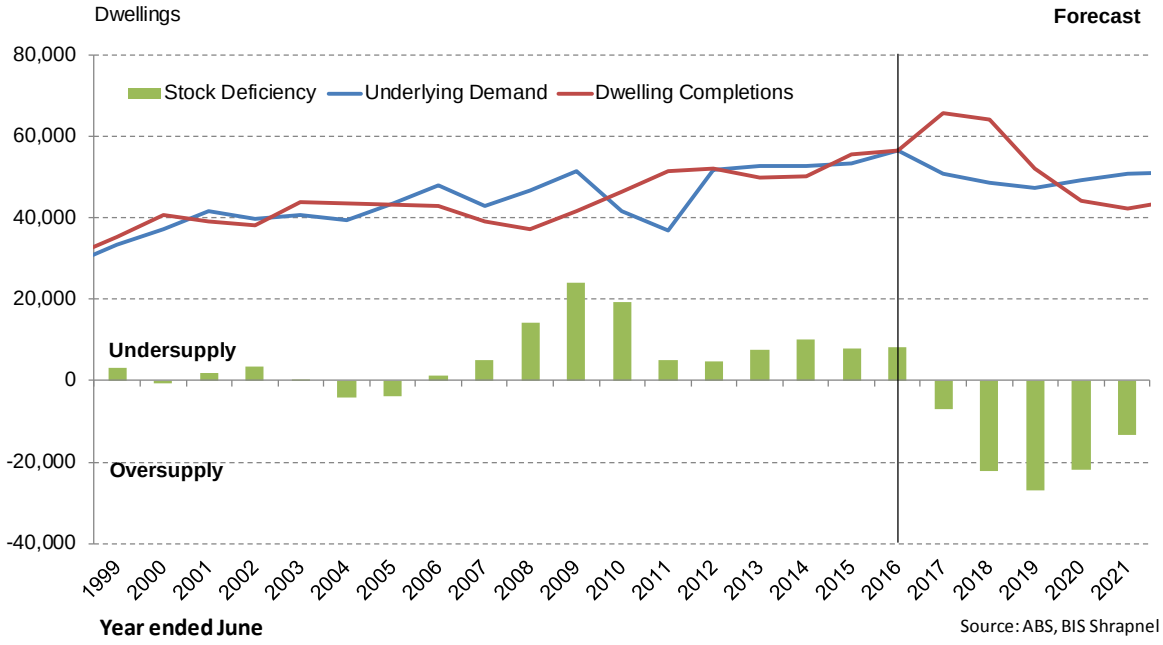
On a more positive note, public investment has now emerged from its trough in 2014/15, after new public investment had fallen 21 per cent since 2010/11. Despite the scrapping of the $8 billion East-West link, recoveries in roads, rail (notably the Metro Rail Project), water and telecommunications construction is expected to underpin a solid recovery from 2015/16. Having been subdued for the past three years, private consumption appears to be returning with some strength, with growth of 3.1 per cent through-the-year to March 2016. We anticipate growth to remain around the 3 per cent level over 2015/16 and 2016/17, driven by improvements in the labour market, before weaker employment growth in 2017/18 slows spending.

Building activity will be a drag on Victoria's growth from this year

Private dwelling construction has picked up speed over the past 18 months, with through-the-year growth to March, 2016 of 10.1 per cent. This has been driven by a number of projects in the detached housing market, along with a rebound in the alterations and additions activity. With Victoria now in a housing over-supply, this growth will be unsustainable, and we anticipate that 2016/17 will see a fall of around 2 per cent in overall dwelling investment and much deeper falls in 2017/18 and 2018/19.

Private non-dwelling building has enjoyed good growth over the past four years and increased a further 1.4 per cent in 2015/16, driven by solid growth in the retail, accommodation (hotels, etc), factories, education and other social and institutional sectors, the latter courtesy of the privately funded $550 million Ravenhall Prison. However, the completion of a number of projects will see total private non-residential building decline modestly over 2016/17, although there will be further increases in accommodation and entertainment and recreation buildings, the latter due to work on the Flemington Racecourse and Rod Laver Arena refurbishments. Modest growth in private non-dwelling building will then ensue from 2017/18, boosted by projects in retail, offices, transport (Tullamarine airport terminals), health and entertainment and recreation.

Chart 2.1: Underlying demand for dwellings and estimated stock deficiency - Victoria



Non-mining business investment is being boosted by the low Australian dollar

In terms of other business investment, Victoria has seen strong growth in machinery and equipment over 2015/16, with further increases in machinery and equipment investment in 2016/17, as a return to confidence encourages businesses to invest. Intellectual property products investment (IPP) have maintained the robust growth of 2014/15, with through-the-year to June 2016 up 4.7 per cent, led by computer software expenditure. We expect a further acceleration in 2016/17. The 30 per cent depreciation of the Australian dollar (against the US dollar) over the past three years is providing a significant boost to the state's key trade-exposed industries, namely agriculture, manufacturing, international student education, tourism and some business services. Although the dollar has risen to over US76 cents recently, the overall improved competitiveness should underpin further growth and investment. It is likely that the

pick-up in machinery and equipment investment and IPP (mostly software and research & development expenditure) is related to the improved outlook for the non-mining tradeables sectors (excluding motor vehicle manufacturing). Overall, after the comparative stellar performance of 2015/16, we expect growth of around 2.5 per cent for both SFD and GSP in 2016/17, slowing further in 2017/18 as the housing downturn deepens and the negatives from the car manufacturing impact the Victorian economy. However, later in the decade, we anticipate a return to stronger growth, built on a lower dollar, recovery in non-mining investment, a recovery in interstate economies, demand for services and Victoria's competitive edge over NSW.

Long Term Projections

The strengthening in Victoria's economic growth is forecasts to continue into the early 2020s. SFD annual growth is projected to average around 3.8 per cent over the three years from 2019/20 to 2021/22. Key drivers will be a moderate recovery in dwelling investment, strong growth in private non-dwelling building activity, equipment and IPP investment, and further growth in private engineering construction activity in 2019/20 (but a decline is expected in the early 2020s as work on the $5.5bn Western Distributor and $1.3bn CityLink-Tullamarine widening winds down). Although we anticipate a weakening in public investment in the early 2020s, the overall strength of private investment will drive a pick-up in employment, which will underpin solid growth in household spending.

Higher growth in the Australian and interstate economies from 2019/20 will also benefit the Victorian economy via higher net interstate exports of goods and services. The main dampener to growth in the economy will be the expected appreciation of the Australian dollar, with the A$ projected to rise back over US 80 cents in the early 2020s. This will negatively impact on Victoria's tradeable sectors of manufacturing, agriculture, tourism and education services.

Table 2.3: Victoria – Key Economic Indicators, Financial Years

Year Ended June	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Victoria												
Total Construction Activity(*)	6.9	1.1	-2.8	-1.7	5.3	6.6	0.7	-2.0	-4.8	-3.4	-3.4	-3.4
State Final Demand	3.5	2.0	0.3	1.8	2.6	4.0	2.7	1.8	1.6	3.5	4.3	3.5
Gross State Product (GSP)	**2.6**	**1.9**	**1.0**	**1.0**	**2.5**	**3.4**	**2.6**	**1.6**	**1.7**	**3.1**	**3.5**	**3.0**
Employment Growth	1.0	2.4	2.9	0.7	0.8	0.8	2.5	2.2	3.1	0.8	0.5	1.0
Australia												
Total Construction Activity(*)	7.0	14.8	5.3	0.7	-6.3	-5.1	-7.4	-5.5	-4.6	0.0	2.0	4.1
Australian Domestic Demand	4.3	5.0	1.4	1.0	1.0	1.1	1.8	1.5	1.5	3.6	4.0	3.6
Gross Domestic Product (GDP)	2.4	3.6	2.4	2.5	2.3	2.9	2.9	2.6	2.2	3.2	3.3	3.3
Employment Growth	2.4	1.2	1.2	0.5	1.2	2.2	1.5	1.1	0.7	1.3	2.1	2.0

Source: BIS Shrapnel and ABS

* Total Construction work done (constant prices), equals sum of new dwellings, building, alterations and additions activity over $10 000, non-residential building and engineering construction by private and public sectors.

Gross State Product for Year ended June 2016 is an estimate.

3. INFLATION AND WAGES

3.1 Inflation: current state of play and outlook

Consumer price inflation hasn't been a problem for nearly two years despite a significant depreciation of the Australian dollar. Underlying inflation has generally remained in the lower half of the Reserve Bank's 2 to 3 per cent target range over calendar year 2015 and dipped below 2% in the first half of 2016. Increases in import prices have largely been offset by deflation in costs of intermediate inputs including freight costs. In addition, weak domestic demand has kept a lid on wages and non-tradeables inflation. We believe price inflation is unlikely to be of concern over the short-term.

We expect broadly based price pressures to remain contained over the next 12 to 18 months as weak wages growth provides a drag, although the headline rate will rise due to higher petrol prices as oil prices recover from their troughs. With underlying inflation subdued, we expect the Reserve Bank to keep rates on hold until the economy strengthens. However, the risk is on the downside. The Reserve Bank may choose to cut rates again if the dollar appreciates materially in the near-term or if the economy weakens significantly.

CPI rises by 0.4 per cent in the June quarter, with petrol retailers also lifting margins

The consumer price index rose by 0.4 per cent in the June quarter, dragging through-the-year inflation even further down to 1 per cent (June 2016 quarter on June 2015 quarter) from 1.3 per cent in the March quarter. Underlying inflation picked up slightly in the June quarter but eased marginally through-the-year (1.5 per cent in June from 1.6 per cent in March) and generally remains under the Reserve Bank's 2 – 3 per cent target range.

Tradeables inflation rose 0.6 per cent in the quarter to be flat through-the-year (i.e. 0 per cent increase on June 2015), while non-tradeables inflation rose 0.4 per cent in the quarter – the fourth consecutive quarterly rise of 0.4 per cent – to be up 1.6 per cent through-the-year.

A key contributor to the increase in June CPI and tradeables inflation was higher global oil prices which drove a 5.9 per cent rise in automotive fuel prices, adding 0.2% to the headline result. Global supply reductions saw Brent oil prices recover from US$36/barrel in the March 2016 quarter to US$47/barrel in June — an increase of around 31 per cent. However, the pass-through of higher oil prices to pump prices was tempered by a 3.4 per cent appreciation in the Australian dollar (from US 72 cents in the March quarter to US 75 cents in the June quarter) as well as a 3 cent/litre reduction in refiners' margins, which incidentally wasn't passed fully to customers. Retailers chose to absorb a cent/litre into their gross margins. If the fall in refiners' margin was passed in full to consumers, then the rise in petrol prices would have been more muted at 5.2 per cent and the headline CPI lower by 0.1%.

Although the dollar strengthened slightly in the June quarter, garment prices rose by 1.9 per cent in June with men's, women's and children's clothing all increasing by 1.5, 1.7 and 3.8 per cent respectively. In addition, prices of footwear rose by a strong 4.2 per cent while furniture prices rose by 2.4 per cent. Together, these contributed to a rise in underlying inflation to 0.5 per cent in June compared to 0.2 per cent in March. However, food inflation fell again in the June quarter and has been a key factor in low inflation over the past two years.

Garment prices including men's, women's and children's clothing have generally been falling over recent quarters despite higher prices of imported clothing due to depreciation of the Australia dollar over the past three years. We believe higher prices of imported consumer durables, including clothing, footwear and furniture, have largely been offset by reduced freight costs of transporting these goods from ports to warehouses and to retail stores. This had

allowed retailers to maintain their margins and even discount a lot of these goods. However, with oil and petrol prices now on the way up, the deflation from freight costs will be reversed and the close relationship between import prices and final retail prices is likely to be restored.

Meanwhile, non-tradeables inflation is subdued, weighed down by weak wages growth.

Non-tradeables inflation has remained at 0.4 per cent for the past four quarters, which is not surprising given the current environment of weak demand and wages growth. The June 2016 quarter showed the wage price index slowing to 2.1 per cent growth through-the-year — the same annual increase for the previous two quarters. Meanwhile, Average Weekly Ordinary Time Earnings (AWOTE) increased by a weak 2.2 per cent (through-the-year) in the June quarter.

Falling terms of trade, spare capacity in the labour market, weak inflation and low inflation expectations, along with a flexible labour market, have conspired to slow recent wages growth to its historical lows. Year average growth in 2015/16 was 2.1 per cent for the WPI — the lowest increase since 1998 (i.e. since the ABS starting recording this data) while year average growth for AWOTE slowed to 1.9 per cent in 2015/16, the weakest increase since 1993.

Where to from here? Our inflation forecasts.

Overall, BIS Shrapnel's view is that broadly based inflationary pressures will be weak over the near-term reflecting spare capacity and weak demand in the economy, with some second round depreciation effects gradually adding to overall price growth. In addition, food inflation is expected to rise over the medium term. Food inflation has averaged close to 3 per cent p.a. over the past two decades, but had been very weak over the past two years (averaging only 0.6 per cent p.a.), due to intense competition between the major supermarkets (Coles, Woolworths and 'new-comer' Aldi) and falling or weak global agricultural prices. These two influences are unsustainable – the supermarkets cannot keep cutting prices (and either their own margins or suppliers'), while world agricultural prices will pick up over the medium term as global oversupply dissipates.

Underlying inflation is forecast to rise only slowly over the next 2 years to 2.4 per cent by late 2017. However, we are forecasting headline inflation to pick up to 2.9 per cent in 2016/17, with tradeables inflation seeing a strong rebound. This will be largely due to rising petrol prices and other components of tradeables inflation (including food), along with another increase in tobacco excise (which came into effect on 1 September 2016), adding around 0.25% to headline inflation.

With oil prices now appearing to rise from their cyclical lows (Brent is around US$40 to 50/barrel compared to low of US$29/barrel in mid-January), the anticipated recovery in oil prices over 2016/17 (to around US$55/barrel by mid-2017) will see petrol prices rise and add to tradeable and headline CPI inflation – estimated to add 0.5% back to the CPI over the next 18 months. There will also be indirect impacts via higher transport costs.

This increase in headline inflation will, however, be a one-off. A flatter global oil price, low global inflation, less impact from increases in tobacco excise and weak consumer demand will see headline inflation return back to around 2.5 per cent by 2018/19, largely in line with underlying inflation. Meanwhile, underlying inflation is expected to ease over 2018/19, before picking up through 2019/20 and 2020/21 as demand strengthens, spare capacity diminishes and the unemployment rate falls back toward 5%.

Meanwhile, wage inflation is expected to remain subdued due to little improvement in the unemployment rate over the next 18 months, with only a gradual rise over the next two years with the WPI rising to 2.8 per cent by December 2017, largely in response to the lift in the headline CPI rate over 2016/17. Wages growth is then expected to ease over 2018/19 as a

Table 3.1: Wages and Prices – Australia
Year Average Growth

Year Ended December	Average Weekly Ordinary Time Earnings[1]		Wage Price Index (All Industries)		CPI Headline Inflation (BIS Shrapnel forecasts)		Official Headline CPI [2]	
	$/week	%CH	Index	%CH	Index	%CH	Index	%CH
2000	785.9		72.9		71.5		71.5	
2001	825.1	5.0	75.5	3.6	74.6	4.4	74.6	4.4
2002	867.1	5.1	77.9	3.2	76.9	3.0	76.9	3.0
2003	913.7	5.4	80.8	3.7	79.0	2.7	79.0	2.7
2004	948.5	3.8	83.6	3.6	80.8	2.3	80.8	2.3
2005	998.9	5.3	87.0	4.0	83.0	2.7	83.0	2.7
2006	1 032.6	3.4	90.4	3.9	85.9	3.6	85.9	3.6
2007	1 081.8	4.8	94.1	4.1	87.9	2.3	87.9	2.3
2008	1 133.8	4.8	98.1	4.2	91.8	4.4	91.8	4.4
2009	1 198.6	5.7	101.6	3.6	93.4	1.8	93.4	1.8
2010	1 257.0	4.9	105.0	3.4	96.1	2.9	96.1	2.9
2011	1 312.8	4.4	108.9	3.7	99.3	3.3	99.3	3.3
2012	1 366.8	4.1	112.9	3.6	101.0	1.8	101.0	1.8
2013	1 424.6	4.2	116.1	2.9	103.5	2.4	103.5	2.4
2014	1 461.4	2.6	119.1	2.6	106.1	2.5	106.1	2.5
2015	1 489.7	1.9	121.7	2.2	107.7	1.5	107.7	1.5
Forecasts								
2016	1 524.7	2.3	124.2	2.1	109.0	1.3	109.1	1.3
2017	1 577.4	3.5	127.3	2.5	112.0	2.7	111.3	2.0
2018	1 636.0	3.7	130.6	2.6	114.9	2.6	113.6	2.0
2019	1 690.4	3.3	133.9	2.5	117.7	2.4	116.4	2.5
2020	1 759.2	4.1	138.1	3.2	120.8	2.7	119.3	2.5
2021	1 839.1	4.5	143.0	3.6	124.2	2.9	122.3	2.5
2022	1 928.1	4.8	148.4	3.8	127.9	2.9	125.4	2.5
Compound Annual Growth Rates [3]								
1990-2000	3.8				2.2		2.2	
2000-2010	4.8		3.7		3.0		3.0	
2010-2015	3.5		3.0		2.3		2.3	
2015-2022	3.8		2.9		2.5		2.2	
2017-2022	4.1		3.1		2.7		2.4	

Source: BIS Shrapnel, ABS

(1) Earnings per person for full-time adults. Data is year ended November (available only mid month of quarter).
(2) Headline CPI forecasts based on Reserve Bank of Australia forecasts to June 2018 quarter and then Commonwealth Treasury medium term projections.
(3) CAGR (Compound Annual Growth Rates) for 2017-2022 is CAGR for 2017 to 2022 inclusive (ie next Access Arrangement period).

lagged response to a weakening in economic growth, lower CPI and a rising unemployment rate. Stronger wages growth is anticipated in 2019/20 as economic growth strengthens and the unemployment rate falls.

Headline CPI inflation is forecast to average 2.5 per cent per annum over the next seven years to 2022, with underlying inflation slightly lower at 2.4 per cent.

Reserve Bank of Australia CPI forecasts

The Reserve Bank provides the 'official' view of CPI forecasts. The RBA's August 2016 'Statement on Monetary Policy' projects the annual headline CPI rate at 1.5 per cent through-the-year to December 2016 quarter, rising to 1½ to 2½ per cent range through to December 2018. Beyond 2018, we have used annual CPI inflation at 2.5 per cent which is in the middle of the RBA's target range of between 2 and 3 per cent.

3.2 Australian All Industries Wages: current state of play and outlook

3.2.1 A note on different wage measures and BIS Shrapnel's wage model

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

The main wage measures are:

- Average Weekly Ordinary Time Earnings (AWOTE) — earnings gained from working the standard number of hours per week. It includes agreed base rates of pay, over-award payments, penalty rates and other allowances, commissions and retainers; bonuses and incentive payments (including profit share schemes), leave pay and salary payments made to directors. AWOTE excludes overtime payments, termination payments and other payments not related to the reference period. The AWOTE measures used in this report refer to full-time adult AWOTE, and are sourced from the Australian Bureau of Statistics (ABS) catalogue number 6302.0, with BIS Shrapnel forecasts.
- The Wage Price Index (WPI) — a CPI-style measure of changes in wage and salary costs based on a weighted combination of a surveyed 'basket' of jobs. The WPI used in this report excludes bonuses. The WPI also excludes the effect of changes in the quality or quantity of work performed and most importantly, the compositional effects of shifts within the labour market, such as shifts between sectors and within firms. The WPI figures quoted in this report are sourced from ABS catalogue number 6345.0, with BIS Shrapnel forecasts.

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

males and all persons) — between -0.2 and +0.2 per cent — since the 1980s or basically since the equal pay legislation was enacted through the 1970s.

The wage price index was specifically designed to get around these compositional problems. It uses a weighted average of wage inflation across a range of closely specified jobs. As it measures the collective variations in wage *rates* made to the current occupants of the *same* set of specified jobs, the WPI reflects pure price changes, and does not measure variations in quality or quantity of work performed. However, like the CPI (Consumer Price Index), the weights are fixed in a base year, so that the further away from that base and the more the composition of the labour market changes over time, the more 'out of date' the measure becomes.

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

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

Description of BIS Shrapnel's wage model

BIS Shrapnel's wage model (for both AWOTE and WPI) is based on the analysis of past and future (expected) wage movements in three discrete segments of the workforce, based on the three main methods of setting pay and working conditions (see tables 3.2 and 3.3):

- Those dependent on awards rely on pay increases given in the annual National Wage case by Fair Work Australia (formerly by the Fair Pay Commission and the Australian Industrial Relations Commission). Most of the wage increases in the National Wage case over the past decade have been given as flat, fixed amount (ie dollar value) increases, rather than as a proportional increase. At the all industries level, 8.1 per cent of all employees (data excludes those in agriculture, forestry and fishing) have their pay rises determined by this method. In the electricity, gas, water and waste services sector, only 2.7 per cent of workers have their pay set by this method.
- Collective agreements negotiated under enterprise bargaining account for 41.9 per cent of all employees, but 67.7 per cent of electricity, gas, water and waste services employees' wage increases are determined by this method.
- The remaining 50 per cent of all industries employees have their pay set by individual arrangements, such as individual contracts or other salary arrangements (including incentive-based schemes), while the proportion for electricity, gas, water and waste services is 30 per cent.

Table 3.2: Methods of Setting Pay, Industry, May 2010
Proportion of Full-Time Adult Employees (%)

Industry (ANZSIC 2006)	Award Only	Collective Agreements	Individual Arrangements	All Methods of Pay Setting
Mining	1.8%	42.1%	56.1%	100.0%
Manufacturing	9.1%	29.3%	61.6%	100.0%
Electricity, Gas, Water & Waste Services	**2.7%**	**67.7%**	**29.6%**	**100.0%**
Construction	6.7%	26.3%	67.0%	100.0%
Wholesale trade	7.7%	11.3%	81.0%	100.0%
Retail trade	16.6%	20.7%	62.7%	100.0%
Accommodation and Food Services	31.7%	23.0%	45.3%	100.0%
Transport, Postal and Warehousing	3.9%	55.9%	40.2%	100.0%
Information Media and Telecommunications	3.6%	29.0%	67.4%	100.0%
Finance and Insurance Services	1.5%	39.9%	58.7%	100.0%
Rental, Hiring and Real Estate Services	13.1%	10.4%	76.5%	100.0%
Professional, Scientific ans Technical Services	2.2%	11.5%	86.3%	100.0%
Administrative and Support Services	15.9%	30.1%	54.1%	100.0%
Public Administration and Safety	1.2%	92.5%	6.3%	100.0%
Education and Training	2.9%	88.9%	8.1%	100.0%
Health Care and Social Assistance	12.3%	66.6%	21.1%	100.0%
Arts and Recreation Services	10.4%	40.1%	49.4%	100.0%
Other Services	15.7%	11.0%	73.3%	100.0%
All Industries 2010 Survey	**8.1%**	**41.9%**	**50.0%**	**100.0%**

Source: ABS

Future movements of forecasts of wage inflation are based on the key influences on the different wage determination mechanisms of each discrete segment ie:

- increases in the Federal Minimum Wage (on which a range of mostly lower paid awards are also based) granted by Fair Work Australia (and by the Fair Pay Commission and the AIRC previously) each year are usually set in relation to recent increases in the CPI and with regard to the wage-setting body's view of both current and short-term future economic conditions. For instance, the $21.66 increase granted by the Fair Pay Commission in its decision in mid-2008 (effective October 2008) amounted to a 4.1 per cent increase for those on the Federal Minimum Wage of $522/week. This reflected the marked acceleration in the CPI in the first half of 2008 (to 4.2 per cent in the March quarter and to 4.5 per cent in the June quarter). It also reflected the strong economic conditions apparent around mid-2008 (the unemployment rate was just over 4 per cent). Conversely, the Fair Pay Commission gave no increase in its July 2009 decision, citing as its reasons, the deterioration of economic conditions and what we believe is a spurious link between minimum wage increases and higher unemployment.

- increases in collective agreements under enterprise bargaining are influenced by a combination of recent CPI increases, inflationary expectations, the recent profitability of relevant enterprises, current business conditions and the short-term economic outlook, and by the industrial relations 'strength' of relevant unions. Because the average duration of agreements now runs for two-to-three years, BIS Shrapnel bases its near-term forecasts on the strength of recent agreements, which have been 'formalised' over recent quarters. Thereafter, collective agreements are based on BIS Shrapnel's macroeconomic forecasts.

- increases in individual agreements are primarily influenced by the strength of the labour market (especially the demand-supply balance of skilled labour), inflationary expectations, the recent profitability of relevant enterprises, current business conditions and the short-term economic outlook.

Note in table 3.3, wage increases under 'individual arrangements' are calculated by deduction. Data from DEEWR (Department of Education, Employment and Workforce Relations) are used for wage increases under collective agreements.

Chart 3.1: Australia – Wages and Prices

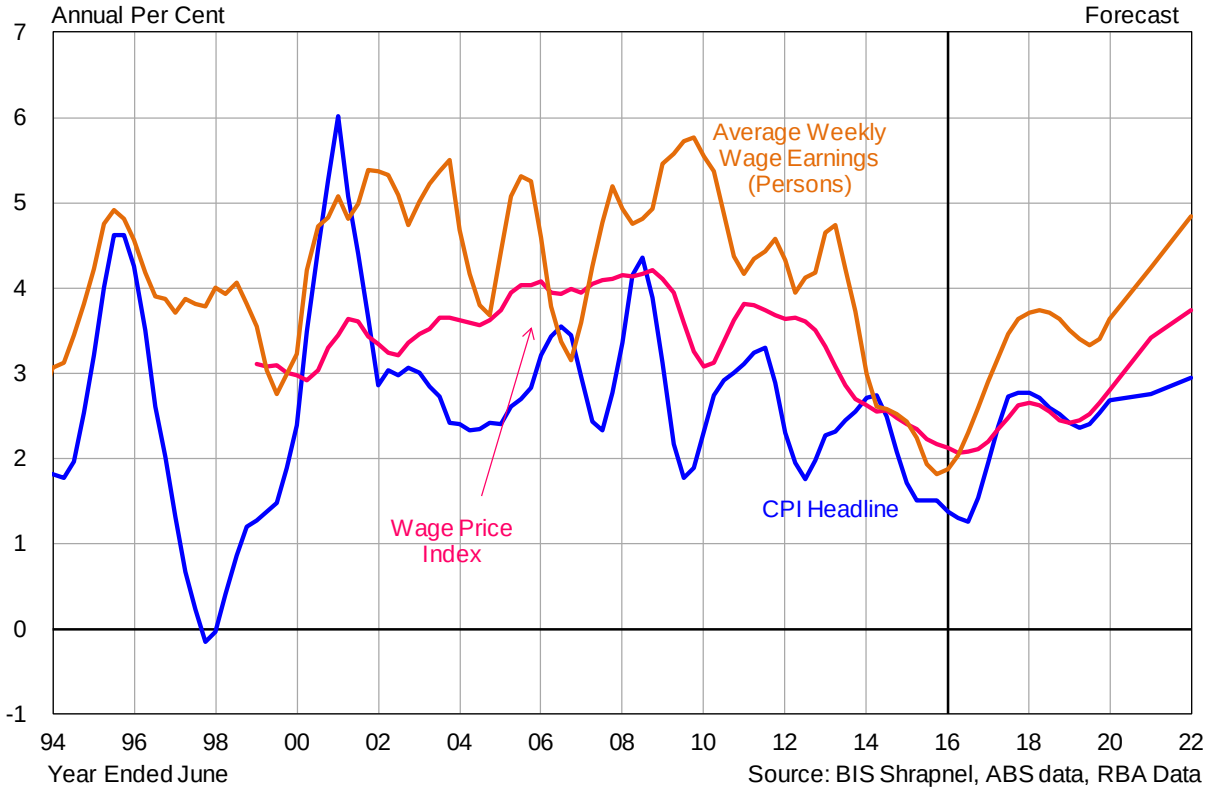
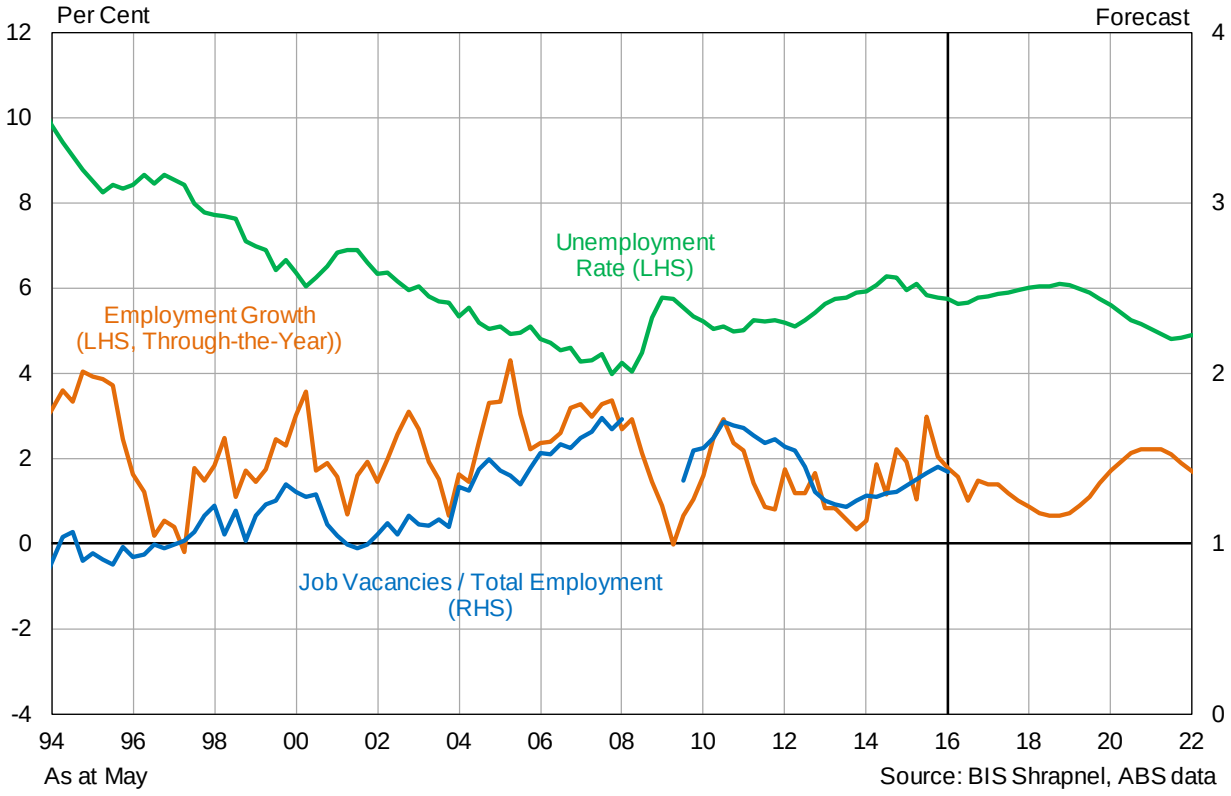


Chart 3.2: Employment and Unemployment



Some Deficiencies in Econometric Models of Wage Determination for the EGWWS Sector

We believe that BIS Shrapnel's institution-based or bottom-up wage model for the EGWWS sector better approximates the underlying (actual) data generating process than a straight application of an econometric model. As a result, we strongly believe our model of wage determination for the EGWWS or utilities sector is superior to a methodology utilising purely econometric regression techniques, in particular linear regression models to forecast wages. This opinion is based on a number of factors, some of which are described below:

- the evolution of the wage determination system from the 1980s and particularly during the 1990s in the utilities sector means that econometric equations struggle with the changes in
- the relative importance of different factors influencing wages growth that have occurred over the past two-to-three decades. As such, we believe that an econometric equation would struggle to properly model the present complexity of the wage determination processes in this sector.
- BIS Shrapnel's model of wage determination does take account of the present complexity of the wage determination process, both at the national (all industries) level and at the industry sector level. Our methodology and explanation of the macroeconomic influences are, we believe, clear and transparent. We use small sector mathematical models to derive forecasts for discrete segments, rather than an over-riding, overall macroeconomic model.

BIS Shrapnel believes the use of univariate or multi-equation time series econometric modelling is not the best method for forecasting wages growth in the utilities sector. This is because many regression equations include lagged dependent variables, and econometric models that include lagged dependant variables tend to miss turning points in the cycle, often producing results we know to be spurious. Indeed, the models performed no better (or worse) than a combination of a large range of 'mini' sectoral models overlaid with our expertise and knowledge of key influences.

3.2.2 Australian wages: current conditions and outlook

Wages growth remains at its slowest pace in two decades – and will remain soft

Falling terms of trade, spare capacity in the labour market, weak inflation and inflation expectations along with a flexible labour market have conspired to slow wages growth over recent years. Year average growth in 2015/16 was 2.1 per cent for the WPI and 1.9 per cent for Average Weekly Ordinary Time Earnings, both down from 2.4 per cent in 2014/15. In through the year terms, wages growth at present is the lowest since 1998 (i.e. since the ABS started recording this data).

As Table 4.1 shows, many of the industry sectors that were the leaders of strong wages growth in the decade to 2011/12 are now at the other end of the spectrum. The end of the mining investment boom has seen wage rises in the mining, construction, professional services and transport sectors all fall back below the national average.

Low wages growth is both a product of and key cause of low underlying inflation. Low wages are keeping business costs down and thus muting price pressures, while a significant section of pay deals are being set in line with CPI inflation. The unemployment rate has fallen from 6.3% in July 2015 to 5.8% now. There is often a lagged response of wages to improvements in the labour market (i.e. unemployment rate), which may see wages gradually pick up from here, albeit modestly as plenty of spare capacity still exists due to weak demand and investment.

WPI inflation is expected to remain subdued due to little improvement in the unemployment rate over the next 18 to 24 months. Only a gradual rise over the next two years is forecast with the WPI expected to rise by 2.7 per cent by June 2018, largely in response to the lift in the headline CPI over 2016/17. Wages growth is then expected to ease over 2018/19 as a lagged response to a weakening in economic growth, lower CPI and a rising unemployment rate. Stronger wages growth is anticipated in 2019/20 as economic growth strengthens and the unemployment rate falls.

Indeed, a broadening in employment, profits and investment is expected from early next decade as the next set of economic drivers, in particular non-mining business investment, comes through. The increase in profits combined with rising price inflation next decade will push up wages growth over 2019/20 and 2021/22. There is usually a lag of at least a year for wages to respond upward to a strengthening in employment and falls in unemployment (and conversely downward wage pressure responding to weaker economic conditions). Wages growth (in year average terms) is expected to rise further and peak at 3.7 per cent for WPI (4.8 per cent for AWOTE) in 2021/22 – which would be the strongest result in WPI terms in a decade.

Longer term, both skilled and general labour shortages will begin to emerge due to demographic factors, in particular retirements of Australia's 'baby boomers' generation. Australia will continue to experience sustained labour shortages in the 10 years to 2031 (and beyond), and these shortages will become more significant as the workforce ages. As Australia's 'baby boomers' generation move into the 65+ age group, the growth of the 15-64 year old cohort of Australia's working age population (the overwhelming majority of Australia's workforce) will begin to slow.

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

Table 3.3: Wages Growth: All Industries, Australia (by Workforce Segmented by Pay Setting Method)

Year Ended June	% of Workforce in 2010	Year Average Per Cent Change														
									Forecast						Average	Average
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2016-22	2017-22
Wage Price Index																
Awards Only	8.1%	0.7	3.5	3.4	2.9	2.6	3.0	2.5	2.4	2.9	2.7	2.6	2.7	2.9	2.7	2.8
Collective Agreements	41.9%	3.9	3.8	3.8	3.6	3.5	3.3	3.2	3.1	3.0	3.0	3.0	3.1	3.3	3.0	3.1
Individual Arrangements	50.0%	2.8	3.8	3.5	3.1	1.9	1.5	1.1	1.4	2.3	1.9	2.7	3.8	4.3	1.9	3.0
Wage Price Index (a)	**100%**	**3.1**	**3.8**	**3.6**	**3.3**	**2.6**	**2.4**	**2.1**	**2.2**	**2.7**	**2.4**	**2.8**	**3.4**	**3.7**	**2.4**	**3.0**
Compositional Effects + Bonuses,etc		2.5	0.4	0.7	1.3	0.4	0.0	-0.2	0.7	1.0	1.1	0.8	0.8	1.1	0.7	1.0
AWOTE (b)	**100%**	**5.6**	**4.2**	**4.3**	**4.6**	**3.0**	**2.4**	**1.9**	**2.9**	**3.7**	**3.5**	**3.6**	**4.2**	**4.8**	**3.1**	**4.0**

(a) Full-time Adult Persons, ordinary time
(b) Average Weekly Ordinary Time Earnings for Full-time Adult Persons

4. INTERNAL LABOUR COST ESCALATION FORECASTS

We proxy the distributors' internal labour cost escalator by wages growth in the Victorian Electricity, Gas, Water and Waste Services (EGWWS) industry. In this section, we provide an outlook for the EGWWS at the national level followed by a discussion and forecasts of the EGWWS industry in Victoria.

At the national level, wages growth in the EGWWS sector is invariably higher than the total Australian national (all industry) average. The wage price index growth has consistently been above the national average since the index's inception in 1997 and averaged 0.6 per cent higher over the decade to 2013 (see tables 4.1 and 4.5). While growth in average weekly ordinary time earnings (AWOTE) of the electricity, gas, water and waste services sector has displayed considerably more volatility over the past two decades (mainly related to compositional effects), AWOTE growth in the sector has also usually been higher than the national average over the past two decades (see tables 4.2 and 4.5).

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

In addition, the electricity, gas and water sector is a largely capital intensive industry whose employees have higher skill, productivity and commensurately higher wage levels than most other sectors. Further, the overall national average tends to be dragged down by the lower wage and lower skilled sectors such as the Retail Trade, Wholesale Trade, Accommodation, Cafés and Restaurants, and, in some periods, also Manufacturing and Construction (see tables 4.1 and 4.2). These sectors tend to be highly cyclical, with weaker employment suffered during downturns impacting on wages growth in particular. The EGWWS sector is not impacted in the same way due to its obligation to provide essential services and thus retain skilled labour.

Strong union presence in the utilities sector will ensure collective agreements remain above the all industry average

Despite the relative weakness of the economy over 2008/09 and 2009/10, wages remained elevated in the utilities sector due to the comparative strength of demand for skilled labour, and particularly because of the strength of unions in what is an essential service sector. The industrial relations reality is that there are powerful utilities unions such as the Communications, Electrical and Plumbing Union (CEPU) and Australian Services Union (ASU), which have a history of achieving high wage outcomes for the sector. Other unions active in the sector include the Australian Workers Union (AWU).

The key elements of the utilities wage forecast are set out in table 4.3. This shows that collective bargaining dominates the pay setting arrangements in the utilities sector, while the relative absence of workers relying on (often) low-increase awards (set in the National Wage Case) means the overall average for total utilities wages will generally be higher than the all industries average. Over the past five years, the outcomes from collective agreements have been 0.2 per cent higher, on average, than the all industries average, at 3.8 per cent compared to 3.6 per cent. We expect this trend to continue over the outlook period, with collective agreements achieving average increases of 3.4 per cent for the utilities sector, compared to 3.3 per cent for all industries.

Table 4.1: Wage Price Index Growth by Industry Sector and by State

Sector	% of Total Employment Jun'16	Annual Per Cent Change (year-on-year)[1]										Five-Year YE Dec Average
		Dec'08	Dec'09	Dec'10	Dec'11	Dec'12	Dec'13	Dec'14	Dec'15	Mar'16	Jun'16	
Private		4.3	3.3	3.2	3.8	3.7	2.9	2.5	2.1	2.1	2.0	3.0
Public		4.0	4.3	4.1	3.4	3.3	2.8	2.8	2.6	2.6	2.5	3.0
Industry												
Mining	1.9%	6.3	4.3	3.9	4.1	5.0	3.5	2.4	2.0	1.8	1.6	3.4
Manufacturing	7.4%	4.3	2.7	2.9	3.8	3.7	2.9	2.8	2.6	2.5	2.4	3.2
Electricity, Gas, Water and Waste Services	**1.2%**	**4.2**	**4.4**	**4.7**	**3.6**	**3.9**	**3.8**	**3.1**	**2.5**	**2.4**	**2.4**	**3.4**
Construction	9.0%	4.6	4.2	3.3	4.1	3.9	3.0	2.7	1.7	1.6	1.6	3.1
Wholesale Trade	3.1%	4.1	3.2	2.4	4.5	4.7	3.0	2.2	2.0	1.9	1.9	3.3
Retail Trade	10.7%	4.2	4.4	3.2	3.7	3.7	2.8	2.5	2.2	2.1	2.2	3.0
Accommodation and Food Services	6.9%	2.5	3.0	2.7	3.3	2.9	2.4	2.4	2.4	2.3	2.3	2.7
Transport, Postal and Warehousing	5.3%	4.2	4.4	3.1	3.7	3.7	2.8	2.4	2.2	2.2	2.2	3.0
Information Media and Telecommunications	1.7%	3.6	2.6	2.3	3.7	3.2	2.6	2.5	2.4	2.3	2.2	2.9
Finance and Insurance Services	3.6%	4.1	2.9	3.7	4.2	3.7	2.8	2.7	2.7	2.7	2.6	3.2
Rental, Hiring and Real Estate services	1.9%	3.7	3.2	2.6	3.6	3.3	2.8	2.5	2.0	1.8	1.6	2.8
Professional, Scientific and Technical Services	8.5%	5.0	4.2	3.6	4.4	4.2	2.4	2.0	1.6	1.6	1.6	2.9
Administration and Support Services	3.6%	4.9	2.8	3.0	3.4	3.5	2.8	2.2	1.6	1.5	1.4	2.7
Public Administration and Safety	6.3%	4.0	4.3	3.8	3.2	3.5	3.0	2.5	2.2	2.2	2.2	2.9
Education	7.7%	4.1	4.2	4.2	3.8	3.3	2.6	3.3	2.8	2.7	2.7	3.2
Health Care and Social Assistance	12.7%	3.5	4.1	3.7	3.3	3.1	3.1	2.9	2.6	2.5	2.5	3.0
Arts and Recreation Services	1.9%	3.5	3.5	3.1	3.5	3.3	2.6	3.3	2.4	2.4	2.4	3.0
Other Services	3.9%	3.6	2.8	2.8	3.9	3.6	2.8	2.2	2.3	2.2	2.2	2.9
State/Territory												
New South Wales	31.9%	3.9	3.5	3.4	3.7	3.5	2.6	2.5	2.1	2.1	2.1	2.9
Victoria	25.5%	4.1	3.3	3.2	3.7	3.5	2.9	2.7	2.6	2.5	2.3	3.1
Queensland	19.7%	4.1	3.8	3.6	3.8	3.4	2.8	2.6	2.1	2.0	2.0	2.9
South Australia	6.8%	4.3	3.3	3.2	3.4	3.4	3.4	2.9	2.4	2.3	2.3	3.1
Western Australia	11.2%	5.5	4.3	3.6	4.0	4.5	3.4	2.4	2.0	1.9	1.9	3.3
Tasmania	2.0%	3.9	4.1	3.4	3.6	3.2	2.7	2.4	2.3	2.3	2.2	2.9
Northern Territory	1.1%	4.3	4.0	3.5	4.1	3.5	2.9	2.8	2.4	2.3	2.2	3.1
Australian Capital Territory (ACT)	1.8%	3.9	3.9	3.5	3.3	3.9	2.8	2.0	1.7	1.7	1.7	2.7
Total All[2]	100%	4.2	3.6	3.4	3.7	3.6	2.9	2.6	2.2	2.2	2.1	3.0

Source: BIS Shrapnel, ABS

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

Table 4.2: Australia
AWOTE Growth by Industry Sector

Industry Sector	% of Total Employment Jun'16	Average Weekly Earnings[1]											Five-Year YE Dec Average
		$ / Week Jun'16	Annual Percent Change (year-on-year)										
			Dec '06	Dec '07	Dec '08	Dec'09	Dec'10	Dec'11	Dec'12	Dec'13	Dec'14	Dec'15	Jun'16	
Mining	1.9%	2 597	6.9	6.2	8.5	7.0	7.3	5.2	7.6	5.6	2.4	1.4	1.7	4.4
Manufacturing	7.4%	1 364	4.6	4.2	5.5	3.2	1.7	3.6	1.6	5.8	4.3	2.4	1.0	3.5
Electricity, gas, water and waste services	1.2%	**1 734**	**1.9**	**4.0**	**3.5**	**6.7**	**9.4**	**5.9**	**3.6**	**4.3**	**1.5**	**1.6**	**3.5**	**3.4**
Construction	9.0%	1 503	1.7	8.8	6.8	8.4	6.5	5.0	2.4	4.2	1.4	2.5	1.4	3.1
Wholesale trade	3.1%	1 457	4.2	3.7	5.4	3.8	2.5	8.4	8.3	1.1	2.1	-0.8	0.9	3.8
Retail trade	10.7%	1 115	4.9	5.3	3.2	4.1	4.0	1.5	3.0	4.0	2.3	5.6	4.2	3.3
Accommodation and food services	6.9%	1 070	6.3	8.4	1.2	4.2	3.8	3.8	2.9	7.5	0.2	1.9	2.3	3.3
Transport, postal and warehousing	5.3%	1 550	1.7	-0.4	3.6	3.1	9.3	6.2	7.7	3.5	2.4	3.3	5.2	4.6
Information media and telecommunications	1.7%	1 807	2.9	10.1	4.3	5.1	5.2	3.9	3.5	4.1	0.1	2.8	4.2	2.9
Finance and insurance	3.6%	1 823	3.2	4.3	3.5	2.1	7.6	2.6	4.0	2.3	2.4	4.9	4.6	3.2
Rental hiring and real estate services	1.9%	1 369	5.5	4.5	8.2	6.1	-0.9	-0.3	3.1	3.6	-1.7	-0.3	5.7	0.9
Professional, scientific and technical services	8.5%	1 746	4.6	5.0	6.9	5.2	6.3	2.9	4.6	4.4	2.4	0.6	-1.1	3.0
Administration and support services	3.6%	1 283	3.0	4.8	7.1	7.2	4.8	-3.0	4.1	5.1	0.3	-2.7	-0.4	0.7
Public administration and defence	6.3%	1 571	4.1	3.5	4.5	6.0	7.2	3.3	4.5	4.0	2.1	1.3	1.8	3.1
Education and training	7.7%	1 641	3.7	3.6	2.9	5.8	5.5	4.3	4.8	3.0	3.3	1.9	2.4	3.5
Health and social assistance	12.7%	1 441	0.6	5.6	3.5	7.0	2.7	4.9	1.0	7.1	2.1	2.7	2.5	3.6
Arts and recreational services	1.9%	1 368	-4.1	5.3	5.4	7.5	3.9	5.5	1.9	8.7	-0.4	1.4	3.6	3.4
Other services	3.9%	1 185	2.4	2.7	4.6	6.9	2.0	2.6	4.4	1.9	-1.0	4.0	5.5	2.4
Total All Industries[2]	100%	1 516	3.4	4.8	4.8	5.7	4.9	4.4	4.1	4.2	2.6	1.9	1.9	3.4

(1) Full Time Adult Ordinary Time earnings for persons
(2) Excludes Agriculture, Forestry and Fishing sector

Source: BIS Shrapnel, ABS

BIS Shrapnel analysis shows collective agreements in the EGWWS sector have been on average around 1.5 per cent higher than CPI inflation over the decade to 2010 (excluding the effects of GST introduction in 2000/01). In the five years to 2010 when the labour market was very tight, collective agreements were on average 1.7 per cent above the CPI. Given the strength of unions in the sector and a still strong demand for skilled labour over the next four years (and possibly beyond) than for most of the 2000s, collective agreements are forecast to remain around 1.4 per cent above the CPI in the forecast period.

As well as increases in CPI, increases in collective agreements under enterprise bargaining are also influenced by a combination of inflationary expectations, the recent profitability of relevant enterprises, current business conditions and the short-term economic outlook, and by the industrial relations 'strength' of relevant unions. Because the average duration of agreements runs for two-to-three years, BIS Shrapnel bases its near-term forecasts of Enterprise Bargaining Agreement (EBA) wages on the strength of recent agreements, which have been 'formalised' or 'lodged' (i.e. an agreement has been 'reached' or 'approved') over recent quarters.

We expect EBA outcomes to show modest growth over the next two years but remain above inflation and the 'all industries' average given that the demand for skilled labour remains strong and particularly given the recent high enterprise agreement outcomes in the construction sector. This will influence negotiations in the EGWWS sector, as some skills can be transferable. A mild recovery in EBA outcomes will occur over subsequent years as the labour market begins to tighten, unemployment falls and business profitability improves. However, forecast growth in wage agreements of around 3.5 per cent per annum remains below that experienced over much of the past decade.

Demand for skilled labour also a key driver of utilities wages

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

We believe investment in the sector, particularly engineering construction, has been the key driver of employment growth in the sector over the past decade. Chart 4.2 illustrates this relationship, and shows employment has a stronger relationship with utilities engineering construction rather than utilities output.

Table 4.3: Electricity, Gas, Water and Waste Services Forecasts – Australia

Year Ended June	% of Workforce in 2010	Year Average Per Cent Change (a)														
									Forecast						Average	Average
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2016-22	2017-22
Wage Price Index																
Awards Only	2.7%	0.7	3.2	3.4	2.9	2.6	3.0	2.5	2.4	2.9	2.7	2.6	2.7	2.9	2.7	2.8
Collective Agreements	67.7%	4.6	4.2	4.1	3.9	3.6	3.4	3.2	3.3	3.0	3.5	3.5	3.7	4.0	3.3	3.5
Individual Arrangements	29.6%	4.2	4.2	2.1	5.0	2.4	1.7	0.9	2.5	1.8	2.5	3.4	4.5	4.9	2.2	3.4
Wage Price Index (Ord. Time)	**100%**	**4.3**	**4.2**	**3.5**	**4.2**	**3.3**	**2.8**	**2.4**	**2.8**	**3.0**	**3.2**	**3.5**	**3.9**	**4.2**	**3.0**	**3.6**
Compositional Effects + Bonuses,etc		3.2	4.9	-1.0	1.9	-1.2	-2.2	1.1	0.6	0.7	0.7	0.5	0.5	0.7	0.7	0.6
AWOTE (Persons)(b)	**100%**	**7.6**	**9.1**	**2.5**	**6.1**	**2.0**	**0.7**	**3.5**	**3.4**	**3.7**	**3.8**	**4.0**	**4.4**	**4.9**	**3.7**	**4.2**

(a) Full-time Adult Persons
(b) Full-time Adult Persons, excluding overtime

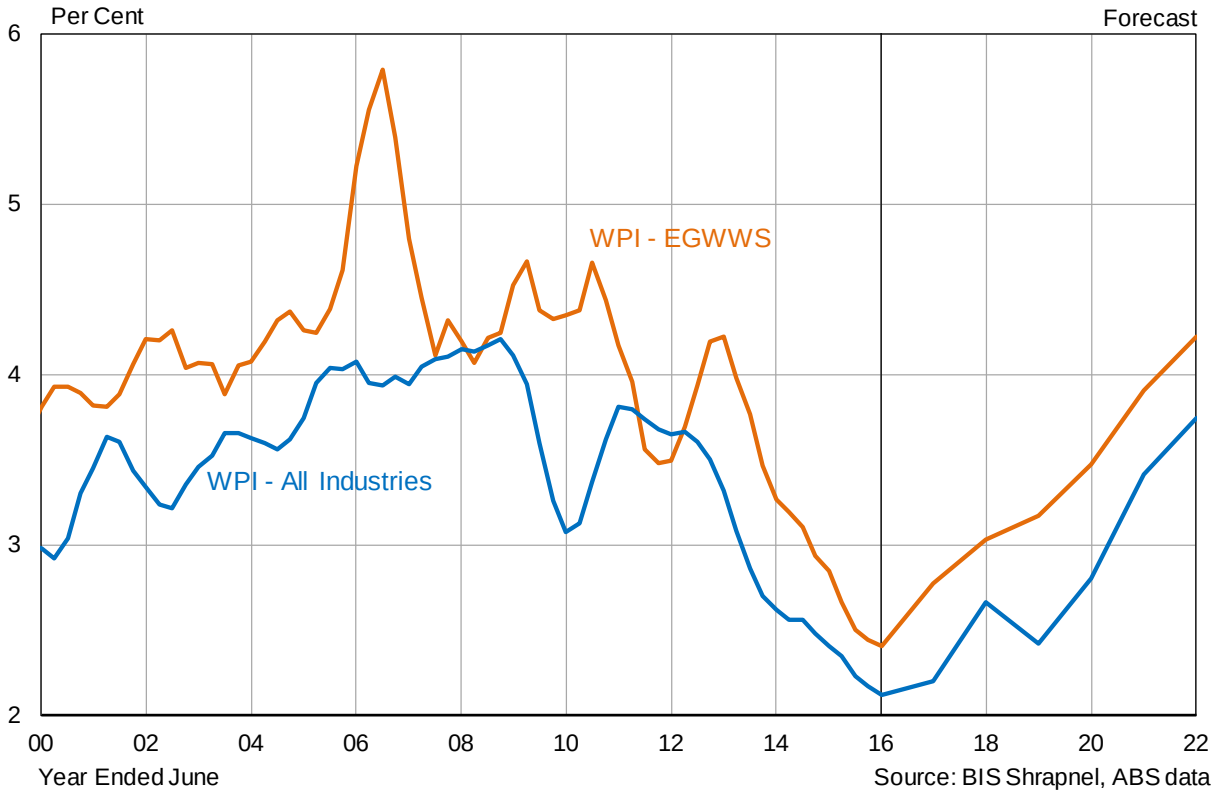
Table 4.4: Federal Wage Agreements – Collective Agreements by Industry (Average Annualised Wage Increase)

Selected Industry (ANZSIC 2006)	Collective Agreements Average Annualised Wage Increase[1]											Average
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2005-2015
Electricity, Gas, Water and Waste Services	**4.3**	**4.3**	**4.3**	**4.6**	**4.6**	**4.5**	**4.2**	**4.1**	**3.7**	**3.6**	**3.3**	**4.1**
Agriculture, Forestry and Fishing	2.8	3.0	2.9	3.4	3.7	3.3	3.5	3.5	3.5	3.1	2.9	3.2
Mining	3.6	3.7	3.9	4.2	4.2	4.1	4.2	4.4	4.3	4.0	3.2	4.0
Manufacturing	4.2	4.1	4.1	4.0	3.9	3.7	3.7	3.8	3.6	3.3	3.0	3.8
Construction	4.5	4.7	4.7	4.6	5.1	5.2	4.5	5.0	5.0	4.9	4.0	4.7
Wholesale Trade	4.1	3.5	3.6	4.0	4.0	3.7	3.6	3.6	3.6	3.2	3.0	3.6
Retail trade	3.5	3.5	3.4	3.4	3.4	3.4	3.4	3.2	3.2	3.0	3.4	3.4
Accommodation and Food Services	3.3	3.4	3.2	3.4	3.9	3.7	3.7	3.5	3.3	3.0	2.9	3.4
Transport , Postal and Warehousing	3.9	3.8	3.9	4.0	4.1	3.8	3.6	3.7	3.7	3.5	3.3	3.8
Information Media and Telecommunications	3.1	3.1	3.2	3.6	3.6	3.4	3.3	3.4	3.4	3.3	2.8	3.3
Financial and Insurance Services	4.2	4.1	3.7	3.8	3.6	3.4	3.4	3.1	3.1	3.1	3.0	3.5
Rental, Hiring and Real Estate Services	4.4	4.5	4.6	4.3	3.5	3.7	3.8	4.2	4.2	4.1	3.4	4.1
Professional, Scientific and Technical Services	4.0	3.7	3.9	4.3	4.2	4.1	4.0	4.0	4.0	3.9	3.5	4.0
Administrative and Support Services	3.5	3.4	3.5	3.6	3.5	3.6	3.6	4.1	4.0	3.9	3.6	3.7
Public Administration and Safety	4.4	4.0	4.0	4.1	3.9	3.6	3.5	3.6	3.5	3.5	3.2	3.7
Health Care and Social Assistance	3.9	4.1	3.9	3.9	4.0	3.8	3.8	3.2	3.0	3.1	3.1	3.6
Education and Training	5.0	4.5	4.8	4.2	4.3	4.3	4.4	3.9	3.5	3.7	3.7	4.2
Arts and Recreation Services	3.8	3.6	3.8	4.0	3.8	3.3	3.2	3.3	3.2	3.3	3.2	3.5
Other Services	3.4	3.7	3.8	3.6	3.6	3.5	3.6	4.0	3.6	3.2	2.9	3.6
ALL INDUSTRIES	4.2	4.0	4.0	3.9	3.9	3.9	3.8	3.6	3.5	3.4	3.3	3.8

(1) Current agreements in December of each year.

Source: Department of Employment

Chart 4.1: Wage Price Index
Total Australia (All Industries) and Electricity, Gas, Water and Waste Services



As well as the pick-up in infrastructure work, this strong growth in utilities employment has also been associated with an ongoing reversal in the sharp losses in employment seen through the 1990s. Privatisation and rationalisation were the drivers of the job cuts in the 1990s, but in some cases the desire to be streamlined left only a 'skeleton' crew in-house for routine operations and emergency disruptions, while capital and maintenance works (both minor and major) tended to be contracted out. Capital expenditure in the utilities sector during the 1990s was also relatively low, and this may also have contributed to weaker employment.

The emergence of skilled labour shortages across many industry sectors over the 2000s encouraged utilities businesses to boost their in-house response capabilities, while increasing competition has shifted the business focus towards customer service in order to enhance product differentiation with an accompanying increase in employment not directly related to the provision of electricity, gas, and water services. The entrance of new players in the sector (such as new businesses related to renewable energy provision, new private electricity and gas businesses, etc.) has also exacerbated this situation as it has increased demand for all occupations within this sector.

The strong growth in employment in the Utilities, Mining and Construction sectors, and the associated sustained strong demand for skilled labour, contributed to above average wages growth in all three sectors. At the same time, the overall labour market tightened considerably during the 2000s, with the unemployment rate falling from around 7 per cent in 2001 to 5 per cent by 2005, and to 4.0 per cent in early 2008. This saw skilled labour shortages worsen and employers in these sectors bid up wages.

The global financial crisis and the subsequent slowing in the economy over 2008/09 reduced labour demand and wage pressures, and this has weighed down on the labour market through to the present, with the unemployment rate reaching a peak of 6.1 per cent in August 2014.

Chart 4.2: Australia – Utilities Employment, Output and Investment

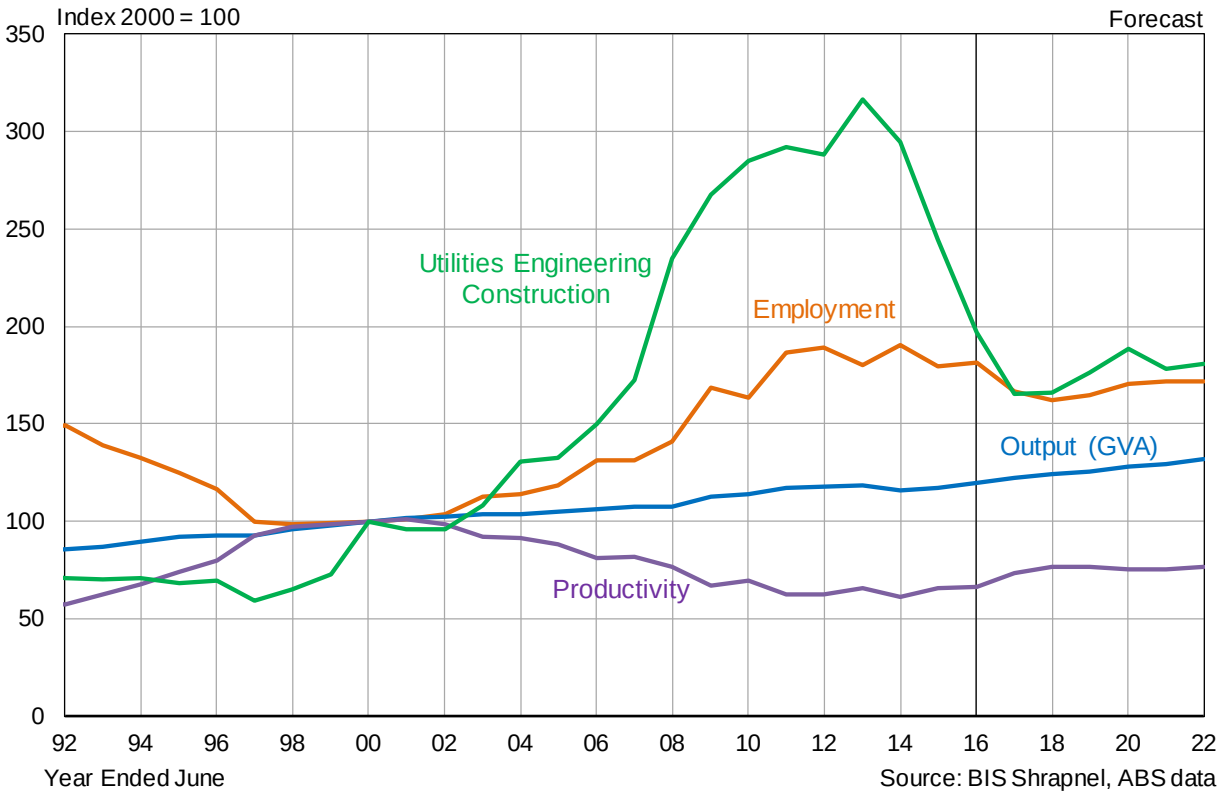


Table 4.5: Average Weekly Ordinary Time Earnings and Wage Price Index
Total Australia and Electricity, Gas, Water and Waste Services Sector
(Year Average Growth)

Year Ended December	Average Weekly Ordinary Time Earnings (1)				Wage Price Index (2)			
	All Industries		Electricity, Gas, Water and Waste Services		All Industries		Electricity, Gas, Water and Waste Services	
	$	%CH	$	%CH	Index	%CH	Index	%CH
1999	750.4	2.8	837.2	2.3	70.7	3.1	66.9	3.4
2000	785.9	4.7	895.8	7.0	72.9	3.0	69.5	3.9
2001	825.1	5.0	954.4	6.5	75.5	3.6	72.2	3.9
2002	867.1	5.1	985.9	3.3	77.9	3.2	75.3	4.3
2003	913.7	5.4	1,031.6	4.6	80.8	3.7	78.2	3.9
2004	948.5	3.8	1,073.8	4.1	83.6	3.6	81.6	4.3
2005	998.9	5.3	1,105.3	2.9	87.0	4.0	85.2	4.4
2006	1 032.6	3.4	1,126.0	1.9	90.4	3.9	90.1	5.8
2007	1 081.8	4.8	1,171.2	4.0	94.1	4.1	93.8	4.1
2008	1 133.8	4.8	1,212.8	3.5	98.1	4.2	97.7	4.2
2009	1 198.6	5.7	1,294.5	6.7	101.6	3.6	102.0	4.4
2010	1 257.0	4.9	1,415.9	9.4	105.0	3.4	106.8	4.7
2011	1 312.8	4.4	1,499.3	5.9	108.9	3.7	110.6	3.6
2012	1 366.8	4.1	1,553.1	3.6	112.9	3.6	114.9	3.9
2013	1 424.6	4.2	1,620.2	4.3	116.1	2.9	119.2	3.8
2014	1 461.4	2.6	1,643.7	1.5	119.1	2.6	122.9	3.1
2015	1 489.7	1.9	1,669.4	1.6	121.7	2.2	126.0	2.5
Forecasts								
2016	1 524.7	2.3	1,736.9	4.0	124.2	2.1	129.1	2.5
2017	1 577.4	3.5	1,799.8	3.6	127.3	2.5	132.9	2.9
2018	1 636.0	3.7	1,868.5	3.8	130.6	2.6	137.1	3.1
2019	1 690.4	3.3	1,941.6	3.9	133.9	2.5	141.5	3.3
2020	1 759.2	4.1	2,022.7	4.2	138.1	3.2	146.8	3.7
2021	1 839.1	4.5	2,116.4	4.6	143.0	3.6	152.7	4.1
2022	1 928.1	4.8	2,221.3	5.0	148.4	3.8	159.2	4.3
Compound Annual Growth Rates (3)								
2000-2010	4.8		4.7		3.7		4.4	
2010-2015	3.5		3.3		3.0		3.4	
2015-2022	3.8		4.2		2.9		3.4	
2017-2022	4.1		4.3		3.1		3.7	

Source: BIS Shrapnel, ABS

(1) Earnings per person for full-time adults. Data is year ended November (available only mid month of quarter).
(2) Ordinary time hours excluding bonuses.
(3) CAGR (Compound Annual Growth Rates) for 2017-2022 is for the next Access Arrangment period.

However, with the economy expected to return to balanced and trend growth early next decade, employment growth will outpace population and labour force growth and the unemployment rate is expected to approach 5.1 per cent by early next decade. Hence, from early 2020s, we expect to again witness the re-emergence of skilled labour shortages and competition for scarce labour particularly from the construction sector, which will push up wage demands in the utilities sector.

Individual agreements will strengthen from their current weakness

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

Wage growth from individual agreements rose by just 1.7 per cent over the year to June 2015 and slowed to 0.9 per cent last year, reflecting general weakness in the economy and the full-time labour market. However, this is expected to turn around from this year, albeit gradually. Stronger increases are expected from the beginning of next decade in line with a strengthening economy. Businesses will find they must 'meet the market' on remuneration in order to attract and retain staff and we expect wages under individual arrangements to continue to rise through the middle of the next decade.

Two other factors which will act to push up wages growth attributable to the individual arrangements segment — that is the compositional effects — include the up skilling of the workforce and, later in the period, the ageing of the workforce. Apprentices, trainees and numbers of new staff have increased markedly over recent years, across the electricity, gas and water sector generally. Given slower growth in employment numbers over the next decade, it is likely that there will be overall up skilling of the existing workforce, which will see a commensurate movement by much of the workforce into higher grades (ie on higher pay), although the 'base' movement — the nominal increase in EBA's — will not reflect this, so this upgrading will end up as compositional increases in the individual arrangements segment.

A related aspect is an ageing labour profile, which will particularly affect the 'professionals' on non-EBA's, who tend to be older and more experienced.

The net result is that all the compositional effects from the up skilling of the workforce will fall into the individual arrangements wage setting residual. This is because the electricity, gas and water sector has a relatively small workforce and the individual arrangements segment picks up the standard errors of WPI estimates by the ABS. Overall, BIS Shrapnel expects individual wage agreements to average growth of 3.4 per cent per annum over the five years to 2021/22 well up on the 2.4 per cent experienced over the five years to 2015/16.

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

Overall, BIS Shrapnel expects total wage costs for the Australian Electricity, Gas, Water and Waste Services (EGWWS or 'Utilities) sector — expressed in Average Weekly Ordinary Time Earnings (AWOTE) — will average 4.3 per cent per annum over the five years to 2022, 0.2 per cent higher than the national 'All Industries' AWOTE average of 4.1 per cent per annum over the same five-year period (see table 4.5). In terms of *underlying* wages growth in the 'utilities' sector for total Australia — expressed in wage price index (WPI) terms — BIS Shrapnel is forecasting an average of 3.7 per cent per annum (also 0.6 percentage points higher than the national 'All Industries' WPI average of 3.1 per cent per annum) over the five years to 2022.

4.1 Outlook for utilities wages growth in Victoria

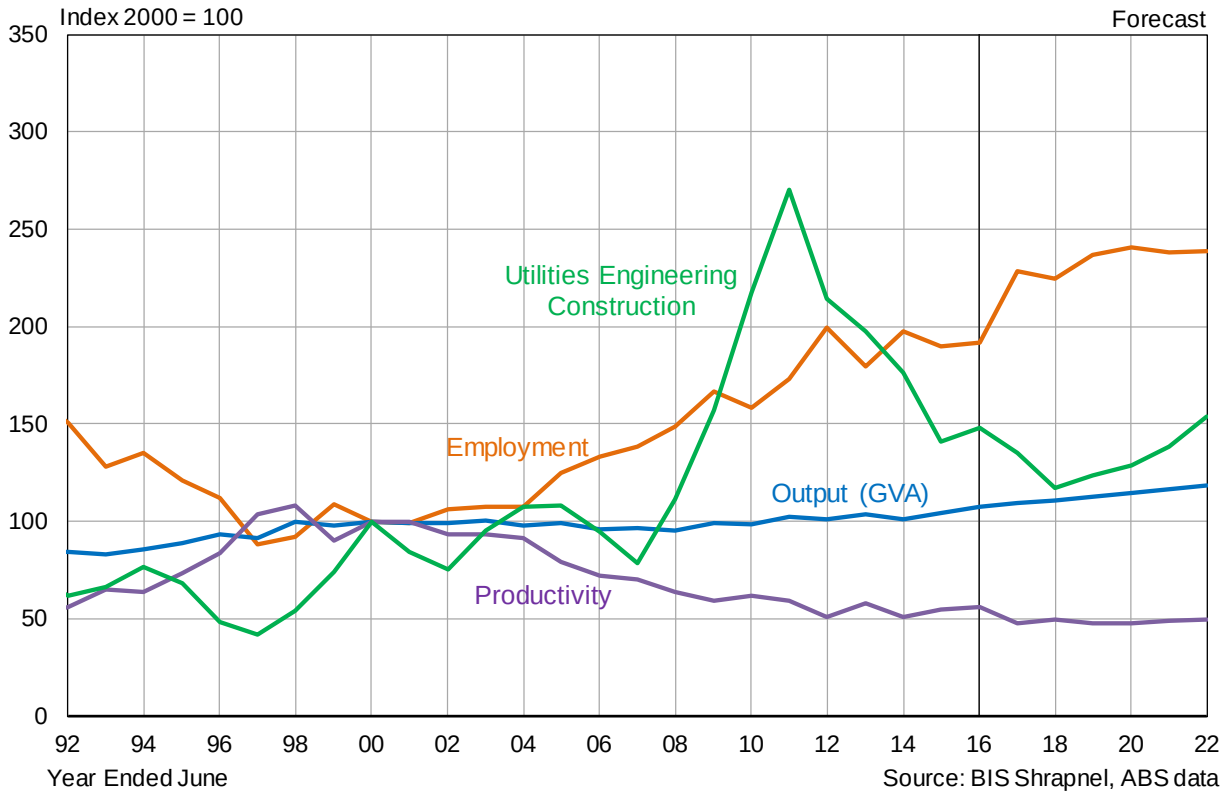
The utilities wage forecasts for Victoria are expected to slightly exceed the national average over the five years to December 2022 (i.e. the distributors' next Access Arrangement period). Victorian utilities WPI growth is forecast to average 3.8 per cent per annum compared with Australian utilities industry wage forecast of 3.7 per cent per annum over the same period. This forecast is outlined in table 4.6.

Chart 4.3 shows that engineering construction for the utilities-related segments (including electricity, gas pipelines, water and sewerage) in Victoria has fallen significantly over the past three years. This follows a doubling in work done over the last decade, as a result of substantial additions to capacity in the 2000s, against a backdrop of generally increasing transmission and distribution work. As this round of periodic investment came to an end, activity fell sharply.

On the positive side, electricity network refurbishment, extension and augmentation programs directed at improving reliability levels, and measures to address ageing asset profiles will keep electricity-related activity at historically high levels. The renewable energy industry (particularly the wind farm industry) now has some level clarity on whether to resume projects — in June 2015, the Federal Parliament finally passed legislation implementing the Renewable Energy Target (RET) requiring 33,000 gigawatt hours of large scale electricity production by 2020.

The $700 million Mount Gellibrand Wind Farm, which was on hold since 2012, is now expected to commence construction this year. Other projects, such as the Moorabool Wind Project and Cherry Tree Wind Farm, are expected to commence later. Although the ambiguity around renewable energy is beginning to clear, we forecast annual average activity of $2.5 billion over the five years to 2019/20, down on the previous five-year period but remaining well above the long-run historical average.

Chart 4.3: Victoria – Utilities Employment, Output and Investment



Long term, we expect steady levels of electricity construction activity over the decade to 2029/30, as steady population and income growth necessitates increases in base load capacity in the future. With previously stalled wind-farm construction back on the agenda, we expect a shift away from ageing brown coal plants towards wind, hydro and geothermal energy generation in the future.

Table 4.6: Electricity, Gas, Water and Waste Services – Victoria and Australia Year Average Growth

Year Ended December	Wage Price Index			
	Victoria		Australia	
	Index	%CH	Index	%CH
1999			66.9	3.4
2000			69.5	3.9
2001			72.2	3.9
2002			75.3	4.3
2003			78.2	3.9
2004			81.6	4.3
2005			85.2	4.4
2006			90.1	5.8
2007			93.8	4.1
2008			97.7	4.2
2009	101.4	3.3	102.0	4.4
2010	105.1	3.6	106.8	4.7
2011	109.5	4.1	110.6	3.6
2012	113.7	3.9	114.9	3.9
2013	118.7	4.4	119.2	3.8
2014	123.0	3.7	122.9	3.1
2015	127.1	3.3	126.0	2.5
Forecasts				
2016	130.9	3.0	129.1	2.5
2017	134.6	2.8	132.9	2.9
2018	138.8	3.1	137.1	3.1
2019	143.4	3.4	141.5	3.3
2020	148.8	3.7	146.8	3.7
2021	155.0	4.2	152.7	4.1
2022	161.9	4.5	159.2	4.3
Compound Annual Growth Rates				
2000-2010			4.4	
2010-2015	3.9		3.4	
2015-2022	3.5		3.4	
2017-2022	3.8		3.7	

Source: BIS Shrapnel, ABS

5. EXTERNAL LABOUR COST ESCALATION FORECASTS

This section provides forecasts of the distributors' external or 'out-sourced' labour cost escalation. Given the businesses outsourced labour is predominantly supplied by firms in the construction industry, we proxy the Victorian Gas Distributors external labour cost escalation by wages growth (as measured by the WPI) in the Victorian construction industry.

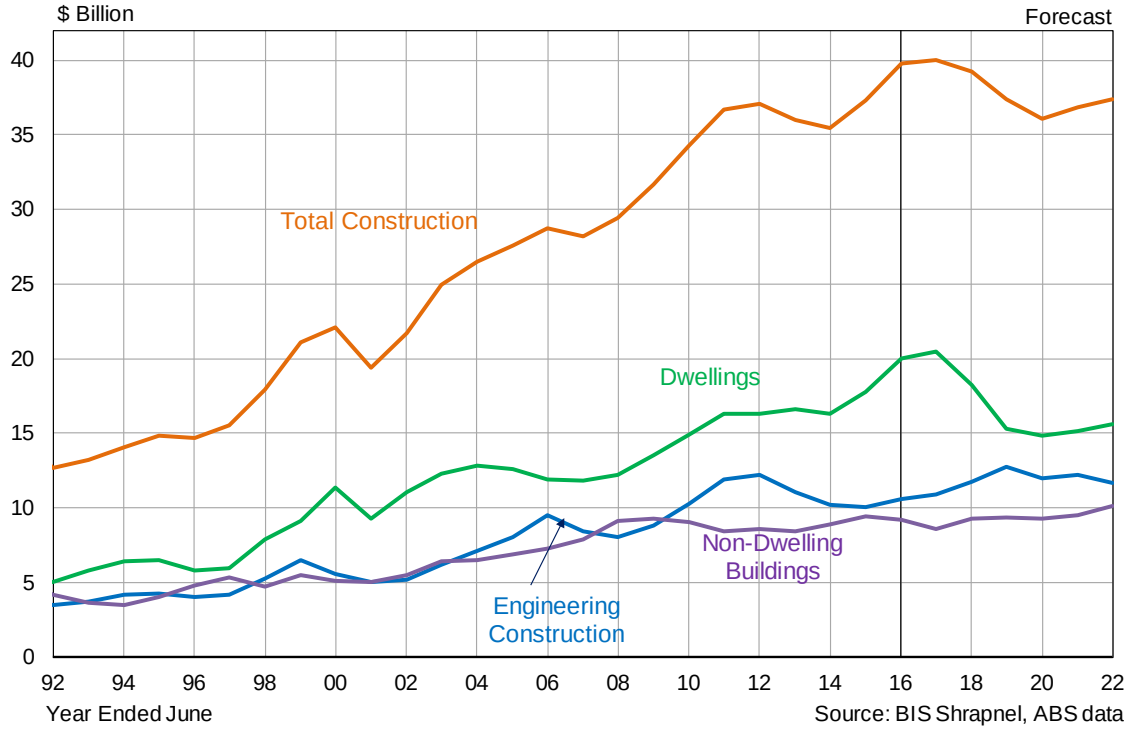
Our research has shown that construction activity (ie work done in the sector) normally has a strong influence on construction wages. Hence, our wage forecasts for external labour are based on BIS Shrapnel's forecasts of construction activity by state (which includes residential and non-residential building, plus engineering construction) as well as predicted movements in construction wages at the national level.

5.1 Construction Sector Wages Growth in Victoria

Much like the other states and territories, wages growth in the Victoria construction sector generally tracks growth in total construction activity, although changes in wages tend to lag construction (in work done terms) by around one to two years.

Construction activity in Victoria peaked in 2012, driven by a simultaneous upswing in dwelling buildings and engineering construction. Although dwelling building has remained elevated, engineering construction has fallen heavily upon completion of significant projects such as the Wonthaggi Desalination Plant, and the Kipper and Turrum gas field projects, and this has weighed down on total construction. Private engineering construction is not expected to recover until 2018/19. On a more positive note, public investment is now emerging from its trough, after new public investment had fallen 21 per cent since 2010/11. Despite the scrapping of the $8 billion East-West link, recoveries in roads (notably the Metro rail Project), water and telecommunications construction is expected to underpin a solid recovery from 2016/17. Private dwelling construction has picked up speed over the past 18 months, with through-the-year growth to March, 2016 of 10.1 per cent. This has been driven by a number of projects in the detached housing market, along with a rebound in the alterations and additions activity.

Chart 5.1: Total Construction – Victoria
Value of Work Done, Constant 2013/14 Prices



With Victoria now in a housing over-supply, this growth will be unsustainable, and we anticipate that 2016/17 will see a fall of around 2 per cent in overall dwelling investment and much deeper falls in 2017/18 and 2018/19.

Private non-dwelling building has enjoyed good growth over the past four years and is predicted to increase another 2 per cent in 2015/16, driven by solid growth in the retail, accommodation (hotels, etc), factories, education and other social and institutional sectors, the latter courtesy of the privately funded $550 million Ravenhall Prison. However, the completion of a number of projects will see total private non-residential building decline modestly over 2016/17, although there will be further increases in accommodation and entertainment and recreation buildings, the latter due to work on the Flemington Racecourse and Rod Laver Arena refurbishments. Modest growth in private non-dwelling building will then ensue from 2017/18, boosted by projects in retail, offices, transport (Tullamarine airport terminals), health and entertainment and recreation.

Overall, construction wages in Victoria are forecast to rise by an average of 3.7 per cent (WPI) over the five years to 2022, the same as the national construction industry average.

Table 5.1: Construction Wages Growth – Victoria and Australia
Year Average Growth

Year Ended December	Wage Price Index			
	Victoria		Australia	
	Index	%CH	Index	%CH
1999			66.9	3.4
2000			69.5	3.9
2001			72.2	3.9
2002			75.3	4.3
2003			78.2	3.9
2004			81.6	4.3
2005			85.2	4.4
2006			90.1	5.8
2007			93.8	4.1
2008			97.7	4.2
2009	102.9	5.4	102.0	4.4
2010	107.8	4.7	106.8	4.7
2011	112.5	4.4	110.6	3.6
2012	116.0	3.1	114.9	3.9
2013	120.9	4.2	119.2	3.8
2014	125.1	3.5	122.9	3.1
2015	128.7	2.9	126.0	2.5
Forecasts				
2016	131.2	1.9	128.0	1.6
2017	134.3	2.3	131.3	2.5
2018	138.1	2.8	135.1	2.9
2019	142.6	3.3	139.6	3.3
2020	147.9	3.7	144.5	3.5
2021	154.4	4.3	150.6	4.2
2022	161.3	4.5	157.3	4.4
Compound Annual Growth Rates				
2000-2010			4.4	
2010-2015	3.6		3.4	
2015-2022	3.3		3.2	
2017-2022	3.7		3.7	

Source: BIS Shrapnel, ABS

APPENDIX A: TERMS OF REFERENCE

To be inserted by the distributors.

APPENDIX B: STATEMENT OF COMPLIANCE WITH EXPERT WITNESS GUIDELINES

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

APPENDIX C: CURRICULUM VITAES OF KEY PERSONNEL

Kishti Sen
Senior Economist

As a senior economist, Kishti contributes to the formulation of BIS Shrapnel's economic forecasts, at the Australia, State, regional and industry level. In addition, he is the lead author of BIS Shrapnel's monthly Economic Outlook Bulletin and annual Long Term Forecasts report.

Prior to joining BIS Shrapnel in 2007, Kishti managed the Reserve Bank of Fiji's research and analytical work programme. At the Reserve Bank, he was also a member of the Monetary Policy Committee - a small group of senior staff advising the Governor directly on interest-rate settings.

Kishti holds a PhD in Economics from the University of Sydney and has special interest in macroeconomic forecasting, monetary policy, benefit-cost assessments, econometric modelling and general macroeconomic consultancy.

Richard Robinson
Senior Economist and Associate Director - Economics

Richard Robinson has been employed with BIS Shrapnel since 1986.

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

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

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

Richard holds a Bachelors Degree in Commerce with Honours from the University of Wollongong.

Alex Cousley
Research Assistant

Alex joined BIS Shrapnel in 2015 after graduating with first class honours in Economics from the University of Wollongong. Alex works across the Economics, Infrastructure and Mining units and Asset Sales units. Alex has contributed to a range of private client studies, as well as subscription service publications.