Jemena Electricity Networks (Vic) Ltd

2016-20 Electricity Distribution Price Review Regulatory Proposal

Attachment 8-8

Real labour and material cost escalation forecasts to 2020

Public

30 April 2015

Real Labour and Material Cost Escalation Forecasts to 2020

– Australia and Victoria

> FINAL REPORT • NOVEMBER 2014

Report prepared for:

- **Jemena Electricity Networks Ltd**
- **United Energy**

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BUSINESS RESEARCH AND FORECASTING

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

Job no: E6097

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SUMMARY

- In June 2014, BIS Shrapnel was engaged by Jemena Electricity Networks Ltd and United Energy to provide an expert opinion regarding the outlook for labour and a range of material cost escalators relevant to electricity distribution networks in Victoria. These forecasts will be used by the distributors to escalate their labour and material costs to develop their operating and capital expenditure forecasts, covering the period 2016 to 2020.
- Australia's economy is currently in a transition phase. As we move past the peak of the mining boom, we are waiting on the next growth drivers to come through and take over from the mining sector. But non-mining investment is likely to be slow to come through, while much of the economy remains weighed down by the still-high Australian dollar. Economic growth is therefore likely to run below its long-run average for the next few years, before picking up through the second half of the decade.
- We expect wages growth will follow a similar path. The reluctance of business to invest and expand will weigh down on potential wage growth over the near term. But business investment and employment are expected to pick up through the latter half of 2015, supported by the non-mining sectors and a return to growth in public investment. A falling unemployment rate and emerging skills shortages are expected to push up wages growth through 2016 and 2017, before rising interest rates cause a slowdown in the economy and employment growth, which will transfer to slowing wages. Overall, the national 'All Industries' Average Weekly Ordinary Time Earnings (AWOTE) measure will average growth of 4.8 per cent over the 2016 to 2020 period. In terms of *underlying* wages growth, expressed in Wage Price Index (WPI) terms, BIS Shrapnel is forecasting average growth of 3.9 per cent per annum.
- Wages within the Australian Electricity, Gas, Water and Waste Services (EGWWS or 'Utilities) sector is forecast to slightly exceed the all industry result. We forecast average growth in the utilities sector of 5 per cent and 4.1 per cent for AWOTE and WPI respectively, given the utilities sector generally has employees with higher skill, productivity and wage levels than most other sectors.
- Utilities wages in Victoria are expected to average the same as nationwide wages over the 2016 to 2020 period. This is primarily due to the similar outlook for utilities engineering construction (which is a key driver of demand for labour) within Victoria and Australia. However, wage growth will differ in individual years and the construction cycle differs somewhat. The outlook for utilities engineering construction in Victoria is weak over the next three years, mostly due to the current round of electricity investment coming to an end. However, the outlook at a national level is even weaker, with New South Wales, Queensland and South Australia all contributing to declines in activity. Utilities wages growth in Victoria will therefore equal or exceed nationwide growth over the next three years, before stabilising around the national average over the remainder of the forecast period as a steady recovery in construction takes place.
- Construction wages tend to follow construction activity, including residential and non-residential building, and engineering construction. Construction activity in Victoria is estimated to be currently sitting at a trough, and will cycle around higher levels over the rest of the forecast period. This will initially be driven by a further increase in dwelling construction to record levels, and will be joined shortly after by a significant boom in engineering construction, due mostly to the roads (East-West Link) and telecommunications (NBN) sectors. This is forecast to result in growth in Victorian construction wages equal to or above the nationwide results for each of the years through to 2020. Wages growth is expected to average 4.7 per cent and 4.1 per cent in AWOTE and WPI terms respectively, between 2016 and 2020.

- The prices of all electricity network-related materials are forecast to increase, on average, to 2020. Wood is expected to experience the strongest price growth, at an average of 4.7 per cent per annum between 2016 and 2020, closely followed by aluminium, with average growth of 4.4 per cent. On the other hand, concrete prices are expected to post mild growth of just 0.6 per cent per annum. Note that these prices are in *nominal* terms. When the effect of inflation is removed, i.e. yielding prices in *real* terms, copper, steel, oil and concrete prices are all forecast to actually decline over the regulatory period to 2020.
- Our labour and material cost escalators are summarised in tables below.

Summary – Labour Cost Escalation Forecasts
(per cent change, year average, year ended December)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	5 yr Avg (g)
	Actuals			Forecasts							
NOMINAL PRICE CHANGES											
1. Gas Network-Related Labour											
EGWWS AWOTE - Victoria (a,b)	7.6	2.9	3.9	3.1	3.8	4.0	4.5	5.5	5.9	4.9	5.0
EGWWS WPI - Victoria (a)	**4.1**	**3.9**	**4.4**	**3.3**	**3.5**	**3.6**	**3.8**	**4.3**	**4.6**	**4.3**	**4.1**
EGWWS AWOTE - Australia (c)	5.9	3.6	4.3	2.7	3.6	4.2	4.7	5.3	5.5	5.2	5.0
EGWWS WPI - Australia (c)	3.6	3.9	3.8	3.2	3.3	3.6	3.9	4.3	4.5	4.3	4.1
2. Contractor Labour Cost Escalation											
Construction AWOTE - Victoria (d,b)	-0.6	0.8	2.4	3.2	4.6	4.5	4.1	4.2	5.0	5.4	4.7
Construction WPI - Victoria (d)	**4.4**	**3.1**	**4.2**	**3.7**	**3.8**	**3.9**	**4.1**	**4.0**	**4.1**	**4.4**	**4.1**
Construction AWOTE - Australia (c)	5.0	2.4	4.2	3.3	3.6	4.0	4.0	4.1	4.9	5.2	4.5
Construction WPI - Australia (c)	4.1	3.9	3.0	3.1	3.3	3.6	3.8	3.8	4.1	4.4	4.0
3. Australian Wages											
All Industries - AWOTE (e)	4.4	4.1	4.2	2.8	3.9	4.5	4.9	4.6	4.7	5.0	4.8
All Industries - WPI (e)	3.7	3.6	2.9	2.7	3.2	3.7	4.0	3.7	3.9	4.0	3.9
Consumer Price Index (headline) (f)	3.3	1.8	2.4	2.0	3.0	2.8	2.5	2.5	2.5	2.5	2.5
REAL PRICE CHANGES (h)											
1. Gas Network-Related Labour											
EGWWS AWOTE - Victoria (a)	4.3	1.1	1.5	1.1	0.8	1.3	2.0	3.0	3.4	2.4	2.4
EGWWS WPI - Victoria (a)	**0.8**	**2.1**	**1.9**	**1.3**	**0.5**	**0.9**	**1.3**	**1.8**	**2.1**	**1.8**	**1.6**
EGWWS AWOTE - Australia (b)	2.6	1.8	1.9	0.7	0.6	1.5	2.2	2.8	3.0	2.7	2.4
EGWWS WPI - Australia (b)	0.3	2.2	1.3	1.2	0.3	0.9	1.4	1.8	2.0	1.8	1.6
2. Contractor Labour Cost Escalation											
Construction AWOTE - Victoria (c)	-3.9	-0.9	0.0	1.2	1.6	1.7	1.6	1.7	2.5	2.9	2.1
Construction WPI - Victoria (c)	**1.1**	**1.4**	**1.8**	**1.7**	**0.8**	**1.2**	**1.6**	**1.5**	**1.6**	**1.9**	**1.6**
Construction AWOTE - Australia (b)	1.7	0.7	1.8	1.3	0.6	1.2	1.5	1.6	2.4	2.7	1.9
Construction WPI - Australia (b)	0.8	2.1	0.6	1.1	0.3	0.9	1.3	1.3	1.6	1.9	1.4
3. Australian Wages											
All Industries - AWOTE (e)	1.1	2.3	1.7	0.8	0.9	1.8	2.4	2.1	2.2	2.5	2.2
All Industries - WPI (e)	0.4	1.8	0.4	0.7	0.2	0.9	1.5	1.2	1.4	1.5	1.3

(a) Electricity, Gas, Water and Waste Services (EGWWS) Average Weekly Ordinary Time Earnings (AWOTE) and Wage Price Index (WPI) for Victoria.
(b) The ABS stopped producing AWOTE at the state industry level from February 2012. Hence, subsequent increases in AWOTE at the state industry level is estimated from historical data, changes in the relevant Australian industry AWOTE forecasts as well as known movements in state industry WPI. Similarly, our forecasts for AWOTE are based on our Australian industry wage forecasts and state industry WPI forecasts.
(c) Australian sector wage forecasts provided for comparison.
(d) Construction Sector AWOTE and WPI for Victoria.
(e) Australian All Industries AWOTE and WPI provided for comparison.
(f) Headline CPI forecasts based on Reserve Bank of Australia forecasts to December 2016 quarter and then Commonwealth Treasury medium term projections.
(g) Average Annual Growth Rate for 2016 to 2020 inclusive ie for next regulatory period.
(h) Real price changes are calculated by deducting the inflation rate from nominal price changes.

Summary – Material Cost Escalation Forecasts

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

Nominal Price Changes	Nominal Average annual Jan to Dec real index factor (or in annual real % change)										
	Actuals			Forecasts							
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	5 yr Avg (b)
Copper (without the impact of Australian Carbon pricing mechanism)	3.9	-10.1	-1.4	-0.8	3.4	6.2	10.2	4.6	-7.5	-3.6	2.0
Aluminium (without the impact of Australian Carbon pricing mechanism)	-1.8	-15.1	-3.3	3.9	12.5	10.7	10.7	7.6	-4.5	-2.7	4.4
Steel (without the impact of Australian Carbon pricing mechanism)	1.1	-11.5	-2.4	0.4	7.8	7.5	5.5	5.2	-8.5	-0.9	1.8
Oil	6.6	-2.2	12.7	8.2	1.1	1.6	6.8	5.0	-5.2	-2.5	1.2
Concrete	8.5	4.7	-3.1	-1.8	1.9	1.8	0.5	-2.4	-0.7	3.8	0.6
Wood	5.1	3.3	2.8	5.8	5.5	4.9	4.2	3.4	4.7	6.4	4.7
Consumper Price Index (Headline)[(a)]	**3.3**	**1.8**	**2.4**	**2.0**	**3.0**	**2.75**	**2.5**	**2.5**	**2.5**	**2.5**	**2.6**
Real Price Changes											
Copper (without the impact of Australian Carbon pricing mechanism)	0.6	-11.8	-3.9	-2.8	0.4	3.5	7.7	2.1	-10.0	-6.1	-0.6
Aluminium (without the impact of Australian Carbon pricing mechanism)	-5.1	-16.9	-5.8	1.9	9.5	8.0	8.2	5.1	-7.0	-5.2	1.8
Steel (without the impact of Australian Carbon pricing mechanism)	-2.2	-13.3	-4.8	-1.6	4.8	4.7	3.0	2.7	-11.0	-3.4	-0.8
Oil	3.3	-3.9	10.3	6.2	-1.9	-1.1	4.3	2.5	-7.7	-5.0	-1.4
Concrete	5.2	2.9	-5.6	-3.8	-1.1	-1.0	-2.0	-4.9	-3.2	1.3	-2.0
Wood	1.8	1.5	0.4	3.8	2.5	2.2	1.7	0.9	2.2	3.9	2.2

(a) Headline CPI forecasts based on Reserve Bank of Australia forecasts to December 2016 quarter and then Commonwealth Treasury medium term projections.

(b) Average Annual Growth Rate for 2016 to 2020 inclusive ie for next regulatory period.

1. INTRODUCTION, OUTLINE OF REPORT & DATA SOURCES

In June 2014, BIS Shrapnel was engaged by Jemena Electricity Networks Ltd and United Energy (collectively the distributors) to provide an expert opinion regarding the outlook for labour and a range of material cost escalators relevant to electricity distribution networks in Victoria. The labour and material cost escalators will be used by Jemena and United Energy to develop their operating and capital expenditure forecasts for inclusion in their revenue proposal to the Australian Energy Regulator (AER) on 30 April 2015. Although the next revenue proposal period is 1 January 2016 to 31 December 2020, BIS Shrapnel will provide seven year forecasts covering the calendar years 2014 to 2020 (ie 1 January 2014 to 31 December 2020).

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 E. I have been assisted in the preparation of this report by Dr Kishti Sen, Senior Economist at BIS Shrapnel, and Daniel Gradwell, Economic Analyst at BIS Shrapnel. Curriculum vitas of all relevant personnel are attached in Appendix D. Notwithstanding the assistance from the other two economists, the opinions in this report are my own and I take full responsibility for them. A brief description of the material upon which I have relied for the preparation of this report follows.

The Australian Bureau of Statistics (ABS) 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 2.2. The most recent wages data is for the June 2014 quarter and the latest industry employment data is for the month of August 2014. The June 2014 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 2.2. The detailed engineering construction data (by state and by category) have data up to March 2014 quarter. The latest data for Gross State Product (GSP) and real gross value added for state industry sectors was 2012/13. Other inflation and interest rate data were sourced from the Reserve Bank of Australia. Other data and information concerning enterprise agreements and skills shortages was 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: 2014 – 2029* report*, Engineering Construction: 2013/14 to 2027/28 and Long Term Building Work Done Forecasts*, plus other unpublished forecasts and from BIS Shrapnel internal research.

Commodity price forecasts including copper, aluminium, steel and oil were sourced from Consensus Economics *Energy & Metals Consensus Forecasts* publication. Concrete price and non-hydro electricity construction implicit price deflator forecasts are based on our projections of underlying construction activity, while wood price forecasts are based on qualitative research into the relevant supply and demand side drivers.

Our historical data is sourced from 'official' sources including the ABS, the Reserve Bank, and state and federal governments. In addition, we believe our forecasts are arrived at on a reasonable basis as they are based on reasonable assumptions taking into account the risks — both positive and negative — to our central scenario. As a completely independent firm, we have no vested interests of any kind in any of the industry sectors and markets which we research and forecast.

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 forecasts generated from this approach may be classified as 'hand-made' estimates given the method endeavours to approximate the real world dynamics as close as possible. In doing so, we do not rely solely on results of large-scale econometric models, which are often conditional on restrictive assumptions and, as a result, miss important turning points in economic activity.

BIS Shrapnel won acclaim for correctly forecasting the domestic downturn in 2000/01; the subsequent boom in business investment and the chronic labour and capacity constraints by mid-decade; the rise in interest rates through 2006 to 2008, including picking the peak in housing interest rates in mid 2008; and was virtually alone in forecasting that Australia would not suffer a recession during the global financial crisis.

Our real strength is in understanding the fundamental drivers of supply and demand in key markets and industry sectors. Economic forecasts are built from the industry sector level up, not merely from the macro level down.

As mentioned, we put considerable effort into understanding and quantifying the risks (both positive and negative) to our baseline forecasts making our model valid under different assumptions or robust.

The structure of this report is as follows:

- The previous **Summary** section presents an overview of the outlook for the labour and material cost escalators and provides summary tables of each.
- **Section 2** provides an overview of the 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, with the Reserve Bank of Australia and Treasury medium-term projections of CPI inflation. The latter is used to deflate the nominal escalators provided in this report.
- **Section 4** provides an outlook for the distributors' internal labour cost escalation which is based on forecasts of wages growth for the Electricity, Gas, Water and Waste Services industry for Australia and Victoria.
- **Section 5** provides forecasts of the distributors' external or 'out-sourced' labour cost escalation. As most out-sourced labour is provided by firms in the construction industry, Jemena's and United Energy's external cost labour escalation is based on forecasts of wages growth in the Victoria construction industry.
- **Section 6** provides an outlook for a range of material cost escalators relevant to the operation and maintenance of electricity networks in Victoria.
- **Appendices,** which includes a note on different wage measures and a description of BIS Shrapnel's wage and exchange rate model.

2. MACROECONOMIC FORECASTS: WORLD, AUSTRALIA AND VICTORIA

2.1 Overview

The Mining Investment Boom has peaked and will decline from now

Australia's solid economic performance over the last decade was largely underwritten by an investment boom in the resources sector. An investment boom made possible by the high commodity prices and strong Chinese and Asian demand for bulk commodities. However, the surge in resources investment resulted in a significant reallocation of resources (capital and labour) away from the non-mining industries to the mining and mining-related sectors.

High commodity prices drove the Australian dollar above parity with the US dollar, creating competitive challenges and enormous pressure on other trade-exposed industries including agriculture, manufacturing, tourism, education, finance and business services. This was part of the structural change brought about by the escalation in the resources investment, "making room" for the mining investment boom. Ultimately, higher commodity prices and the associated mining investment boom as well as the rise in the Australia dollar delivered Australia strong but uneven composition of growth last decade and early this decade.

The mining investment boom peaked in 2013/14. As a result, resources investment will now make negative contributions to investment and real GDP growth. That said, we anticipate a soft landing in the resources construction market. In other words, we don't expect activity to collapse completely.

Commodity prices remain high from a long run historical perspective and will support the investment decisions for a number of projects expected to commence over the short-to-medium term. This, in turn, will keep minerals investment at healthy levels over the next four years. Further, a strong pipeline of work driven by oil and gas construction, with several large LNG (liquefied natural gas) projects now ramping up off the North West Coast and a range of projects around Gladstone, Queensland will place a floor under the level of work. And, eventually, further (smaller) mining investment cycles will play out in response to global demand, prices and movements in the Australian dollar.

We wait for recovery in non-mining business investment and structural change associated with a lower dollar to underpin solid growth in the second half of the decade.

The peak in the mining boom puts Australia's economy in a transition phase. We are looking for the next growth drivers to come through and take over from the mining sector. But this 'handover' is unlikely to be as successful as those in the last decade when growth switched basically 'on cue' from housing construction, to minerals investment, later (around mid-decade and following the GFC) to public sector, then to mining investment subsequently. We think the next set of drivers will be slow to come through. The rebalancing, the reversing of high commodity prices, and hence reversing of high Australian dollar-induced structural change to more broadly based growth will take time. The Australian dollar remains still 'too high' from a competitiveness perspective.

Meanwhile, the Australian economy is operating below capacity. Nonetheless, the ingredients of positive (albeit below long-run average) growth remain in place.

Real GDP growth in the interim will be driven by net exports. We expect the world economy to continue to gather momentum and won't pull the rug from under us. Countries important to us, especially China, are expected to continue to grow at a solid pace. Meanwhile, imports will be soft in the near term consistent with the peak of mining investment boom as well as weak domestic demand. We anticipate net exports will add at least 1 per cent to growth over each of the next four years.

Table 2.1: Australia – Key Economic Indicators, Financial Years

Year Ended June	Actuals								Forecasts					
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Private Investment														
– Dwellings	-0.2	1.8	-1.4	1.2	2.2	-2.2	-0.2	5.0	7.0	3.0	-1.8	-5.5	2.0	7.4
– New Non-Dwelling Construction (+)	13.1	6.4	12.1	-10.2	11.4	37.2	14.9	-2.2	-6.3	-5.6	-7.6	-8.1	5.5	8.0
– New Non-Dwelling Building (+)	10.7	11.7	-3.9	-14.4	0.5	9.6	9.1	3.0	7.5	2.9	-2.9	-8.2	1.3	10.2
– New Engineering Construction (+)	15.5	1.3	29.2	-7.0	19.0	53.6	17.3	-4.3	-12.0	-9.8	-10.3	-7.9	8.1	6.8
Total New Private Investment (+)	**5.2**	**8.3**	**1.2**	**-2.2**	**5.3**	**14.9**	**5.1**	**-1.8**	**0.4**	**1.3**	**-0.4**	**-3.4**	**5.3**	**9.2**
New Public Investment (+)	**4.7**	**10.6**	**8.1**	**22.6**	**-2.7**	**-4.0**	**-10.4**	**0.7**	**-3.5**	**6.5**	**12.0**	**6.2**	**2.4**	**-0.7**
Gross National Expenditure (GNE)	**5.1**	**6.0**	**0.6**	**2.2**	**4.2**	**5.0**	**1.8**	**0.8**	**1.8**	**3.1**	**2.7**	**1.4**	**3.7**	**4.6**
GDP	**3.8**	**3.7**	**1.7**	**2.0**	**2.2**	**3.6**	**2.6**	**2.9**	**2.5**	**3.4**	**3.5**	**2.9**	**3.4**	**3.9**
Inflation and Wages														
CPI (Yr Avg)- RBA/Treasury forecasts (*)	3.0	3.4	3.1	2.3	3.1	2.3	2.3	2.0	3.0	2.8	2.5	2.5	2.5	2.5
Wage Price Index (Jun on Jun)(**)	4.0	4.2	3.8	3.1	3.8	3.7	2.9	2.6	3.2	3.7	3.9	3.5	3.9	4.0
Wage Price Index (Yr Avg)(**)	3.9	4.1	4.1	3.1	3.8	3.6	3.3	2.6	2.9	3.5	3.8	3.7	3.7	4.0
Average Weekly Earnings (Yr Avg)	3.6	4.9	5.5	5.6	4.2	4.3	4.6	3.0	3.3	4.3	4.9	4.8	4.5	4.9
Employment														
– Employment Growth (Yr Avg)	3.0	3.1	1.7	0.9	2.4	1.2	1.2	0.8	1.1	1.9	2.0	0.8	1.3	2.4
– Employment Growth (May on May) (%)	3.3	2.7	0.9	1.6	2.2	1.7	0.9	0.9	1.2	2.0	1.9	0.5	1.8	2.6
– Unemployment Rate (May) (%)	4.3	4.3	5.8	5.2	5.0	5.2	5.6	5.8	6.2	5.8	5.5	5.9	5.6	4.9
Labour Productivity Growth														
– Total	0.8	0.6	0.0	1.0	-0.1	2.4	1.4	2.1	1.4	1.5	1.4	2.0	2.1	1.5
– Non-farm	1.3	0.5	-0.3	1.1	-0.2	2.4	1.5	2.1	1.5	1.5	1.5	2.0	2.1	1.5
Exchange Rates														
– US$ per A$ (Yr Avg)	0.79	0.90	0.75	0.88	0.99	1.03	1.03	0.92	0.90	0.87	0.83	0.77	0.80	0.89

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 calendar year 2015 and then Commonwealth medium term projections.
** Based on Ordinary Time Hourly Rates of Pay

Further, the long-awaited recovery in dwelling investment is now entrenched. Having been delayed due to weak housing market sentiment and excessive caution by investors, the expectation of low interest rates for an extended period combined with a substantial deficiency of residential stock is driving a solid increase in dwellings construction. This will build momentum from here. But this recovery will not be uniform between regions, with sizeable stock deficiencies set to drive the markets in parts of Queensland and New South Wales in particular. Private non-dwelling building should also post, albeit moderate, growth over the next few years with major projects in retail, warehouses and accommodation sectors offset by declines after the current boom in hospital building.

The key to the broadening of growth will be the recovery in non-mining business investment. However, that is still 18 months to two years away. Ever since the GFC hit, most non-mining business enterprises have been facing weak demand, weak profits and weak confidence. Even the stronger ones have been cutting costs, preserving cash and deferring investment. It will be tightening capacity and improved confidence that drives a recovery in non-mining business investment.

The other major change will be a structural change back towards the trade-exposed industries as and when the Australian dollar falls. While in some cases the loss of industry will be irreversible, the lower dollar will improve the competitiveness of agriculture, trade-exposed manufacturing, mining, tourism, education, finance and business services.

While growth will look good, boosted by minerals production, the labour market will remain weak in the near-term. Loss of jobs associated with mining investment will keep employment growth subdued. Hence we expect interest rates to remain at current low levels over 2014/15.

Our forecast is for growth of 2.5 per cent in 2014/15. It's only when non-mining business investment and structural change chime in that we'll see an acceleration taking us close to potential. And, as growth broadens beyond mining, employment will pick up underwriting a strong final third of this decade. Only then will the Reserve Bank raise rates to dampen demand.

The upshot is that we are a long way from stable, balanced growth or what feels like a healthy economy. The mining boom brought with it a negative structural shift in the non-mining-related part of the economy. And that will reverse. Certainly, continuation of strong cycles in investment will continue to drive cyclical shifts in the economy. But most importantly, a lower dollar will allow Australia to build its industrial and services base with a resumption of non-mining investment underwriting a stronger economy in the medium-term.

2.2 Detailed Assumptions and Forecasts

Global Economy

The United States economy expanded for the fourth year in succession, with mild growth of 1.9 per cent. The Euro area contracted again in 2013, down 0.4 per cent (although posting growth over the final quarters of the year), while China's rapid growth of recent years continued to ease, reaching 7.7 per cent. These themes are expected to continue over the next few years.

Quantitative easing is the key global variable over the next few years…

A year ago, we noted that the unwinding of QE ran the risk of igniting sovereign and bank credit crises, and causing dangerous swings in capital flows and exchange rates, particularly for developing countries. Since then, the unwinding of QE in the United States has been clearly signalled and implemented by the Federal Reserve, and the stable tapering has minimised the impact on markets.

On the other hand, Japan's quantitative easing program has ramped up over the past year, and is beginning to show the desired effects. The $1.4 trillion stimulus saw inflation reach 1.6 per cent in early 2014 – the highest level in five years – although this has since eased to 1.3 per cent as the raising of the sales tax has hindered expenditure somewhat. The remaining year of further stimulus will be vital in ensuring inflation continues to rise to the Bank of Japan's desired target of 2 per cent, and avoid the prospect of a return to deflation.

The conclusion of Japan's bond purchasing program in early to mid 2015 is likely to coincide with the beginning of interest rate increases in the United States. This next stage in the recovery process of unwinding QE will be the key source of risk and uncertainty in the global economy. Despite the considerable risks around the potential timing of changes in QE policy, we continue to believe that QE will be unwound in a cautious and systematic fashion with moderate, yet navigable, global hiccups along the way.

…although the outlook differs markedly across countries.

The world's largest economy, the United States, continues its recovery. Growth over the past year or two has been driven by the private sector, with residential construction and consumer expenditure remaining solid, despite tapering Government stimulus, and across the board budget cuts. Steady growth is expected to continue on the private side, driven by low interest rates, internationally cheap energy due to the shale gas boom, and ongoing employment growth.

China posted growth of 7.7 per cent for the second year in a row in 2013. Although down from the double-digit growth rates experienced through to 2000's, this represents by far the strongest result of the major economies. This rapid growth is forecast to continue to ease over coming years, dipping to below 7 per cent by 2017. Although this sounds like a significant slowdown, it is

worth bearing in mind that the Chinese economy is already twice the size that it was as recently as 2006. As a result, although the percentage growth rates are lower, the actual value added to the economy each year continues to rise. The key implication of this is that China is forecast to become the world's largest economy by 2018, and continue to rise in importance to Australia.

As expected, Euro zone output fell again in 2013. However, growth actually began to increase over the final quarters of the year, moving the area out of recession. But the outlook remains weak, shackled by austerity measures, slow to evolve structural improvements, and competitive disparities in the currency union. BIS Shrapnel believes that if Europe is to escape low growth, austerity must be relaxed in aggregate. Even so, Europe's long term problems will remain unsolved: rigid labour markets and a monetary union without fiscal union that has highlighted the wide competitive imbalances between the less competitive periphery and the more competitive nations to the north-west. Regardless whether or not these structural challenges are addressed – the road will be treacherous. Therefore, over the next five years, we expect the euro area to experience low growth, dragging on world growth and confidence.

Emerging market economies, particularly China and India, are expected to continue to outperform their advanced economy counterparts. Emerging economies are forecast to sustain relatively strong growth rates and represent a larger share of global GDP. Over the next five years, we expect Chinese growth to gently moderate to a "new normal" in comparison to the past five-year period, but otherwise continue to remain strong over the medium to long-term. Meanwhile, India's outlook is strong over the medium and long-term, but yet remains a country of unrealised economic potential. Overall, emerging economies will assume the leadership mantle in driving world growth over the medium to long term, resulting in a substantial increase in share of world GDP.

Overall, due to the more positive growth prospects of our key Asian trading partners and positive momentum outlook in the United States, Australia is well insulated from a low growth Europe. Global economic growth is expected to strengthen over the next three years as headwinds to growth such as fiscal consolidation and household deleveraging dissipate. This will support Australia's exports, commodity prices and terms of trade.

The Australian Dollar

The value of the Australian dollar is generally driven by two key factors:

- **Commodity prices**. As mineral and agricultural commodities make up over 70 per cent of Australia's exports, they have a direct impact on the demand for the Australian dollar through exporters converting foreign currency returns. In addition, high commodity prices have encouraged record mineral investment in recent years, which is boosting Australian growth above the rest of the developed world, further lifting the currency.
- **Interest rate differentials.** A larger interest rate differential with the rest of the world, particularly the US, will boost the value of the Australian dollar. This is due to the 'carry trade' market, where participants borrow money in low interest rate currencies and invest elsewhere at higher interest rates, such as in Australia.

The record strength of the Australian dollar over the three years to 2012/13 is unlikely to be seen again over the forecast period. The Australian dollar has shed around 15 per cent since April 2013, when it was last at parity with the US dollar, to sit at around $US0.88 at the time of writing. We believe the dollar will average around $US0.89 over the next two years.

We now believe the dollar will not regain parity with the US dollar. In other words, we expect the dollar will now trend around a level supported by its fundamentals, rather than being overvalued due to excessive investor confidence, as prevailed over the three years to April 2013.

Now that investor weight of money is largely removed as a driver of the currency's value, the largest risk facing the dollar is the growth outlook in the Asia region, particularly China. Because the currency is so sensitive to commodity price fluctuations, a significant shift in minerals demand (through Chinese growth accelerating or slowing more than expected) will have a direct effect on the value of the dollar. In short, bad news on the Chinese economy usually pushes the A$ down (and vice versa), while bad news on the US economy usually pushed the A$ up, because investors view that as a negative for US interest rates.

Further price declines in commodities such as coal and iron ore, will contribute to further declines in the exchange rate, however this will be offset to some degree by price rises in non-ferrous metals and agricultural prices until 2016/17. Additionally, we expect US interest rates to begin to rise through calendar year 2015. As overseas economies recover, their interest rates will also rise faster in comparison to Australian rates, putting further downward pressure on the Australian dollar. Overall, we anticipate the Australian dollar will slowly ease over the next three years, to around US$0.83 in 2016/17.

During 2017/18, we are forecasting a larger fall in the dollar, to around US$0.77. This will be driven by further declines in key commodity prices, as world economic growth rates slow. Although mineral demand is likely to remain elevated due to solid growth in the Asia region, in particular China, growth in world supply is expected to outstrip this demand. Consequently, this will apply downward pressure on commodity prices, and hence the currency. Additionally, forecast RBA interest rate cuts will contribute to a larger interest rate differential favouring the rest of the world for higher returns, especially the United States.

There remains a high probability of the currency 'overshooting' on the way down below prevailing trade and interest rate fundamentals over the short-to-medium term, particularly if the currency drops quickly and gathers strong downward momentum. However, should it overshoot, the currency is expected to gradually return toward its fundamental value, on which our forecasts are based. Eventually, the dollar will attain around US$0.80 during 2018/19, before rising further to US$0.89 in 2019/20, supported by further growth in commodity prices, as well as a return to relatively high interest rates in Australia compared to overseas.

Table 2.2: Construction Work Done
2011/12 Prices, Annual Percentage Change

							Forecast						Average
Category and Sector	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2016-2020
Building: private	0.2	-5.4	1.6	-0.7	2.8	5.0	9.2	2.1	-2.3	-6.7	1.2	8.4	1.3
-Dwelling([1])	-0.4	0.5	2.5	-3.7	3.0	5.3	9.4	2.6	-2.2	-6.2	1.6	8.1	1.6
-Non-Dwelling Buildings	1.2	-15.6	-0.4	5.6	2.3	4.2	8.8	0.9	-2.6	-7.7	0.3	9.2	0.6
Building: public	10.1	104.7	7.2	-29.0	-19.3	6.2	-10.9	-8.0	-3.6	3.6	5.5	3.5	-2.8
-Dwelling([1])	-7.2	167.0	32.0	-53.1	-41.2	3.3	-12.5	-6.5	2.0	8.6	9.6	-7.4	-1.3
-Non-Dwelling	12.7	97.1	3.1	-23.9	-16.4	6.4	-10.8	-8.1	-4.1	3.1	5.0	4.6	-2.9
Engineering Construction: private	18.4	-1.6	19.2	54.4	10.5	0.1	-11.3	-9.4	-10.1	-7.9	8.1	6.8	-7.8
-Mining and Heavy Industry	27.0	4.4	18.5	70.6	8.8	7.8	-13.5	-16.0	-11.8	-13.2	14.6	4.5	-9.7
Engineering Construction: public	20.3	8.3	1.3	2.4	-2.5	-12.4	-5.3	10.8	17.3	7.4	0.1	-7.3	3.0
-Road Construction	30.0	-5.7	12.9	13.6	-1.0	-13.6	-5.7	19.7	16.1	7.5	-6.7	-8.5	4.0
Total Construction	9.2	4.0	7.1	14.6	3.9	0.2	-3.2	-2.1	-2.5	-4.2	3.6	4.6	-2.4

1. Total dwellings ie includes new dwellings and Alterations and Additions > $10,000.

Source: BIS Shrapnel, ABS Data

Australian Economic Outlook

Having gone through a structural change with the mining boom shifting activity and labour towards servicing high levels of mining investment, that investment has now peaked and will enter a period of sustained, albeit orderly, decline. That means dismantling the capacity to service high levels of resources investment and redeploying resources to the non-mining sectors. It means a structural shift back towards balanced growth.

The driving force of the structural change — away from domestic trade-exposed industries towards the mining-related sectors — was the currency. The high dollar impacted on competitiveness creating enormous pressure on other trade-exposed industries including agriculture, manufacturing, tourism, education, finance and business services. As a result, investment outside the mining sector has been bumping around the bottom of the cycle since the post-GFC collapse. The next stage is for a recovery in non-mining spending, especially non-mining business investment. However, the Australian dollar is still too high from a competitiveness point of view. This, combined with low capacity utilisation suggest that a generalised pick up in non-mining business investment is still 12 to 18 months away. As a result, the Australian economy sits in a soft patch and is likely to remain weak for another 12 months at least. But there is little chance of a collapse with growth to be underwritten by resources exports due to increased production capacity, a legacy of the recent mining investment boom.

Meanwhile, there are cyclical forces at play.

- Residential investment is usually the first sector to recover after a downturn, and it has finally picked up strongly.
- Government investment has been falling, and continues to fall, as governments focus on budgets. We expect another year or so of declining activity before the next round of projects boosts activity.
- The next stage is a more solid recovery in growth and employment underwritten by recovery in non-mining business investment. However, given still low capacity utilisation, this appears to be 12 to 18 months away.

That means that the Australian economy will remain soft, and employment growth softer, until the structural shift and cyclical upswings underwrite stronger growth in the second half of the decade. The next 12 to 18 months will be characterised by:

- Continued tight business conditions - cutting costs and deferring investment.
- Tight government expenditure
- Further rises in unemployment
- Subdued wage pressures and further labour productivity increases, offsetting the inflationary impact of falls in the dollar
- A sustained period of low interest rates until growth picks up.

We expect the economy to build momentum from late 2015 with growth returning to trend over 2015/16 and 2016/17. Growth could ease in 2017/18 as interest rates rise, but quickly return to trend reflecting more broadly based balanced growth in the final third of the decade.

The difficult period is now – waiting for a lower dollar and structural change to come through and waiting for non-mining business investment to recover.

Consumer expenditure to grow in line with incomes

Household consumption expenditure growth slowed sharply in the immediate aftermath of the global financial crisis as people cut spending and sharply increased savings. That came after the spending binge of the previous decade when the banks turned mortgages into lines of credit allowing households to borrow against the value of their home to boost current expenditure. And they did, sharply reducing savings ratios. Increased concern about high household debt was brought to a head by the GFC and concerns about job security. The decline in household consumption expenditure growth was more marked than the decline in real household disposable income with the household saving rate rising to its highest level since the 1980s.

Over the past three years, households have stayed cautious, keeping savings high and only very slightly loosening the purse strings. Through this period growth in consumption expenditure has been in line with growth in household disposable income.

We expect that to continue over the next few years. Households have built up a considerable savings buffer after several years of high savings ratios. While household income growth is now softening, improved financial security will see expenditure continue to pick up. With the Australian dollar now lower, the ongoing growth in household consumption expenditure is expected to translate into increased retail turnover and activity in Australia over the next few years.

We expect interest rates to remain around current relatively low levels until strength in the broader economy causes the Reserve Bank to begin to increase interest rates from the second half of calendar year 2015 and through 2016 back towards neutral levels. This would dampen consumer spending from 2016/17. Overall, household consumption expenditure is forecast to average growth of 2.9 per cent per annum over the five years to 2018/19.

Over the longer term, population growth is expected to be the primary driver of household expenditure. As such, slowing population growth will see household consumption expenditure growth moderate slightly over the following decade, averaging 2.8 per cent per annum between 2019 and 2029. Although the economy is expected to remain healthy through this period, we do not expect a return to the debt-driven increases in consumption that occurred through the late 1990's and early 2000's when growth rates often approached and exceeded 5 per cent.

Offsetting cycles will keep investment subdued

Private investment will be characterised by offsetting cycles. The mining investment boom which underwrote the strength in Australia's GDP growth last decade peaked last year and will detract from investment growth over the next four years. We estimate that mining and heavy industry construction will decline by 41 per cent over the next four years. It is important to note that we expect an orderly decline, rather than activity falling off the cliff. Projects already under construction, and their outstanding activity, will place a floor under the level of work, ensuring investment remains around historically strong levels.

On the bright side, the long-awaited recovery in dwellings investment is now entrenched. This upswing has been delayed due to weak housing market sentiment and excessive caution by investors. However, with the expectation of low interest rates for an extended period, and a growing deficiency of stock, a solid increase in dwellings building is now well under way and will build momentum from here. But this recovery will not be uniform between regions, with sizeable stock deficiencies set to drive the markets in parts of Queensland and New South Wales in particular.

Private non-dwelling building is also likely to experience solid growth over the next few years, although the outlook varies across states. Strong growth in retail building in line with improving economic conditions will see this sector momentarily usurp offices as the largest sector. Activity

will also be supported by significant projects in the accommodation, warehouses, and aged care sub-sectors. The longer term outlook is positive, as improving demand across non-mining industries will see capacity constraints emerge and prompt the next round of investment in commercial and industrial buildings.

The maturing of the mining investment boom will see further declines in private plant and equipment investment in the near-term. However, the downturn will be softened somewhat as service industries equipment investment picks up from the bottom of the cycle. Broad-based growth in equipment investment will return when capacity constraints emerge as demand picks up. That we think is another 18 months to 2 years away. The net result is a soft period for total private investment over the next five years.

Government spending affected by fiscal consolidation

The completion of the last of the post GFC stimulus in particular health projects and belt tightening to control budget deficits and debt will be a drag on investment in the short-term. However, we expect a recovery in the second half of the decade. This will be underwritten by the next round of infrastructure projects as governments at all levels embrace the process of 'asset recycling' where mature assets are taken off the balance sheet to finance new ones.

State Government finances in Queensland and Western Australia in particular will be boosted by increased royalties as the large mining projects come on stream, but the other states will remain dependent on the Commonwealth Government, and may not fare so well.

Strong external demand will underwrite Australia's GDP growth

The outlook for Australia's exports, in particular resources exports, is largely dependent on the prospects of the Chinese economy as China alone accounts for a nearly a third of Australia's merchandise exports.

China's economic growth is expected to remain solid, supported by near-term targeted stimulus measures and ongoing medium-term economic reforms aimed at reorienting growth toward domestic consumption and away from investment and exports. Overall, we expect economic growth in China to remain between 7 and 7½ per cent over the next three years.

The level of infrastructure in China however remains well below that in developed countries. This suggests that infrastructure investment encompassing municipal infrastructure, utilities, transportation and social infrastructure such as schools and hospitals is likely to remain strong well into the next decade and possibly beyond. As infrastructure investment is intensive in its use of steel which in turn requires iron ore and coking coal as inputs, the prospects of Australia's bulk commodity exports remains bright.

Meanwhile, the expected improvement in world economic growth rates over the next two years coupled with the lower exchange rate, will facilitate a recovery in export volumes of non-commodity manufactures. Even though the Australian dollar has fallen over 10 per cent from above parity since April 2013, improvements in manufacturing exports will still depend on future world economic conditions. We expect manufacturing year average export growth rates to reach 2.8 per cent in 2014/15, picking up even further in 2015/16. This recovery will gain more speed over the medium term as world economies return to trend economic growth rates, and the dollar falls toward (and below) US$0.80.

Overall, total exports of goods and services are forecast to increase at a robust annual compound growth rate of 5.7 per cent over the next five years, compared to 4.6 per cent growth over the past five years.

Labour shortages to re-emerge in the second half of 2016

The labour supply will be critical for medium-term economic growth potential, given relatively low unemployment rates (ie there is not a large pool of spare labour currently available). We expect the labour force to grow at slightly below total population growth over the next 15 years — labour supply is currently roughly in line with population growth. This is in contrast to previous decades where the baby boomers, immigration and increased participation rate provided a significant boost to the working age population. In the long term, growth in labour supply is expected to contract as the 65 years and over category grows strongly and total population growth slows.

Employment growth has been subdued since mid 2011 reflecting a weakening in employers' demand for labour due to a prevailing orthodoxy of cost cutting including labour costs. More recently, the slowdown in mining investment — and the transition to less labour-intensive production phase of the mining boom — have weighed on the demand for labour in mining and mining-related sectors such as employment services firms, engineering & technical services firms and vehicle and equipment leasing providers.

The (subdued) pace of employment growth of 1.1 per cent over the past three years has not kept pace with the growth in the labour force (the number of people working or available and actually looking for work) — which has been around 1.5 per cent annually. This has resulted in the unemployment rate rising from 5.0 per cent in May 2011 to 6.1 per cent in August 2014.

Employment growth will remain weak over the next 12 months as trade-exposed businesses continue to focus on cost-cutting to deal with problems of competitiveness associated with the high Australian dollar. Other businesses' demand for labour will also be weak due to slower growth in output. With the labour force expected to continue to outpace employment growth, the unemployment rate is forecast to remain above 6 per cent until mid 2015.

However, employment growth should pick up from the second half of 2015 and average over 2 per cent over calendar year 2016. This will see the unemployment rate drop to 5.3 per cent by the end of 2016, before again rising to a peak of 5.8 per cent by early 2018 when the economy slows.

Overall, we expect employment growth to average 1.4 per cent per annum over the next five years. However, the labour force will grow more slowly with lower immigration and an aging population restricting labour supply and constraining employment and GDP growth.

In the medium to longer term, continued solid employment growth should see the unemployment rate cycle between 4.5 and 5.5 per cent, with any further decrease in the unemployment rate moderated by increases in migration and/or higher interest rates. An unemployment rate much below 5 per cent - which is thought to be the non-accelerating inflation rate of unemployment (NAIRU) - would cause a rise in wage inflation, as employers bid up wages for scarce skilled labour in a tightening labour market.

Main risks to outlook

There is a risk that we could have a bigger collapse in mining investment. Our assumption is for an orderly decline in resources investment but a drastic deterioration in the prospects of mining projects could trigger a bigger fall in mining investment and a recession in Australia. However, we see this as a low probability (tail) event as the Federal Government has scope to loosen fiscal policy to support growth in Australia if needed.

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 low even longer than our current forecast to support economic recovery.

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 occurred during the 1980s and 1990s.

2.2.1 Medium Term Issues

The Australian economy is subject to strong internally generated cyclical swings. In addition, Australia's market economy orientation and non-interventionist policy means that the economy has to adjust to short-term external forces beyond our control with little regard to the longer term consequences. The commodities demand and price boom with the associated rise in the Australian dollar driving structural change is a case in point. The financial engineering boom followed by the GFC-induced correction was another.

A decade ago, the Australian economy was just recovering from the overinvestment of the 1980s debt-driven investment boom and the subsequent financial crisis and recession. It took a long time to absorb the excess capacity created during the boom. But capacity constraints eventually drove a recovery in business investment early last decade, spreading through to balanced growth in the economy by mid-decade.

The minerals boom, and the consequent minerals investment boom, left everything else in abeyance. Since that time, underwritten by the strong rise in the Australian dollar, we have built up our capability to service much higher levels of minerals investment at the expense of trade-exposed activity, focused in regions servicing those major projects. The boost to activity from strong mining investment, albeit just starting to decline, has been the primary driver of growth in the economy and masked the weakness of other sectors. That was aided by the boost from the Government's GFC (global financial crisis) stimulus package, now still being wound back and lower interest rates.

We went through a process of structural change, shifting labour and operational resources towards mining investment and away from non-mining, and particularly non-mining trade-exposed export and import-competing, industries. This has resulted in a corresponding shift between regions. Those regions servicing mining investment, and the capital cities where much of that took place, prospered largely at the expense of non-mining-related activities and regions.

Many workers involved in those projects work on a fly-in/fly out rotation, boosting associated residential, hospitality, retail and transportation services. The cities servicing those projects have boosted their capacity to undertake design, construction, project management, legal, financial, accounting and other services, requiring increased facilities such as office space to house that activity and flowing on to stimulate the broader economy.

The main transmission mechanism for the shift of resources towards minerals investment was the rise in the Australian dollar. The resultant reduction in international competitiveness underwrote the process of structural change mentioned above, with the hollowing out of trade-exposed industries 'making room for the minerals boom.' Hence the continued loss of industry, regular announcements of job losses and shifting of activities offshore. These businesses are

under enormous competitive pressure. Typically, in what has become an increasingly global economy, the decision whether to remain operating in Australia is made when the next major investment or retooling decision has to be made. Hence the protracted adjustment period.

That structural change process is ongoing as the impact of the still too high Australian dollar continues to work its way through the system.

Nor has the weakness only been felt in the non-mining trade-exposed sectors. Much of the rest of the economy, sheltered from the impact of the high dollar, is still suffering from the consequences of the GFC. Weak confidence, revenue and profits continue to impact on business psychology. Further, cost-cutting and cash preservation is deferring and delaying investment. The weakness of non-mining business investment, coupled with long lead times between investment and capacity coming on stream, is setting up Australian industry for a period of tight capacity through the middle of the decade, leading to a surge in investment. But not yet. There is still sufficient capacity to cater for another 18 months to two years of growth, with weak confidence delaying the next round of investment. Hence the current weakness of the non-mining economy.

The 'new normal' of weak demand and profits driving cost-cutting 'productivity initiatives' is a child of the long period of weakness of non-mining-related industries since the GFC. This psychology is self-fulfilling, perpetuating the weakness of confidence, demand and profits. But it also contains the seeds of the next upswing. Eventually, inadequate investment will lead to capacity constraints, underwriting the next phase of investment. Indeed, investment delayed will require a catch-up to increase capacity to levels required to service demand, later adopting new labour-saving technologies to improve efficiency and allow companies to service market shifts. As the cycle moves into the investment phase, the psychology of business will shift from survival to growth mode.

Rolling investment cycles will continue to dominate as drivers of Australia's economic growth

The boost to government investment associated with the stimulus package is still being wound back aggressively.

The extraordinary stimulus to GDP from minerals investment growth is over. That contribution will turn negative from now on as minerals investment recedes from peak levels. Even so, minerals investment remains extraordinarily high, at a level adding substantially to our capacity to produce and export. That is both a strength and a weakness, the risk being that a substantial decline will have a major negative impact on demand and activity. Meanwhile, growth in resources production and exports is sustaining GDP growth, but with a lesser effect on employment.

And now a phase of residential investment has begun, with activity strengthening through the middle of the decade.

After that, the main driver of growth will be non-mining business investment. We do not think it will pick up pace for another year or two. However, once it picks up momentum, it will constitute a long and strong upswing. Some sectors, notably commercial property, look like peaking in some cities around the end of this decade, though others will turn down earlier. The delay to the commencement of this investment is setting the preconditions for a strong cyclical upswing.

We are a long way from stable, balanced growth. It looks as though the continuation of strong cycles in investment will continue to drive cyclical shifts in the economy.

The next structural shift

In any case, the next structural shift will come as the dollar falls further. That will again be a painful process involving substantial change at the industry and regional levels, with declining minerals investment offset by strong growth in minerals production and a recovery in other parts of the economy. Most likely, the dollar will fall when commodity prices fall. The extent of structural change will depend on the extent to which the dollar falls. That will offset part of the negative impact of the fall in mining investment and partially reverse the structural change we have been going through, with an improvement in the competitiveness of industries currently hit by the high dollar. It means a boost to manufacturing, agriculture, tourism, education, finance and business services. But we are unlikely to go back to where we started. The question is the extent to which industry lost in the current episode is irreversible. Manufacturing may never recover lost ground — unless new highly capital intensive technologies change the game. Services are likely to be the major beneficiaries.

2.3 The Victorian Economy: Past Growth, Current Conditions and Short-to-Medium Term Outlook

Victoria has lagged behind the national economy over the past three years…

The Victorian economy has hit a soft patch over the past three years. Housing construction has fallen heavily from its 2010 peak, while non-residential building has also suffered as stimulus projects in the education and health sectors reach completion. Government investment has been making a negative contribution to growth, resulting from budget cuts aimed at reducing the size of Government debt. Meanwhile, the persistently high Australian dollar over the past few years has dampened growth in some of Victoria's key trade-exposed industries, namely agriculture, manufacturing, finance and business services, international student education, and tourism.

A weak construction sector has seen total activity fall over 2012/13 and 2013/14. Employment growth has lagged behind the national average and, combined with weak consumer sentiment, has caused State Final Demand (SFD) to record 0.2 per cent growth in 2012/13 – below even the GFC-affected result of 0.8 per cent growth in 2008/09. The net result is that Victorian Gross State Product (GSP) has averaged growth of an estimated 2.2 per cent over the three years to 2013/14, which is well below the average of 3.1 per cent experienced nationwide.

Despite the Australian dollar depreciating by more than 10 per cent since April 2013, it is not yet weak enough to significantly boost the competitiveness of the Victoria's trade-exposed sectors. The manufacturing industry, a key employer in the state, has arguably suffered the most from the persistently strong dollar. The announcements that Holden, Ford and Toyota will withdraw manufacturing from Australia will have a significant and ongoing negative impact on the entire industry. Many parts manufacturers and firms that service the car manufacturing industry will also be forced to exit. The high dollar is not only taking its toll on the state's manufacturing industry, but also on other key industries, such as agriculture, retail trade, and accommodation and food services.

...and will remain below average over the near and medium term

With businesses still feeling the pressure, we expect the weakness in the labour market to continue, with employment forecast to grow by just 1.2 per cent in 2014/15, and reach a peak of 1.7 per cent in 2015/16. By way of contrast, Australian employment growth is expected to accelerate over the next three years to a peak of 2.0 per cent in 2016/17. This relatively weak employment outlook for Victoria will in turn weigh down on household income and consumer confidence. However, the current record-low interest rates will provide some support, and result in Private Consumption Expenditure (PCE) rising to a respectable 3.3 per cent by 2015/16, although this is still (slightly) below the national average.

After several years of weakness, the construction sector is expected to provide a more positive outlook over the near term, with residential and non-residential building driving overall activity in 2014/15, before engineering construction takes over from 2015/16.

Dwelling building will rise to record levels in 2014/15, underpinned by the investor and upgrader/downsizer segments of the market, as first home buyers drop out of the market as they adjust to new policy measures. Non-residential building rose by 6.8 per cent in 2013/14, boosted by commercial and industrial projects such as offices, retail and warehouses, while the health sector was also a key driver of growth, with the commencement of the $600 million Bendigo Hospital. Similar growth is expected over 2014/15, as gradually improving business confidence supports continued growth in commercial and industrial building, including the accommodation and retail sectors. Although social and institutional work, which is primarily publicly funded, is expected to decline – mostly due to the resumption of declines in the key education sector – the strength of the commercial and industrial sectors will ensure that total non-residential activity rises in 2014/15.

However, both residential and non-residential building are expected to decline in 2015/16. Residential construction will continue to be held back by the absence of first home buyers. Because the policy changes affecting this market segment (removal of assistance grants for established housing) occurred later than in New South Wales or Queensland, the subsequent adjustment will limit demand over this period. Non-residential building will also fall as the current round of health projects approach completion, and education continues its trend decline away from stimulus-induced peak levels.

However, the weakness across dwelling and non-dwelling construction will be more than offset by a boom in engineering construction from 2015/16. Engineering work done is expected to leap 15 per cent, almost entirely due to the ramping up of work on the $8 billion East-West Link road project. This is expected to see total construction continue to rise in 2015/16, to a record $37 billion.

Overall, the construction outlook beyond 2015/16 is weak. Although engineering construction will continue to rise, heavy declines across the residential and non-residential building will see total construction register flat or negative growth over the following three years to 2018/19. Following an extended run of strong growth in residential building, we believe a surplus of housing will emerge. From mid-decade, we expect residential building to enter a steep, sustained decline, with other dwellings expected to be hardest hit as the market adjusts to the influx of apartments over recent years. The outlook for non-residential building is mixed by sector, although the key driver of declines will continue to be the health and education segments, while retail buildings will eventually pay the price for their near-term strength.

Because the construction industry has significant spill-overs into other industries, the wider economy, specifically the industries that support building activity, will suffer through this period.

As the national economy heats up, and the Reserve Bank raises the cash rate from the end of 2015 and through 2016, Victoria will also experience tightening household expenditure. Coupled with the soft construction outlook, Victoria's growth will likely deteriorate again over 2016/17 and 2017/18. Overall, Victorian GSP growth is expected to slip from a peak of 3.0 per cent in 2015/16, to a low of just 1.8 per cent by 2017/18.

However, we anticipate a period of respite over the two years to 2019/20, with GSP growth in Victoria exceeding the national average. Construction will be a key driver. During the earlier period of weak dwelling construction, ongoing population growth and underlying demand will eventually erode the surplus housing stock, and allow residential building to return to growth. In addition, a degree of pent-up demand from households after an extended period of weakness will see SFD and GSP reach the strongest levels in over 15 years by 2019/20.

Overall, we expect the Victorian economy to grow at around 2.3 per cent through 2014/15, before improving to an average of 2.9 per cent per annum over the five years to 2019/20. The Victorian economy will benefit from a depreciating dollar over the next few years, although it may still be insufficient to prevent further losses in the manufacturing industry. Victoria also benefits from its position as a key net interstate exporter of goods and services to other states, and will be supported by nationwide growth averaging 3.4 per cent per annum over the forecast period.

Table 2.3: Victoria – Key Economic Indicators, Financial Years

	Actuals						Forecasts					
Year Ended June	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Victoria												
Total Construction Activity[(a)]	7.6	8.3	7.0	1.3	-2.7	-1.9	3.5	2.8	-1.5	-2.5	0.1	5.0
State Final Demand	0.8	3.5	3.7	2.6	0.2	1.6	2.5	3.4	2.6	1.5	3.3	4.9
Gross State Product (GSP) (b)	**1.1**	**1.6**	**2.2**	**2.8**	**1.6**	**2.4**	**2.3**	**3.0**	**2.4**	**1.8**	**3.4**	**4.0**
Employment Growth	1.0	2.4	2.9	0.7	0.8	0.9	1.2	1.7	1.6	0.4	1.3	2.5
Australia												
Total Construction Activity[(a)]	9.2	4.0	7.1	14.6	3.9	0.2	-3.2	-2.1	-2.5	-4.2	3.6	4.6
Australian Domestic Demand	0.6	2.2	4.2	5.0	1.8	0.8	1.8	3.1	2.7	1.4	3.7	4.6
Gross Domestic Product (GDP)	1.7	2.0	2.2	3.6	2.6	2.9	2.5	3.4	3.5	2.9	3.4	3.9
Employment Growth	1.7	0.9	2.4	1.2	1.2	0.8	1.1	1.9	2.0	0.8	1.3	2.4

Source: BIS Shrapnel and ABS

(a) 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.

(b) 2014 is an estimate

3. INFLATION AND WAGES

3.1 Outlook for Australian Inflation

Despite the 15 per cent depreciation of the Australian dollar since April last year, CPI inflation has generally been contained. While tradeables prices lifted in response to the exchange rate and higher import prices, the pass-through to final consumer prices was smaller and slow, consistent with historical relationship. The fall in the exchange rate added about 0.3 per cent to underlying inflation over the past year. While the second and third year effects are yet to flow through, we think inflation will remain within (albeit in the top half) of the Reserve Bank's 2 to 3 per cent target range over the next five years.

Meanwhile, wage pressures have moderated significantly due to weakness in the labour market. This, in turn, has stalled growth in real wages. We expect a slow build in wage pressures to keep a lid on non-tradeables inflation, particularly price increases in the labour intensive household services sectors (excluding child care).

Headline CPI inflation lifted to 3.0 per cent through-the-year to the June quarter 2014, which we expect will be a short term peak, before easing over the next year. Meanwhile, both the Reserve Bank's measure of underlying inflation and 'baseline' inflation (the latter excludes the volatile items of fuel and fruit and vegetable price movements and estimated carbon impacts) rose 2.8 per cent through-the-year to June.

Over 2013/14, **tradeables inflation** (which accounts for around 40% of the CPI basket) increased 2.9 per cent (through-the-year to June). This followed declines in the previous two years. The 8 to 9 per cent increase in imported consumer goods was a key driver of the tradeables inflation outcome, with sharp rises in automotive fuel and fruit and vegetables also contributing.

Our modelling suggests that a 10 per cent rise in import prices (due to depreciation in the currency) would add 0.31 percentage points to underlying inflation over the first year, 0.48 per cent over the second year and 0.36 per cent over the third year before washing out in the fourth year. Overall, a 10 per cent increase in import prices, on average, will lift the underlying inflation rate by just over one percentage point over a period of three years.

Partially offsetting the rise in tradeables inflation was an easing of non-tradeables inflation to 3.1 per cent through-the-year to June 2014, down from 4.3 per cent through-the-year to June 2013. The 2012/13 non-tradeables result was boosted by the imposition of the carbon tax in July 2012, which added an estimated 0.7 per cent to total headline CPI inflation in 2012/13.

Non-tradeables inflation, which largely reflects domestic services inflation (and includes some non-traded goods such as milk, bread, beer and pet food), is influenced by domestic unit labour costs – basically wages less productivity. Non-tradeable inflation has also been pushed higher over recent years by a number of sub-groups where prices growth has generally been well above average CPI inflation due to constrained supply/inelastic demand (such as rents, health services, education, child care) or by regulated price increases (including utilities, property rates and urban transport fares). While lower wages growth, rising productivity and tight cost control by businesses – plus weaker consumer demand – has helped alleviate inflationary pressures, the easing in rents and utilities increases have also contributed to lower non-tradeables inflation over the past year. These two sub-groups, which collectively account for around 13% of the CPI, have been significant contributors to CPI inflation over the last eight years.

Table 3.1: Wages and Prices – Australia
Year Average Growth

Year Ended December	Average Weekly Ordinary Time Earnings[1] $/week	%CH	Wage Price Index All Industries 2012=100	%CH	CPI Headline Inflation (BIS Shrapnel forecasts) 2012=100	%CH	Official Headline CPI [2] 2012=100	%CH
2000	785.9		64.6		70.7		70.7	
2001	825.1	5.0	66.9	3.6	73.9	4.4	73.9	4.4
2002	867.1	5.1	69.0	3.2	76.1	3.0	76.1	3.0
2003	913.7	5.4	71.6	3.7	78.1	2.7	78.1	2.7
2004	948.5	3.8	74.1	3.6	80.0	2.3	80.0	2.3
2005	998.9	5.3	77.1	4.0	82.1	2.7	82.1	2.7
2006	1 032.6	3.4	80.1	3.9	85.1	3.6	85.1	3.6
2007	1 081.8	4.8	83.4	4.1	87.0	2.3	87.0	2.3
2008	1 133.8	4.8	86.9	4.2	90.8	4.4	90.8	4.4
2009	1 198.6	5.7	90.0	3.6	92.4	1.8	92.4	1.8
2010	1 257.0	4.9	93.0	3.4	95.1	2.9	95.1	2.9
2011	1 312.8	4.4	96.5	3.7	98.3	3.3	98.3	3.3
2012	1 366.8	4.1	100.0	3.6	100.0	1.8	100.0	1.8
2013	1 424.6	4.2	102.9	2.9	102.4	2.4	102.4	2.4
Forecasts								
2014	1 464.2	2.8	105.6	2.7	105.3	2.8	104.5	2.0
2015	1 522.0	3.9	109.0	3.2	108.1	2.6	107.6	3.0
2016	1 590.8	4.5	113.0	3.7	111.4	3.0	110.6	2.8
2017	1 668.9	4.9	117.5	4.0	115.0	3.3	113.4	2.5
2018	1 746.4	4.6	121.8	3.7	118.2	2.8	116.2	2.5
2019	1 828.7	4.7	126.6	3.9	121.3	2.6	119.1	2.5
2020	1 920.0	5.0	131.7	4.0	124.8	2.9	122.1	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	
2008-2013	4.7		3.4		2.4		2.4	
2013-2020	4.4		3.6		2.9		2.5	
2015-2020	4.8		3.9		2.9		2.5	

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 December 2016 quarter and then Commonwealth Treasury medium term projections.

(3) e.g. CAGR (Compound Annual Growth Rates) for 2015-2020 is CAGR for 2015/16 to 2019/20 inclusive (ie next regulatory period).

3.1.1 Medium-term Outlook for Inflation

While the underlying rate of inflation is forecast to remain in a 2.5 to 3.0 per cent band over the next five years, the overall outlook for inflation will be subject to a number of competing influences:

- Soft consumer demand, modest employment growth and only a slow decline in the unemployment rate (following a rise in 2014/15) will keep demand inflationary pressures muted and provide little scope for retailers and service providers to expand margins.
- Cost pressures will be constrained by relatively weak wages growth and good productivity growth, with rising capacity utilisation (as demand and output grows) also helping to contain unit labour costs.

- Rent increases are expected to be contained by increasing supply of dwellings and slower population growth, although pockets of undersupply, low vacancies and faster rent rises will persist (especially in Sydney).
- Utilities inflation will be much lower over the next five years, although there will be larger rises in gas prices, particularly in the eastern states, as local gas prices rise toward international prices driven by the three export LNG plants in Gladstone, which will consume a much larger share of available east coast gas. However, as gas only accounts for just under 20% of overall utilities prices (which in turn comprise 4.5% of the CPI), the effect on overall CPI inflation will be small.
- Higher increases in tradeables inflation (compared to the 1.0 per cent annual average of the past five years) will partially offset lower non-tradeables inflation. But as we are forecasting only gradual declines in the exchange rate over the next three years, tradeables inflation will remain contained.
- Fuel price increases are expected to be contained despite the depreciating A$, with global oil prices expected to be lower (in US$ terms) over the next five years compared to the 2013/14 average, as there are expected to be adequate supply increases to match global demand. However, the global oil price will still be hostage to geo-political tensions and supply disruptions.
- Food prices could be the sleeper. Food price increases have been mostly low over the past five years, helped by a high exchange rate, low world and local price rises (including meat and dairy prices) and aggressive competition between Coles and Woolworths (the latter mostly at the expense of their suppliers). An overdue series of droughts could easily see much higher food inflation – not too dissimilar to the 4.2 per cent averaged over 2001 to 2008.

Headline CPI inflation is forecast to average 2.9 per cent p.a. over the next five years, compared to an annual average of 2.4 per cent over the past five years, while underlying inflation is predicted to average 2.7 per cent, slightly lower than the 2.8 per cent annual average of the past five years. However, we expect a cycle in inflation over the forecast period, with underlying inflation rising to 2.7 per cent (through-the-year) to June 2016 and then 3.0 per cent by June 2017 in response to stronger economic growth and consumer spending over 2015 and 2016, a tightening in the labour market and rising wages growth. Modest but gradual declines in the exchange rate will also maintain some upward pressure on tradeables inflation.

The rise in inflation over 2016 and 2017 will see the Reserve Bank raise rates over these two years to reduce demand inflationary pressures. The efforts of the Reserve Bank are expected to successfully rein in growth in domestic demand from the second half of 2017, but wage and price pressure will be sticky downward, because both wages and, to a lesser extent, price inflation, tend to lag growth in demand and output. However, in 2017/18, we expect non-tradeables inflation to ease through the year as the domestic economy and employment soften. However, weaker non-tradeables inflation will be partially offset by higher tradeables inflation, caused mainly by a larger depreciation of the Australian dollar in 2018. Our base forecast is for the Australian dollar to fall to an average of US$0.77 in 2018, from US$0.80 in 2017. Nevertheless, our forecast is for both underlying and headline inflation to begin easing through the first half of 2018.

The easing wage pressures over 2018 plus an expected *appreciation* of the Australian dollar in 2019 – pushing down tradeables inflation – is expected to result in a further easing of CPI inflation in 2019 to 2.6 per cent. However, a strengthening in investment and domestic demand, coupled with a tightening in the labour market is projected to see much stronger inflationary pressures re-emerge over subsequent years, seeing inflation return to 2.9 per cent in 2020.

Table 3.2: Wages Growth, All Industries, Australia, (by Workforce Segmented by Pay Setting Method)

						Forecast						Averages	
Year Ended June	2010	2011	2012	2013	2014(d)	2015	2016	2017	2018	2019	2020	2003-13	2013-20
Proportion of Workforce by Pay setting Method (a)													
Awards Only	8.1%	8.1%	8.1%	8.1%	8.1%	8.1%	8.1%	8.1%	8.1%	8.1%	8.1%	8.1%	8.1%
Collective Agreements	41.9%	41.9%	41.9%	41.9%	41.9%	41.9%	41.9%	41.9%	41.9%	41.9%	41.9%	41.9%	41.9%
Individual Arrangements	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100.0%	100.0%
AWOTE													
Awards Only	0.7	3.5	3.4	2.9	2.6	3.0	2.8	3.3	3.3	2.8	2.9	2.6	3.0
Collective Agreements	4.1	4.0	4.0	3.7	3.6	3.5	3.5	3.9	4.0	3.9	4.1	4.0	3.8
Individual Arrangements (b)	7.2	4.4	4.7	5.5	2.6	3.2	5.0	5.9	5.7	5.1	5.7	5.1	5.1
AWOTE (Persons)(c)	**5.6**	**4.2**	**4.3**	**4.6**	**3.0**	**3.3**	**4.3**	**4.9**	**4.9**	**4.5**	**4.9**	**4.5**	**4.5**
Wage Price Index													
Awards Only	0.7	3.5	3.4	2.9	2.6	3.0	2.8	3.3	3.3	2.8	2.9	2.6	3.0
Collective Agreements	4.1	4.0	4.0	3.7	3.6	3.5	3.5	3.9	4.0	3.9	4.1	4.0	3.8
Individual Arrangements (b)	2.6	3.7	3.4	3.0	1.8	2.4	3.5	3.9	3.6	3.8	4.1	3.5	3.5
Wage Price Index (Ord. Time)	**3.1**	**3.8**	**3.6**	**3.3**	**2.6**	**2.9**	**3.5**	**3.8**	**3.7**	**3.7**	**4.0**	**3.6**	**3.6**
Compositional Effects + Bonuses,etc	2.5	0.4	0.7	1.3	0.4	0.4	0.8	1.1	1.1	0.8	0.9	0.8	0.9

Source: BIS Shrapnel, ABS, Department of Employment

(a) Full-time Adult Persons

(b) Indiv Agreements picks up all the compositional effects and bonuses plus all the standard errors of WPI and AWOTE estimates by the ABS

(c) Full-time Adult Persons, excluding overtime

(d) Collective Agreements result for 2014 is an estimate

Table 3.3: 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

3.1.2 Reserve Bank of Australia CPI forecasts

The Reserve Bank and the Federal Treasury provide the 'official' view of CPI forecasts. The RBA's August 2014 'Statement on Monetary Policy' projects the annual headline CPI rate at just 2 per cent for the year ended December 2014, rising to the 2.5 to 3.5 per cent range through 2015, and 2 ¼ to 3 ¼ in 2016.

The Federal Treasury, in their 2014-15 Budget, projected CPI inflation at 2.5 per cent for the year ended June 2016, which is in the middle of the RBA's target range of between 2 and 3 per cent, and has been applied to all subsequent years.

3.2 Outlook for Australian All Industries Wages

3.2.1 Brief description of BIS Shrapnel's wages model

The key determinants of nominal wages growth are consumer price inflation, productivity and the relative tightness of the labour market (ie the demand for labour compared to the supply of labour). Price inflation, in turn, is primarily determined by unit labour costs. Other factors which influence price inflation include the exchange rate, the stage of the business cycle and the level of competition in markets generally.

BIS Shrapnel's model of wage determination 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 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 although the last three increases were given as a percentage increase. At the all industries level, 8.1 per cent of all full-time employees (data excludes those in agriculture, forestry and fishing) have their pay rises determined by this method. In the electricity, gas, water & 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 currently estimated to be around 30 per cent.

The key influences on the different wage determination mechanisms of each discrete segment are described below:

- Fair Work Australia (the body responsible for setting minimum wages in Australia) is responsible for establishing and maintaining a safety net of fair minimum wages for employees' dependant on Awards. This requires maintenance of employees' cost of living. Hence, in setting minimum wages, Fair Work Australia takes into account the performance and competitiveness of the national economy, including productivity, business competitiveness and viability, inflation and employment growth. Accordingly, increases in the Federal Minimum Wage (on which a range of mostly lower paid awards are also based)

Chart 3.1: Australia – Wages and Prices

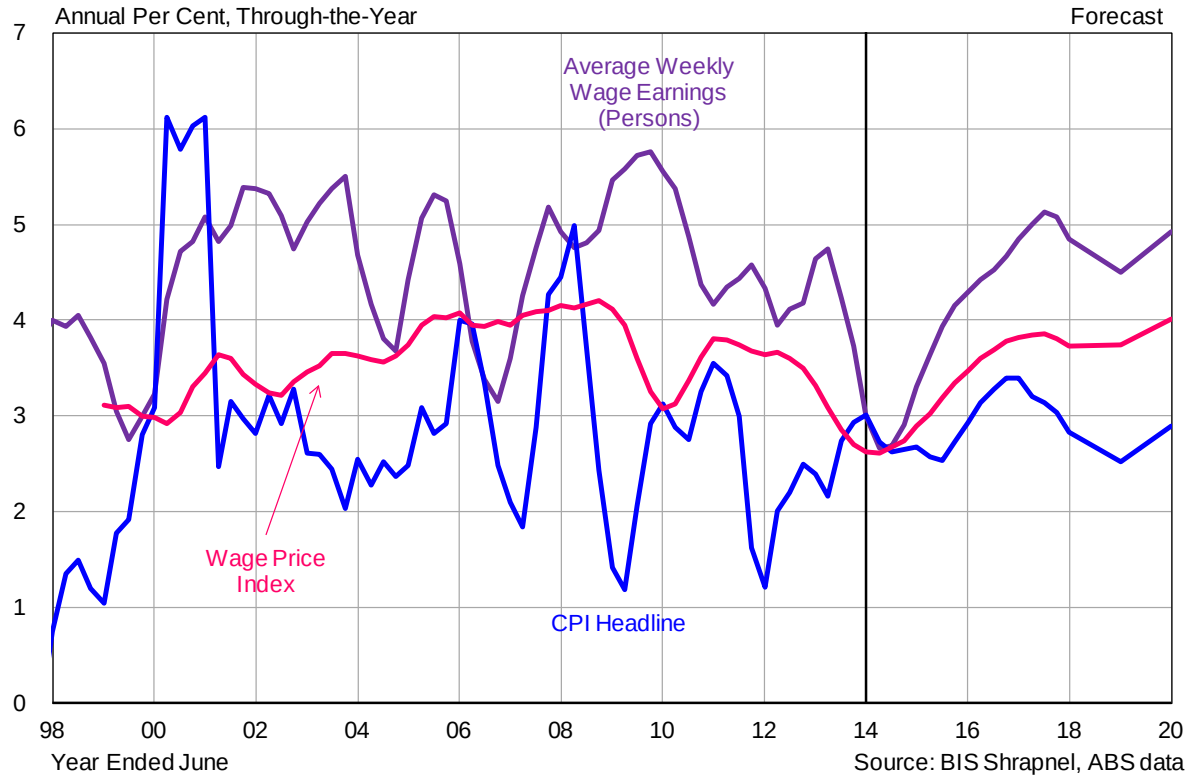
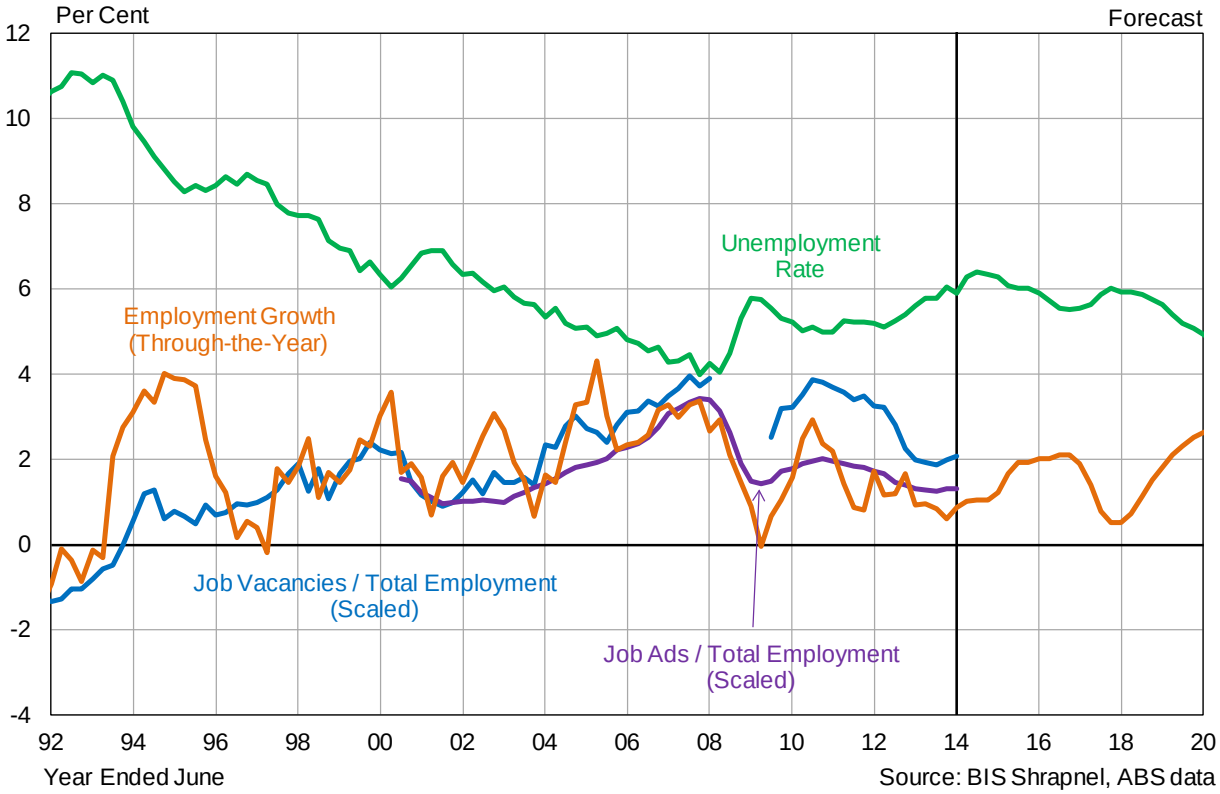


Chart 3.2: Employment and Unemployment



granted by the Fair Work Australia each year are usually set in relation to recent increases in the CPI and with regard to the Fair Work Australia's view of both current and short-term future economic conditions. Fair Work Australia granted a 3 per cent ($18.70) increase in minimum wages, effective July 2014. The $18.70 per week increase lifted the Federal Minimum Wage to $640.90 per week.

- 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.

3.3 Outlook for Australian All Industries Wages

Wages growth slowed considerably in calendar year 2013, following a mild easing through 2012. The wage price index (WPI) grew by 2.9 per cent in year average terms in calendar 2013. Through-the-year growth to December 2013 was even weaker at 2.5 per cent — the slowest pace since the early 2000s and lower than the post GFC weakening, when WPI growth troughed at 2.9 per cent through-the-year to December 2009. This follows growth in the WPI of 3.8, 3.6 and 3.3 per cent respectively in the 2010/11, 2011/12 and 2012/13 financial years.

The WPI improved marginally to 2.6 through-the-year to March 2014, but in real terms, overall wages growth (in WPI terms) has now gone negative, i.e. CPI inflation is rising faster than wages. This is a relatively rare occurrence – last occurring (briefly) in 2008 and 2009/10. Year average growth in 2013/14 is expected to be only 2.7 per cent for the WPI and 3.3 per cent for AWOTE (average weekly ordinary time earnings), the latter down from 4.6 per cent in 2012/13.

The marked slowing in wages growth over the past year is partly due to the relatively low increase in the minimum wage which came into effect in July 2013. Fair Work Australia granted a $15.80 per week increase to $622.20 per week, or a 2.6 per cent increase. Although only 8 per cent of full time workers directly rely on this award increase, a number of awards and pay settings use this award increase as a benchmark. More importantly, there were much lower increases among those 50 per cent of workers who have their pay set by 'individual agreements'.

Among the industry sectors, over recent quarters there has been a significant slowing in wages growth in the mining, wholesale trade, transport, finance and insurance, professional, scientific and technical services (PSTS) and administrative and support services (see tables 4.1 and 4.2).

We continue to believe that the December quarter 2013 result will have been the low point in wage growth outcomes, and that wages growth will gradually pick-up through 2014 and 2015 as employment growth also slowly builds momentum. Our forecast for the WPI over 2014 and 2015 (year average terms) is 2.7 and 3.2 per cent respectively (2.8 and 3.9 per cent for AWOTE), but this growth is still low in historical terms.

The subdued wage pressures and continued productivity improvements will help contain unit labour costs — the average cost of labour per unit of output — and put downward pressure on domestic goods and services inflation over the short-term. This means that wages growth poses no threat to our low inflation outlook over the next two years, at least.

A broadening in employment, profits and investment is expected from early 2016 as the next set of economic drivers, in particular non-mining business and public investment, slowly come through. Meanwhile, current low interest rates will also stimulate wider economic activity, lifting confidence and spending and encouraging businesses to switch out of cost containment mode.

The acceleration in profits, rising price inflation through 2016 and 2017 and emerging skills shortages — with the unemployment rate approaching 5.5 per cent by late 2016 — will push up wages growth during 2016 and 2017. 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 4 per cent for WPI (4.9 per cent for AWOTE) in 2017 – which would be the strongest result in WPI terms in nearly a decade. While the RBA will not be too alarmed at wage inflation of 4 per cent (which, with long term productivity of around 1.5 per cent puts unit labour costs around 2.5 per cent – the mid-point of its target band), it will nevertheless raise rates through 2016 and 2017 to prevent any serious inflationary pressures emerging.

The higher interest rates are expected to cause a slowdown in economic and employment growth during 2018, and this will eventually feed through to wages growth, with wages growth in the individual arrangements segment slowing first. Wages growth is forecast to ease to 3.7 per cent in WPI terms in 2018, while AWOTE growth eases to 4.6 per cent at the same time. But with only a small rise expected in the average unemployment rate to 5.9 per cent in 2018 — because of the deceleration in the 'working population' and slower labour force growth — the ongoing tight labour market is expected to see wage pressures re-emerge again towards the end of the decade once the subsequent recovery resumes from 2019.

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 EGWWS at the national level followed by a discussion and forecasts of EGWWS industry in Victoria. Note that our **wages model** is described in **section 3** and **Appendix A**.

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.

Utilities wages growth will ease over the next two years, and slip below the all industries average the following two years

The mining investment boom has passed its peak and will decline over the next four years. Similarly, we believe utilities engineering construction has reached its peak and will fall over the next three years. Accordingly, wages growth in the utilities sector (in WPI terms) will slow over 2014 and 2015.

With many of the particular skills relevant to the electricity, gas and water sector expected to remain in relatively high demand (as evidenced by the 2013 industry survey conducted by Energy Skills Australia), wage increases are still expected to remain higher in this industry than the national average over the next two years. However, the following two years to 2017, will see utilities wages slip below the all industries average for consecutive years for the first time on record.

The overall outlook for total utility wages is shaped by the combination of drivers from the different pay setting methods – awards, collective agreements and individual agreements.

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

The key elements of the utilities wage forecast are set out in table 4.4. 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

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

Sector	% of Total Employment Jun'14	Annual Per Cent Change										Five-Year YE Dec Average
		Dec '06	Dec'07	Dec'08	Dec'09	Dec'10	Dec'11	Dec'12	Dec'13	Mar'14	Jun'14	
Private		3.7	4.4	4.3	2.5	3.9	3.8	3.4	2.5	2.6	2.5	3.2
Public		4.4	4.0	4.3	4.0	4.0	3.2	3.3	2.7	3.0	2.8	3.4
Industry												
Mining	8.0%	6.5	4.9	6.4	3.6	4.5	3.6	5.1	3.1	2.4	2.5	4.0
Manufacturing	1.3%	3.4	4.5	4.2	2.1	3.7	3.8	3.3	2.8	3.1	2.8	3.1
Electricity, Gas, Water and Waste Services	**8.9%**	**5.7**	**4.3**	**4.8**	**3.7**	**4.8**	**3.2**	**4.2**	**3.3**	**3.2**	**3.0**	3.9
Construction	3.3%	5.5	4.9	4.5	3.5	3.9	4.0	3.5	2.8	3.1	2.9	3.5
Wholesale Trade	10.7%	4.2	3.1	4.3	2.5	3.5	4.4	4.6	2.2	2.3	2.0	3.4
Retail Trade	6.6%	2.7	5.1	3.9	2.4	3.3	3.0	2.5	2.6	2.5	2.4	2.8
Accommodation and Food Services	5.1%	2.1	3.5	2.9	1.9	3.5	3.8	2.2	2.2	2.2	2.2	2.7
Transport, Postal and Warehousing	1.7%	4.1	4.0	4.5	4.1	2.8	3.4	3.9	2.4	2.5	2.4	3.3
Information Media and Telecommunications	3.5%	3.2	3.5	3.3	2.0	3.0	4.2	2.8	2.3	2.5	2.4	2.9
Finance and Insurance Services	2.0%	3.8	4.0	4.4	2.1	4.4	4.0	3.3	2.6	2.8	2.6	3.3
Rental, Hiring and Real Estate services	8.1%	3.8	5.0	3.7	2.0	2.9	4.0	2.7	2.8	2.8	2.3	2.9
Professional, Scientific and Technical Services	3.4%	4.8	4.2	5.2	2.9	4.6	4.7	3.7	1.8	1.9	2.0	3.5
Administration and Support Services	6.3%	3.1	4.4	5.0	1.9	4.0	3.0	3.6	2.4	2.3	2.5	3.0
Public Administration and Safety	7.8%	3.9	4.4	4.5	3.7	4.0	2.9	3.6	2.9	2.9	2.8	3.4
Education	12.1%	4.3	3.9	4.4	3.9	4.4	3.6	3.0	2.9	3.3	3.2	3.6
Health Care and Social Assistance	1.6%	4.5	3.9	3.7	3.9	3.6	3.0	3.4	2.8	2.9	2.9	3.3
Arts and Recreation Services	4.4%	2.9	4.8	4.2	2.5	3.1	4.2	2.6	2.3	3.3	3.0	3.0
Other Services	0.0%	2.5	4.0	3.8	2.1	3.1	4.4	3.3	2.3	2.3	2.3	3.0
State/Territory												
New South Wales	31.2%	3.8	3.9	4.0	2.9	3.8	3.8	3.3	2.4	2.6	2.5	3.2
Victoria	24.7%	3.6	3.9	4.2	2.7	3.7	3.5	3.5	2.5	2.7	2.7	3.2
Queensland	20.4%	4.4	4.4	4.2	3.1	4.2	3.6	3.1	2.6	2.7	2.6	3.3
South Australia	7.0%	3.7	5.0	4.1	2.4	3.9	3.3	3.1	3.5	3.3	3.1	3.2
Western Australia	11.8%	4.6	5.9	5.6	3.0	4.0	4.0	4.2	3.0	2.7	2.4	3.6
Tasmania	2.0%	4.2	4.1	4.3	3.6	3.4	3.6	3.3	2.2	2.3	2.3	3.2
Northern Territory	1.1%	3.6	3.8	4.8	3.4	3.8	4.3	3.2	2.3	2.8	2.8	3.4
Australian Capital Territory (ACT)	1.8%	4.0	4.5	3.6	3.7	3.7	3.0	4.3	2.3	2.3	2.3	3.4
Total All[2]	100%	4.0	4.1	4.3	2.9	3.9	3.7	3.4	2.5	2.6	2.6	3.3

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'14	Average Weekly Earnings[1]											Five-Year YE Dec Average
		$ / Week Jun'14	Annual Percent Change										
			Dec '06	Dec '07	Dec '08	Dec'09	Dec'10	Dec'11	Dec'12	Dec'13	Mar'14	Jun'14	
Mining	8.0%	2 493	6.9	6.2	8.5	7.0	7.3	5.2	7.6	5.6	5.1	4.2	6.5
Manufacturing	1.3%	1 294	4.6	4.2	5.5	3.2	1.7	3.6	1.6	5.8	5.6	4.8	3.2
Electricity, gas, water and waste services	**8.9%**	**1 659**	**1.9**	**4.0**	**3.5**	**6.7**	**9.4**	**5.9**	**3.6**	**4.3**	**3.3**	**2.0**	**6.0**
Construction	3.3%	1 449	1.7	8.8	6.8	8.4	6.5	5.0	2.4	4.2	3.2	2.1	5.3
Wholesale trade	10.7%	1 463	4.2	3.7	5.4	3.8	2.5	8.4	8.3	1.1	0.3	0.5	4.8
Retail trade	6.6%	1 040	4.9	5.3	3.2	4.1	4.0	1.5	3.0	4.0	3.4	2.5	3.4
Accommodation and food services	5.1%	1 048	6.3	8.4	1.2	4.2	3.8	3.8	2.9	7.5	6.4	3.9	4.4
Transport, postal and warehousing	1.7%	1 443	1.7	-0.4	3.6	3.1	9.3	6.2	7.7	3.5	2.6	1.8	6.0
Information media and telecommunications	3.5%	1 665	2.9	10.1	4.3	5.1	5.2	3.9	3.5	4.1	3.2	1.7	4.3
Finance and insurance	2.0%	1 665	3.2	4.3	3.5	2.1	7.6	2.6	4.0	2.3	1.6	1.1	3.7
Rental hiring and real estate services	8.1%	1 269	5.5	4.5	8.2	6.1	-0.9	-0.3	3.1	3.6	0.9	-1.1	2.3
Professional, scientific and technical services	3.4%	1 716	4.6	5.0	6.9	5.2	6.3	2.9	4.6	4.4	4.9	3.8	4.7
Administration and support services	6.3%	1 287	3.0	4.8	7.1	7.2	4.8	-3.0	4.1	5.1	3.4	1.7	3.6
Public administration and defence	7.8%	1 531	4.1	3.5	4.5	6.0	7.2	3.3	4.5	4.0	3.8	3.5	5.0
Education and training	12.1%	1 552	3.7	3.6	2.9	5.8	5.5	4.3	4.8	3.0	3.2	3.3	4.7
Health and social assistance	1.6%	1 373	0.6	5.6	3.5	7.0	2.7	4.9	1.0	7.1	5.9	3.9	4.5
Arts and recreational services	4.4%	1 305	-4.1	5.3	5.4	7.5	3.9	5.5	1.9	8.7	7.9	4.6	5.5
Other services	0.0%	1 088	2.4	2.7	4.6	6.9	2.0	2.6	4.4	1.9	0.5	-0.4	3.6
Total All Industries[2]	100%	1 454	3.4	4.8	4.8	5.7	4.9	4.4	4.1	4.2	3.7	3.0	4.7

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

Source: BIS Shrapnel, ABS

industries average. Over the past five years, the outcomes from collective agreements have been 0.5 per cent higher, on average, than the all industries average, at 4.5 per cent compared to 4.0 per cent. We expect this trend to continue over the outlook period, with collective agreements achieving average increases of 3.9 per cent for the utilities sector, compared to 3.8 per cent for all industries.

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).

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 1.5 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' (ie an agreement has been 'reached' or 'approved') over recent quarters.

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

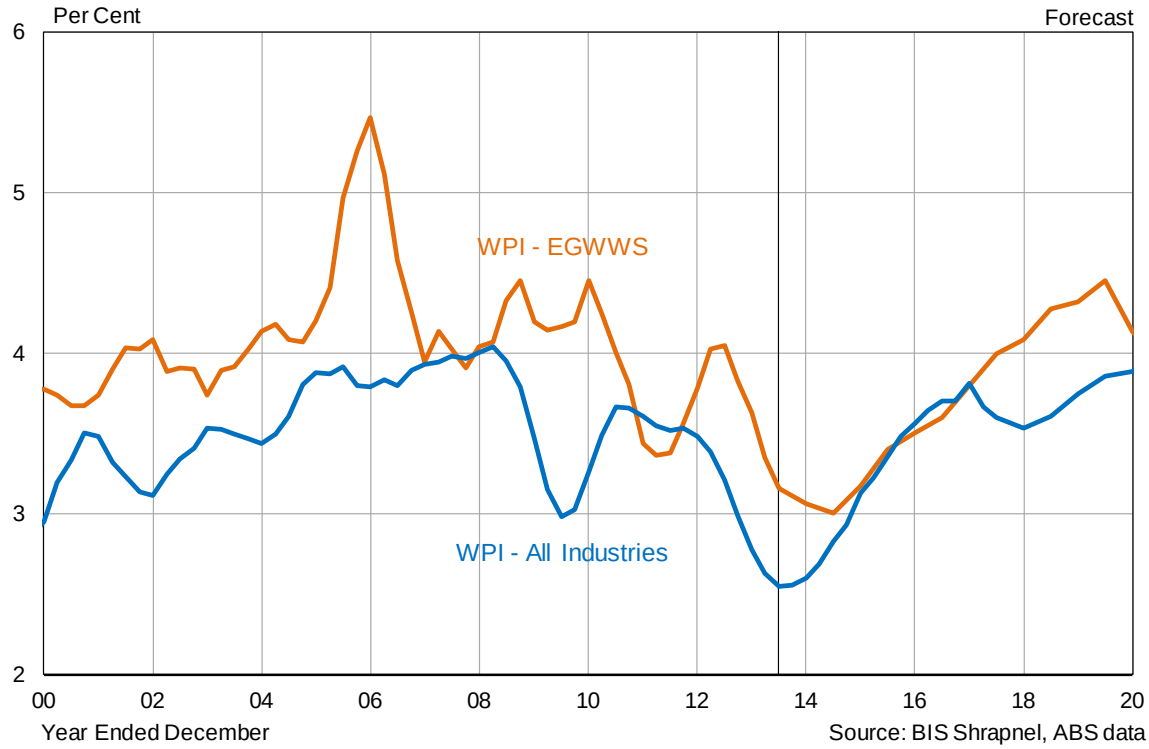


Table 4.3: Federal Wage Agreements – Collective Agreements by Industry (Average Annualised Wage Increase)

Selected Industry (ANZSIC 2006)	Collective Agreements Average Annualised Wage Increase[1]									Average 2005-2013
	2005	2006	2007	2008	2009	2010	2011	2012	2013	
Electricity, Gas, Water and Waste Services	**4.2**	**4.4**	**4.5**	**4.7**	**4.8**	**4.8**	**4.4**	**4.2**	**4.1**	**4.5**
Agriculture, Forestry and Fishing	3.0	3.0	2.9	3.0	3.7	3.7	3.7	3.8	3.7	3.4
Mining	3.6	3.7	4.0	4.3	4.4	4.3	4.2	4.5	4.6	4.2
Manufacturing	4.1	4.2	4.3	4.2	4.1	3.9	3.9	3.9	3.8	4.0
Construction	4.4	4.9	4.9	4.6	5.3	5.4	4.8	5.1	5.3	5.0
Wholesale Trade	4.0	3.7	3.6	3.8	4.1	4.0	3.7	3.8	3.8	3.8
Retail trade	3.4	3.5	3.5	3.5	3.6	3.5	3.4	3.6	3.3	3.5
Accommodation and Food Services	3.2	3.3	3.4	3.2	3.6	3.9	3.9	3.8	3.7	3.6
Transport , Postal and Warehousing	3.7	3.7	3.9	4.0	4.2	4.2	4.0	3.9	3.9	3.9
Information Media and Telecommunications	4.1	3.6	3.2	3.3	3.8	3.8	3.4	3.4	3.5	3.6
Financial and Insurance Services	4.1	4.1	4.1	3.8	4.0	3.6	3.7	3.5	3.3	3.8
Rental, Hiring and Real Estate Services	4.1	3.8	4.8	4.5	3.5	3.7	3.9	4.7	4.4	4.2
Professional, Scientific and Technical Services	4.1	3.8	4.0	4.0	4.5	4.3	4.0	4.1	4.1	4.1
Administrative and Support Services	4.1	3.8	3.6	3.6	3.8	3.7	3.6	4.2	4.3	3.9
Public Administration and Safety	4.3	4.0	4.1	4.2	4.3	3.9	3.7	3.7	3.7	4.0
Health Care and Social Assistance	4.1	4.0	4.0	4.0	4.1	4.0	4.0	3.6	3.3	3.9
Education and Training	4.7	4.9	4.8	4.9	4.4	4.6	4.6	4.7	3.9	4.6
Arts and Recreation Services	3.8	3.5	3.8	4.0	4.1	3.5	3.5	3.4	3.3	3.7
Other Services	4.0	4.0	4.1	4.0	3.9	3.7	3.6	4.5	4.4	4.0
ALL INDUSTRIES	4.0	4.1	4.1	4.0	4.2	4.1	4.0	4.0	3.7	4.0

1) Current agreements in December of each year.

Source: Department of Employment

Table 4.4: Electricity, Gas, Water and Waste Services Forecasts – Australia

						Forecast						Averages	
Year Ended June	2010	2011	2012	2013	2014(d)	2015	2016	2017	2018	2019	2020	2003-13	2013-20
Proportion of Workforce by Pay setting Method (a)													
Awards Only	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%
Collective Agreements	67.7%	67.7%	67.7%	67.7%	67.7%	67.7%	67.7%	67.7%	67.7%	67.7%	67.7%	67.7%	67.7%
Individual Arrangements	29.6%	29.6%	29.6%	29.6%	29.6%	29.6%	29.6%	29.6%	29.6%	29.6%	29.6%	29.6%	29.6%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100.0%	100.0%
AWOTE													
Awards Only	0.7	3.2	3.4	2.9	2.6	3.0	2.8	3.3	3.3	2.8	2.9	2.5	3.0
Collective Agreements	4.8	4.4	4.2	4.1	3.9	3.4	3.7	3.8	4.2	4.5	4.6	4.4	4.0
Individual Arrangements (b)	14.0	18.7	-0.6	10.0	-1.2	3.0	4.2	5.9	6.7	7.6	7.5	4.2	5.8
AWOTE (Persons)(c)	**7.6**	**9.1**	**2.5**	**6.1**	**2.0**	**3.2**	**3.9**	**4.5**	**5.1**	**5.6**	**5.6**	**4.6**	**4.6**
Wage Price Index													
Awards Only	0.7	3.2	3.4	2.9	2.6	3.0	2.8	3.3	3.3	2.8	2.9	2.5	3.0
Collective Agreements	4.8	4.4	4.2	4.1	3.9	3.4	3.7	3.8	4.2	4.5	4.6	4.4	4.0
Individual Arrangements (b)	3.7	3.7	1.9	4.6	1.8	2.5	3.2	3.6	4.1	4.6	5.0	4.4	3.8
Wage Price Index (Ord. Time)	**4.3**	**4.2**	**3.5**	**4.2**	**3.3**	**3.1**	**3.5**	**3.7**	**4.2**	**4.5**	**4.7**	**4.2**	**3.9**
Compositional Effects + Bonuses,etc	3.2	4.9	-1.0	1.9	-1.2	0.1	0.3	0.8	0.9	1.1	1.0	0.4	0.7

(a) Full-time Adult Persons.

Source: BIS Shrapnel, ABS, DEEWR

(b) Because of relatively small workforce (and therefore small sample size) in EGWWS, Indiv Agreements picks up all the standard errors of WPI and AWOTE estimates by ABS.

(c) Full-time Adult Persons, excluding overtime.

(d) Collective Agreements result for 2014 is an estimate

We expect EBA outcomes to ease over the next two years but remain above inflation and the 'all industries' average given that the skilled labour market remains tight 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 4 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.

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.

However, with the economy expected to grow close to trend in about two years, employment growth will outpace population and labour force growth and the unemployment rate is expected to approach 5.3 per cent by late 2016. Hence, we expect to again witness the re-emergence of skilled labour shortages and competition for scarce labour through 2016, particularly from the construction sector, which will push up wage demands in the utilities sector.

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
Forecasts								
2014	1 464.2	2.8	1,663.3	2.7	119.2	2.7	123.0	3.2
2015	1 522.0	3.9	1,722.6	3.6	123.0	3.2	127.0	3.3
2016	1 590.8	4.5	1,795.1	4.2	127.6	3.7	131.6	3.6
2017	1 668.9	4.9	1,879.5	4.7	132.6	4.0	136.8	3.9
2018	1 746.4	4.6	1,978.8	5.3	137.5	3.7	142.7	4.3
2019	1 828.7	4.7	2,087.7	5.5	142.8	3.9	149.1	4.5
2020	1 920.0	5.0	2,195.5	5.2	148.6	4.0	155.5	4.3
Compound Annual Growth Rates (3)								
1990-2000	3.8		4.6					
2000-2010	4.8		4.7		3.7		4.4	
2008-2013	4.7		6.0		3.4		4.1	
2013-2020	4.4		4.4		3.6		3.9	
2015-2020	4.8		5.0		3.9		4.1	

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.

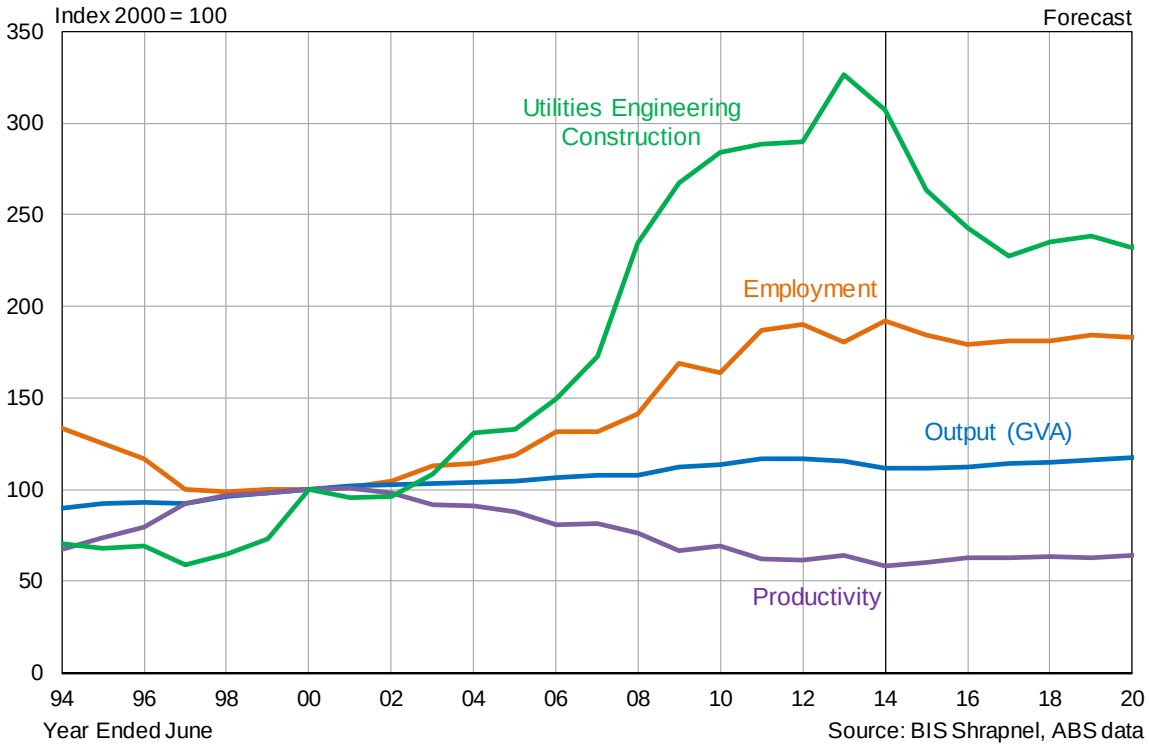
(3) e.g. CAGR (Compound Annual Growth Rates) for 2015-2020 is for the next regulatory period

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 1.8 per cent over the year to June 2014, reflecting general weakness in the economy and the labour market. However, this is expected to recover over the near term. With the economy expected to grow close to trend in two years, we expect further growth in wages in the segment to come through, as employers bid up wages for skilled labour in scarce supply. 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 decade.

Chart 4.2: Australia – Utilities Employment, Output and Investment



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 and AWOTE estimates by the ABS. Overall, BIS Shrapnel expects individual wage agreements to average growth of 4.1 per cent per annum over the five years to December 2020 – well up on the 3.1 per cent experienced over the most recent five years.

Together with the awards and collective agreements, 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 5 per cent per annum over the five years to 2020, 0.2 per cent higher than the national 'All Industries' AWOTE average of 4.8 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 4.1 per cent per annum (also 0.2 percentage points higher than the national 'All Industries' WPI average of 3.9 per cent per annum) over the five years to 2020.

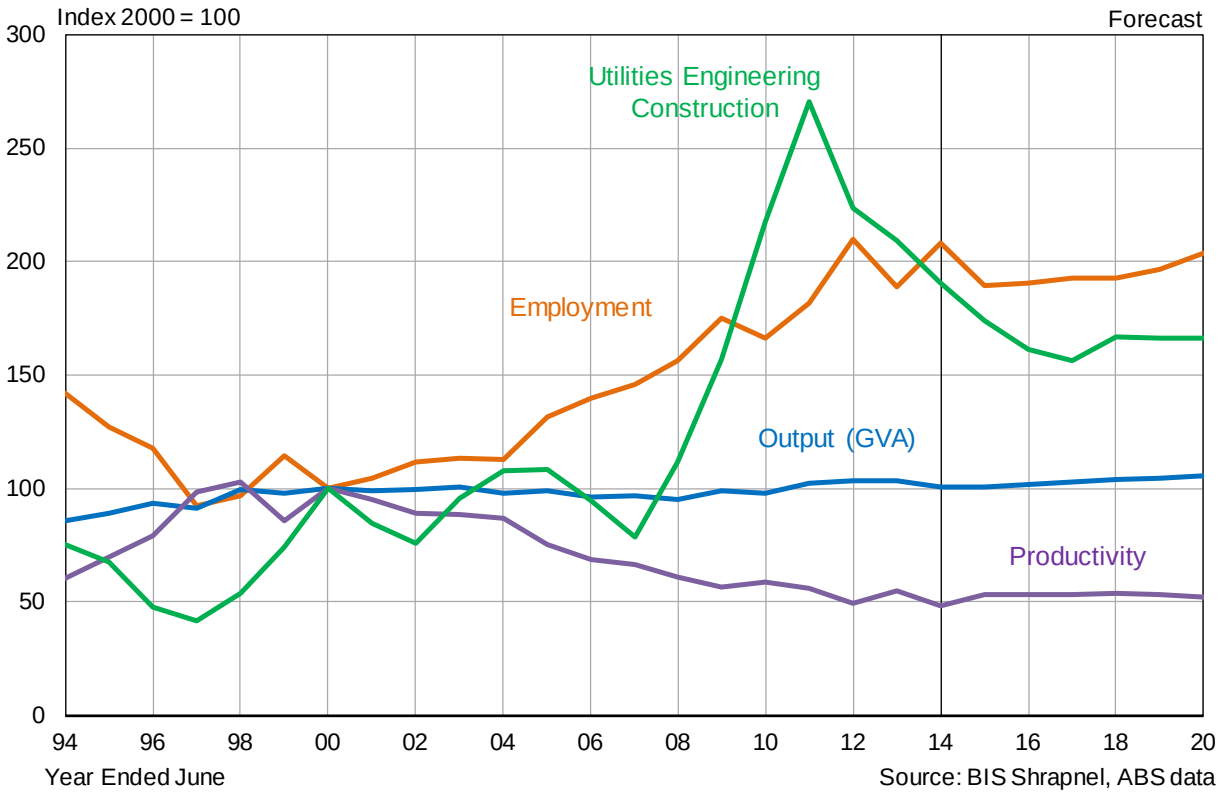
4.1 Outlook for utilities wages growth in Victoria

The utilities wage forecasts for Victoria are expected to slightly exceed the national average over 2014 and 2015. However, over the following five years to December 2020 (i.e. the distributors' next regulatory period), Victorian utilities WPI growth is forecast to average 4.1 per cent per annum – identical to that of the national utilities average. 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 is expected to continue falling over the next 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 comes to an end, we are forecasting declines in work done over the next three years, based on our expectations of reduced consumer demand (in response to rising electricity prices), further energy efficiency measures, lower manufacturing consumption and reduced resource-related electrical projects. In addition to this, the Federal Coalition government is less in favour of renewable energy, and has already removed several subsidies and targets, making some projects untenable, whilst leaving question marks over several other projects.

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. However, due to the uncertainty surrounding renewable energy projects, as well as the end of the current round of investment, we are forecasting annual average activity of around $3.0 billion over the six years to 2019/20, down on the $3.9 billion recorded during the previous six-year period but remaining well above the long-run historical average.

Chart 4.3: Victoria – Utilities Employment, Output and Investment



Despite this weak outlook for Victoria, the industry prospects at the national level are actually worse. As shown on charts 4.2 and 4.3, utilities engineering construction nationwide is expected to shed a cumulative 26 per cent, compared to 18 per cent in Victoria, over the next three years. As well as Victoria's contribution to this nationwide decline, falls will be experienced in the electricity sector across New South Wales, Queensland, South Australia and Western Australia.

The net result is that even though construction is declining in Victoria, it is not as bad as the national outlook, and will result in correspondingly higher wage growth over the next few years. But beyond 2016 the outlook is similar across Victoria and nationwide. All major states are going to experience flat to very mild growth in utilities construction through to 2020 although work done will remain at high levels from a historical perspective.

Utilities wages are therefore forecast to grow at 4.1 per cent per annum (WPI terms) in both Victoria and nationwide over the 2016 to 2020 period.

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

	Victoria - Nominal				Australia- Nominal			
Year Ended December	AWOTE (1)		WPI (2)		AWOTE (1)		WPI (2)	
	$	A% CH	Index	A% CH	$	A% CH	Index	A% CH
2000					895.8		69.5	
2001					954.4	6.5	72.2	3.9
2002					985.9	3.3	75.3	4.3
2003					1,031.6	4.6	78.2	3.9
2004					1,073.8	4.1	81.6	4.3
2005					1,105.3	2.9	85.2	4.4
2006					1,126.0	1.9	90.1	5.8
2007					1,171.2	4.0	93.8	4.1
2008					1,212.8	3.5	97.7	4.2
2009	1,168.6		101.4		1,294.5	6.7	102.0	4.4
2010	1,364.1	16.7	105.1	3.9	1,415.9	9.4	106.8	4.7
2011	1,467.7	7.6	109.5	4.1	1,499.3	5.9	110.6	3.6
2012	1,510.1	2.9	113.7	3.9	1,553.1	3.6	114.9	3.9
2013	1,569.3	3.9	118.7	4.4	1,620.2	4.3	119.2	3.8
Forecasts								
2014	1,617.3	3.1	122.6	3.3	1,663.3	2.7	123.0	3.2
2015	1,678.2	3.8	126.9	3.5	1,722.6	3.6	127.0	3.3
2016	1,745.4	4.0	131.5	3.6	1,795.1	4.2	131.6	3.6
2017	1,824.0	4.5	136.5	3.8	1,879.5	4.7	136.8	3.9
2018	1,924.0	5.5	142.4	4.3	1,978.8	5.3	142.7	4.3
2019	2,037.6	5.9	148.9	4.6	2,087.7	5.5	149.1	4.5
2020	2,136.7	4.9	155.3	4.3	2,195.5	5.2	155.5	4.3
Long Term Averages								
2000-2010					4.7		4.4	
2008-2013					6.0		4.1	
2013-2020	4.5		3.9		4.4		3.9	
2015-2020	4.9		4.1		5.0		4.1	

(1) Earnings of persons. Data is year ended December. Source: BIS Shrapnel, ABS

(2) Ordinary time hours excluding bonuses.

5. EXTERNAL LABOUR COST ESCALATION FORECASTS

This section provides forecasts of the distributors' external or 'out-sourced' labour escalation. Given utility service providers outsourced labour is mostly supplied by firms in the construction industry, we proxy Jemena's and United Energy's external labour cost escalation by wages growth (as measured by the WPI) in the Victorian construction industry.

Methodology

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.

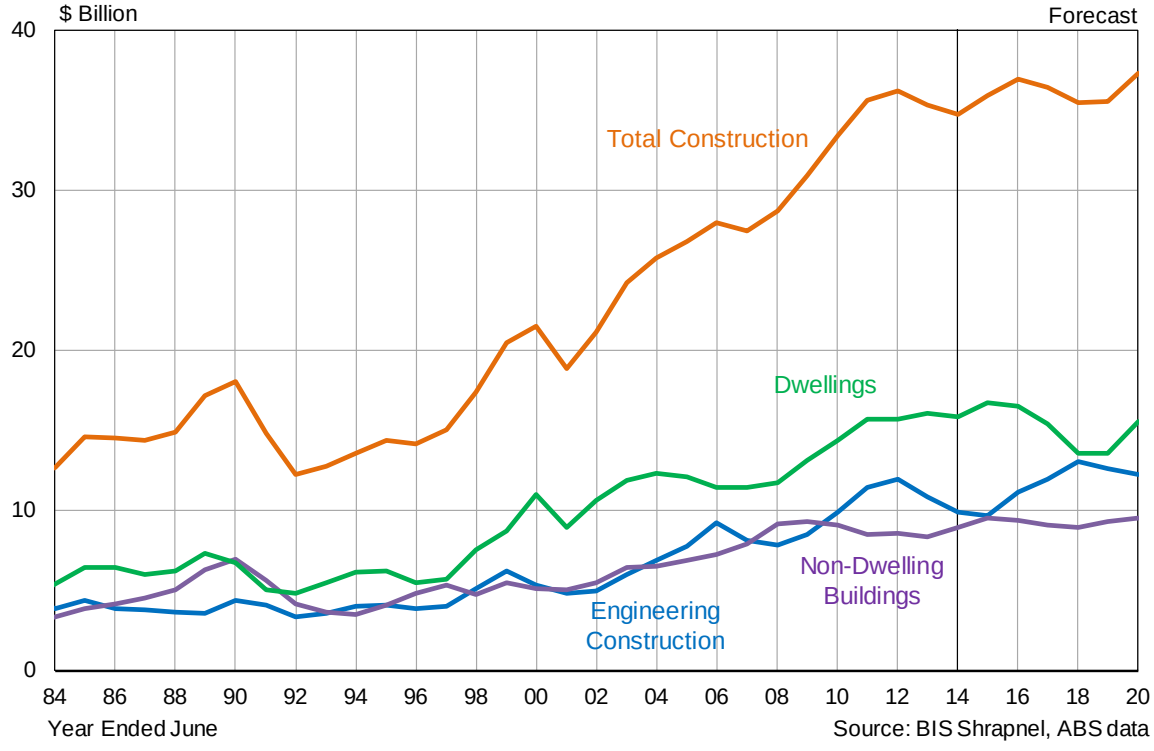
5.1 Construction Sector Wages Growth in Victoria

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 2010, 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.

Last year is believed to be the trough of total construction activity in Victoria, and the next six years to 2019/20 will see activity oscillate around slightly higher levels than today. Initially, this will be due to building construction pushing ahead to new record levels, supported by detached house starts on the fringes of Melbourne. But the key driver of this solid total construction

Chart 5.1: Total Construction – Victoria
Value of Work Done, Constant 2011/12 Prices



outlook is a boom in engineering construction, set to commence around 2015/16. This will be underpinned by the commencement of the $8 billion East-West Link road project, although support will also come from the telecommunications sector (as the NBN continues) as well as billion-dollar projects in the Ports (Port of Melbourne Port Capacity Project) and Mining and heavy industry (Longford Gas Conditioning Plant) sectors.

As a direct result of this relatively solid outlook for the construction industry, wages in the construction sector will be equal to or higher than the nationwide average each year to 2020. Overall, construction wages in Victoria are forecast to rise by an average of 4.1 per cent (WPI) and 4.7 per cent (AWOTE) over the five years to 2020, compared to 4 per cent and 4.5 per cent respectively at the national level.

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

	Victoria - Nominal				Australia- Nominal			
Year Ended December	AWOTE (1)		WPI (2)		AWOTE (1)		WPI (2)	
	$	A% CH	Index	A% CH	$	A% CH	Index	A% CH
2000	659.4		73.0		735.3	4.8	69.9	3.8
2001	669.9	1.6	76.0	4.2	741.9	0.9	72.5	3.7
2002	723.1	7.9	77.8	2.3	790.3	6.5	74.9	3.3
2003	796.2	10.1	80.8	3.9	859.6	8.8	77.3	3.3
2004	824.4	3.5	83.6	3.5	894.7	4.1	80.9	4.7
2005	880.1	6.8	86.7	3.7	941.2	5.2	84.7	4.7
2006	872.9	-0.8	91.1	5.1	957.2	1.7	89.4	5.5
2007	969.4	11.1	95.0	4.3	1,041.2	8.8	93.4	4.6
2008	1,073.7	10.8	98.5	3.7	1,111.9	6.8	97.7	4.6
2009	1,208.9	12.6	101.2	2.8	1,205.1	8.4	101.8	4.2
2010	1,274.2	5.4	104.6	3.9	1,283.8	6.5	105.2	3.3
2011	1,266.6	-0.6	108.4	3.7	1,348.2	5.0	109.5	4.1
2012	1,277.3	0.8	111.8	3.1	1,381.2	2.4	113.7	3.9
2013	1,308.1	2.4	116.5	4.2	1,439.3	4.2	117.2	3.0
Forecasts								
2014	1,350.0	3.2	120.8	3.7	1,486.8	3.3	120.8	3.1
2015	1,412.6	4.6	125.4	3.8	1,540.9	3.6	124.7	3.3
2016	1,475.7	4.5	130.3	3.9	1,602.1	4.0	129.3	3.6
2017	1,536.8	4.1	135.7	4.1	1,666.8	4.0	134.2	3.8
2018	1,601.2	4.2	141.1	4.0	1,735.0	4.1	139.3	3.8
2019	1,681.9	5.0	146.9	4.1	1,820.7	4.9	145.0	4.1
2020	1,773.5	5.4	153.4	4.4	1,916.2	5.2	151.4	4.4
Long Term Averages								
2000-2010	6.8		3.7		5.7		4.2	
2008-2013	4.0		3.4		5.3		3.7	
2013-2020	4.4		4.0		4.2		3.7	
2015-2020	4.7		4.1		4.5		4.0	

(1) Earnings of persons. Data is year ended December. Source: BIS Shrapnel, ABS

(2) Ordinary time hours excluding bonuses.

6. ELECTRICITY NETWORK RELATED MATERIALS

Table 6.1 below shows BIS Shrapnel's forecasts of price growth for electricity network related materials through to 2020. Prices of all forecast materials are expected to increase on average over the five year period to 2020. However, after adjusting for the expected impacts of inflation the results are mixed. Wood is expected to achieve the strongest price growth over the forecast period at a compound annual growth rate of 2.2 per cent in real terms, closely followed by aluminium with forecast growth of 1.8 per cent. On the other hand, copper, steel, oil and concrete prices are forecast to fall in real terms.

Table 6.1: Electricity Network Related Materials Summary

Nominal Price Changes	Nominal Average annual Jan to Dec real index factor (or in annual real % change)										
	Actuals			Forecasts							
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	5 yr Avg (b)
Copper (without the impact of Australian Carbon pricing mechanism)	3.9	-10.1	-1.4	-0.8	3.4	6.2	10.2	4.6	-7.5	-3.6	2.0
Aluminium (without the impact of Australian Carbon pricing mechanism)	-1.8	-15.1	-3.3	3.9	12.5	10.7	10.7	7.6	-4.5	-2.7	4.4
Steel (without the impact of Australian Carbon pricing mechanism)	1.1	-11.5	-2.4	0.4	7.8	7.5	5.5	5.2	-8.5	-0.9	1.8
Oil	6.6	-2.2	12.7	8.2	1.1	1.6	6.8	5.0	-5.2	-2.5	1.2
Concrete	8.5	4.7	-3.1	-1.8	1.9	1.8	0.5	-2.4	-0.7	3.8	0.6
Wood	5.1	3.3	2.8	5.8	5.5	4.9	4.2	3.4	4.7	6.4	4.7
Consumper Price Index (Headline)[a]	**3.3**	**1.8**	**2.4**	**2.0**	**3.0**	**2.75**	**2.5**	**2.5**	**2.5**	**2.5**	**2.6**
Real Price Changes											
Copper (without the impact of Australian Carbon pricing mechanism)	0.6	-11.8	-3.9	-2.8	0.4	3.5	7.7	2.1	-10.0	-6.1	-0.6
Aluminium (without the impact of Australian Carbon pricing mechanism)	-5.1	-16.9	-5.8	1.9	9.5	8.0	8.2	5.1	-7.0	-5.2	1.8
Steel (without the impact of Australian Carbon pricing mechanism)	-2.2	-13.3	-4.8	-1.6	4.8	4.7	3.0	2.7	-11.0	-3.4	-0.8
Oil	3.3	-3.9	10.3	6.2	-1.9	-1.1	4.3	2.5	-7.7	-5.0	-1.4
Concrete	5.2	2.9	-5.6	-3.8	-1.1	-1.0	-2.0	-4.9	-3.2	1.3	-2.0
Wood	1.8	1.5	0.4	3.8	2.5	2.2	1.7	0.9	2.2	3.9	2.2

(a) Headline CPI forecasts based on Reserve Bank of Australia forecasts to December 2016 quarter and then Commonwealth Treasury medium term projections.

(b) Average Annual Growth Rate for 2016 to 2020 inclusive ie for next regulatory period.

Given the variety of supply and demand drivers affecting prices of these commodities, each will be discussed in detail in the following section. As well as individual supply and demand drivers, movements in the exchange rate also impact on the price of commodities. In fact, movements in the Australian dollar (A$) against the US dollar (US$) can have significant effects on the domestic price of minerals and metals. This is being seen at present, as the rapid depreciation of the Australian dollar over the past year will see several Australian-denominated commodity prices rise through 2014, despite weakness in the US$ prices of the same commodities.

The reversal of this trend is a key component of the forecast price declines through 2019 and 2020 as shown in table 6.1. The A$ is expected to appreciate by more than ten per cent over these two years, and this directly flows through to lower commodity prices for Australian consumers.

The remainder of this section identifies and explains the key drivers of prices for each material, and their resultant forecasts.

6.1 Steel

Steel price forecasts are derived from the Consensus Economics Energy & Metals Consensus Forecasts publication. This publication provides steel price forecasts for Hot Rolled Coil in the Asia market, measured in US$ per metric tonne. This methodology (as described in Appendix

C) has previously been accepted by the AER, including in the recent SP AusNet 2013-17 Determination[1].

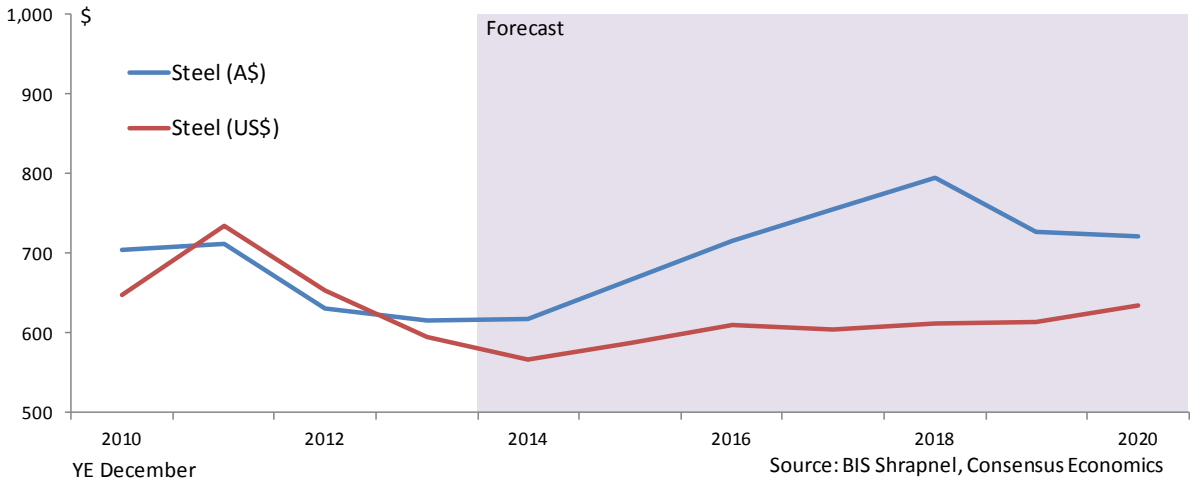
However, this previous methodology used the average of Consensus steel forecasts for the USA and Europe markets. BIS Shrapnel believe the Asia market is more appropriate in this situation. This is based on ABS data on the source of steel imports to Australia. As shown in table 6.2, the majority of source-identified steel imports to Australia are from the Asia region, rather than Europe or the USA. As a result, we believe the Asia market price more accurately reflects the prices faced by Australian steel consumers.

Table 6.2: Australia Steel and Iron Imports, 2013/14

Source Country	2013/14 (Tonnes)[1]
China	202,026
Taiwan	141,103
New Zealand	138,027
Singapore	100,968
Japan	79,582
South Korea	56,944
Malaysia	44,752
United Kingdom	33,217
Sweden	28,287
South Africa	21,388
1) Some data are not identified due to confidentiality.	Source: ABS data, BIS Shrapnel

Steel prices have fallen over the past two years, due to the unsustainable peaks in prices reached prior to the GFC. This effect has now unwound, and steel prices are likely to rise strongly over the near term, and continue to rise over much of the forecast period. However, there are significant differences between the outlook for global steel prices in US$, and A$ terms. These differences (for the Asia market) are shown in chart 6.1.

Chart 6.1: Steel Price



[1] http://www.aer.gov.au/sites/default/files/SP%20AusNet%20-%20draft%20decision%20-%20part%203.docx

After reaching a trough in 2014, steel prices in US$ are expected to slowly increase over the forecast period. The primary driver of this increase will be coking coal prices. The current weakness in coking coal prices is expected to pass as demand for steel improves, and the pace of growth in new coking supply remains somewhat constrained. New mine developments are likely to be more costly as we dig deeper to extract the same resources, lifting production costs and subsequently raising the price floor of coking coal.

However, much of this rising input cost will be offset by a weak iron ore price. Iron ore has fallen significantly through 2014, currently sitting below US$90 per tonne. Strong supply growth from Australia and Brazil underpin a weak price forecast despite rising steel demand, resulting in an outlook of prices remaining below US$100 per tonne over the next decade. This will work to offset the rising coal price, and ensure that any growth in steel prices is only mild.

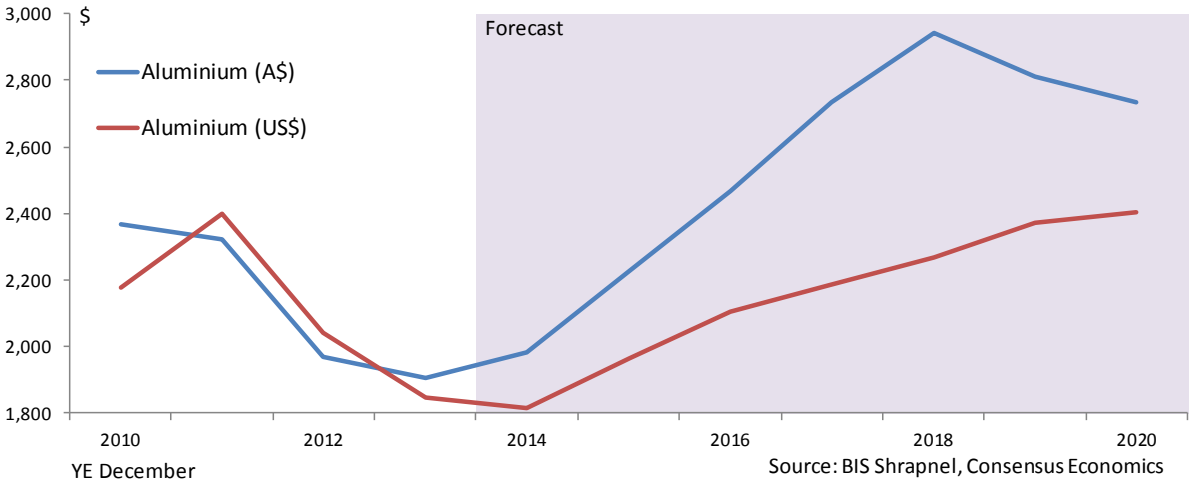
On the other hand, the price faced by Jemena and United Energy in Australian dollar terms will be significantly affected by exchange rate movements. Having decreased by around ten per cent over the past year, the weakness in the domestic currency will result in steel prices actually rising in Australian dollar terms in 2014. Ongoing depreciation of the Australian dollar over the next four years will see relatively strong growth in steel prices through to 2018. Thereafter, the rapid appreciation of the dollar back towards US$0.90 will outweigh continued growth in US$ steel prices, and ensure the price paid by Australian consumers' declines.

Overall, we expect Asia steel prices to rise by an average of 1.8 per cent per annum over the five years to 2020, although this mild growth translates to a decline of 0.8 per cent per annum in real terms, i.e. after allowing for inflation.

6.2 Aluminium Prices

Similar to steel, aluminium prices have been falling over the past three years, due to a combination of unwinding record high US$ prices, as well as the strength of the A$. However, we believe the trough in prices has now been reached, meaning prices will continue to climb from here.

Chart 6.2: Aluminium Price



Solid growth is expected in A$ prices over the five years to 2017/18, rising a cumulative 54 per cent. This is due to a combination of a weakening Australian dollar, as well as price growth in US$ terms.

A rising middle class in China, and an accelerating US consumer economy, should lift international aluminium consumption. Further, the anticipated rising cost of electricity globally, as the major input to production, will place upward pressure on aluminium smelting operating costs over the medium term. Higher operating costs will discourage additions to smelting capacity (and indeed be responsible for the closure of existing smelters) and will act to keep a floor on prices. This will contribute to a slowing in the rate of growth in production over the longer term, and ensure prices in US$ remain around historically strong levels.

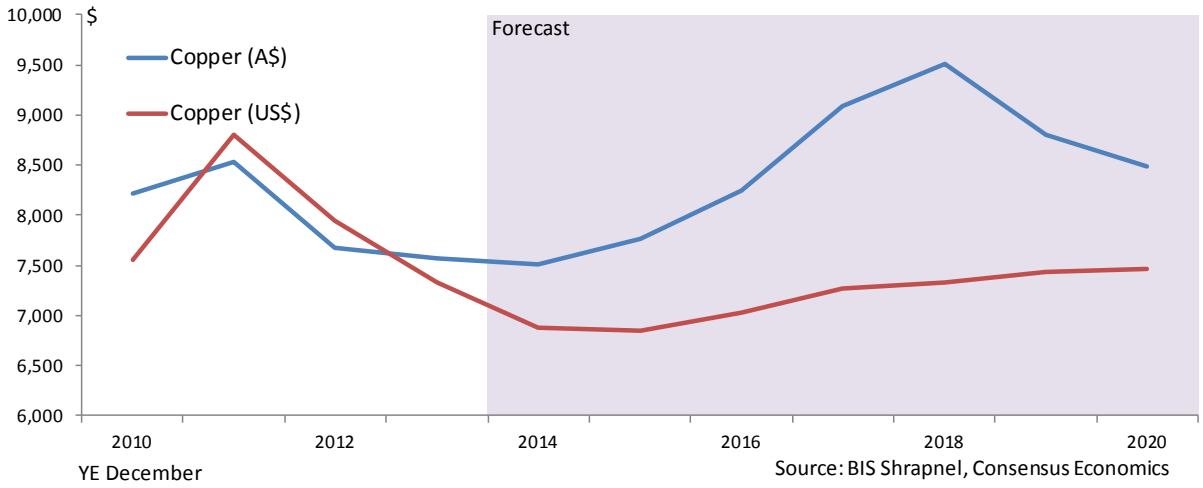
Compounding this price growth is ongoing depreciation of the Australian dollar. Having already shed over 10 per cent over the past year to around US$0.90, further falls are expected through to a low of just $US0.77 by 2018. This will exacerbate the growth in aluminium prices faced by Australian consumers, resulting in particularly rapid price growth through to 2018. However, some of this will be unwound as the Australian dollar regains some ground over the final two years of the outlook period, driven by rising commodity prices and higher domestic interest rates.

Overall, aluminium prices in Australian dollars are expected to rise by an average of 4.4 per cent per annum over the five years to 2020, or 1.8 per cent growth in real, inflation adjusted terms.

6.3 Copper

As per steel and aluminium, copper prices in Australian dollar terms have fallen over the past two years, due to a large backlog of inventory as world supply increased at pace.

Chart 6.3: Copper Price



Further price declines are expected in US$ terms through 2014 and 2015, as global copper production continues to ramp up. New world production coming on-stream (sourced from Indonesia, Peru and Mongolia) will substantially outpace expected demand growth, seeing copper stocks rise and apply downward pressure on prices. Therefore, over the next couple of years copper prices are expected to remain below US$7,000/t before rebounding through reduced supply (mothballing more marginal copper operations) and increased world demand beyond 2016.

On the demand side, the outlook for Chinese growth is critical due to its dominant (over 40 per cent) world copper consumption share, followed by key advanced economies (US, Germany, Japan and South Korea) and emerging economies (Brazil, India and Mexico). Chinese growth, while expected to remain around 7.5 per cent for the next few years, will still support relatively robust world copper consumption growth, and ensure that copper prices continue to rise, albeit only slowly, through the remainder of the forecast period.

However, once again the outlook is rather different when the impact of the Australian dollar is taken into account. In Australian dollar terms, the price of copper is expected to rise between 2015 and 2018 as the dollar depreciates, before falling over the two years to 2020 as the dollar climbs back into the mid US$0.80's. Overall, nominal copper prices are forecast to rise by 2 per cent per year over the 2016-2020 period, and fall by 0.6 per cent per annum after removing the impact of inflation.

6.4 Oil Prices

Due to the rapid uptake of fracking technology and corresponding shale gas boom in the US, there have been significant divergences in the Brent and West Texas Intermediate oil price measures. Australia primarily imports oil that has been processed in Asian refineries which use Brent oil, which is most closely linked to the price of Automotive fuel in Australia. As a result, BIS Shrapnel believes using the Brent is the best measure of oil prices for this cost escalation study.

After peaking at around $110 per barrel due to escalating conflict in the Middle East in 2011, prices have since trended lower as slowing growth in China has lowered expectations of future energy demand. Further falls are expected through to 2018, with prices remaining around $97 per barrel in US$ terms. The primary reason for this soft price outlook is the shale gas breakthrough emerging in the US. The abundance of gas, and its low-cost extraction, is likely to cause a shift in demand away from oil, and toward gas, as a source of energy. However, after a sustained period of weakness, prices are expected to creep upward over the two years to 2020 as the global economy strengthens and production costs rise.

Again, the falling Australian dollar will more than offset this weak price outlook, and result in sustained growth in Australian oil prices through to 2018, before an appreciation in the dollar drives prices back down over the two years to 2020. Overall, the Australian oil price is expected to increase by an average of 1.2 per cent per annum over the five years to 2020. However, this is actually a decline of 1.4 per cent per year in inflation-adjusted, real terms.

6.5 Concrete Prices

Concrete prices are proxied by the Concrete, Cement and Sand price index from the ABS Producer Price Indexes series, in the absence of a single Concrete series. The Concrete, Cement and Sand index also has the benefit of being produced at the Capital City level, meaning that we are able to more accurately analyse the demand-side drivers at greater detail than a nationwide index would allow.

Concrete, Cement and Sand prices for the Melbourne region are forecast through analysis of the historical relationships between price growth and demand for Concrete, Cement and Sand products from the construction sector. This relationship between residential, non-residential and roads construction, and price growth, is shown in chart 6.4 below.

Melbourne Concrete, Cement and Sand prices rose strongly in the early 2000s, supported by a strong upswing in construction activity. Price growth remained positive, although at lower levels, through to the end of the decade. However, prices have since fallen for three of the past five years, including an estimated decline of 1.8 per cent in 2014, as total construction fell from its record levels. Dwelling building retreated from its previous peak levels, and engineering construction fell upon completion of the Wonthaggi Desalination Plant and the Kipper and Turrum gas field projects, as well as lesser subdivision road construction.

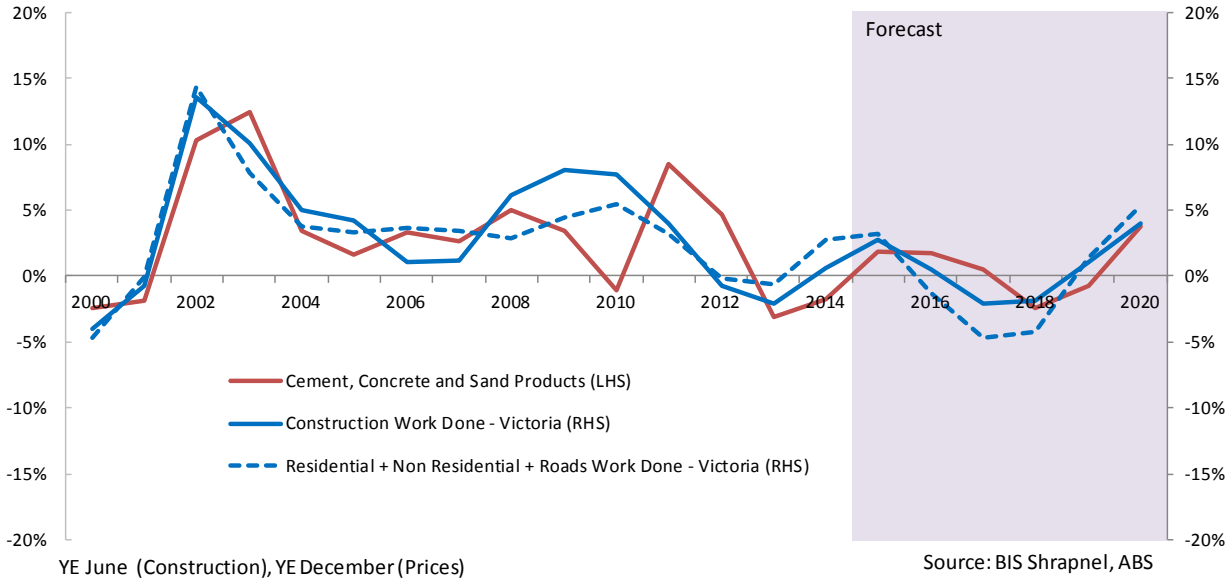
Prices are forecast to return to growth over the next three years to 2017, due initially to a brief recovery in the dwelling and non-dwelling construction markets in 2015. However, the key driver of this price growth will be significant increases in engineering construction in 2016 and 2017, which in turn will be primarily caused by the commencement of the $8 billion East-West Link road project. Although this project will single-handedly boost demand for Concrete,

Cement and Sand products in Melbourne, price growth is expected to remain subdued due to the resumption of declining dwelling and non-dwelling activity.

Prices are expected to fall once more through 2018 and 2019 as a lagged response to the weakness of the previous few years, before posting the strongest growth in nearly a decade in 2020 (3.8 per cent), as activity in all three construction sectors rises simultaneously for the first time since 2009.

Overall, Concrete, Cement and Sand prices are forecast to increase by just 0.6 per cent per annum over the five years to 2020, in nominal terms. In real terms, this translates to annual declines of 2 per cent per annum, in line with the weak construction outlook for Victoria through this period.

Chart 6.4: Concrete, Cement and Sand Prices vs Construction Activity



YE June (Construction), YE December (Prices)

Source: BIS Shrapnel, ABS

6.6 Wood Prices

Wood prices, according to ABARES data on Australian domestic price indices of Hardwood – Structural wood, were particularly volatile through the early to mid-2000's. This was caused by a number of factors, including constraints on domestic supply, changing demand patterns, and large changes in the value of the Australian dollar, which, when appreciating, makes imported hardwood more competitive with Australian products.

Price growth has been more contained in recent years, ranging between 2.8 and 5.1 per cent over the past four years. We believe this makes for a suitable base for forecasting prices.

The wood prices faced by the distributors are subject to quotas on the wood available for poles, and we believe this quota is inversely related to activity levels in the construction industry. For example, a booming construction sector is likely to reduce the quota of wood available for poles, and apply upward pressure on prices.

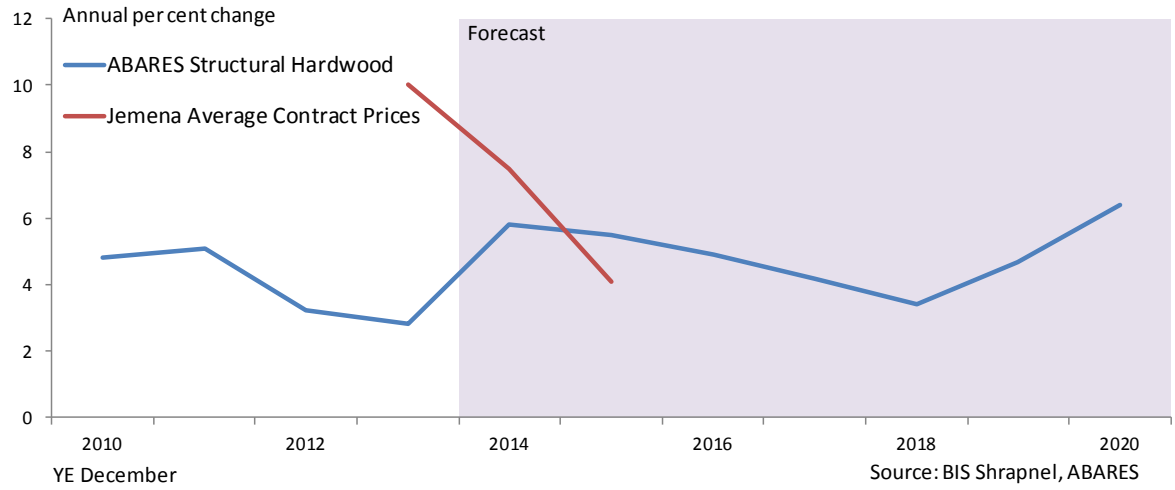
We expect prices will pick up over the near term, spurred on by the long-awaited upswing in dwelling construction, which will boost demand for hardwood, particularly along the eastern seaboard of Victoria and New South Wales. Nationwide dwelling construction by the peak of 2016 will be more than ten per cent higher than today's levels, providing upward pressure on prices.

In addition, the outlook for prices over the near term is likely to be affected by the recent, and ongoing, depreciation of the Australian dollar. A falling dollar reduces the competitiveness of timber imported from Asia and North America, and tightens the market for domestic product. Having already fallen over ten per cent since April 2013, further depreciation of the Australian dollar is expected over the next four years, although at a slower rate than recently experienced.

The net result is that we expect wood price growth to peak in 2014, and remain elevated over the next few years, although easing slightly through to 2018 as dwelling related activity retreats from its peak, and the falls in the Australian dollar slow down. However, prices are expected to pick up strongly over the final two years of the forecast period. Although the currency is forecast to be appreciating over this period, which would ordinarily work to lower prices, this effect will be outweighed by a significant boom in dwelling construction, which is expected to leap by 20 per cent between 2018 and 2020.

Overall, wood prices are forecast to rise by an average of 4.7 per cent per annum over the 2016 to 2020 period. This is above CPI growth of 2.6 per cent per annum over the same period, meaning we expect real growth of 2.2 per cent per annum. This is in line with recent comparable wood price growth as recorded by ABARES, as well as actual contract values over the 2012 to 2015 period.

Chart 6.5: Wood Prices



6.7 IT Software and Hardware Prices

The IT Software and Hardware IPD includes a range of items used in most businesses and organisations. Across the range of items, the average price increase would be similar to consumer price inflation. Accordingly, the appropriate cost escalator for general materials will be the Consumer Price Index (CPI), as described in section 3.

6.8 Non-Hydro Electricity Construction IPD

Non-Hydro Electricity Construction costs rose very strongly through the middle of the 2000's, in line with simultaneously surging prices of both steel and copper. Some of this rapid growth was unwound by consecutive price declines through to the end of the decade, Since then, cost growth has been much more stable, ranging from 2.5 per cent to 3.1 per cent between 2011 and 2013. This reflects generally weaker growth in most inputs, with declines in copper and steel prices evident.

BIS Shrapnel is forecasting the IPD to continue to rise at this stable rate, with growth likely to range between 2.6 per cent and 3.9 per cent over the 2016 to 2020 period. This reflects more evenly balanced copper and steel markets which will limit price growth, particularly in later

years. In addition, our construction outlook does not envisage a return to the rapid wage growth in the construction sector that was experienced through much of the 2000's, as described in section 5.

Overall, we expect the IPD will increase by an average of 3.1 per cent per annum over the five years to 2020 in nominal terms, or 0.6 per cent per annum in real terms.

6.9 Conversion to Real Prices

All price forecasts are conducted in nominal terms. These are converted to real prices (ie inflation adjusted prices) using the 'Official Headline CPI' forecasts (i.e. forecasts from the RBA), as described in section 3.

APPENDIX A: 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.

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

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

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.

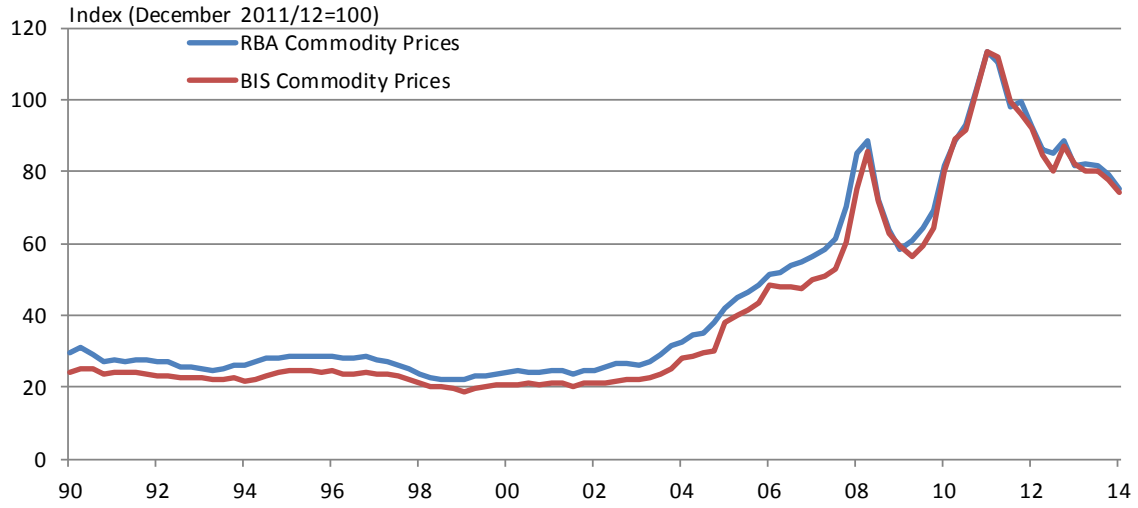
APPENDIX B: EXCHANGE RATE FORECAST METHODOLOGY

BIS Shrapnel's exchange rate forecast is a function of three key drivers:

- Commodity price forecast
- Interest rate differentials between Australia and the US
- 'VIX' volatility index

The commodity price series that we consider is an internal (ie BIS Shrapnel generated) composite commodity price index. This index is a weighted average index of metals and mineral commodity prices and agriculture commodity prices with each commodity price weighted according to the export share of the commodity. Historically, our index closely tracks the RBA's own commodity price index (see chart B.1). We consider the following metals and minerals in the composite index: LNG and LPG (using the WTI price, US$/bbl), thermal coal (average export price, US$/t), coking coal (average export price, US$/t), aluminium & alumina (London Metals Exchange price, US$/t), copper (LME price, US$/t), gold (US$/oz), iron-ore (average export price US$/t), lead (LME price, US/t), nickel (LME price, US$/t) and zinc (LME price, US$/t). The agriculture commodities included in the composite commodity index include beef (USc/kg), cotton (USc/lb), sugar (USc/lb), wheat (US$/t) and wool (AUDc/kg).

Chart B.1: BIS Shrapnel Commodity Price Index



The quarterly historical data is sourced from the ABARES (Australian Bureau of Agricultural and Resource Economics and Sciences) *Australian Agricultural Commodities* and BREE (Bureau of Resources and Energy Economics) *Resources and Energy Quarterly* and *Australian Mineral Statistics* publications, plus data from the Australian Financial Review.

The other key driver of our exchange rate forecasts is the interest rate differential between Australia and the US interest rates. Here, we take the difference between the 90 day bank bill rate in Australia and the 3-month bank accepted bill rate in the United States. Quarterly historical interest rate data is sourced from the Reserve Bank of Australia.

The final driver is the VIX volatility index. This measures volatility of the US sharemarkets, with the rationale being that a lower level of market volatility increases investor's confidence, and causes them to look outside the US when investing, lowering the US$. This variable has had considerable swings and effects on the exchange rate over time, although when forecasting we assume it returns to its long-term average level, thus reducing the effect on the exchange rate forecast.

Table A1: Exchange Rate Model - Eviews

Dependent Variable: LOG(AUD_USD)
Method: Least Squares
Date: 09/22/14 Time: 09:54
Sample: 1990Q1 2014Q2
Included observations: 98
LOG(AUD_USD)=C(1)+C(2)*_90_DAY_NOM+C(3)*LOG(COMMODITY_PRICES)+C(4)*VIX

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-1.185328	0.068760	-17.23861	0.0000
C(2)	0.015122	0.005288	2.859810	0.0052
C(3)	0.277553	0.018740	14.81050	0.0000
C(4)	-0.007468	0.001234	-6.053642	0.0000

R-squared	0.775247	Mean dependent var	-0.287379
Adjusted R-squared	0.768074	S.D. dependent var	0.183215
S.E. of regression	0.088234	Akaike info criterion	-1.977690
Sum squared resid	0.731811	Schwarz criterion	-1.872182
Log likelihood	100.9068	Hannan-Quinn criter.	-1.935014
F-statistic	108.0787	Durbin-Watson stat	0.230934
Prob(F-statistic)	0.000000		

All commodity forecasts are converted into Australian dollars using BIS Shrapnel's in-house methodology as described above. This is used instead of forward exchange rates from the Chicago Mercantile Exchange (CME). There are two primary reasons for this:

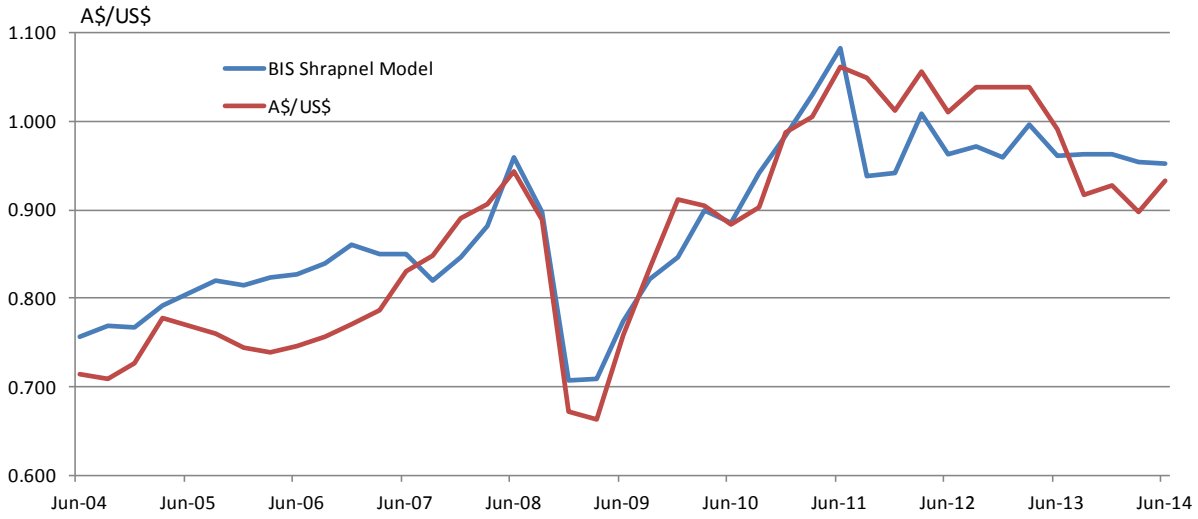
- It is difficult to track the historical accuracy of CME futures, also making it difficult to place weight on current expectations.
- BIS Shrapnel's exchange rate model is explicitly included in the report above. It is a simple model, and the resulting forecasts can be readily quantified in terms of the drivers that caused the results. We believe this makes it a more transparent and reproducible forecast than the market-driven CME futures. As shown in charts B.1 and B.2, the model has a high degree of accuracy, which provides a level of confidence for future forecasts.

Interpretation of the model

The outputs of the model can be interpreted as follows:

- A 1 point increase in the interest rate differential will increase the value of the Australian dollar by 1.5 per cent. For example, if Australian interest rates rise by 1 percentage point while US interest rates remain constant, the Australian dollar will rise by 1.5 per cent.
- A 1 per cent increase in the commodity price index will increase the value of the Australian dollar by 0.27 per cent. For example, if the commodity price index rises by 10 per cent, the value of the Australian dollar will rise by 2.7 per cent.
- A 1 point increase in the value of the VIX volatility index will decrease the value of the Australian dollar by 0.7 per cent. Note, however, that this variable is assumed to trend toward its long term historical average, and therefore has no impact on forecast values of the Australian dollar.

Chart B.2: BIS Shrapnel Exchange Rate Model



APPENDIX C: ELECTRICITY NETWORK RELATED MATERIALS FORECAST METHODOLOGY

Steel, Aluminium, Copper, Zinc and Oil

Steel, Aluminium, Copper, Zinc and Oil price forecasts are derived from the Consensus Economics Energy & Metals Consensus Forecasts publication.

This publication provides price forecasts measured in US$ per metric tonne. Quarterly forecasts are provided for two financial years, followed by calendar year forecasts for the next three years. Long term forecasts are provided by a five-year average. We assume a constant growth rate beyond the final annual forecast to yield annual forecasts over the remaining five year period (i.e. for the 2020 to 2024 period).

These forecasts, which are denominated in US$, are then converted into Australian dollars. Due to the lack of authoritative forecasts over the long term, we apply BIS Shrapnel's internal exchange rate forecasts. Details of our methodology can be found in appendix B.

Concrete

Historical concrete prices are sourced from the Australian Bureau of Statistics (ABS), publication 6427 Producer Price Indexes, Cement, Concrete and Sand series. This series is used as a proxy for concrete prices because it is available at the State level (i.e. Victoria). Prices tend to track demand for Concrete, Cement and Sand products, which primarily arises from the construction industry. Specifically, key sectors which support demand for, and therefore drive prices of concrete include Engineering Construction, Residential Building and Non-Residential Building.

BIS Shrapnel provides detailed forecasts of each of these industries in existing reports.[2]

The summation of each of these industries, yielding total construction in Australia (and Victoria), is used as the key driver to forecast future movements in concrete prices. These relationships are shown in chart 6.4.

Wood

Wood prices can be particularly volatile from year to year. This is because of a number of variables that directly influence the price of wood, that are unable to be forecast in a quantitative manner. Specific to the wood (pole) industry, these include issues such as royalty payments and quota systems.

As a result, we are unable to create an econometric model that provides forecasts of wood prices. Rather, we believe that price forecasts can be derived from developing an in-depth understanding of the timber market in Australia. To provide this, there are a number of key variables which we focus on, and which are used to help shape our forecasts. These include:

- Supply side drivers. Because of the length of time taken to grow the native forest trees suitable for poles, supply is essentially fixed over the outlook period considered here.
- Demand side drivers. Because of the presence of a quota for wood designated for poles, our understanding is that the wood can be used across various other platforms. The wood used is hardwood, which is primarily used for structural applications or for flooring, meaning that the building industry cycle is a key source of demand.

[2] *Engineering Construction in Australia, 2013/14 to 2027/28*, and *Building in Australia, 2014 to 2029*.

- Although the wood used by the distributors is 100 per cent domestically produced, hardwood is also imported from North America and Asia. Despite not being used by the distributors, these imports can still have an effect on Australian prices, by changing the relative competitiveness. A strong Australian dollar makes imported products more competitive, and may lower demand levels for domestic produce, and vice versa. The value of the Australian dollar is therefore taken into account when analysing movements in wood prices.

Historical wood prices are sourced from the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES). The series we believe to be most relevant is the Australian Domestic Hardwood – Structural, from *the Australian Forest and Wood Products Statistics, September/December Quarters 2013* publication.

Non-Hydro Electricity Construction IPD

The Non-Hydro Electricity Implicit Price Deflator is sourced from the Australian Bureau of Statistics Engineering Construction in Australia Survey (catalogue number 8762). The IPD is calculated implicitly by dividing current price estimates of activity by a constant price series generated by the Australian Bureau of Statistics and is therefore considered to be an output index. The Non-Hydroelectricity Implicit Price Deflator is available at the national level only.

The components of the Non-Hydro Electricity IPD are as follows:

- Construction Wages (20 per cent)
- Electric Cable and Wire Manufacturing PPI (30 per cent)
- Power Transformers PPI (30 per cent)
- Steel Beams and Sections PPI (10 per cent)
- Other Electrical Equipment PPI (10 per cent)

These items are typically sourced from the Producer Price Index survey (ABS catalogue number 6427) and the Average Weekly Earnings survey (ABS catalogue number 6302). These components are regularly forecast individually by BIS Shrapnel, and are summated to recreate and forecast the ABS series. Note that BIS Shrapnel's re-creation of the IPD using these components is essentially an input index, whereas the ABS engineering IPD is an output index. The difference between the two likely represents margins along the supply chain, and this is incorporated into the final Non-Hydro Electricity Construction Index forecast.

APPENDIX D: TERMS OF REFERENCE

1. BACKGROUND

Jemena Electricity Networks (Vic) Ltd (**JEN**) is an electricity distribution network service provider in Victoria. JEN supplies electricity to approximately 300,000 homes and businesses through its 10,285 kilometres of distribution system. JEN's electricity distribution system services 950 square kilometres of northwest greater Melbourne. JEN's electricity network is maintained by infrastructure management and services company, Jemena Asset Management Pty Ltd (**JAM**).

United Energy (**UE**) distributes electricity to more than 640,000 customers across east and south-east Melbourne and the Mornington Peninsula. UE manages a network of 209,000 poles and over 13,000 kilometres of wires, and ninety per cent of its customers are residential. Electricity is received via 78 sub transmission lines at 46 zone stations, where it is transformed from sub transmission voltages to distribution voltages.

JEN and UE are currently preparing their Electricity Distribution Pricing Review submissions to be submitted to the Australian Energy Regulator (**AER**) on 30 April 2015 (**Regulatory Proposal**). The Regulatory Proposal will cover the regulatory period from 1 January 2016 to 31 December 2020.

In approving JEN's and UE's Regulatory Proposals, the AER must have regard to the National Electricity Objective (as per section 7 of the National Electricity Law):

"to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to:

(a) price, quality, safety, reliability and security of supply of electricity; and

(b) the reliability, safety and security of the national electricity system."

The AER may also take into account the revenue and pricing principles in section 7A(2) of the National Electricity Law, and must do so when considering whether to approve a reference tariff:

"A regulated network service provider should be provided with a reasonable opportunity to recover at least the efficient costs the operator incurs in:

(a) providing direct control network services; and

(b) complying with a regulatory obligation or requirement or making a regulatory payment."

Some of the key National Electricity Rules that JEN and UE must comply with in submitting its Regulatory Proposals are set out below.

Clause 6.5.6(c) of the National Electricity Rules:

> The AER must accept the forecast of required operating expenditure of a Distribution Network Service Provider that is included in a building block proposal if the AER is satisfied that the total of the forecast operating expenditure for the regulatory control period reasonably reflects:
>
> 1. the efficient costs of achieving the operating expenditure objectives; and
>
> 2. the costs that a prudent operator would require to achieve the operating expenditure objectives; and
>
> 3. a realistic expectation of the demand forecast and cost inputs required to achieve the operating expenditure objectives.

Clause 6.5.7(c) of the National Electricity Rules:

> The AER must accept the forecast of required capital expenditure of a Distribution Network Service Provider that is included in a building block proposal if the AER is satisfied that the total of the forecast capital expenditure for the regulatory control period reasonably reflects:
>
> 1. the efficient costs of achieving the capital expenditure objectives; and
>
> 2. the costs that a prudent operator would require to achieve the capital expenditure objectives; and
>
> 3. a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.

2. SCOPE OF WORK

The Expert will provide an opinion report that:

1. describes the global, Australian and Victorian macroeconomic and industry context and outlook over the 2014–2020 period, including forecast movements in exchange rates, inflation, and growth;

2. describes what real input cost escalation is and how it applies to expenditure (or cost) forecasting;

3. assesses whether real input cost escalators are relevant for forecasting capital and operating expenditure for an electricity distribution network and, if so:

    a. identifies what escalators are relevant and explains why;

    b. identifies the drivers behind each escalator and how these should be taken into account when forecasting them;

4. recommends and describes the best method or methods for forecasting each relevant real input cost escalator (identified under 3) that are likely to provide efficient costs when used to forecast capital and operating expenditure;

5. uses this method or methods to forecast each relevant cost escalator (identified under 3), by calendar year, over 2014–2020 and compare these to historical real cost changes over 2011–2013, clearly explaining:

    a. the properties of each forecast, including the date made, the data used, and the purpose it was made for;

    b. how each forecast relates to the macroeconomic and industry context and outlook (described in 1);

In preparing the opinion, the Expert should:

A. consider all relevant cost escalators including (but not limited to):

    i. labour costs for both enterprise bargaining agreement (EBA) and non-EBA staff; and by pay-setting method;
    ii. IT software and hardware costs;

    iii. contractor costs;

    iv. copper prices;

    v. steel prices;

vi. aluminium prices;

vii. wood prices;

viii. concrete prices.

B. consider whether carbon prices affects real input cost escalators and whether these are likely to over the 2014–2020 forecast period;

C. consider any comments made by the AER, other regulators, or their consultants, including (but not limited to) (i) on which real input cost escalators are relevant and (ii) how best to forecast each relevant escalator;

D. use robust method and data.

3. OTHER INFORMATION TO BE CONSIDERED

The Expert is also expected to consider the following additional information:

1. such information that, in Expert's opinion, should be taken into account to address the questions outlined above;

2. relevant published research literature;

3. relevant government decisions on energy policy and policy implementation;

4. relevant historical regulatory decisions, including the AER's final determination for other Victorian Electricity distribution businesses;

5. reviews of market trends and consumer behaviour; and

6. any other matters that the Expert considers relevant.

7. JEN's and UE's energy demand and energy consumptions.

4. DELIVERABLES

At the completion of its review the Expert will provide an independent expert report containing real cost escalation forecasts for the period 1 January 2016 to 31 December 2020, which such report is to be fit for submission by JEN and UE as part of its Regulatory Proposals to the AER, and without limitation must:

- be of a professional standard capable of being submitted to the AER;

- clearly set out all findings and the reasons for those findings, justifies the methodology applied, separates facts from opinions, and explains all the assumptions made to provide the real cost escalation forecasts;

- explains how and why the forecasts are fit for submission to the AER as part of JEN's and UE's Regulatory Proposals for the regulatory period from 1 January 2016 to 31 December 2020, including an assessment that the forecasts comply with relevant requirements of the National Electricity Law and the National Electricity Rules;

- contains a section summarising the Expert's experience and qualifications, and attaches the Expert's curriculum vitae (preferably in a schedule or annexure);

- identifies any person and their qualifications, who assists the Expert in preparing the report or in carrying out any research or test for the purposes of the report;

- summarises JEN's instructions and attaches these term of reference;

- includes an executive summary which highlights key aspects of the Expert's work and conclusions, and;

- (without limiting the points above) carefully sets out the facts that the Expert has assumed in putting together his or her report, as well as identifying any other assumptions made, and the basis for those assumptions.

The Expert is to provide an electronic (Excel) version of its model(s) used to derive all real cost escalation price changes, including any proprietary model(s) provided by a third party. These models should contain all input data with linkages to the outputs, so that a layperson can determine how the output real cost escalation price changes for any given direct or indirect input can be traced back to the input data.

Use of the report

It is intended that the Expert's report will form part of JEN's and UE's Regulatory Proposals for the regulatory period from 1 January 2016 to 31 December 2020. The report may be provided by the AER to its own advisers. The report must be expressed so that it may be relied on by JEN, UE and the AER. The Expert agrees that the Intellectual Property Rights developed or created by the Expert in performing the services (as described in this document) to JEN and UE (including the development and preparation of the report) (whether by the Expert, its related bodies corporate, its employees, contractor or agents) (**Developed IP**) will from the date that the Developed IP is developed or created will be owned by and vest in JEN and UE.

"**Intellectual Property Rights**" means all present and future rights conferred by Law or in relation to any copyright, trademarks, designs, patents, circuit layouts, plant varieties, business and domain names and other results of intellectual activity in the industrial, commercial, scientific, literary or artistic fields whether or not registrable, registered or patentable.

The AER may ask queries in respect of the report and the Expert will be required to assist JEN and UE in answering these queries. In addition, the AER may choose to interview the Expert and, if so, the Expert will be required to participate in any such interview.

The report will also be reviewed by JEN's and UE's legal advisers to provide legal advice to JEN and UE about its rights and obligations under the National Electricity Law and the National Electricity Rules. The Expert will be required to work with JEN's and UE's legal advisors and personnel to assist them to prepare JEN's and UE's Regulatory Proposals and submissions in response to the draft and final decisions made by the AER.

If JEN and / or UE choose to challenge any decision made by the AER in relation to the Regulatory Proposal that appeal will be made to the Australian Competition Tribunal and the Expert's report may be considered by the Tribunal. JEN and / or UE may also seek review by a court and as such the report may be subject to consideration by that court. The Expert should therefore be conscious that the report may be considered as part of these processes, including in connection with the review of a dispute between the AER, JEN or UE as to the appropriate level of JEN's and UE's distribution tariffs and / or forecast operating and capital expenditure over the regulatory period from 1 Jan 2016 to 31 Dec 2020. Due to this, in carrying out the requirements of these terms of reference, JEN and UE require that the Expert comply with the Federal Court requirements for expert reports, which are set out in Attachment A.

The Expert must be available to assist JEN and UE in connection with the work defined in the scope of works (Section 2), until such time as the Regulatory Proposal, including subsequent appeals (if any), is finalised.

Compliance with the code of conduct for expert witnesses

Attachment G is a copy of the Federal Court's Practice Note CM 7, entitled "Expert Witnesses in Proceedings in the Federal Court of Australia", which comprises the code of conduct for expert witnesses in the Federal Court of Australia (the Code of Conduct).

The Expert is required to be familiar with the Code of Conduct and comply with it at all times in the course of the engagement by JEN and UE. In particular, the expert report prepared for JEN and UE should contain a statement at the beginning of the report to the effect that the author of the report has read, understood and complied with the Code of Conduct.

In particular, the report should contain particulars of the timing, study or experience by which the Expert has acquired specialised knowledge. The report should also state that each of the Expert's opinions is wholly or substantially based on the Expert's specialised knowledge.

It is also a requirement that the report be signed by the Expert and a declaration that:

"[the expert] has made all the enquires which [the expert] believes are desirable and appropriate and that no matters of significance which [the expert] regards as relevant have, to [the expert's] knowledge, been withheld from the report."

As noted previously, JEN and UE require a copy of these terms of reference to be attached the Expert's report, as well as copies of the curriculum vitae of each of the report's authors.

5. CONFLICTS

The Expert is to promptly identify and disclose any current or future realised or potential conflicts of interest.

6. RESPONSE TO THESE TERMS OF REFERENCE

The Expert is to propose:

- The approach and timeframes that the Expert will use to develop the escalation forecasts;
- The staff who will provide the strategic analysis/modelling and advice;
- A fixed total cost of delivering the scope of work set out in these terms of reference, and hourly rates for the proposed project team should additional work be required beyond those items specified in Section 2 (for example, in the event that the AER has queries in relation to the Expert's report, or requires an interview); and
- The Expert is also to indicate its preparedness to enter into JEN's and UE's standard form confidentiality agreement for the EDPR project, which will apply to information provided by JEN and UE in connection with the work required under these terms of reference, as well as information generated by the Expert in carrying out the scope of works (Section 2).

7. TIMETABLE

The Expert will deliver its required output to JEN and UE as follows:

An initial version of the real cost escalation forecasts must be delivered to JEN and UE by 23 Jul 2014 in order to inform the budget forecasts for capital and operating expenditure.

The final outputs, for the purpose of submission in JEN's and UE's Regulatory Proposals must be delivered as follows:

- updated real cost escalation forecasts 6 Aug 2014; and
- final written report 6 Aug 2014.

8. TERMS OF ENGAGEMENT

The terms on which the Expert will be engaged to provide the requested advice shall be as provided in accordance with arrangement as set out in Attachment 2.

APPENDIX E: 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 F: CURRICULUM VITAES OF KEY PERSONNEL

Richard Robinson, B.Comm (Hons),
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).

Kishti Sen, B.A., M.Ec. (Hons), Ph.D.
Senior Economist

Kishti works across both the Economics and Infrastructure and Mining units at BIS Shrapnel. As a senior economist, Kishti contributes to the formulation of BIS Shrapnel's economic forecasts, at the Australia, State, and industry level. In addition, he is a contributing author for BIS Shrapnel's subscriptions services including Economic Outlook, Long Term Forecasts and Engineering Construction in Australia.

As a consulting economist, Kishti has advised blue-chip clients in the Mining, Construction and Utilities industries, investment banks, private equity firms, industry associations and trade unions.

Prior to joining BIS Shrapnel, Kishti worked as a Senior Economist at the Reserve Bank of Fiji where he managed the Policy and Research Team. He was also a senior member of the Bank's monetary policy advisory committees. Kishti holds a PhD in Economics from the University of Sydney and has special interest in labour economics, cost escalation, benefit-cost assessments and econometric modelling.

Daniel Gradwell, B.Com (Hons, Economics)
Economic Analyst

Daniel joined BIS Shrapnel in 2010, and works across both the Economics and Infrastructure and Mining units. Since joining the company, Daniel has worked on a number of projects, including contributing to the analysis and forecasting of the Economic department's Long Term Forecasts report, forecasting construction and maintenance activity for the Maintenance in Australia and Engineering Construction in Australia reports respectively, and project managing the Road Construction in Australia and Road Maintenance in Australia publications. Daniel has also contributed to several cost escalation reports for private clients in the utilities and mining sectors.

Daniel achieved First Class Honours in Economics at the University of Otago, New Zealand.

APPENDIX G: FEDERAL COURT PRACTICE NOTE

FEDERAL COURT OF AUSTRALIA

Practice Note CM 7

EXPERT WITNESSES IN PROCEEDINGS IN THE FEDERAL COURT OF AUSTRALIA

Commencement

1. This Practice Note commences on 4 June 2013.

Introduction

2. Rule 23.12 of the Federal Court Rules 2011 requires a party to give a copy of the following guidelines to any witness they propose to retain for the purpose of preparing a report or giving evidence in a proceeding as to an opinion held by the witness that is wholly or substantially based on the specialised knowledge of the witness (see **Part 3.3 - Opinion** of the Evidence Act 1995 (Cth)).

3. The guidelines are not intended to address all aspects of an expert witness's duties, but are intended to facilitate the admission of opinion evidence[3], and to assist experts to understand in general terms what the Court expects of them. Additionally, it is hoped that the guidelines will assist individual expert witnesses to avoid the criticism that is sometimes made (whether rightly or wrongly) that expert witnesses lack objectivity, or have coloured their evidence in favour of the party calling them.

Guidelines

1. **General Duty to the Court**[4]

1.1 An expert witness has an overriding duty to assist the Court on matters relevant to the expert's area of expertise.

1.2 An expert witness is not an advocate for a party even when giving testimony that is necessarily evaluative rather than inferential.

1.3 An expert witness's paramount duty is to the Court and not to the person retaining the expert.

2. **The Form of the Expert's Report**[5]

2.1 An expert's written report must comply with Rule 23.13 and therefore must

(a) be signed by the expert who prepared the report; and
(b) contain an acknowledgement at the beginning of the report that the expert has read, understood and complied with the Practice Note; and
(c) contain particulars of the training, study or experience by which the expert has acquired specialised knowledge; and
(d) identify the questions that the expert was asked to address; and
(e) set out separately each of the factual findings or assumptions on which the expert's opinion is based; and
(f) set out separately from the factual findings or assumptions each of the expert's opinions; and
(g) set out the reasons for each of the expert's opinions; and
(ga) contain an acknowledgment that the expert's opinions are based wholly or substantially on the specialised knowledge mentioned in paragraph (c) above[6]; and
(h) comply with the Practice Note.

2.2 At the end of the report the expert should declare that "[the expert] has *made all the inquiries that* [the expert] *believes are desirable and appropriate and that no matters of significance that*

[3] As to the distinction between expert opinion evidence and expert assistance see *Evans Deakin Pty Ltd v Sebel Furniture Ltd* [2003] FCA 171 per Allsop J at [676].
[4] The "*Ikarian Reefer*" (1993) 20 FSR 563 at 565-566.
[5] Rule 23.13.
[6] See also *Dasreef Pty Limited v Nawaf Hawchar* [2011] HCA 21.

[the expert] *regards as relevant have, to* [the expert's] *knowledge, been withheld from the Court*."

2.3 There should be included in or attached to the report the documents and other materials that the expert has been instructed to consider.

2.4 If, after exchange of reports or at any other stage, an expert witness changes the expert's opinion, having read another expert's report or for any other reason, the change should be communicated as soon as practicable (through the party's lawyers) to each party to whom the expert witness's report has been provided and, when appropriate, to the Court[7].

2.5 If an expert's opinion is not fully researched because the expert considers that insufficient data are available, or for any other reason, this must be stated with an indication that the opinion is no more than a provisional one. Where an expert witness who has prepared a report believes that it may be incomplete or inaccurate without some qualification, that qualification must be stated in the report.

2.6 The expert should make it clear if a particular question or issue falls outside the relevant field of expertise.

2.7 Where an expert's report refers to photographs, plans, calculations, analyses, measurements, survey reports or other extrinsic matter, these must be provided to the opposite party at the same time as the exchange of reports[8].

3. Experts' Conference

3.1 If experts retained by the parties meet at the direction of the Court, it would be improper for an expert to be given, or to accept, instructions not to reach agreement. If, at a meeting directed by the Court, the experts cannot reach agreement about matters of expert opinion, they should specify their reasons for being unable to do so.

J L B ALLSOP
Chief Justice

4 June 2013

[7] The *"Ikarian Reefer"* [1993] 20 FSR 563 at 565

[8] The *"Ikarian Reefer"* [1993] 20 FSR 563 at 565-566. See also Ormrod *"Scientific Evidence in Court"* [1968] Crim LR 240

