2013-2017 Gas Access Arrangement Review –

Access Arrangement Information

Appendix 5F:

BIS Shrapnel –

Real Cost Escalation Forecasts to 2017

Submitted 30 March 2012

SP AusNet

Real Cost Escalation Forecasts to 2017 – Victoria and New South Wales

Prepared by BIS Shrapnel for the Victorian Gas Distributors – Envestra Limited, SP-AusNet and Multinet Gas Pty Limited

NOVEMBER 2011

ECONOMICS

BIS Shrapnel
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: E5579

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SUMMARY

- BIS Shrapnel was engaged by Envestra Limited, SP-AusNet and Multinet Gas Pty Limited to provide an expert opinion regarding the outlook for a range of labour, materials and contractor cost escalators relevant to gas networks in Victoria and NSW over the six year period from 2012 to 2017 inclusive. Table 1 presents a summary of the annual escalation (in year average terms) for the relevant escalators in both nominal and real terms. The latter is adjusted for the RBA's/Commonwealth Treasury forecasts of CPI inflation which is projected to average 2.8 per cent over the six years to 2017.

- The report provides both AWOTE and LPI escalators for network-related labour (electricity, gas and water (EGW)) – which include a range of skilled labour involved in construction, maintenance, design and operation of the gas networks. As around 80 per cent of employees in the EGW sector receive their pay increases via collective agreements, which run for around three years, the industrial relations strength of unions in the sector and recent inflation outcomes and inflationary expectations are key influences for wages. EGW wages are forecast to strengthen over the three years to 2013/14 as the demand for labour in the EGW sector, construction, mining and manufacturing sectors (the latter three sectors compete with EGW for similarly skilled labour) all pick-up as the economy and investment recover solidly.

- BIS Shrapnel considers the labour price index (LPI) to be a measure of *underlying* wage inflation in the economy or in a specific industry, as the LPI only measures changes in the *price* of labour, or wage rates, for specific occupations or job classifications, which are then aggregated into a measure of the collective variations in wage *rates* made to the current occupants of the *same* set of specific jobs. The LPI, therefore, reflects pure price changes, but does not measure variations in the quality or quantity of work performed. The LPI also does not reliably measure the changes in total labour costs which a particular enterprise or organisation incurs, because the LPI does not reflect the changes in the skill levels of employees within an enterprise or industry. As skills are acquired, employees will be promoted to a higher grade or job classification, and with this promotion will move onto a higher base pay. So the change in the cost of labour over, say a year, includes increases in the base pay rates (which the LPI measures) and the higher average base pay level. The AWOTE captures both these elements, while the LPI only captures the first element. Basically, promoting employees to a higher occupation does not necessarily show up in the LPI, but the employer's total wages bill (and average unit labour costs) is higher, as is AWOTE.

- AWOTE is a better measure of the change in overall costs per employee, because it takes into account movements of employees to higher grades, changes in compositional effects from entry/exits of higher skilled/lower skilled (i.e. higher paid/lower paid) workers in an enterprise or industry, and also the payments *above* base rates of pay, such as bonuses, incentives, penalty rates and other allowances that are a *normal* part of an employees earnings over the quarter or year. With regard to the latter, many enterprises in the utilities (and other industry) sectors(s) regularly include bonuses or incentive payments which are linked to a range of objectives, such as up skilling, additional training, productivity targets, safety targets, etc. These 'extra' payments — or changes in the quantum of payments — are not included in changes in the LPI, but can make a material difference to an enterprise's overall labour costs.

- Despite the limitations of the LPI, the Australian Energy Regulator has previously indicated a preference for the LPI, largely because of the volatility of AWOTE caused by 'significant' compositional problems with AWOTE. BIS Shrapnel believes AWOTE is a better measure

of the change in overall costs per employee, because it takes into account movements in employees to higher grades changes in compositional effects from entry/exits of higher skilled/lower skilled (i.e. higher paid/lower paid) workers in an enterprise or industry. In addition, as mentioned, AWOTE also includes payments *above* base rates of pay, such as bonuses, incentives, penalty rates and other allowances that are a *normal* part of an employees earnings over the quarter or year. In this report we provide (for comparison purposes) forecasts of both the LPI and AWOTE.

- Overall, BIS Shrapnel expects nominal labour cost growth in the electricity, gas and water ('utilities') sector for total Australia — expressed in AWOTE terms — will average 5.8 per cent per annum (0.7 percentage points higher than the national 'All Industries' LPI average of 5.1 per cent per annum) over the six years from 2012 to 2017 inclusive. Underlying wages growth in the national utilities sector — expressed in LPI terms — is forecast to average 5.0 per cent per annum over the six years to 2017, 0.6 per cent higher on average than the national all industries average of 4.4 per cent per annum. The faster wages growth expected in the electricity, gas and water sector over the next six years is in line with historical movements in both AWOTE and the LPI over the past six years.

- Utilities wages growth in Victoria is forecast to average 5.5 per cent per annum (in AWOTE terms) over the six years from 2012 to 2017, 0.3 percentage points lower than the national utilities AWOTE average of 5.8 per cent per annum, while Victorian utilities LPI growth is forecast to average 4.7 per cent p.a. (also 0.3 per cent lower than the national utilities average of 5.0 per cent per annum) over the six years from 2012 to 2017 inclusive. The weaker utilities wages growth in Victoria is due to Victoria's lower exposure to the resources investment boom (compared to Queensland and Western Australia in particular), the comparative weakness of the state's construction sector (compared to total Australia) and the comparative weaker growth in Victorian utilities-related engineering construction. This means a lower relative demand for similarly-skilled labour from the state's construction and mining sectors and within the states utilities sector, compared to other states and therefore slower wages growth compared to the national utilities average.

- Utilities wages growth in NSW is forecast to average 5.6 per cent per annum (in AWOTE terms) over the six years from 2012 to 2017, 0.2 percentage points lower than the national utilities AWOTE average of 5.8 per cent per annum, while the NSW utilities LPI is forecast to average 4.9 per cent p.a.(slightly lower than the national utilities average of 5.0 per cent p.a,) over the six years from 2012 to 2017 inclusive. Similar to Victoria, NSW is also expected to derive less benefit from the resources investment boom than Queensland and Western Australia. However, strong growth in coal-related investment and potential coal-seam gas projects will see pressure from the state's mining sector for similarly-skilled labour. Meanwhile, the NSW construction sector is forecast to exhibit stronger growth than the national (construction) average, with utilities-related engineering construction also stronger than the national average over the six years to 2017.

- Envestra Limited, SP-AusNet and Multinet Gas Pty Limited's 'general labour' includes mainly clerical/ administration, professionals and managerial staff, who provide administration and corporate support services. The escalator which BIS Shrapnel used for 'General Labour' was wage movements in Victoria and NSW for the Administration and Support Services (ASS) sector — which includes labour units mainly engaged in performing routine support activities for day-to-day operations of other businesses and organisations; and Professional, Scientific and Technical Services (PSTS) which, as the name suggests, includes business units mainly engaged in providing professional, scientific and technical services including engineering, law, accountancy, management and other consultancy.

- Discussions with Envestra, SP-AusNet and Multinet Gas staff have indicated that 80 per cent of the distributors general labour belongs to the PSTS sector with the remaining 20 per cent providing mainly administrative and support services. We applied these proportions to the Victoria and NSW PSTS and the ASS industry sectors to derive a weighted average escalator for 'general labour' for Envestra, SP-AusNet and Multinet Gas. Wages growth in the PSTS and ASS sectors, at the national level, picked up (in LPI terms) over 2010 and early 2011 following the ending of wage freezes in early 2010. With strong demand for labour in 2009/10 continuing into 2010/11 and 2011/12 (although easing this year due to the current soft patch), wages growth is expected to strengthen further in 2012 (in both LPI and AWOTE terms). The weighted 'general labour' escalator (in AWOTE terms) for both Victoria and NSW, on average, is expected to be weaker than the national (PSTS) average over the next six years as the Australian PSTS wages is expected to be boosted by robust growth in PSTS wages in strong mining states such as Queensland and WA.

- As most contractor labour is assumed to undertake construction or maintenance related projects, they would be classified to the construction sector. Accordingly, the escalator used for contractor labour is Construction sector wages growth. Our research has shown that construction activity (i.e. work done in the sector) normally has a strong influence on construction wages. BIS Shrapnel's forecasts of construction activity by state (which includes residential and non-residential building, plus engineering construction) were used to derive the wages forecasts.

- We believe engineering construction in Victoria will decline over 2011/12 and 2012/13, as work is progressively completed on the desalination plant, major sewerage infrastructure and the current round of pipelines, oil and gas investments. Non-residential building will continue to decline, with the end of stimulus spending causing steep declines in schools construction and, later, health and other social and institutional buildings and more than offsetting a recovery in commercial and industrial building. Dwelling building is also forecast to decline over 2012/13 to 2014/15 with the deficiency of stock predominately eliminated by June 2013. Accordingly, construction wages growth is expected to be weaker over the next six years. We expect construction wages (in AWOTE terms) to average 5.6 per cent per annum over the 2012 to 2017 period compared to the 8.0 per cent per annum average achieved in the second half of the previous decade.

- In contrast, NSW construction wages over the next six years are expected to be stronger. After underperforming the Australian average for most of the last decade, the NSW economy is on the cusp of recording moderate to solid growth over the next two years. And this will predominantly be driven by a relatively buoyant construction sector. Private dwelling construction will be the initial driver, followed by a new round of private infrastructure projects and industrial and commercial building. NSW construction wages will follow the recovery in dwelling construction and the improvement in total construction. Construction wages (in AWOTE terms) is expected to peak at 7.8 per cent in 2013 before easing in line with a moderation in total construction activity.

- We forecast that productivity growth in the Utilities sector will remain weak over the next six years. Going forward, we believe demand and output growth will be constrained in this sector for three key reasons: (1) Higher utilities prices (including the possibility of a carbon tax) will keep demand muted, (2) population growth will be slower over the next five years and (3) with the government announcing its intention to place a price of carbon, we do not expect a significant jump in energy intensive projects, such as aluminium smelters. This will further contain demand for energy in the future. In addition, our forecasts assume moderate and fairly stable growth in employment in Australia and the states beyond 2011. The

Table 1: Summary – Forecasts of Wage, Materials and Contractor Escalators

(percent change, year average, year ended December)

	2010	2011e	2012	2013	2014	2015	2016	2017	2012-2017 (k)
	Actuals	Forecasts							
NOMINAL PRICE CHANGES									
1. Gas Network related Labour									
EGW AWOTE - Victoria (a)	**18.2**	**9.3**	**5.0**	**5.8**	**5.5**	**5.6**	**5.5**	**5.4**	**5.5**
EGW LPI - Victoria (a)	**3.6**	**4.3**	**4.5**	**4.8**	**4.7**	**4.6**	**4.5**	**4.9**	**4.7**
EGW AWOTE - New South Wales (b)	**8.5**	**6.1**	**5.7**	**5.8**	**5.3**	**5.6**	**5.7**	**5.6**	**5.6**
EGW LPI - New South Wales (b)	**3.9**	**3.5**	**4.9**	**5.0**	**4.8**	**4.7**	**4.8**	**5.0**	**4.9**
EGW AWOTE - Australia (b)	9.8	7.3	5.6	5.9	5.7	5.8	5.8	5.8	5.8
EGW LPI - Australia (b)	4.7	4.1	4.9	5.3	5.0	4.9	4.9	5.2	5.0
2. General Labour									
Weighted Index AWOTE- Victoria (c)		**-1.1**	**5.3**	**5.7**	**5.7**	**5.0**	**5.2**	**6.0**	**5.5**
Weighted Index LPI- Victoria (c)	**3.1**	**4.8**	**4.4**	**4.7**	**4.6**	**3.8**	**4.9**	**5.1**	**4.6**
Weighted Index AWOTE- New South Wales (c)		**5.9**	**4.7**	**6.0**	**6.1**	**5.3**	**5.3**	**6.2**	**5.6**
Weighted Index LPI - New South Wales (c)	**3.7**	**3.7**	**4.8**	**5.1**	**4.9**	**3.9**	**4.8**	**5.2**	**4.8**
PSTS AWOTE - Australia (b)	6.3	3.6	5.4	6.2	6.3	5.4	5.3	6.3	5.8
PSTS LPI - Australia (b)	3.6	4.3	4.9	5.1	5.1	3.8	5.0	5.3	4.9
ASS AWOTE - Australia (b)	4.8	-0.2	5.2	5.1	5.1	4.3	4.4	5.3	4.9
ASS LPI - Australia (b)	3.0	3.6	3.8	4.4	4.0	3.5	3.8	4.3	4.0
3. General Materials Prices									
General Materials Prices (d)	**2.8**	**3.5**	**3.5**	**3.3**	**2.7**	**2.5**	**2.5**	**2.5**	**2.8**
4. Gas Network Related Materials									
Crude Oil Price - CME Futures forecasts (g)	-0.8	0.8	-0.3	8.1	22.0	9.9	-1.5	9.3	7.9
Polyethylene Price - futures oil price (e),(g)	**0.2**	**1.3**	**0.8**	**5.9**	**14.2**	**6.9**	**0.0**	**6.5**	**5.7**
5. Contractor Escalation									
Construction AWOTE - Victoria	**5.4**	**0.5**	**5.7**	**6.3**	**5.8**	**4.9**	**5.0**	**5.8**	**5.6**
Construction LPI - Victoria	**4.7**	**4.5**	**4.9**	**5.0**	**4.6**	**4.0**	**4.5**	**5.3**	**4.7**
Construction AWOTE - New South Wales	**-1.4**	**1.9**	**4.6**	**7.8**	**6.6**	**5.4**	**5.3**	**5.9**	**5.9**
Construction LPI - New South Wales	**3.3**	**4.1**	**4.7**	**5.1**	**5.3**	**4.4**	**5.0**	**5.4**	**5.0**
Construction AWOTE - Australia (b)	6.5	4.9	5.7	6.9	6.8	5.4	5.3	6.1	6.0
Construction LPI - Australia (b)	3.3	4.2	5.4	5.8	5.4	4.3	4.9	5.5	5.2
Gas & Fuel Construction Price Index (h)	**-8.9**	**-1.7**	**5.5**	**6.9**	**5.7**	**2.6**	**1.2**	**2.2**	**4.0**
Engineering Construction Price Index (i)	*1.8*	*3.4*	*4.4*	*5.9*	*5.7*	*4.1*	*2.0*	*3.5*	4.3
Consumer Price Index (headline) (j)	2.8	3.5	3.5	3.3	2.7	2.5	2.5	2.5	2.8
REAL PRICE CHANGES									
1. Gas Network related Labour									
EGW AWOTE - Victoria (a)	**15.3**	**5.8**	**1.5**	**2.6**	**2.8**	**3.1**	**3.0**	**2.9**	**2.6**
EGW LPI - Victoria (a)	**0.8**	**0.8**	**1.0**	**1.6**	**2.0**	**2.1**	**2.0**	**2.4**	**1.8**
EGW AWOTE - New South Wales (b)	**5.7**	**2.6**	**2.2**	**2.6**	**2.6**	**3.1**	**3.2**	**3.1**	**2.8**
EGW LPI - New South Wales (b)	**1.1**	**0.0**	**1.4**	**1.7**	**2.1**	**2.2**	**2.3**	**2.5**	**2.0**
EGW AWOTE - Australia (b)	7.0	3.8	2.1	2.7	3.0	3.3	3.3	3.3	2.9
EGW LPI - Australia (b)	1.9	0.6	1.4	2.0	2.3	2.4	2.4	2.7	2.2
2. General Labour									
Weighted Index AWOTE- Victoria (c)		-4.6	1.8	2.5	3.0	2.5	2.7	3.5	**2.7**
Weighted Index LPI- Victoria (c)	**0.3**	1.3	0.9	1.4	1.9	1.3	2.4	2.6	**1.8**
Weighted Index AWOTE- New South Wales (c)		2.4	1.2	2.7	3.4	2.8	2.8	3.7	**2.8**
Weighted Index LPI - New South Wales (c)	**0.8**	0.2	1.3	1.8	2.2	1.4	2.3	2.7	**2.0**
PSTS AWOTE - Australia (b)	3.5	0.1	1.9	2.9	3.6	2.9	2.8	3.8	3.0
PSTS LPI - Australia (b)	0.8	0.8	1.4	1.9	2.4	1.3	2.5	2.8	2.1
ASS AWOTE - Australia (b)	1.9	-3.7	1.7	1.8	2.4	1.8	1.9	2.8	2.1
ASS LPI - Australia (b)	0.1	0.1	0.3	1.2	1.3	1.0	1.3	1.8	1.2
3. General Materials Prices									
General Materials Prices (d)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
4. Gas Network Related Materials									
Crude Oil Price - CME Futures forecasts	-3.6	-2.7	-3.8	4.8	19.4	7.4	-4.0	6.8	5.1
Polyethylene Price - futures oil pr (e),(g)	**-2.7**	**-2.2**	**-2.7**	**2.7**	**11.5**	**4.4**	**-2.5**	**4.0**	**2.9**
5. Contractor Escalation									
Construction AWOTE - Victoria	**2.6**	**-3.0**	**2.2**	**3.0**	**3.1**	**2.4**	**2.5**	**3.3**	**2.8**
Construction LPI - Victoria	**1.9**	**1.0**	**1.4**	**1.8**	**1.9**	**1.5**	**2.0**	**2.8**	**1.9**
Construction AWOTE - New South Wales	**-4.2**	**-1.6**	**1.1**	**4.5**	**3.9**	**2.9**	**2.8**	**3.4**	**3.1**
Construction LPI - New South Wales	**0.5**	**0.6**	**1.2**	**1.9**	**2.6**	**1.9**	**2.5**	**2.9**	**2.2**
Construction AWOTE - Australia (b)	3.7	1.4	2.2	3.7	4.1	2.9	2.8	3.6	3.2
Construction LPI - Australia (b)	0.5	0.7	1.9	2.5	2.7	1.8	2.4	3.0	2.4
Gas & Fuel Construction Price Index (h)	**-11.8**	**-5.2**	**2.0**	**3.6**	**3.0**	**0.1**	**-1.3**	**-0.3**	**1.2**
Engineering Construction Price Index (i)	-1.0	-0.1	0.9	2.7	3.0	1.6	-0.5	1.0	1.4

(a) Electricity, Gas & Water (EGW) Average Weekly Ordinary Time Earnings (AWOTE) and Labour Price Index (LPI) for Victoria and New South Wales
(b) Australian sector wage forecasts provided for comparison
(c) Weighted index of wages growth in Administrative and Support Services (ASS) and Professional, Scientific and Technical Services (PSTS)
(d) General Materials prices assumed to move in line with CPI
(e) We have used the A$ denominated US PPI (Producer Price Index) for Thermoplastic Resins and Plastic Materials as a proxy for Polyethylene Resin Prices.
(f) using BIS Shrapnel oil priced forecasts
(g) WTI prices are forecast from June CLM WTI contract prices, sourced from the Chicago Mercantile Exchange (CME)
(h) Gas Construction Price Index (Gas & Fuel Engineering Construction implicit price deflator)
(i) Engineering Construction Implicit Price Deflator for total Australia - alternative to Gas & Fuel Eng Const. IPD
(j) Headline CPI forecasts based on Reserve Bank of Australia forecasts to 2013 and then Commonwealth Treasury medium term projections
(k) For regulatory period. Average Annual Growth Rate for 2011/12 to 2017 inclusive

combination of muted output and moderate employment growth means productivity growth will remain weak for the utilities sector at the national as well as the state level over most of the current decade.

- The end result is that once nominal AWOTE is adjusted for CPI inflation and productivity movements, the real productivity adjusted AWOTE for EGW is forecast to average 2.7 per cent and 3.8 per cent per annum over the six years from 2012 to 2017 inclusive for the Victoria and NSW utilities sector, respectively.

Table 1b: Forecasts of Wage Escalators Adjusted for Productivity

(percent change, year average, year ended December)

	2010	2011e	2012	2013	2014	2015	2016	2017	2012-17
	Actuals	Forecasts							
PRODUCTIVITY GROWTH (l)									
EGW - Victoria	**0.1**	**-5.7**	**-0.1**	**-0.5**	**-3.8**	**-1.1**	**2.0**	**2.9**	**-0.1**
EGW - New South Wales	**-7.9**	**2.1**	**8.4**	**-3.0**	**-4.3**	**-2.6**	**-1.8**	**-3.0**	**-1.0**
EGW - Australia	-2.7	-3.6	1.9	-1.3	-2.3	-1.1	-0.4	-1.6	**-0.7**
Construction - Victoria	**-2.1**	**-1.9**	**-1.8**	**0.0**	**0.2**	**0.1**	**1.7**	**1.4**	**0.3**
Construction - New South Wales	**6.8**	**2.8**	**-1.6**	**0.4**	**-1.1**	**0.2**	**1.2**	**-0.2**	**-0.2**
Construction - Australia	1.1	2.0	1.6	1.1	-1.1	-0.8	1.1	0.2	**0.4**
NOMINAL PRICE CHANGES	Actuals	Forecasts							
NOMINAL ADJUSTED PRODUCTIVITY									
1. Gas Network related Labour (m)									
EGW AWOTE - Victoria	**18.1**	**15.0**	**5.1**	**6.3**	**9.3**	**6.7**	**3.6**	**2.5**	**5.6**
EGW LPI - Victoria	**3.6**	**9.9**	**4.6**	**5.3**	**8.6**	**5.7**	**2.5**	**2.0**	**4.8**
EGW AWOTE - New South Wales	**16.4**	**4.0**	**-2.7**	**8.9**	**9.6**	**8.1**	**7.5**	**8.5**	**6.7**
EGW LPI - New South Wales	**11.8**	**1.4**	**-3.5**	**8.0**	**9.1**	**7.3**	**6.5**	**7.9**	**5.9**
EGW AWOTE - Australia	12.5	10.9	3.7	7.1	8.0	6.8	6.3	7.4	6.5
EGW LPI - Australia	7.4	7.7	3.0	6.5	7.3	6.0	5.3	6.8	5.8
2. General Labour (m)									
Weighted Index AWOTE- Victoria		**4.6**	**5.4**	**6.2**	**9.5**	**6.1**	**3.2**	**3.1**	**5.6**
Weighted Index LPI- Victoria	**3.0**	**10.5**	**4.5**	**5.2**	**8.4**	**4.9**	**2.9**	**2.2**	**4.7**
Weighted Index AWOTE- New South Wales		**3.8**	**-3.7**	**9.0**	**10.4**	**7.9**	**7.1**	**9.2**	**6.6**
Weighted Index LPI - New South Wales	**11.6**	**1.6**	**-3.6**	**8.1**	**9.2**	**6.5**	**6.6**	**8.2**	**5.8**
PSTS AWOTE - Australia	9.0	7.2	3.5	7.5	8.6	6.5	5.7	7.9	6.6
PSTS LPI - Australia	6.3	7.9	3.0	6.4	7.4	4.9	5.4	6.9	5.7
ASS AWOTE - Australia	7.5	3.4	3.3	6.4	7.4	5.4	4.8	6.9	5.7
ASS LPI - Australia	5.7	7.2	1.9	5.7	6.3	4.6	4.2	5.9	4.8
5. Contractor Escalation (n)									
Construction AWOTE - Victoria	**7.5**	**2.4**	**7.4**	**6.3**	**5.6**	**4.8**	**3.4**	**4.4**	**5.3**
Construction LPI - Victoria	**6.8**	**6.4**	**6.6**	**5.0**	**4.4**	**3.9**	**2.9**	**3.9**	**4.4**
Construction AWOTE - New South Wales	**-8.1**	**-0.9**	**6.2**	**7.3**	**7.7**	**5.2**	**4.1**	**6.1**	**6.1**
Construction LPI - New South Wales	**-3.5**	**1.2**	**6.3**	**4.7**	**6.4**	**4.2**	**3.8**	**5.6**	**5.2**
Construction AWOTE - Australia	5.4	3.0	4.0	5.8	7.8	6.2	4.3	5.9	5.7
Construction LPI - Australia	2.2	2.2	3.8	4.6	6.4	5.1	3.9	5.2	4.9
REAL PRICE CHANGES									
REAL ADJUSTED PRODUCTIVITY									
1. Gas Network related Labour (m)									
EGW AWOTE - Victoria	**15.2**	**11.5**	**1.6**	**3.0**	**6.6**	**4.1**	**1.0**	**-0.1**	**2.7**
EGW LPI - Victoria	**0.7**	**6.5**	**1.1**	**2.0**	**5.8**	**3.2**	**-0.1**	**-0.6**	**1.9**
EGW AWOTE - New South Wales	**13.6**	**0.5**	**-6.3**	**5.5**	**6.8**	**5.6**	**4.9**	**6.0**	**3.8**
EGW LPI - New South Wales	**9.0**	**-2.1**	**-7.1**	**4.7**	**6.4**	**4.7**	**4.0**	**5.4**	**3.0**
EGW AWOTE - Australia	**9.7**	**7.4**	**0.2**	**3.9**	**5.2**	**4.3**	**3.7**	**4.8**	3.6
EGW LPI - Australia	**4.6**	**4.2**	**-0.5**	**3.2**	**4.5**	**3.4**	**2.7**	**4.2**	2.9
2. General Labour (m)									
Weighted Index AWOTE- Victoria		**1.1**	**1.9**	**3.0**	**6.8**	**3.6**	**0.7**	**0.6**	**2.8**
Weighted Index LPI- Victoria	**0.2**	**7.0**	**1.0**	**1.9**	**5.7**	**2.4**	**0.4**	**-0.3**	**1.9**
Weighted Index AWOTE- New South Wales		**0.3**	**-7.2**	**5.7**	**7.7**	**5.4**	**4.6**	**6.7**	**3.8**
Weighted Index LPI - New South Wales	**8.7**	**-1.9**	**-7.1**	**4.8**	**6.5**	**4.0**	**4.1**	**5.7**	**3.0**
PSTS AWOTE - Australia	6.2	3.7	0.0	4.2	5.9	4.0	3.2	5.4	3.8
PSTS LPI - Australia	3.5	4.4	-0.5	3.2	4.7	2.4	2.9	4.4	2.9
ASS AWOTE - Australia	4.6	-0.1	-0.2	3.1	4.7	2.9	2.3	4.4	2.9
ASS LPI - Australia	2.8	3.7	-1.6	2.5	3.6	2.1	1.7	3.4	2.0
5. Contractor Escalation (n)									
Construction AWOTE - Victoria	**4.7**	**-1.1**	**3.9**	**2.9**	**2.8**	**2.2**	**0.8**	**1.8**	**2.4**
Construction LPI - Victoria	**4.0**	**2.9**	**3.1**	**1.7**	**1.7**	**1.4**	**0.3**	**1.3**	**1.6**
Construction AWOTE - New South Wales	**-11.0**	**-4.4**	**2.8**	**3.9**	**4.9**	**2.6**	**1.5**	**3.5**	**3.2**
Construction LPI - New South Wales	**-6.3**	**-2.2**	**2.8**	**1.4**	**3.6**	**1.7**	**1.2**	**3.0**	**2.3**
Construction AWOTE - Australia	2.6	-0.6	0.5	2.4	5.0	3.6	1.7	3.1	2.7
Construction LPI - Australia	-0.6	-1.3	0.2	1.3	3.7	2.6	1.3	2.4	1.9
Consumer Price Index (headline)	2.8	3.5	3.5	3.3	2.7	2.5	2.5	2.5	2.8

(l) Productivity is output (real Gross Value Added) divided by Total Employment

(m) Both Gas Network related labour costs and General labour costs are adjusted for productivity growth in the Electricity, Gas, Water and Waste Services (EGWWS) sector, as both sets of labour are located in the EGWWS sector.

(n) Construction wage costs are adjusted for Construction productivity

1. INTRODUCTION, OUTLINE OF REPORT & DATA SOURCES

In July 2011, BIS Shrapnel was engaged by Envestra Limited, SP-AusNet and Multinet Gas Pty Limited ("the distributors") to provide an expert opinion regarding the outlook for a range of labour, materials and contractor cost escalators relevant to the operating and capital expenditure of natural gas networks in Victoria and New South Wales over the six year period from 2012 to 2017 inclusive. The labour, materials and contractor escalator forecasts and reports were used for internal budgeting and planning purposes and particularly in the preparation of cost estimates for operating and capital expenditure to be included in the distributors' regulatory submissions to the Australian Energy Regulator (AER) early in 2012.

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 D. I have been assisted in the preparation of this report by Kishti Sen, an Economist at BIS Shrapnel and Daniel Gradwell Economic Analyst at BIS Shrapnel. Curriculum vitaes of all relevant personnel are attached in Appendix E. Notwithstanding the assistance from the other two economists, the opinions in this report are my own and I take full responsibility for them. A 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 2.1. The June quarter, 2011 was the latest available data for wages, industry employment, real gross value added (at the Australian level only), investment and indeed most of the economic variables in Table 2.1. The detailed engineering construction data (by state and by category) have data only up to March quarter 2011. The latest data for Gross State Product (GSP) and real gross value added for state industry sectors was 2009/10 (annual data only is available). Other inflation and interest rates 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 Education, Employment and Workplace Relations (DEEWR).

Information on thermoplastic resins and plastic materials prices, which we used as a proxy for polyethylene pipe prices were sourced from the US Bureau of Labor Statistics.

Forecasts of the economic variables in this report were mostly sourced from BIS Shrapnel reports, including *Economic Outlook, Long Term Forecasts: 2011 – 2026, Engineering Construction: 2010/11 to 2024/25 and Long Term Building Work Done Forecasts*, plus other unpublished forecasts and from BIS Shrapnel internal research.

The structure of this report is as follows:

- The **Summary** section presents an overview of the outlook for the cost escalators and a summary table.
- **Section 2** provides an overview of the macroeconomic outlook for Australia, Victoria and NSW, including a brief commentary of the logic and key drivers, plus forecasts of key economic variables.
- **Section 3** discusses BIS Shrapnel's model of wage determination and provides forecasts of the outlook for national ('all industries') wages and CPI inflation, with the Reserve Bank of Australia and Commonwealth 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 'gas network-related labour' cost escalation, based on forecasts of wages growth for the Electricity, Gas and Water Supply sector for Australia, Victoria and NSW, including productivity adjusted wage escalators. This section also analyses and provides forecasts of wages in industries which compete with the utilities sector for similar types of skilled labour, namely Mining, Construction and Manufacturing.
- **Section 5** provides an outlook for 'general labour' cost escalation, based on forecasts of wages growth for the Professional, Scientific and Technical Services and Administration and Support Services sectors for Australia, Victoria and NSW, including productivity adjusted wage escalators.
- **Section 6** provides forecasts of 'general materials' cost escalation, assumed to be the same as CPI inflation.
- **Section 7** provides forecasts of 'gas network related materials' cost escalation, which is mainly polyethylene piping.
- **Section 8** provides forecasts of 'contractor' escalation, which is predominately related to the costs of construction related labour and/or construction-related labour and materials.
- **Section 9** provides an analysis of the forecasting record of the utilities wage model of the AER's preferred consultant for utilities wage forecasts, Deloitte Access Economics, with regard to their previous forecasts versus the actual outcomes.
- **Appendices,** including a note on different wage measures and a description of BIS Shrapnel's wage model.

2. MACROECONOMIC OVERVIEW — AUSTRALIA

2.1 The Australian economy

2.1.1 Current State of Play

The economy hit a soft patch late last year just as the Reserve Bank raised interest rates. This was compounded by the interruptions to production and investment as a result of the summer floods and cyclone. The result was a -0.9 per cent contraction in real gross domestic product (GDP) in the March quarter. Production and investment rebounded in the June quarter but year average growth in GDP in 2010/11 was a relatively modest 1.8 per cent.

Markets spooked by overseas problems, delaying a pick-up in growth

Over recent months, local and overseas share markets have experienced sharp falls as US and European debt and equity markets finally reacted to the combination of European sovereign debt difficulties, the politics of expanding the ability of the US to take on debt, the downgrade of US government securities, and weak US and European growth.

- These problems are serious - for the countries in debt and the banks that financed them. But Australia has little direct exposure. A large part of the problem for Europe is the inflexibility of fixed exchange rates in the Euro zone.
- For the US and much of Europe, this will be a long hard haul. Still absorbing excess capacity created during the boom, they won't have strong investment to drive growth. As we have argued previously, it will take a decade to claw back the unemployment rate.

But this is nothing like the situation which led to the GFC. This is just the next stage in the unwinding of the pre-GFC boom. And market gyrations will gradually settle down, learning to live with what we expect will remain largely unresolved problems associated with the financial engineering boom which led to the financial crisis.

Australia has been caught in the financial market contagion, with a sharp fall in the share market and the threat of higher spreads on our overseas borrowings. Equity markets are experiencing enormous volatility. Many think that this will be GFC phase 2 and are again battening down for an anticipated recession. Confidence is again taking a hammering, delaying the next phase of recovery from the current soft patch in the economy.

Don't confuse what's happening overseas with what's happening in Australia

Australia doesn't have these problems. Australia didn't have a financial crisis. The major banks are strong. Australia didn't overinvest in the boom which preceded the GFC, but is under-investing now so that we are not far from running into capacity constraints.

Meanwhile, resource companies have just committed to a second major phase of investment projects, sufficient to underwrite solid growth over the next five years. As long as China remains strong, we'll be supplying the resources to help them grow.

Nevertheless, the Australian economy remains soft

The economy has been soft since the beginning of the year. Precautionary savings by households and businesses is constraining demand and hence growth. Confidence is weak. And that is spreading to private investment. Households are delaying long-term commitments such as investment in housing. And, apart from the resources sector, business investment remains weak.

Consumers are keeping their powder dry, still increasing savings. Nevertheless, private consumption expenditure remains solid. But much of that expenditure is leaking into imports. Retailers are crying poor because of low growth in retail sales. But margins remain high. We shouldn't expect sales growth in order of magnitude of last decade when the banks effectively transformed traditional mortgages into lines of credit, thereby stimulating a spending binge financed by debt. We've now learnt to live with readily available credit and are erring on the side of caution. The growth in savings is a strength not a weakness. But we will only gradually loosen the purse strings.

Residential property and housing construction have been a casualty of the combination of uncertainty and higher interest rates. All the talk of 'overvalued housing markets' compared with overseas has spooked owner-occupiers and housing investors alike. Without the prospect of capital gain, let alone facing the spectre of capital loss, they are keeping their powder dry. In some states, particularly NSW, the shortage of housing has become critical. The next stage is an upswing in both property and construction markets but, as we speak, they remain weak, and indeed are drifting downwards.

And, apart from Resources, private investment remains flat, below the level required to underwrite even moderate growth, setting the scene for future capacity constraints. Business remains in cost containment mode rather than going for growth.

The latest 'market crisis' hasn't helped. It will delay the improvement in confidence that will drive a pick-up in growth.

There is no danger of recession. The worst outcome would be that the Australian economy would stay soft for another 6 to 12 months.

2.1.2 Outlook for the Australian economy

Beyond 2011, the medium term outlook is positive overall. Private investment will recover gradually and build momentum three to four years from now. Business investment in particular is expected to rise sharply over the next five years and be a key driver of growth. Although consumers remain risk averse and budget conscious, due to uncertainty over a range of political and economic issues, they have built up a significant savings buffer which provides households with latent spending power. Eventually, confidence will return and households will lift spending and make a larger contribution to growth. Meanwhile, weak advanced world growth and European sovereign debt problems will have little impact on external demand – Australia is an Asian economy now**.** We forecast real GDP to grow by an average of 3.6 per cent per annum over the three years to 2013/14. We expect rising interest rates to cause a mild downturn in 2014/15 before the economy rebounds quickly and builds momentum thereafter.

Investment in the resources sector has already picked up strongly. There is more to come. Meanwhile, commodity prices remain at historically high levels, supported by China's insatiable demand for steel making raw materials (i.e. iron-ore and coking coal). This has locked-in another round of mining-related projects over the next five years.

The current round of mining investment is expected to peak in 2014/15, with the main impetus to growth seen over 2011/12 to 2013/14. We are not expecting a major setback to commodity prices – demand is expected to remain strong with a recovery in developed world demand taking up the baton from a moderation in the super hot growth experienced by the developing world, particularly China. However, we are seeing a significant world supply response to current prices and this will see future prices below their current levels by mid-decade.

We expect residential markets to improve over the next two years as the economic recovery broadens and as confidence picks up. The key is that, Australia wide, the residential market is under-building and undersupplied. Dwelling completions over 2004/05 to 2010/11 averaged

150,000 per annum compared with annual average underlying demand of around 171,000. This has resulted in an estimated housing stock deficiency of about 120,000 dwellings in mid 2011. Recovery at present is being impeded by dismal confidence and excessive caution by households. Nonetheless, with interest rates still at moderate levels, the chronic deficiency of stock, combined with tight rental vacancies and rising rents will drive a solid recovery in dwelling construction over the next two years.

Private non-dwelling construction has passed the trough of the cycle and begun the long road to recovery. But it will be slow! Demand is expected to recover as the economy picks up momentum through the course of this year and over the next three to five years. Recovering demand and constrained supply (excessive caution by banks and investors suppressed development following the GFC) will result in a tightening of leasing markets leading to a long period of firming rents across the sub-sectors of commercial and industrial construction. This, in turn, will underwrite financial feasibilities and the next round of investment in private commercial and industrial building. We expect Retail building to be the first cab off the rank, followed by Industrial and Commercial (Office) investment. The upswing will build momentum into a boom, peaking in the second half of this decade.

Australia's swift rebound from a GFC-induced downturn and a strong outlook means capacity constraints will soon emerge. This will induce strong levels of investment in new machinery and equipment over the next two years.

The economic outlook among Australia's major export markets, however, has considerable differences. While economic growth in US and Western Europe is expected to remain weak in the short term, China, India, Korea and Thailand are expected to record solid growth rates over the next two years and beyond. As the majority of Australia's exports now go to Asian markets, the strong performance of the Chinese and Indian economies as well as Japan's reconstruction following the earthquake will support Australia's external demand well into the medium term.

But it won't all be plain sailing. The high dollar is eroding the competitiveness of the export and import-competing sectors, with imports taking a larger share of the domestic market at the expense of local manufacturers and tradeable services (such as tourism and education) while non-commodity exporters continue to suffer lower revenues and profits. Ultimately, investment will be affected on trade-exposed sectors, while some operations will close down and/or relocate overseas, in many cases meaning a permanent loss of industry. This process has already begun.

Partly offsetting growth in private demand will be declining public investment — as the post-GFC schools, housing and hospitals building programs wind down — and slower growth in government recurrent spending and employment. The desire to return the budget to surplus also means that broadly-based income tax cuts are off the agenda until mid-decade (notwithstanding the recent announcement of tax cuts to compensate households for the proposed Carbon Tax). The lack of tax cuts will help restrain consumer spending.

The extent to which consumers choose to loosen their purse strings will determine the speed at which wage and price pressures build over the next 18 months. Consumers have built up a considerable savings buffer, but they will be constrained in their ability to run up debt levels by the watchfulness of the RBA to any signs of excessive demand on the part of households. The RBA knows there is a major phase of mining investment gathering momentum, which is insensitive to interest rates, and will be accompanied both by strong growth in mining incomes and strong resources investment underpinned by record high commodity prices. With the unemployment rate already hovering around 5 per cent, the economy does not have sufficient capacity to accommodate a strong pick-up in demand from households and the additional demand on labour, materials and capital that would generate. The RBA position is to use interest rates to make room for the minerals boom. Housing activity and non-mining domestically produced tradeables will be the collateral damage.

Table 2.1: Australia – Key Economic Indicators, Financial Years

Year Ended June	2007	2008	2009	2010	2011	Forecasts 2012	2013	2014	2015	2016	2017	2018	Average 2012-18
Selected Expenditure Categories													
Private Investment													
– Dwellings	1.9	1.2	-1.9	2.1	2.6	1.9	5.4	3.2	-5.8	4.6	9.4	2.0	3.0
– New Non-Dwelling Construction (+)	12.3	10.1	8.5	-8.2	11.3	10.3	12.6	10.4	-2.2	0.0	5.0	3.2	5.6
– New Non-Dwelling Building (+)	7.6	11.7	-5.3	-19.0	-4.6	4.7	13.1	8.6	-1.7	6.8	12.6	3.1	6.7
– New Engineering Construction (+)	17.9	8.6	24.2	1.1	22.2	13.2	12.3	11.2	-2.4	-3.4	0.9	3.3	5.0
Total New Private Investment (+)	**5.6**	**10.1**	**-0.1**	**-2.4**	**3.8**	**7.3**	**11.4**	**7.8**	**-1.9**	**6.7**	**10.6**	**4.1**	6.6
New Public Investment (+)	**4.7**	**10.5**	**5.9**	**26.3**	**6.0**	**-3.9**	**-3.7**	**-2.9**	**2.7**	**7.2**	**9.9**	**1.9**	1.6
Gross National Expenditure (GNE)	**4.9**	**6.0**	**0.2**	**2.4**	**4.0**	**3.6**	**4.8**	**3.8**	**1.1**	**5.0**	**6.1**	**3.4**	4.0
GDP	**3.6**	**3.8**	**1.4**	**2.3**	**1.8**	**3.3**	**3.8**	**3.8**	**2.2**	**4.1**	**4.4**	**3.2**	3.6
Inflation and Wages													
CPI (Yr Avg)- RBA/Treasury forecasts (*)	2.9	3.4	3.1	2.3	3.1	2.5	3.8	2.5	2.5	2.5	2.5	2.5	2.7
Labour Price Index (Jun on Jun)	4.0	4.2	3.8	3.1	3.8	4.2	4.7	4.6	3.8	4.4	4.5	4.6	4.4
Labour Price Index (Yr Avg)	3.9	4.1	4.1	3.1	3.8	3.9	4.5	4.7	4.1	4.0	4.4	4.6	4.3
Average Weekly Earnings (Yr Avg)	3.6	4.9	5.5	5.6	4.2	4.3	5.0	5.7	5.2	4.6	5.2	5.2	5.0
Employment													
– Employment Growth (Yr Avg)	3.1	3.0	1.6	1.4	2.9	1.1	2.8	2.5	0.7	2.3	2.8	2.0	2.0
– Employment Growth (May on May) (%)	3.3	2.7	0.9	2.2	2.3	1.6	3.0	1.5	1.3	2.6	2.6	1.4	2.0
– Unemployment Rate (May) (%)	4.3	4.3	5.8	5.2	5.0	5.0	4.3	4.4	4.8	4.3	3.6	3.7	4.3
Labour Productivity Growth													
– Total	0.5	0.8	-0.2	0.9	-1.0	2.2	1.0	1.3	1.5	1.8	1.5	1.2	1.5
– Non-farm	1.0	0.7	-0.5	0.9	-1.4	2.1	1.2	1.2	1.7	1.8	1.6	1.5	1.6
Exchange Rates													
– US$ per A$ (Yr Avg)	0.79	0.90	0.75	0.88	0.99	1.05	1.07	1.07	0.89	0.86	0.99	1.02	1.0

+Expenditure on new assets (or construction work done). Excludes sales (or purchases) of second hand assets. Source: BIS Shrapnel, ABS Data, RBA
*Forecasts to 2013 from RBA, followed by Treasury long-term forecasts

With underlying inflation now appearing to have troughed we expect the RBA to start lifting the cash rate once we're through the current soft patch. However, with the current market turmoil, debt and other problems overseas, and budget conscious households adopting a cautious approach to spending, the next rate rise is not expected until the second half of 2012. Nonetheless, as the economic upswing gains momentum and moves towards full employment over the next two years, we expect the RBA will get on the front-foot and move official rates to more restrictive settings.

An aggressive series of interest rate rises through 2013/14 will dampen consumer spending and send housing activity into a controlled downturn through 2014. Generalised business investment will also moderate at the same time, with the overall slowdown in domestic spending and easing of inflationary pressures expected to see interest rates fall back. However, the impact on employment and demand will be modest, with the unemployment rate expected to peak at around 5 per cent in 2015.

The economy is expected to regain momentum from 2015/16, with a strong growth phase in both residential and non-residential building expected to drive growth. By mid-decade, these two markets will typically be characterized by tight supply and a considerable degree of pent-up demand, given building in both sectors will be constrained over the next few years by high interest rates and lingering finance constraints as the economy makes room for the mining investment boom. With growth in overall mining investment expected to ease over the 2016–2021 period from its mid-decade highs, investment will switch to residential and non-residential building. Another major round of private infrastructure and public investment is also expected, given restrained investment in these areas over the next few years will lead to a worsening of capacity constraints and bottlenecks in essential infrastructure.

Main Risk to Economy is Another Credit Crisis

The main risk to growth in the Australian economy over the short-to-medium term is a major credit crisis, most likely resulting from a worsening of the current European sovereign debt situation. The threat of a default in Greece and some other European countries (such as Spain, Portugal, Ireland and even Italy) has led to heightened nervousness among European and other global banks about which banks have large exposures to the debts of the most indebted countries (known as PIIGS). As in the first global financial crisis in 2008 (GFC phase 1), the banks are again displaying a reluctance to lend to each other and this is limiting the availability of credit and forcing up the price of borrowing.

Should Greece or another one (or more) of the PIIGS default, the danger is a full-blown crisis of confidence in the European banking system which would then possibly cause a recession in Europe, via the drying up of credit and the collapse of confidence and spending. The risk then is the extent to which another significant weakening in the European economies spreads to the US, China and Asia, via the impact on their exports to Europe. If Europe's woes result in a significant weakening in Asia's — and particularly China's — economic growth, it would have a knock-on effect to Australia, via lower commodity prices and export volumes, and secondly via its effect on the next round of mining investment – but mining investment would not fall in the short-term because of the large amount of projects now underway and committed (as in 2008/09 when mining investment actually increased).

While we would assess that there is still some risk of a default in Europe and serious problems there, we believe that growth in China and Asia, although moderately affected, would still remain solid and not significantly derail growth in Australia. In addition, Australia's economic fundamentals are still quite sound and policy makers here have scope to boost the domestic economy – the RBA can significantly cut rates (with the resulting fall in the exchange rate also boosting the tradeables sectors), while the government (with its low debt and relatively small budget deficit) can lift spending or cut taxes. These actions would prevent a recession in Australia.

However, any increased difficulties in accessing overseas credit could delay a broader pick-up in business investment (beyond the resources sector), because Australia still needs to borrow from overseas banks to finance internal investment and finance the Current Account Deficit.

2.2 The Victorian Economy

2.2.1 Current State of Play

The Victorian economy has experienced only a modest downturn relative to other states since the onset of global financial crisis in 2008/09, despite a sharp deceleration in Australian domestic demand. Domestic demand, both in Victoria and interstate, are key drivers of the state economy because of the importance of the wholesale trade, distribution and transport sectors facilitated by the Port of Melbourne — the largest container port by volume. Product from these imported cargoes and from Victoria's manufacturing and mining sectors (gas mainly) are distributed locally and interstate, with Victoria's finance, insurance and business services sectors also providing services interstate. The state's 'events-based' tourism also lures visitors from around Australia. The upshot is that Victoria normally runs a positive net interstate trade in goods and services, which contributes to growth and helps to offset a net external (international) contribution.

The key factor underpinning Victoria's strong performance over the past three years was the overall strength of its construction sector. New dwelling building activity picked up quickly between 2008/09 and 2010/11 after interest rates tumbled and the first home owner grants (FHOG) scheme boosted demand. In addition, stronger population growth and the ready

availability of reasonably priced residential land facilitated a much faster upswing compared to other states which had a greater undersupply of dwellings, but more expensive (and less available) land.

Public investment ramped up significantly over 2008/09 to 2010/11 (growing by 65 per cent), partly because the Victorian government was able to get the Federal stimulus spending underway quickly and partly because the state government was already proceeding with its own major health, rail, harbour and sewerage projects.

Private sector engineering construction also made a healthy contribution, thanks to substantial electricity, pipelines, oil and gas activity, and work on the $1.6 billion Wonthaggi desalination plant. Strong growth in dwelling and public investment continued in 2010, although private engineering construction is now peaking and plant and equipment investment has declined. Partially offsetting these positives was a 32 per cent decline in private non-residential building over the two years to June 2011.

The strength of the construction sector has fuelled strong growth in employment, household incomes and spending. Employment growth averaged 2.8 per cent in 2009/10 and accelerated to 3.6 per cent for 2010/11, compared to 1.4 per cent and 2.9 per cent for Australia.

Overall, state final demand (SFD) grew by 3.4 per cent in 2010/11, marginally faster than the 3.3 per cent in 2009/10 and well above 2008/09 when growth only reached 0.8 per cent. Australian domestic demand over the same periods recorded growth of 3.7 per cent, 2.1 per cent and 0.8 per cent respectively. Gross state product (GSP) is estimated to have increased by 2.6 per cent in 2010/11, compared to Australian GDP growth of 1.8 per cent.

2.2.2 Outlook for the Victorian Economy

While Victoria will not directly benefit from the major mining investment boom now underway (and set to drive the Australian economy over the medium term) the state will nevertheless benefit indirectly from strengthening domestic demand and private investment over the next two to three years and, after a 2013/14 and 2014/15 slowdown, a stronger phase of growth will return over the following three years. Overall, on average, the Victorian economy is forecast to experience slightly stronger growth over the next seven years (i.e. from 2011/12 to 2017/18 inclusive), with SFD averaging 3.6 per cent and GSP averaging 3.0 per cent, compared to 3.3 per cent and 2.5 per cent respectively over the last seven years. Nevertheless, whilst the Victorian economy is set to experience solid growth over the next seven years, weakness in the total dwelling and non-dwelling construction sectors means the state is likely to underperform the national average.

Victoria has a number of ‘structural positives’ which has seen the state economy often disproportionately benefit despite not having obvious internal economic drivers. The ready availability of reasonably priced residential land has prevented a collapse in dwelling investment, which has helped underpin the overall construction sector over the past decade. Office and white collar employment growth has also remained firm, helped by competitive office rents, a strong finance and business services sector, and possibly because the major mining companies such as BHP Billiton and Rio Tinto are headquartered in Melbourne, thereby indirectly benefitting from the resources boom.

The end result has been relatively strong population and employment growth. With these positive structural factors to continue to underpin relatively strong population growth—via an increased share of high net international migration and an only small interstate outflow—healthy demand for housing, infrastructure and household services will in turn support further business investment and employment.

However, there will be some negative factors which will constrain state economic growth over the next few years. The A$ is expected to remain around current levels or higher. This means the competitive pressures on the tradeables sectors will continue, with the state's manufacturing, education and tourism sectors negatively affected.

The downturn in construction over the next three to four years will drag down overall state growth. Engineering construction will decline over 2011/12 and 2012/13, as work is progressively completed on the desalination plant, major sewerage infrastructure and the current round of pipelines, oil and gas investments. Non-residential building will continue to decline, with the end of stimulus spending causing steep declines in schools construction and, later, health and other social and institutional buildings and more than offsetting a recovery in commercial and industrial building. Dwelling building is also forecast to decline over 2012/13 to 2014/15 with the deficiency of stock predominately fulfilled by June 2013. Despite healthy growth in the underlying demand for dwellings, rising interest rates over 2012/13 and into 2013/14 will help trigger the downturn.

Growth in SFD and GSP is expected to pick up marginally in 2011/12 with an expected strengthening in business investment, household expenditure and increased rural export volumes. But growth in employment will slow on signs of an imminent slowdown in dwelling and engineering construction. Growth in SFD, GSP and employment is forecast to slow over 2012/13 and 2013/14, mainly due initially to the decline in overall construction and high interest rates impacting on consumer demand, with the sharp slowing in Australian domestic demand in 2014/15 further impacting on Victoria's economy.

The timing of the downturn is not certain and depends on the overall weakness in the construction sectors. There is a possibility that the downturn in the Victorian economy could be pushed back six months to 2014/15, in line with the national downturn.

Growth is then expected to remain weak 2014/15 before rebounding in 2015/16 and strengthen thereafter as dwelling building, non-residential building and engineering construction pick up in tandem. The expected fall in interest rates will be the initial catalyst, but by mid-decade there will be pent-up demand for a new round of building and infrastructure due to reasonably strong population growth. The strong rebound in Australian domestic demand will also be a key driver, and Victoria's economy is expected to perform well over the second half of the decade.

Table 2.2: Victoria and New South Wales – Key Economic Indicators, Financial Years

	Annual Percentage Change												Average
Year Ended June	2007	2008	2009	2010	2011e	2012	2013	2014	2015	2016	2017	2018	2012-18
VIC													
Total Construction Activity[(a)]	-2.2	4.6	7.2	8.3	5.0	-3.0	-6.0	-0.3	-0.6	3.8	9.3	0.2	0.5
State Final Demand	2.5	4.8	0.8	3.3	3.4	3.7	2.7	1.7	2.2	5.1	6.7	3.4	3.6
Gross State Product (GSP)	**3.6**	**3.6**	**0.9**	**2.0**	**2.6**	**2.7**	**2.3**	**2.1**	**2.3**	**4.0**	**4.4**	**2.9**	3.0
Employment Growth	3.1	3.3	0.9	2.8	3.6	1.7	1.9	1.2	0.5	2.4	3.0	1.8	1.8
NSW													
Total Construction Activity[(a)]	-5.0	3.6	6.9	5.2	2.3	-3.4	6.9	7.4	2.2	5.3	10.7	2.2	4.5
State Final Demand	2.4	5.5	0.0	3.3	3.1	3.9	4.3	2.5	2.3	5.5	5.7	3.3	3.9
Gross State Product (GSP)	**2.8**	**3.4**	**1.1**	**1.7**	**2.5**	**3.1**	**3.4**	**2.9**	**2.8**	**4.2**	**4.5**	**3.2**	3.4
Employment Growth	2.0	2.9	0.6	1.1	3.4	1.0	2.3	2.0	1.0	2.4	3.2	2.2	2.0
AUST													
Total Construction Activity[(a)]	5.8	6.6	9.1	3.1	5.0	3.2	6.9	5.6	-3.0	2.0	7.0	2.4	3.5
Australian Domestic Demand	4.5	6.0	0.8	2.1	3.7	3.7	4.8	4.0	1.2	4.7	6.1	3.6	4.0
Gross Domestic Product (GDP)	**3.6**	**3.8**	**1.4**	**2.3**	**1.8**	**3.3**	**3.8**	**3.8**	**2.2**	**4.1**	**4.4**	**3.2**	3.6
Employment Growth	3.1	3.0	1.6	1.4	2.9	1.1	2.8	2.5	0.7	2.3	2.8	2.0	2.0

[(a)] Total construction work done (constant prices), equals the sum of new dwelling building, alterations and additions activity over $10,000, non-residential building and engineering construction by the private and public sectors.

Source: BIS Shrapnel and ABS Data

e: 2011 State data is an estimate

2.3 The New South Wales Economy

2.3.1 Current State of Play

Healthy signs have developed over the past one-to-two years that the New South Wales economy is finally coming out of its economic malaise. This follows a decade in which New South Wales generally underperformed the Australian average, with gross state product (GSP) averaging 2.3 per cent per annum compared to the national average of 3.1 per cent in the ten years to 2009/10. Growth in state final demand (SFD) accelerated through calendar 2010 — with a number of key indicators recording strong growth and outpacing the national equivalent — before growth eased sharply over the first half of calendar 2011.

Public investment in the state led the recovery through 2010, but the key driver was the healthy growth in dwellings investment. House prices lifted 14 per cent in 2009/10 and commencements rebounded out of the deep 2008/09 trough. The protracted downturn in the housing market and dwelling construction from 2003/04 to 2008/09 was a key negative factor contributing to the poor performance of the state economy over these five years.

Business investment also increased in 2010. Growth in private non-residential building was surprisingly positive, despite lingering financing problems from the global financial crisis (GFC), although much of the growth came from government stimulus to private schools via the 'Building the Education Revolution' program. Private engineering construction increased strongly through 2010, led by surging coal and minerals investment, accompanied by increased electricity and subdivision infrastructure spending. On the other hand, plant and equipment weakened sharply in the March quarter 2010 (following the cessation of government tax breaks for motor vehicles and other allowable equipment in December 2009), and remained subdued for the rest of the year.

Employment growth staged one of the strongest rebounds among the states in 2010—increasing 4.0 per cent through the year—after suffering relatively more during the post-GFC period in 2008/09. The strength of employment and rising wages underpinned the recovery in household spending, although rising interest rates hit the relatively more interest rate-sensitive households in New South Wales (because they carry larger mortgage debt) over the second half of last year.

The state's tradeables sectors, in particular manufacturing, education and tourism, continued to suffer negative impacts from the high A$. Nevertheless, merchandise export growth increased strongly over 2010 as good rains boosted farm exports; as new mine, port and rail capacity boosted coal and mineral exports; and as machinery exports rebounded, despite the rising A$.

Overall, state final demand (SFD) increased 3.8 per cent in calendar 2010 (compared to 2009), despite growth faltering in the December quarter. For financial year 2010/11 SFD growth eased to 3.1 per cent, compared to 3.7 per cent for Australian domestic demand, while GSP is estimated at 2.5 per cent, compared to 1.8 per cent for national GDP.

2.3.2 Outlook for the New South Wales Economy

The New South Wales economy is expected to build on the solid growth in 2010/11 and record moderate to strong growth over the next two years, although both GSP and SFD growth is projected to again lag national GDP and domestic demand growth. Economic growth in the state will be underpinned by a relatively buoyant construction sector and improved export volumes and revenues.

Private dwelling construction will be one of the key drivers of Gross State Product over the medium term. Over recent years the construction of dwellings has not kept pace with underlying demand and subsequently property markets in New South Wales, and in particular Sydney,

remain chronically undersupplied. This has resulted in an estimated housing stock deficiency of almost 88,000 dwellings in mid 2011 (ie almost two years worth of underlying demand). Further, underlying demand will continue to increase in coming years as Sydney continues to attract a large (although declining) proportion of Australia's international migration, which is expected to lift again from 2012/13. Population outflows to other states, however, will offset some pressures.

Recovery at present is impeded by dismal confidence and excessive caution by households. Nevertheless, with interest rates at moderate levels, the chronic deficiency of stock, combined with tight rental vacancies and rising rents will drive a solid recovery in dwelling construction over the next two years. However, any recurrence of weakness in the state's residential sector represents the biggest risk to our growth forecasts. With housing rates expected to rise to 9 per cent in 2014, our near-term forecasts depends critically on finance for apartment developments becoming available and a greatly increased supply of residential lots coming onto the market.

Business investment is expected to strengthen further over the next two years, as the improved outlook for dwelling construction and further increases in coal and minerals investment precipitate a broader pick up in overall business investment. A new round of private infrastructure is expected to boost engineering construction, followed by industrial and commercial buildings. From 2011/12 increases in private sector investment will be partially offset by declines in public sector investment as the current round of projects (largely from the economic stimulus package) are completed and not replaced with a new round of projects.

With the Australian dollar expected to remain around parity with the US dollar over the next three years, the negative impacts on the state's tradeables sectors will continue to weigh on the overall prospects for GSP. This includes the rural sector, which will suffer from falling revenues from next year when current high world prices (ie in US$ terms) for a number of agricultural commodities fall back as global supply responds to the current high prices. Falling farm revenues will have regional impacts. However, the key danger is that the prolonged period of the high A$ will lead to a 'hollowing out' of the manufacturing sector, lower levels of manufacturing investment and long term damage to the state's tourism and education services industries.

Employment growth is forecast to ease back from the 3.4 per cent recorded in 2010/11, to around 1.0 per cent in 2011/12, before growing at around 2 per cent per annum over the following three years. This will underpin further solid growth in household incomes and expenditure. However, over the medium term, higher interest rates and a lack of tax cuts—as the government looks to restore a budget surplus—will limit growth in household consumption.

Indeed, by 2013/14 a string of interest rate rises will begin to inhibit growth. As mentioned, NSW is particularly sensitive to interest rate movements due to higher levels of mortgage debt. The strong economic growth forecast for 2011/12 and 2012/13 will see the RBA increase interest rates aggressively to curb inflation and avoid the economy overheating. This will lead to a weakening in output and employment growth in 2014. But the weakening in the economy is likely to be relatively brief. A subsequent easing in interest rates, a lower A$ and strengthening in residential, public and business investment are projected to lead to buoyant economic conditions over the second half of this decade.

3. OUTLOOK FOR AUSTRALIAN INFLATION AND ALL INDUSTRIES WAGES

The key determinants of nominal wages growth are consumer price inflation, productivity and the relative tightness of the labour market (i.e. the demand for labour compared to the supply of labour). Price inflation, in turn, is primarily determined by unit labour costs (i.e. wage increases adjusted for productivity increases). Other factors which also 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 3.1 and 3.2):

- 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 (i.e. dollar value) increases, rather than as a proportional increase although the most recent increase was given as a proportional increase. At the all industries level, 15.2 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 and water sector, only 0.9 per cent of workers have their pay set by this method.
- Collective agreements negotiated under enterprise bargaining account for 43.4 per cent of all employees, but over 80 per cent of electricity, gas and water employees' wage increases are determined by this method (note the new ANZSIC2006 classification added 'waste services' to the previous ANZSIC1993 electricity, gas and water supply classification. We have excluded the waste services component from our analysis in section 4).
- The remaining 41.4 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 and water is currently estimated to be around 17 per cent.

Table 3.1: Wages Growth, All Industries, Australia, (by Workforce Segmented by Pay Setting Method)

	Year Average Percent Change																		
												Forecast						Averages	
Year Ended June	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2001-11	2012-17
Proportion of Workforce by Pay setting Method																			
Awards Only	21.9%	20.5%	20.3%	20.0%	19.5%	19.0%	17.8%	16.5%	15.8%	15.2%	15.2%	15.2%	15.2%	15.2%	15.2%	15.2%	15.2%	18.7%	15.2%
Collective Agreements	37.5%	38.2%	39.6%	40.9%	41.0%	41.1%	40.5%	39.8%	41.6%	43.4%	43.4%	43.4%	43.4%	43.4%	43.4%	43.4%	43.4%	40.3%	43.4%
Individual Arrangements	40.7%	41.3%	40.2%	39.1%	39.5%	39.9%	41.8%	43.7%	42.6%	41.4%	41.4%	41.4%	41.4%	41.4%	41.4%	41.4%	41.4%	41.0%	41.4%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100.0%	100.0%
AWOTE																			
Awards Only (a)	2.0	1.6	2.1	1.9	2.0	1.7	2.0	1.4	1.7	0.5	2.1	1.5	1.6	1.8	1.5	1.4	1.5	1.7	1.6
Collective Agreements	3.7	3.8	3.8	3.9	4.0	4.1	4.1	4.0	4.2	4.1	4.0	4.1	4.3	4.6	4.4	4.2	4.4	3.9	4.3
Individual Arrangements (b)	8.0	8.7	7.7	6.9	6.0	6.5	3.8	7.1	8.1	8.9	5.1	5.5	6.9	8.3	7.3	6.2	7.4	6.7	6.9
AWOTE (Persons)(c)	**5.1**	**5.4**	**5.0**	**4.7**	**4.4**	**4.6**	**3.6**	**4.9**	**5.5**	**5.6**	**4.2**	**4.3**	**5.0**	**5.7**	**5.2**	**4.6**	**5.2**	**4.7**	**5.0**
Labour Price Index																			
Awards Only (a)	2.0	1.6	2.1	1.9	2.0	1.7	2.0	1.4	1.7	0.5	2.1	1.5	1.6	1.8	1.5	1.4	1.5	1.7	1.6
Collective Agreements	3.7	3.8	3.8	3.9	4.0	4.1	4.1	4.0	4.2	4.1	4.0	4.1	4.3	4.6	4.4	4.2	4.2	3.9	4.3
Individual Arrangements (b)	4.0	3.8	3.8	4.2	4.3	5.2	4.6	5.3	4.9	3.0	4.2	4.5	5.7	5.9	4.6	4.7	5.4	4.2	5.1
Labour Price Index (Ord. Time)	**3.5**	**3.3**	**3.5**	**3.6**	**3.7**	**4.1**	**3.9**	**4.1**	**4.1**	**3.1**	**3.8**	**3.9**	**4.5**	**4.7**	**4.1**	**4.0**	**4.4**	**3.6**	**4.2**
Compositional Effects + Bonuses,etc	1.6	2.0	1.6	1.1	0.7	0.5	-0.3	0.8	1.3	2.5	0.4	0.4	0.5	1.0	1.1	0.6	0.8	1.0	0.7

(a) Contribution of nominal award wage increas to total wages growth, rather than percent change in award wages Source:BIS Shrapnel,ABS,DEEWR
(b) Indiv Agreements picks up all the compositional effects and bonuses, incentives,etc plus all the standard errors of LPI and AWOTE estimates by ABS
(c) Full-time Adult Persons, excluding overtime

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

Industry (ANZSIC 2006)	Award Only	Collective Agreements	Individual Arrangements	All Methods of Pay Setting
Mining	1.9%	41.4%	56.7%	100.0%
Manufacturing	14.6%	26.4%	59.1%	100.0%
Electricity, Gas, Water & Waste Water Services	3.1%	66.9%	30.0%	100.0%
Construction	10.0%	23.1%	66.9%	100.0%
Wholesale trade	10.9%	12.3%	76.8%	100.0%
Retail trade	22.3%	41.0%	36.7%	100.0%
Accommodation and Food Services	45.2%	30.1%	24.7%	100.0%
Transport, Postal and Warehousing	8.0%	52.2%	39.8%	100.0%
Information Media and Telecommunications	5.7%	31.3%	63.0%	100.0%
Finance and Insurance Services	2.1%	42.6%	55.4%	100.0%
Rental, Hiring and Real Estate Services	22.8%	9.5%	67.7%	100.0%
Professional, Scientific ans Technical Services	4.2%	11.9%	83.9%	100.0%
Administrative and Support Services	31.4%	27.2%	41.5%	100.0%
Public Administration and Safety	1.9%	92.3%	5.8%	100.0%
Education and Training	5.1%	84.1%	10.8%	100.0%
Health Care and Social Assistance	17.1%	64.1%	18.8%	100.0%
Arts and Recreation Services	15.1%	46.0%	38.9%	100.0%
Other Services	27.2%	9.8%	63.1%	100.0%
All Industries 2010 Survey	**15.2%**	**43.4%**	**41.4%**	**100.0%**
Electricity, Gas and Water (2006)[1]	**0.9%**	**84.4%**	**14.7%**	**100.0%**
Electricity, Gas and Water (2010)[2]	**0.9%**	**80.0%**	**19.1%**	**100.0%**

Source: Australian Bureau of Statistics, Employees Earnings and Hours, cat. No. 6306, Table 15

(1) Previous ANZSIC 1993 industry calssification, which was used for May 2006 survey (and all previous surveys). August 2008 was the first survey using new ANZSIC 2006 categories. Updated survey May 2010.
(2) EGW proportions for 2010 are estimated from the new ANZSIC 2006 data.

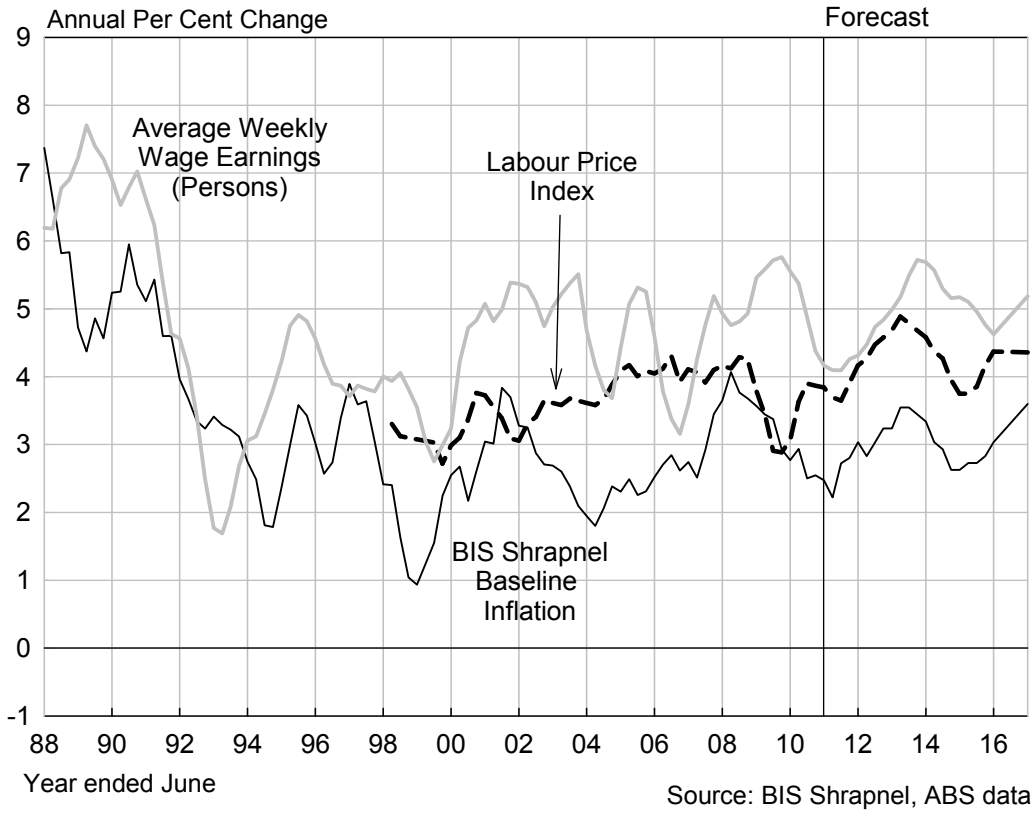
In terms of the key influences on the different wage determination mechanisms of each discrete segment:

- Increases in the Federal Minimum Wage (on which a range of mostly lower paid awards are also based) granted by the 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 Fair Work Australia's view of both current and short-term future economic conditions. Fair Work Australia granted a 3.4 per cent ($19.40) increase in minimum wages, effective July 2011 which lifted the Federal Minimum Wage to $589.30/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.

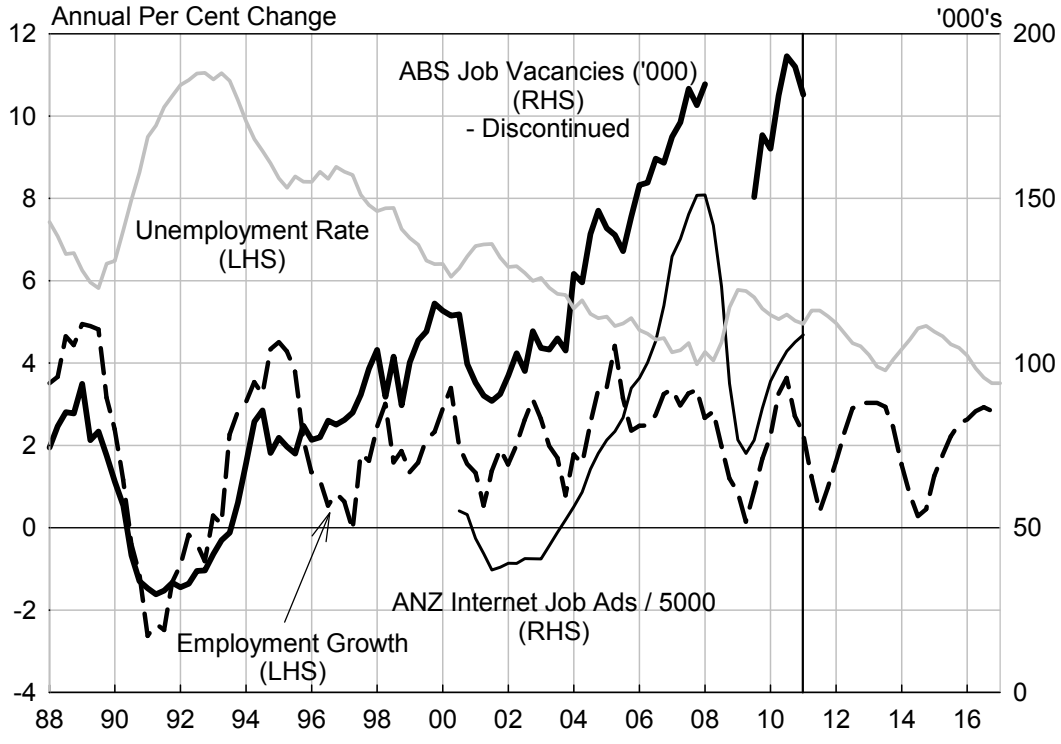
- Increases in individual agreements are primarily influenced by the strength of the labour market (especially the demand-supply balance of skilled labour), inflationary expectations, the recent profitability of relevant enterprises, current business conditions and the short-term economic outlook.

Chart 3.1: Australia – Wages and Prices



Source: BIS Shrapnel, ABS data

Chart 3.2: Employment and Unemployment



Source: BIS Shrapnel, ABS data

3.1 Outlook for Australian All Industries Wages

Wage pressures normalised in 2010/11 – slow build in 2011/12 to precede strong growth

BIS Shrapnel believes that wage inflation over the next 18 months will be shaped by a moderation in wages growth for award-reliant workers, moderate growth in wages for those on enterprise bargaining and solid growth in wages for those on individual agreements, particularly skilled workers.

Increases in the Federal Minimum Wage (on which a range of mostly lower paid awards are also based) granted by the Fair Work Australia (the successor to the Fair Pay Commission) 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. After receiving no increase in entitlement in 2009 — with the Fair Pay Commission citing as its reasons, the deterioration of economic conditions and the spurious link between minimum wage increases and higher unemployment — the 'normalisation' of trading conditions and the strength of competition for skilled workers saw Fair Work Australia grant a $26 increase in all modern award minimum weekly wages in 2010. Following the catch-up in 2010 and the 2010/11 Annual Wage Review, Fair Work Australia granted a 3.4 per cent ($19.40) increase in minimum wages, effective July 2011. The $19.40 per week increase is expected to contribute 1.5 per cent to the all industries AWOTE in 2011/12.

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' (i.e. an agreement has been 'struck') over recent quarters. Thereafter, collective agreements are based on BIS Shrapnel's macroeconomic forecasts.

Recent collective agreements data from the Department of Education, Employment and Workplace Relations (DEEWR) shows that average annualised wage increases (AAWIs) regained momentum in late 2009. Growth recovered to 3.9 per cent in the December quarter 2009 and strengthened to 4.2 per cent in the September 2010 quarter before easing to 3.8 per cent in the December 2010 quarter. The September quarter result was boosted in part by the catch-up in the minimum wage. According to the DEEWR, around 37 per cent of current Federal enterprise collective agreements covering 24 per cent of all employees under Federal enterprise agreements are linked in some way to annual wage review outcomes. However, the divergent outlook for industry sectors will dampen growth in all industry AAWIs for agreements reached in 2011, but the higher agreements in 2010 will offset the lower approved AAWIs in 2009 and overall growth in 2011/12 is expected to be slightly higher than 2010/11.

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. Our expectation is that this segment will see growth strengthen through 2011/12, but the extent of the recovery will vary considerably between industries. Skilled labour shortages are re-emerging in the sectors which drove strong increases in individual agreements prior to the global financial crisis and this will feed into overall wages growth in this segment. However, trading conditions are currently sluggish for many businesses and we don't expect to see much of an improvement until 2012.

The upshot is that annual LPI inflation is forecast to edge up from 3.8 per cent in 2010/11 to 3.9 per cent in 2011/12. Subsequently, growth is expected to pick up speed and reach 4.5 per cent over 2012/13 as employment growth regains momentum, the unemployment rate falls below 4 per cent and the pick up in economic activity broadens. AWOTE wages growth is expected to reach 4.3 per cent in 2011/12, up from 4.2 per cent in 2010/11.

Medium to longer term outlook – wages growth higher as pressures persist

A broadening in employment, profits and investment is expected from 2012 as mining investment and incomes stimulate wider economic activity, lifting confidence and spending and encouraging businesses to switch out of cost-containment mode. The unemployment rate is expected to be pushing back towards 4.0 per cent by the end of the year. The acceleration in profits and widening skills shortages will drive up wages growth during 2012/13, with growth in AWOTE expected to reach 5 per cent and growth in the LPI at 4.5 per cent.

Wages growth (in year average terms) is expected to subsequently rise further and peak at 5.7 per cent for AWOTE in 2013/14. The RBA will be acting to constrain economic growth and inflationary pressures during 2012 and 2013 by raising interest rates. As wage and price pressures build, the approach by the RBA will become increasingly aggressive and this will start to undermine domestic demand. The mining investment boom will be largely unaffected and strong competition for workers will continue to underpin strong growth in investment related sectors, but this will be offset by weakening profits and demand for labour elsewhere in the economy. Consequently, LPI growth in 2013/14 is expected to be on par, albeit slightly higher, than that seen in 2012/13.

The higher interest rates will cause a slowdown in economic and employment growth during 2014, and this will eventually feed through to wages growth in 2015, with wages growth in the individual arrangements and award segments slowing first. But with only a small rise expected in the unemployment rate (to 4.5 per cent) because of the deceleration in 'working population' and labour force growth, the ongoing tight labour market is expected to see wage pressures rise again in the second half of the decade.

Indeed, by the middle of this decade, both skilled and general labour shortages will begin to emerge due to demographic factors (i.e. retirements). Australia will continue to experience sustained labour shortages in the decade to 2022 (and beyond), and these shortages will become more significant as the workforce ages. As Australia's 'baby boomers' generation move into the 65+ age group, the growth of the 15-64 year old component of Australia's working age population (the overwhelming majority of Australia's workforce) will begin to slow.

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

3.2 Outlook for Consumer Price Inflation

Extreme weather events in Australia and high oil prices saw consumer prices shift higher in the first half of 2011. The CPI inflation rose 0.9 per cent in the June 2011 quarter to be 3.6 per cent higher through the year. Meanwhile, annual underlying inflation, which has been on a slow downward drift since the global financial crisis, increased only marginally to 2.3 per cent in the March quarter before rising to 2.9 per cent in June 2011.

BIS Shrapnel believes that underlying inflation has reached its cyclical low point in the current cycle. A combination of factors including a strengthening economy (once we get through the current soft patch), a pick-up in upstream price pressures, the waning of the disinflationary effects of the high A$, and higher rental, financial services and utilities inflation will put upward pressure on underlying inflation through the rest of 2011 and into 2012.

The Australian economy started the post global financial crisis recovery with much less spare capacity than following previous downturns. After a temporary setback in activity in the first half of this year (due to adverse weather affecting coal production in Queensland and iron ore exports from Western Australia), we expect the economic upturn to pick up speed in the second half of 2011. The limited spare capacity will be absorbed quickly once the economy gathers momentum. Tightening of capacity utilization and labour markets will result in wage pressures. With current productivity growth below long-run average, rising wage costs will push up unit labour costs and non-tradeables inflation.

Rising upstream price pressures over 2010 and in the March 2011 quarter will also feed into a range of consumer goods in an environment of a strong economy. After remaining weak over 2009, upstream price pressures picked up in 2010 and rose by a stronger than expected 1.2 per cent in the March 2011 quarter to be 2.9 per cent higher through the year. The pick-up in producer price data over 2010 and so far this year indicates a rebuilding of input costs for businesses after a year of consistent declines in producer price inflation. Given the current stage of economic cycle (limited spare capacity in product and labour markets), we expect the momentum in producer price pressures to continue for the remainder of 2011. Moreover, against a background of record terms of trade and a strengthening economy, we expect a greater proportion of the lift in producer prices to be passed onto consumers over the rest of 2011 and 2012.

The appreciation of the exchange rate (from an average of US90 cents in the September 2010 quarter to now trading comfortably above parity) will help keep a lid on tradeables inflation. But for the exchange rate to keep exerting downward pressure, the dollar needs to appreciate further. With global inflation on the rise and given our expectation that the dollar will hold around current levels in the short term, we expect the disinflationary effects of the high dollar to diminish over the coming quarters and tradeables inflation to rise thereafter.

Rents have been increasing due to a significant deficiency of residential stock, with vacancy rates at near the lowest levels in over a decade across Australia. Dwelling construction in most major capital cities has now fallen to a level where not enough is being built to satisfy underlying demand for dwellings. We believe annual rental inflation will remain elevated at between 4.6 per cent to 5.2 per cent over the next two years (due to the persistent deficiency of residential stock) which will put upward pressure on housing and, in turn, non-tradeables inflation.

Recently, large increases in utilities charges (comprising electricity, gas & other household fuels and water & sewerage costs) have had a significant impact on overall inflation. A move towards cost-based pricing, the need to replace and expand infrastructure to meet demand, and rising input costs has seen utilities inflation move to a higher plane. We believe utilities prices will continue to grow strongly over 2011 as a significant ‘catch-up’ still exists for the below-average price increases and under-investment in infrastructure during much of the 1990s. In fact, regulators in most states have already approved significant price increases for electricity which have been implemented from 1 July 2011. These include: Queensland 5.8 per cent, New South Wales 9.6 per cent to 13.1 per cent, Tasmania 8.5 per cent and South Australia over 12 per cent, while further double-digit increases are expected in Western Australia.

Table 3.3: Wages and Prices – Australia
Year Average Growth

Year Ended December	Average Weekly Ordinary Time Earnings[1] $/week	%CH	Labour Price Index All Industries 2011=100	%CH	CPI Headline Inflation (BIS Shrapnel forecasts) 2011=100	%CH	Official Headline CPI [2] 2011=100	%CH
2000	785.9		66.9		73.1		73.1	
2001	825.1	5.0	69.3	3.6	76.3	4.4	76.3	4.4
2002	867.1	5.1	71.5	3.2	78.6	3.0	78.6	3.0
2003	913.7	5.4	74.1	3.7	80.8	2.8	80.8	2.8
2004	948.5	3.8	76.8	3.6	82.7	2.3	82.7	2.3
2005	998.9	5.3	79.9	4.0	84.9	2.7	84.9	2.7
2006	1 032.6	3.4	83.0	3.9	87.9	3.5	87.9	3.5
2007	1 081.8	4.8	86.4	4.1	90.0	2.3	90.0	2.3
2008	1 133.8	4.8	90.0	4.2	93.9	4.4	93.9	4.4
2009	1 198.6	5.7	93.2	3.6	95.6	1.8	95.6	1.8
2010	1 257.0	4.9	96.4	3.4	98.3	2.8	98.3	2.8
2011e	1 308.5	4.1	100.0	3.8	100.0	1.7	100.0	3.5
Forecasts								
2012	1 370.4	4.7	104.2	4.2	102.3	3.1	103.5	3.5
2013	1 445.6	5.5	109.1	4.7	108.8	3.8	106.9	3.3
2014	1 522.2	5.3	114.0	4.5	112.4	3.3	109.7	2.7
2015	1 597.7	5.0	118.4	3.8	115.4	2.7	112.5	2.5
2016	1 673.4	4.7	123.5	4.3	119.0	3.1	115.3	2.5
2017	1 762.7	5.3	129.1	4.6	123.2	3.6	118.2	2.5
Compound Annual Growth Rates								
1990-2000	3.8				2.2		2.2	
2000-2010	4.8		3.7		3.0		3.0	
2006-2011	4.8		3.8		2.6		2.6	
2011-2017	5.1		4.4		3.5		2.8	

e : estimate Source: BIS Shrapnel, ABS data

(1) Earnings per person for full-time adults. Data is year ended November (available only mid month of quarter).
(2) RBA Forecasts to December 2013. Beyond 2013, Commonwealth Treasury's forecasts are used.

Inflation to remain near the top of RBA's 2-3% target band

Overall, we are forecasting underlying CPI inflation to rise to 3 per cent (through the year) in June 2012. Meanwhile, headline consumer price inflation is forecast to fall back from 3.6 per cent in June quarter 2011 to 2.6 per cent in June 2012, as the higher fruit and vegetable prices of the March quarter 2011 drop out of calculations. We are forecasting that both underlying and headline consumer price inflation will push above 3 per cent by the end of 2012.

Implementation of a price on carbon to provide one-off boost to electricity prices . . . but overall CPI impact likely to be muted

The Federal Government recently announced that it will introduce a carbon price (tax) in an effort to reduce carbon pollution and contribute towards the global initiatives to mitigate climate change caused by greenhouse gas emissions. By imposing a carbon price the government also hopes to facilitate the transition to a low-(carbon) emissions economy, ie generate investment in low emission technologies such as renewable technologies. The initial price of $23 per tonne of CO_2-e emissions will commence on 1 July 2012, subject to passage of legislation through parliament.

The imposition of the initial (fixed) carbon price will lead to a 'one-off' lift in some of the expenditure classes of the CPI. The Commonwealth Treasury projects that under a $23 carbon price, electricity prices will increase by 10 per cent in 2012/13, gas prices by 9 per cent while food prices are expected to rise by less than 0.5 per cent. Overall, the CPI impact in 2012/13 is estimated at 0.7 per cent, significantly lower than the introduction of GST which increased CPI by around 2.5 per cent through-the-year to June quarter 2001.

In dollar terms, the Treasury projects that household expenditure, on average, is expected to increase by $3.30 per week due to higher electricity prices and by $1.50 per week due to higher gas prices. Most items in consumer budgets will increase by less than 1 per cent such as food where households are expected on average to spend only an additional $0.80 per week.

Some second-round impacts of the carbon price could also occur, if these higher relative prices cause consumers and businesses to reassess their beliefs on underlying aggregate inflationary pressure, and therefore change their wage and price setting behaviours. This change in behaviour would have consequences for the medium-term trend of inflation. However, the CPI impact of the carbon tax is likely to be quarantined, and offset in wage formation.

Inflation containment to remain a policy challenge well into the medium term

Over most of the past decade, the steady rise in the Australian dollar has been a key factor in keeping overall inflation mostly within the Reserve Bank's target band of 2-3 per cent – except over 2008/09, when the exchange rate fell from an average of US$0.94 in June quarter 2008 to US$0.66 in the March quarter 2009, before again resuming its upward path. An appreciating currency limits the rise in import prices, which is then partially passed on by retailers to help hold down 'tradeables' inflation. Tradeables inflation constitutes around 42 per cent of the CPI, but includes the volatile automotive fuel and fruit and vegetable sub-categories.

The Australian dollar is influenced by two key factors: interest rates in Australia compared to overseas (particularly US interest rates) and commodity prices. Sustained high commodity prices and rising domestic interest rates will continue to support the A$ over the next two to three years. However, we don't expect to see a further significant appreciation. A considerable overhang in capacity is keeping inflationary pressures at bay in the US, but firming demand should see the Federal Reserve start to lift interest rates by mid 2013. Rising US interest rates will narrow the interest rates differential between Australia and the US which will also weigh down on the attractiveness of the A$. In addition, some commodity prices (particularly some

metals) appear overvalued on fundamentals at present, while the current and near-term record prices for coal, iron ore and some agricultural commodities are unlikely to be sustained, and will ease as supply comes back on stream. Overall, BIS Shrapnel is forecasting the exchange rate to rise to $1.05 and US$1.07 in 2011/12 and 2012/13, before falling to US$1.00 by the end of 2014 – although the currency will continue to be volatile in a US$0.95 to US$1.10 band over the next three years.

These modest rises forecast for the currency will only partially offset rising inflation overseas over 2011/12 and 2012/13, with the end result that underlying tradeables inflation (ie excluding fuel, fruit and vegetables) will increase over the next three years at a faster rate than the six years to June 2008 and over 2009/10 and 2010/11, although still mostly below an annual rate of 2 per cent per annum. Lower fuel, fruit and vegetable process will help keep overall tradeables inflation muted over 2011/12, as the flood and cyclone inspired price spikes reverse and as global oil prices decline back below US$100/barrel – assuming the unrest in the Middle East subsides. However, fruit and vegetable prices are likely to return to their year-to-year volatility over subsequent years, while global oil prices are expected to increase over the medium term as global demand increases in line with economic recovery overseas, but new supply is constrained. We are forecasting oil prices to rise back over US$100/barrel by the second half of 2012 and increase further to a peak of US$114/barrel in late 2013 before easing. This will push up local petrol prices considerably over 2013.

Aggregate CPI inflation will also be pushed up by rising non-tradeables inflation, largely as a result of faster growth in wages and the persistence of high rates of inflation in rents, utilities, health, education, child care services and other housing costs. From the second half of this year, employment growth will follow the recovery in demand and output, with accelerating growth in employment over 2012 producing a decline in the unemployment rate, falling below 5 per cent in the second half of 2012. The strengthening in employment growth and the economy generally will result in rising incomes and demand, which, combined with the shrinking of spare capacity, will add to demand inflationary pressures during 2012. Wages growth is also expected to pick up over these two years, with continuing weak productivity growth also adding to the rise in unit labour costs and non-tradeables inflation.

By 2013, the economy is expected to hit full capacity constraints, with the unemployment rate predicted to fall below 4 per cent. Inflationary pressures therefore will be broad-based, but labour shortages will be the key constraint on the economy and the RBA will take an increasingly aggressive approach to reducing demand pressures through 2013. The efforts of the RBA are expected to successfully rein in growth in domestic demand from the second half of 2013, but wage and price pressure will be sticky downward, because both wages and, to a lesser extent, price inflation tend to lag the strength of growth in demand and output.

We believe inflation containment will remain a policy challenge well into the medium term. Tight labour markets will emerge once again in the medium term to become a chronic problem for inflation. The large pool of unemployed that was a feature of the 1990s has gone. Moreover, skilled labour shortages will remain a problem for the foreseeable future, particularly given anecdotal evidence of a re-emergence of skilled labour shortages so early into the post-GFC recovery. Inflation will act as the main ‘safety valve’ on Australia’s constrained economy. While ever the unemployment rate starts to track below 5 per cent there will be the potential for a demand-driven rise in wages growth and inflation. Pressures may moderate from time to time, but it would take another full-blown recession and a sharp fall in employment to really see inflationary pressures be significantly subdued.

3.2.1 Reserve Bank of Australia CPI forecasts

The Reserve Bank and the Federal Treasury provide the 'official' view of CPI forecasts. The RBA's August 'Statement on Monetary Policy' projects the headline CPI rate at 3.5 per cent in the December quarter 2011, before falling to 2.5 per cent in the June quarter 2012. According to the RBA, CPI inflation (excluding the carbon price) is then expected to rise to 3 per cent by December 2012 and remain within 3 to 3.25 per cent band until December 2013 (current RBA forecasts only extend to December 2013).

The Federal Treasury in the 2011/12 Budget Papers (released in May 2011) projected CPI inflation at 2.75 per cent in 2011/12 and 3 per cent in 2012/13. For the budget forward estimate period ie 2013/14 and 2014/15 financial years, the Federal Treasury forecast CPI inflation at 2.5 per cent.

4. GAS NETWORK-RELATED LABOUR COST ESCALATION

4.1 Key points

- Gas network related labour includes a range of skilled labour who works directly and indirectly on the construction, maintenance, design and operation of the gas network, in both the operational (opex) and capital enhancement (capex) aspects. The workers work both in the field and in the offices. The escalator which BIS Shrapnel proposes to use for the gas network related labour is wages growth in the Electricity, Gas and Water Supply (EGW or 'Utilities') sector for Victoria and New South Wales.
- Overall, BIS Shrapnel expects total wage costs for the Australian utilities sector — expressed in Average Weekly Ordinary Time Earnings (AWOTE) — will average 5.8 per cent per annum over the six years from 2012 to 2017 inclusive, 0.7 per cent higher than the national 'All Industries' AWOTE average of 5.1 per cent per annum over the same six year period (see table 4.5). In terms of *underlying* wages growth in the electricity, gas and water ('utilities') sector for total Australia — expressed in labour price index (LPI) terms — BIS Shrapnel is forecasting an average of 5.0 per cent per annum (0.6 percentage points higher than the national 'All Industries' LPI average of 4.4 per cent per annum) over the six years from 2012 to 2017 inclusive (see table 4.5). The faster wages growth expected in the electricity, gas and water sector over the next six years is in line with historical movements in the LPI over the past six years (see Table 4.5).
- The continued stronger wages growth in the Australian utilities' sectors is due to:
  - Sustained strong demand for skilled labour in the utilities sector, due to continued high levels of capital and maintenance expenditure in the utilities sector, related to major network upgrades and refurbishment and the need for new capacity in the electricity, gas and water sectors to cater for population and economic growth over the long term.
  - Heightened competition from the Mining, Construction and (to a lesser extent) Manufacturing sectors for similar skilled labour as those sought in the utilities sector, driven in particular by the resources investment boom, which is expected to ramp up substantially over the next four years and remain at high levels over the following five to ten years.
  - Relatively stronger unions continuing to win above average enterprise bargaining agreements in what is an essential services sector. Collective agreements dominate the pay setting in the utilities sector (covering around 80 per cent of employees in the Electricity, Gas and Water sector).
- Utilities wages growth in Victoria is forecast to average 5.5 per cent per annum (in AWOTE terms) over the six years from 2012 to 2017, 0.3 percentage points lower than the national utilities AWOTE average of 5.8 per cent per annum, while Victorian utilities LPI growth is forecast to average 4.7 per cent p.a. (also 0.3 per cent lower than the national utilities average of 5.0 per cent per annum) over the six years from 2012 to 2017 inclusive (see table 4.8). The weaker utilities wages growth in Victoria is due to Victoria's lower exposure to the resources investment boom (compared to Queensland and Western Australia in particular), the comparative weakness of the state's construction sector (compared to total Australia) and the comparative weaker growth in Victorian utilities-related engineering construction. This means a lower relative demand for similarly-skilled labour from the state's construction and mining sectors and within the states utilities sector, compared to other states and therefore slower wages growth compared to the national utilities average.

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

Sector	% of Total Employment May 2011	Labour Price Index[1] Annual Percent Change Jun '06	Jun'07	Jun'08	Jun'09	Jun'10	Sep'10	Dec'10	Mar'11	Jun'11	Five-Year Average
Private		4.0	3.9	4.4	3.6	2.7	3.5	3.9	4.0	3.9	3.7
Public		4.3	4.2	3.9	4.4	4.0	4.0	4.0	3.6	3.7	4.1
Industry											
Mining	1.9%	5.9	5.5	6.7	4.2	3.8	3.9	4.5	4.6	4.1	4.9
Manufacturing	8.6%	3.9	4.1	4.6	2.5	2.6	3.2	3.7	3.9	4.1	3.6
Electricity, Gas, Water and Waste Services	1.3%	6.4	4.0	3.5	4.7	4.7	4.5	4.8	3.7	3.7	4.1
Construction	9.2%	5.9	4.2	4.7	4.5	2.9	3.7	3.9	4.4	4.0	4.1
Wholesale Trade	3.5%	3.7	3.7	4.6	3.3	1.7	2.4	3.5	4.4	4.8	3.6
Retail Trade	10.8%	3.4	3.1	4.5	3.5	2.8	3.5	3.3	3.3	3.3	3.4
Accommodation and Food Services	7.0%	3.3	3.0	2.3	3.4	2.0	3.4	3.5	3.3	3.0	2.7
Transport, Postal and Warehousing	5.1%	4.2	4.1	3.9	4.4	3.2	3.1	2.8	3.6	4.0	3.9
Information Media and Telecommunications	1.9%	2.8	3.6	3.9	3.0	2.0	2.3	3.0	3.5	3.2	3.1
Finance and Insurance Services	3.7%	4.0	4.3	3.6	3.2	3.1	4.2	4.4	4.3	4.5	3.7
Rental, Hiring and Real Estate services	1.8%	3.9	3.0	4.1	3.6	2.5	2.6	2.9	3.0	3.6	3.3
Professional, Scientific and Technical Services	7.5%	4.3	4.3	5.1	5.1	2.9	4.0	4.6	4.7	4.0	4.3
Administration and Support Services	3.5%	3.3	3.6	4.9	2.9	2.5	3.4	4.0	3.8	3.7	3.5
Public Administration and Safety	6.3%	4.2	4.3	3.9	4.5	3.7	3.9	4.0	3.6	3.4	3.9
Education	7.7%	4.4	4.1	4.0	4.5	3.9	4.4	4.4	3.9	3.8	4.1
Health Care and Social Assistance	11.3%	4.5	4.3	3.6	3.9	4.0	3.7	3.6	3.3	3.6	3.9
Arts and Recreation Services	1.9%	3.0	4.4	3.4	3.9	2.8	3.3	3.1	3.1	3.4	3.6
Other Services	4.0%	3.2	4.0	3.3	3.3	2.3	3.3	3.1	3.0	3.6	3.3
State/Territory											
New South Wales	31.5	3.9	3.8	4.0	3.6	3.1	3.4	3.8	3.8	3.7	3.6
Victoria	25.2	3.7	3.6	4.2	3.4	2.7	3.5	3.7	3.9	4.1	3.6
Queensland	20.4	4.7	4.6	3.9	4.1	3.3	3.9	4.2	3.9	3.9	3.9
South Australia	7.2	3.7	4.3	4.6	3.7	2.9	3.3	3.9	3.6	3.3	3.7
Western Australia	10.8	4.6	5.2	5.6	4.6	3.4	3.9	4.0	4.1	3.8	4.5
Tasmania	2.1	4.1	4.5	3.6	4.2	3.6	3.2	3.4	3.5	3.5	3.9
Northern Territory	1.1	3.9	4.3	4.2	3.8	3.4	3.8	3.8	4.1	3.9	3.9
Australian Capital Territory (ACT)	1.8	3.8	4.3	4.0	4.1	3.0	3.8	3.7	3.7	3.5	3.8
Total All[2]	100	4.2	4.0	4.2	3.8	3.1	3.6	3.9	3.9	3.8	3.8

Source: BIS Shrapnel, ABS data

(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 May 2011	Average Weekly Earnings[1] $ / Week May '11	Annual Percent Change May '07	May '08	May'09	May'10	Aug'10	Nov'10	Feb'11	May'11	Five-Year Average
Mining	1.9%	2 122	5.8	9.5	6.4	6.4	8.2	6.8	5.9	5.2	6.6
Manufacturing	8.6%	1 170	4.5	4.1	4.5	1.5	2.2	1.7	3.2	4.1	3.7
Electricity, gas, water and waste services	1.3%	1 492	4.2	2.2	7.0	9.5	10.7	9.1	9.5	7.2	6.0
Construction	9.2%	1 332	8.0	7.1	9.0	6.8	6.4	4.4	5.6	3.8	6.9
Wholesale trade	3.5%	1 270	5.9	3.9	4.8	0.8	2.9	2.5	0.9	9.3	4.9
Retail trade	10.8%	940	4.0	2.5	4.8	6.3	2.9	1.4	0.7	-1.2	3.2
Accommodation and food services	7.0%	930	8.9	0.1	3.5	4.5	3.9	3.4	3.5	3.3	4.0
Transport, postal and warehousing	5.1%	1 243	-0.5	1.8	3.4	7.5	11.5	10.3	7.3	6.6	3.7
Information media and telecommunications	1.9%	1 546	10.8	4.2	5.2	5.6	5.5	4.2	4.2	4.5	6.0
Finance and insurance	3.7%	1 538	3.7	4.9	1.4	7.5	7.5	8.8	5.3	2.9	4.1
Rental hiring and real estate services	1.8%	1 209	3.9	7.7	6.4	1.8	-3.7	-2.6	-0.1	-1.9	3.5
Professional, scientific and technical services	7.5%	1 558	5.0	6.5	5.6	7.1	6.4	5.8	2.9	3.0	5.4
Administration and support services	3.5%	1 168	4.5	7.7	6.4	7.3	2.9	1.3	-0.9	-3.5	4.2
Public administration and defence	6.3%	1 558	3.5	3.8	6.0	7.2	8.5	5.8	4.6	3.9	4.9
Education and training	7.7%	1 168	4.4	2.3	5.3	5.6	5.6	5.2	4.2	4.4	4.4
Health and social assistance	11.3%	1 369	6.5	2.5	7.0	2.9	-0.1	2.2	2.2	5.8	4.9
Arts and recreational services	1.9%	1 387	6.9	2.3	5.3	2.2	6.3	4.5	5.7	5.9	5.8
Other services	4.0%	1 254	1.9	2.5	7.0	0.5	2.0	4.9	6.4	1.3	3.5
Total All Industries[2]	100%	1 305	5.0	3.7	10.5	5.2	4.5	3.9	3.8	4.4	4.9

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

Source: BIS Shrapnel, ABS data

- Utilities wages growth in NSW is forecast to average 5.6 per cent per annum (in AWOTE terms) over the six years from 2012 to 2017, 0.2 percentage points lower than the national utilities AWOTE average of 5.8 per cent per annum, while the NSW utilities LPI is forecast to average 4.9 per cent p.a. (slightly lower than the national utilities average of 5.0 per cent p.a.,) over the six years from 2012 to 2017 inclusive (see table 4.9). Similar to Victoria, NSW is also expected to derive less benefit from the resources investment boom than Queensland and Western Australia. However, strong growth in coal-related investment and potential coal-seam gas projects will see pressure from the state's mining sector for similarly-skilled labour. Meanwhile, the NSW construction sector is forecast to exhibit stronger growth than the national (construction) average, with utilities-related engineering construction also stronger than the national average over the six year to 2017.

4.2 Key Drivers of Sustained Strong Growth in Underlying Wages Growth (Labour Price Index) in the National Utilities Sector

Wages growth in the electricity, gas and water sector is invariably higher than the total Australian national (all industry) average. The labour price index growth has consistently been above the national average since the index's inception in 1997 (although it was the same as the national average in 2007/08) and averaged 0.7 per cent higher over the decade to 2009/10 (see Table 4.5). While growth in average weekly ordinary time earnings (AWOTE) of the electricity, gas and water sector has displayed considerably more volatility (mainly related to compositional effects) over the past two decades, 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).

LPI is an underlying wage inflation measure, while AWOTE measures changes in average labour costs

We begin our analysis of labour cost escalation in the utilities sector by first considering the two main wage inflation measures – the labour price index (LPI) and Average Weekly Ordinary Time Earnings (AWOTE). BIS Shrapnel considers the labour price index (LPI) to be a measure of *underlying* wage inflation in the economy or in a specific industry, as the LPI only measures changes in the *price* of labour, or wage rates, for specific occupations or job classifications, which are then aggregated into a measure of the collective variations in wage *rates* made to the current occupants of the *same* set of specific jobs.

The LPI, therefore, reflects pure price changes, but does not measure variations in the quality or quantity of work performed. The LPI also does not reliably measure the changes in total labour costs which a particular enterprise or organisation incurs, because the LPI does not reflect the changes in the skill levels of employees within an enterprise or industry. As skills are acquired, employees will be promoted to a higher grade or job classification, and with this promotion will move onto a higher base pay. So the change in the cost of labour over, say a year, includes increases in the base pay rates (which the LPI measures) and the higher average base pay level. The AWOTE captures both these elements, while the LPI only captures the first element. Basically, promoting employees to a higher occupation does not necessarily show up in the LPI, but the employer's total wages bill (and average unit labour costs) is higher, as is AWOTE. The AWOTE measure here also includes bonuses, incentives, penalty rates and other allowances, which are also part of an enterprises total wage bill (a more detailed description of the wage measures can be found in Appendix A).

Another problem with the use of the LPI is that it is only available from the ABS for two states — NSW and Victoria — which is a problem in using it as a labour cost escalator for other states not covered. Despite the problems with the LPI, the AER has previously indicated a preference for the LPI, largely because of the volatility of AWOTE caused by perceived 'significant' compositional problems with AWOTE, although we would argue the bonuses, incentives, etc. also add markedly to volatility through the cycle.

Chart 4.1: AWOTE & LPI
Total Australia (All Industries) and Electricity, Gas and Water

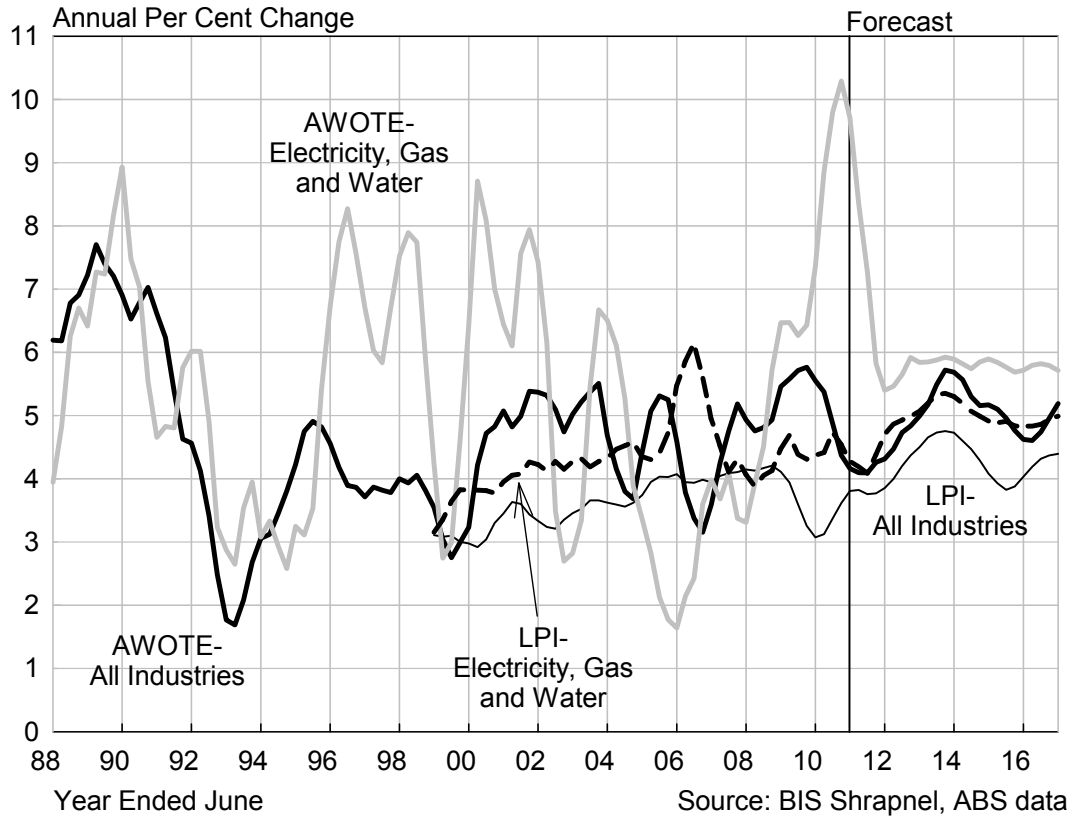


Table 4.3: Federal Wage Agreements – Collective Agreements by Industry
(Average Annualised Wage Increase)

Selected Industry	Collective Agreements									Average
	Average Annualised Wage Increase[1]									
	2002	2003	2004	2005	2006 [2]	2007	2008	2009	2010	2002-2010
Electricity, Gas, Water and Waste Services	**3.9**	**4.2**	**4.3**	**4.2**	**4.4**	**4.5**	**4.7**	**4.8**	**4.8**	**4.4**
Agriculture, Forestry and Fishing	3.3	3.4	3.3	3.0	3.0	2.9	3.0	3.7	3.7	3.3
Mining	3.4	3.2	3.3	3.6	3.7	4.0	4.3	4.4	4.3	3.8
Manufacturing	4.1	4.1	4.1	4.1	4.2	4.3	4.2	4.1	3.9	4.1
Construction	4.7	4.1	4.3	4.4	4.9	4.9	4.6	5.3	5.4	4.7
Wholesale Trade	3.7	3.8	3.9	4.0	3.7	3.6	3.8	4.1	4.0	3.8
Retail trade	3.2	3.2	3.2	3.4	3.5	3.5	3.5	3.6	3.5	3.4
Accommodation and Food Services	2.8	2.8	2.8	3.2	3.3	3.4	3.2	3.6	3.9	3.2
Transport , Postal and Warehousing	3.5	3.6	3.6	3.7	3.7	3.9	4.0	4.2	4.2	3.8
Information Media and Telecommunications	3.8	4.0	4.2	4.1	3.6	3.2	3.3	3.7	3.8	3.7
Financial and Insurance Services	4.1	4.1	4.2	4.1	4.1	4.1	3.8	4.0	3.6	4.0
Rental, Hiring and Real Estate Services	3.6	3.8	4.1	4.1	3.8	4.8	4.5	3.4	3.7	4.0
Administrative and Support Services	3.6	3.8	4.1	4.1	3.8	3.6	3.6	3.8	3.7	3.8
Professional, Scientific and Technical Services	3.6	3.8	4.1	4.1	3.8	4.0	4.0	4.5	4.3	4.0
Public Administration and Safety	3.9	4.4	4.4	4.3	4.0	4.1	4.2	4.3	3.9	4.2
Health Care and Social Assistance	4.0	3.9	4.0	4.1	4.0	4.0	4.0	4.1	4.0	4.0
Education and Training	3.9	3.9	4.5	4.7	4.9	4.8	4.9	4.4	4.6	4.5
Arts and Recreation Services	3.3	3.7	3.5	3.8	3.5	3.8	4.0	4.1	3.5	3.7
Other Services	4.2	4.5	4.4	4.0	4.0	4.1	4.0	3.9	3.7	4.1
ALL INDUSTRIES	3.8	3.8	3.9	4.0	4.1	4.1	4.0	4.2	4.1	4.0

[1] Current agreements in June of each year.
[2] New ANZSIC codes begin in 2006

Source: Department of Employment & Workplace Relations (DEWR)

For the reasons outlined above, BIS Shrapnel believes AWOTE is a better measure of the change in overall labour *costs*. However, in the next part of this section, we will consider the key drivers of the sustained strong growth in underlying wages growth (i.e. the LPI measure) in the national utilities sector, and draw comparisons with the all industries average and (in section 4.7) with competitor industries competing with the utilities sector for labour with similar skills (i.e. Mining, Construction and Manufacturing sectors). The key drivers will essentially boost utilities wages growth measured in both LPI and AWOTE terms, but we will consider the quantum of the combined up skilling effects, compositional effects, bonuses, incentives, etc over the cycle separately in section 4.3.

Utilities wages growth will remain well above 'all industries' average

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. With many of the particular skills relevant to the electricity, gas and water sector expected to remain in relatively high demand, wage increases are expected to remain higher in this industry than the national average over the next six years.

In addition, 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 EGW sector is not impacted in the same way due to its obligation to provide essential services and thus retain skilled labour.

Demand for skilled labour — and therefore wages growth — to remain strong within the utilities sector, due to sustained high levels of utilities investment

Employment growth in the utilities sector over the past decade (2001/02 to 2010/11 inclusive) averaged 6.5 per cent per annum, the second fastest growth among the 18 main industry sectors behind the Mining sector (10.1 per cent per annum), with Construction employment growth third at 4.4 per cent per annum.

This strong growth in utilities employment since 2002 has been associated with a pick-up in infrastructure and maintenance work as well as 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 growth 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

Table 4.4: Electricity, Gas & Water Supply Wage Forecasts – Australia

	Year Average Percent Change																		
												Forecast						Averages	
Year Ended June	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2001-11	2012-17
Proportion of Workforce by Pay setting Method																			
Awards Only	1.2%	1.1%	1.4%	1.7%	1.3%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	1.1%	0.9%
Collective Agreements	77.3%	78.1%	79.0%	79.9%	82.2%	84.4%	82.2%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%
Individual Arrangements	21.5%	20.9%	19.6%	18.4%	16.6%	14.7%	16.9%	19.1%	19.1%	19.1%	19.1%	19.1%	19.1%	19.1%	19.1%	19.1%	19.1%	18.9%	19.1%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100.0%	100.0%
AWOTE																			
Awards Only (a)	1.6	1.3	1.7	1.6	1.6	1.4	1.7	1.2	1.4	0.4	1.8	1.2	1.3	1.4	1.2	1.1	1.2	1.4	1.2
Collective Agreements	3.8	3.9	4.2	4.3	4.2	4.6	4.5	4.7	4.8	4.9	4.7	4.7	4.9	5.1	4.9	4.8	4.8	4.3	4.9
Individual Arrangements (b)	16.2	21.0	-2.6	16.5	-0.7	-15.3	1.6	-2.4	13.7	18.0	31.0	8.5	9.8	9.5	10.3	9.6	9.7	9.6	9.6
AWOTE (Persons)(c)	**6.4**	**7.4**	**2.8**	**6.5**	**3.4**	**1.6**	**4.0**	**3.3**	**6.5**	**7.4**	**9.7**	**5.4**	**5.8**	**5.9**	**5.9**	**5.7**	**5.7**	**5.5**	**5.7**
Labour Price Index																			
Awards Only (a)	1.6	1.3	1.7	1.6	1.6	1.4	1.7	1.2	1.4	0.4	1.8	1.2	1.3	1.4	1.2	1.1	1.2	1.4	1.2
Collective Agreements	3.8	3.9	4.2	4.3	4.2	4.6	4.5	4.7	4.8	4.9	4.7	4.7	4.9	5.1	4.9	4.8	4.8	4.3	4.9
Individual Arrangements (b)	4.6	5.6	4.7	4.7	5.3	10.7	7.3	1.6	3.2	2.3	2.7	4.8	6.0	6.2	5.1	5.1	5.9	4.9	5.5
Labour Price Index (Ord. Time)	**3.9**	**4.2**	**4.3**	**4.3**	**4.4**	**5.5**	**5.0**	**4.1**	**4.5**	**4.4**	**4.3**	**4.7**	**5.1**	**5.3**	**4.9**	**4.8**	**5.0**	**4.4**	**5.0**
Compositional Effects + Bonuses,etc	2.5	3.2	-1.4	2.2	-1.0	-3.8	-1.0	-0.8	2.0	3.0	5.4	0.7	0.7	0.6	1.0	0.9	0.7	1.1	0.8

(a) Contribution of nominal award wage increase (flat $ amount) to total wages growth, rather than percent change in award wages

Source: BIS Shrapnel, ABS, DEEWR

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

(c) Full-time Adult Persons, excluding overtime

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 (see table 4.13).

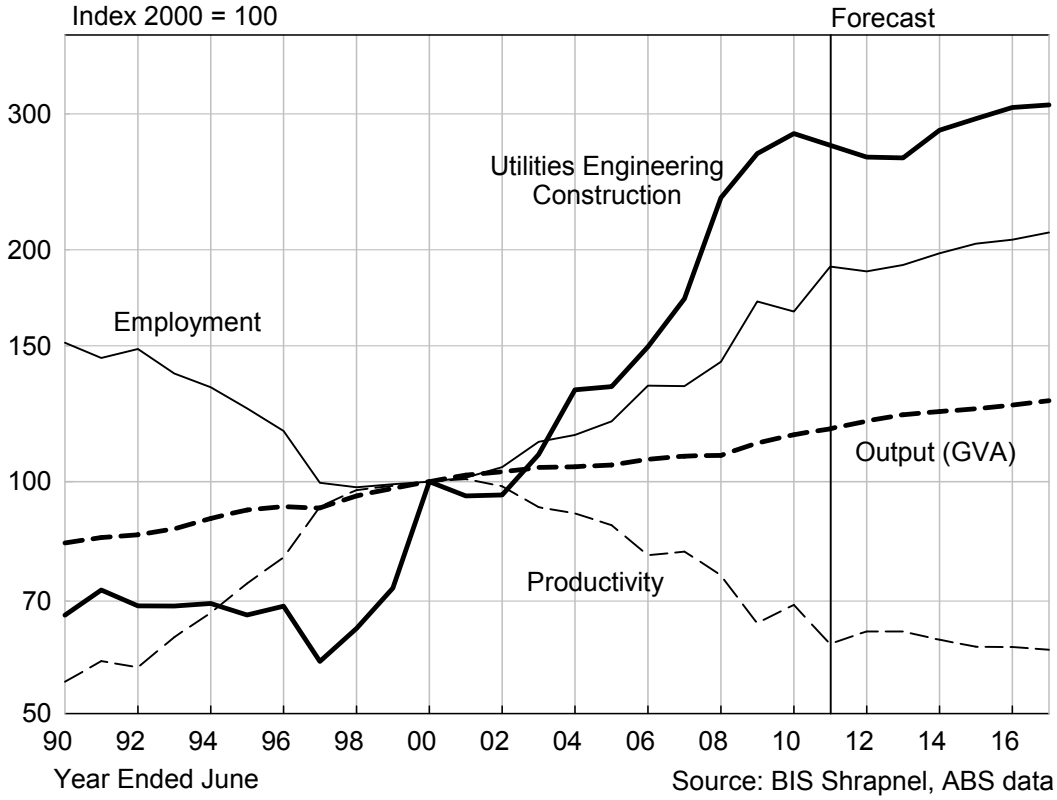
The GFC and associated slowing in the economy over 2008/09 subsequently reduced labour market and wage pressures, but the unemployment rate only rose to a peak of 5.9 per cent in mid 2009 and has now fallen back to around 5 per cent. With the next phase of the resources investment boom now ramping up and utilities across Australia in the midst of a major investment phase itself, skilled labour shortages are already emerging. Job vacancies in the Utilities, Mining and Construction sectors have risen sharply since 2009 back toward (or above) the tight 2007/08 levels.

With the economy recovering, employment growth outpacing population and labour force growth and the unemployment rate now around 5 per cent and expected to fall below 4 per cent within two years, we expect to again witness the re-emergence of skilled labour shortages and competition for scarce labour from 2011/12, particularly from the construction and the mining sectors, which will push up wage demands in the utilities sector.

We expect wages growth in the electricity, gas and water sector to remain above the national average over the medium term, given the relatively high levels of job vacancies in the sector and the current levels of skills shortages being reported. Increased demand for labour will continue in the sector over the next six years at least.

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. We expect employment growth to remain elevated for the utilities sector. Our forecast is for utilities investment to be higher (relative to history) over the next six years (see charts 4.3 and 4.4).

Chart 4.2: Australia – Utilities Employment, Output and Investment



Electricity, gas and water utilities in virtually every state across Australia have embarked on major network refurbishment, extension and augmentation programs. This is due to the need to replace ageing infrastructure to maintain supply capability and to ensure reliability of the network, especially during peak periods. The latter is typically more maintenance type of work and is generally more labour intensive. Given the recent trend towards consolidating work in-house (rather than out-sourcing), we expect the need for regular maintenance work will continue to boost overall employment in the Utilities sector.

Added to this is our expectation that a number of peak, intermediate and base load power stations will be built over the next decade (with gas fuelled generation expected to dominate), along with new renewable generation facilities, while local reticulation construction will continue to be driven by new housing and industrial and commercial demand.

We expect further growth in electricity, gas and water employment over the next six to seven years, although the rate of growth is forecast to be slower than in recent years. Partly underpinning this outlook for further employment growth is the relatively higher levels of utilities-related infrastructure construction expected to occur over the next few years. Submissions to the Australian Energy Regulator (AER) and to other state based equivalents (such as the Victorian Essential Services Commission) from a number of utilities in each state have consistently reported that they expect to increase employment over the next five to six years.[1]

More importantly, electricity, gas and water supplies are essential services where reliability of supply is paramount. Accordingly, this requires adequate skilled labour to maintain reliability of supply, which points to the need to offer high wages to attract and retain skilled labour in this sector.

Powerful unions in utilities sector will also keep wages growth elevated

The key elements of the utilities wage forecast are set out in Table 4.4. Table 4.4 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 invariably be higher than the all industries average. Table 4.3 shows that the utilities sector has consistently had higher wage increase under collective agreements than the all 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. We expect this trend to continue over the next six years, with the all industries average to also continue to be dragged down by the retail and hospitality industries.

The analysis in Table 4.4 also shows that pay outcomes in the individual arrangements segment of the utilities sector is also usually higher than the all industries average, although – as explained in Appendix A – some incentives and compositional effects emanating from the collective agreements may be ending up in the individual arrangements segment calculated in the LPI in Table 4.4.

With regard to the proportions of employees now under collective agreements, we now estimate that the proportion of employees under collective bargaining in the electricity, gas and water supply sector has fallen from 84.4 per cent in 2006 (the last survey conducted under the ANZSIC1993 industry classification) to around 80 per cent now. The August 2008 survey saw the industries classified under the new ANZSIC2006 classifications, with a further small drift to individual arrangements apparent in the most recent survey in May 2010. Under the new industry

[1] See Powerlink Queensland Revenue Proposal 2013 – 2017 submitted to the AER, May 2010, p.90. Ergon Energy Regulatory Proposal 2011 – 2015 submitted to the AER, July 2009, p.49 and SP AusNet, Electricity Transmission Revised Revenue Proposal 2009 –2014 submitted to the AER, October 2007 p.138.

groupings, 'Waste Services' has been added to electricity, gas and water supply services, plus a miniscule part of the old construction sector. Our analysis of the new proportions and relevant employment numbers for these separate sectors suggests some movement from collective bargaining to individual arrangement in the 'pure' utilities sector ie electricity, gas and water sector (assuming no change in employees dependent on award increases).

A comparison of wage movements in the 'old' electricity, gas and water supply (EGW) sector compared to the 'new' electricity, gas and water supply and waste services (EGWWS) sector shows the addition of waste services drags down measured LPI wages growth by 0.1 per cent per annum on average in the combined EGWWS compared to EGW over 1998/99 to 2008/09, with AWOTE growth in EGWWS 0.6 per cent lower on average compared to EGW over the same 11 year period. This result is not surprising given lower skill level and lower demand for workers in the waste services sector.[2] A comparison of EGW and EGWWS wages and employment growth is provided in Appendix B.

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 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' (i.e. an agreement has been 'reached' or 'approved') over recent quarters.

Data from the Department of Education, Employment and Workplace Relations quarterly report, *Trends in Federal Enterprise Bargaining,* shows that average outcomes of agreements accelerated increased through 2008/09, with the year average of the 'formalised' agreements rising to 5.0 per cent in 2008/09, compared to 4.8 per cent in 2007/08. Growth in formalised agreements slowed to an average of 4.3 per cent in calendar 2010, with the latest DEEWR report (March 2011) suggesting a further, albeit slight, moderation in wages growth in the sector. We expect wages to pick up during 2011 given the tightness in the labour market and the high enterprise agreement outcomes in the construction sector in 2010 which will influence negotiations in the EGW sector.

Furthermore, given the average duration of enterprise agreements in the utilities sector is close to 3 years, these high outcomes in 2008/09 will influence the overall EBA average over 2009/10 and 2010/11 (ie it will tend to push up the overall average), with the average for 'current operating' agreements to remain around current levels over the next two years.

With economic conditions continuing to improve, we expect some pick up in the pace of formalised agreements over the next three years toward and above 5 per cent per annum. Subsequently, wages growth in the collective agreements component will rise about 5 per cent over the 2012/13 and 2013/14 before easing over 2014/15 and 2015/16 following the slowing in economic growth.

Note that the latest collective agreements data for EGW from the DEEWR is now classified under the ANZSIC2006 category which includes Waste Services. The DEEWR has also back cast their data under the new classifications to the September quarter 2006. Although this is only a short time frame for comparison, it shows that AAWIs under the 'old' EGW classification were on average 0.1 per cent to 0.2 per cent higher per annum on average compared to the newly combined EGWWS sector.

[2] Given the objective of this section of the report is to provide forecasts of the change in gas network related labour costs and that EGW is more representative of their skill levels and labour demand then EGWWS, we have deliberately excluded the waste services component from our forecasts and back data.

Table 4.5: Average Weekly Ordinary Time Earnings and Labour Price Index
Total Australia and Electricity, Gas & Water
(Year Average Growth)

Year Ended December	Average Weekly Ordinary Time Earnings (1)				Labour Price Index (2)			
	All Industries		Electricity, Gas and Water		All Industries		Electricity, Gas and Water	
	$	%CH	$	%CH	Index	%CH	Index	%CH
2000	785.9		955.2		66.9		61.9	
2001	825.1	5.0	1,027.4	7.6	69.3	3.6	64.5	4.1
2002	867.1	5.1	1,063.2	3.5	71.5	3.2	67.2	4.3
2003	913.7	5.4	1,121.1	5.4	74.1	3.7	70.0	4.2
2004	948.5	3.8	1,180.2	5.3	76.8	3.6	73.2	4.5
2005	998.9	5.3	1,205.3	2.1	79.9	4.0	76.4	4.4
2006	1 032.6	3.4	1,234.5	2.4	83.0	3.9	81.1	6.1
2007	1 081.8	4.8	1,284.9	4.1	86.4	4.1	84.5	4.1
2008	1 133.8	4.8	1,342.8	4.5	90.0	4.2	87.9	4.1
2009	1 198.6	5.7	1,427.0	6.3	93.2	3.6	91.7	4.4
2010	1 257.0	4.9	1,566.8	9.8	96.4	3.4	96.1	4.7
2011	1 308.5	4.1	1,680.7	7.3	100.0	3.8	100.0	4.1
Forecasts								
2012	1 370.4	4.7	1,774.9	5.6	104.2	4.2	104.9	4.9
2013	1 445.6	5.5	1,879.6	5.9	109.1	4.7	110.5	5.3
2014	1 522.2	5.3	1,986.7	5.7	114.0	4.5	116.0	5.0
2015	1 597.7	5.0	2,101.2	5.8	118.4	3.8	121.7	4.9
2016	1 673.4	4.7	2,223.5	5.8	123.5	4.3	127.7	4.9
2017	1 762.7	5.3	2,352.4	5.8	129.1	4.6	134.3	5.2
Compound Annual Growth Rates								
1990-2000	3.8		5.2					
2000-2010	4.8		5.1		3.7		4.5	
2006-2011	4.8		6.4		3.8		4.3	
2011-2017	5.1		5.8		4.4		5.0	

Source: BIS Shrapnel, ABS

(1) Earnings per person for full-time adults. Data is year ended May (available only mid month of quarter).
(2) Ordinary time hours excluding bonuses.

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 EGW 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 tighter labour market over the next six years than for most of the 2000s, collective agreements are forecast to remain around 1.6 per cent above the CPI in the forecast period.

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.

Although the recent downturn saw some easing in overall skilled labour shortages for some professions relevant to the utilities sector, the DEEWR “Skills in Demand Lists” and Clarius Index still revealed ongoing shortages of key professionals and tradespersons in the utilities sector (see section 4.4). These shortages are expected to continue over the next six years and probably longer given the large capital works and maintenance programs planned in most states’ utilities.

With economic conditions improving and skilled labour demand recovering, we expect higher wages growth 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 accelerate rapidly from 2012/13.

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 ageing profile, which will particularly affect the ‘professionals’ on non-EBA’s, who tend to be older and more experienced.

Indeed, the strengthening of non-EBA wages from 2012/13 and the compositional effects from the overall up skilling is expected to result in much stronger growth in individual arrangements over this decade, compared to the last ten years. 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 LPI and AWOTE estimates by the ABS.

Table 4.6: AWOTE Persons by State - Electricity, Gas and Water Supply (Year Average Growth)

Year Ended November	NSW		VIC		QLD		SA		WA		TAS		NT		ACT		AUSTRALIA	
	Year Avg		Year Avg		Year Avg		Year Avg		Year Avg		Year Avg		Year Avg		Year Avg		Year Avg	
	$	A%Ch	$	A%Ch	$	A%Ch	$	A%Ch	$	A%Ch	$	A%Ch	$	A%Ch	$	A%Ch	$	A%Ch
1985	429		425		435		394		413		408		463		420		423	
1986	457	6.3	455	7.0	467	7.2	427	8.2	441	6.7	432	5.8	503	8.6	434	3.5	452	6.9
1987	472	3.3	479	5.4	486	4.1	444	4.1	441	0.1	447	3.6	504	0.3	434	-0.1	470	3.8
1988	503	6.7	504	5.1	513	5.6	473	6.5	485	9.9	481	7.5	509	1.0	468	7.8	499	6.3
1989	530	5.3	556	10.4	545	6.2	500	5.7	524	8.0	498	3.5	575	13.0	521	11.3	535	7.2
1990	562	6.0	610	9.8	559	2.6	539	7.9	553	5.6	532	6.9	608	5.7	571	9.7	573	7.0
1991	596	6.0	640	4.9	573	2.4	567	5.2	586	5.9	554	4.1	623	2.5	573	0.4	600	4.8
1992	628	5.4	674	5.3	594	3.7	584	3.0	606	3.5	591	6.8	652	4.6	591	3.1	630	4.9
1993	651	3.7	712	5.6	605	1.9	599	2.6	618	2.0	629	6.4	663	1.7	612	3.6	652	3.5
1994	667	2.5	721	1.3	634	4.7	634	5.9	646	4.6	684	8.7	686	3.5	625	2.1	671	2.9
1995	699	4.8	722	0.2	667	5.2	646	1.9	701	8.5	703	2.9	701	2.1	677	8.4	695	3.5
1996	769	9.9	786	8.8	726	8.8	685	6.0	751	7.1	710	1.0	716	2.2	722	6.7	752	8.3
1997	800	4.0	832	5.9	773	6.5	768	12.0	801	6.6	752	5.9	749	4.6	789	9.2	796	5.8
1998	887	10.9	894	7.5	791	2.3	800	4.3	867	8.3	839	11.6	789	5.3	855	8.5	858	7.7
1999	892	0.6	921	3.1	843	6.6	827	3.3	903	4.1	881	4.9	1022	29.5	913	6.8	884	3.0
2000	973	9.0	1017	10.3	905	7.4	890	7.6	954	5.7	948	7.6	920	-10.0	950	4.0	955	8.1
2001	1052	8.2	1087	7.0	972	7.4	932	4.7	1034	8.3	1008	6.3	978	6.3	1039	9.4	1027	7.6
2002	1098	4.3	1132	4.1	968	-0.4	981	5.2	1101	6.5	1047	3.9	1006	2.9	1046	0.7	1063	3.5
2003	1137	3.6	1150	1.5	1090	12.5	1072	9.2	1138	3.3	1122	7.2	1005	-0.1	1134	8.3	1121	5.4
2004	1213	6.6	1142	-0.6	1229	12.8	1069	-0.3	1188	4.4	1155	2.9	1025	2.0	1203	6.2	1180	5.3
2005	1203	-0.8	1210	5.9	1244	1.2	1073	0.4	1245	4.8	1222	5.8	1117	9.0	1165	-3.2	1205	2.1
2006	1258	4.6	1208	-0.2	1213	-2.5	1120	4.3	1346	8.1	1284	5.1	1234	10.5	1212	4.0	1234	2.4
2007	1320	4.9	1245	3.1	1240	2.2	1185	5.8	1435	6.6	1285	0.1	1326	7.5	1317	8.7	1285	4.1
2008	1366	3.5	1272	2.1	1304	5.2	1230	3.8	1541	7.4	1311	2.0	1361	2.6	1394	5.8	1343	4.5
2009	1291	-5.5	1414	11.2	1367	5.0	1251	1.9	1651	7.1							1427	6.3
2010	1402	8.5	1671	18.2	1466	7.2	1328	6.1	1807	9.4							1567	9.8
2011e	1487	6.1	1827	9.3													1681	7.3
Forecast																		
2012	1572	5.7	1919	5.0													1776	5.6
2013	1664	5.8	2031	5.8													1880	5.9
2014	1754	5.4	2145	5.6													1988	5.7
2015	1852	5.6	2265	5.6													2103	5.8
2016	1958	5.7	2390	5.5													2225	5.8
2017	2067	5.6	2519	5.4													2354	5.8
Compound Annual Average Growth Rates																		
1985-2010[1]	4.8		5.6		5.0		5.0		6.1		5.2		4.8		5.4		5.4	
1990-2000	5.6		5.2		4.9		5.1		5.6		5.9		4.2		5.2		5.2	
2000-2010[2]	3.7		5.1		4.9		4.1		6.6		4.1		5.0		4.9		5.1	
2006-2011[3,4]	3.4		8.6		3.3		4.4		7.7		3.2		6.3		4.2		6.4	
2011-2017	5.6		5.5														5.8	

e: estimate

Source: BIS Shrapnel, ABS Data

1, 2 and 3: Average growth rates for TAS, NT and ACT are 1985-2008, 2000 to 2008 and 2003-2008 respectively

4: Average growth rates for QLD, SA, WA are 2005-2010

Chart 4.2: Total Engineering Construction
Australia, New South Wales and Victoria

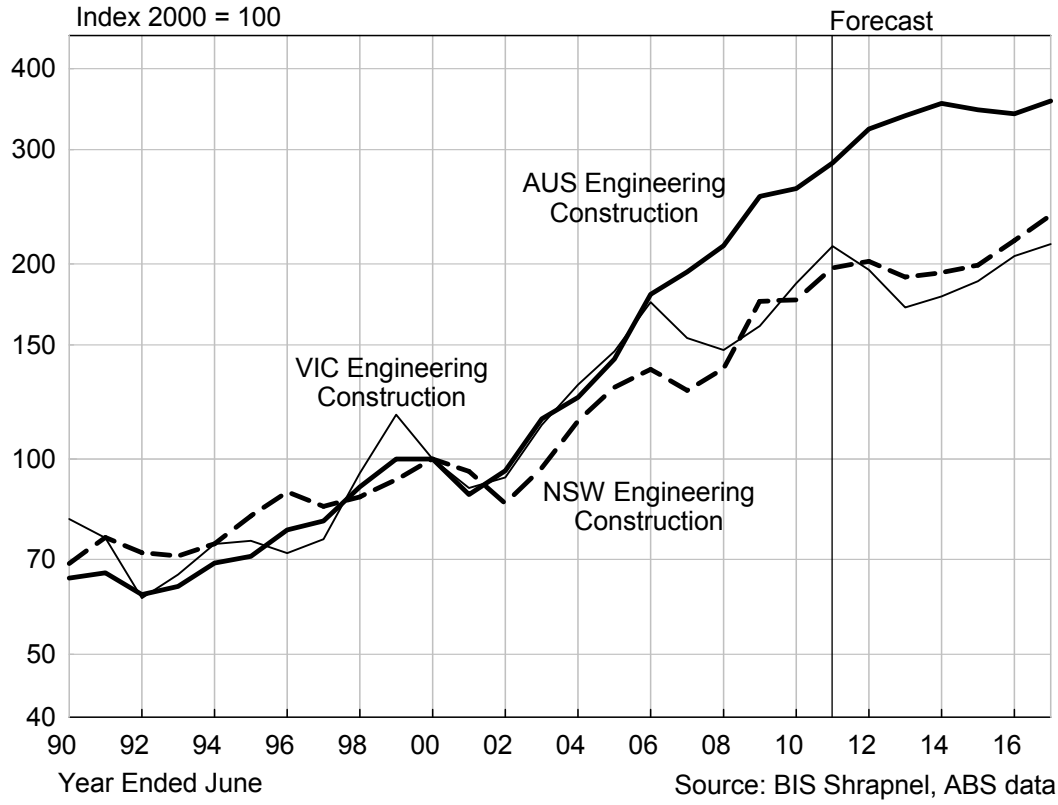


Chart 4.3: Utilities Engineering Construction
Australia, New South Wales and Victoria

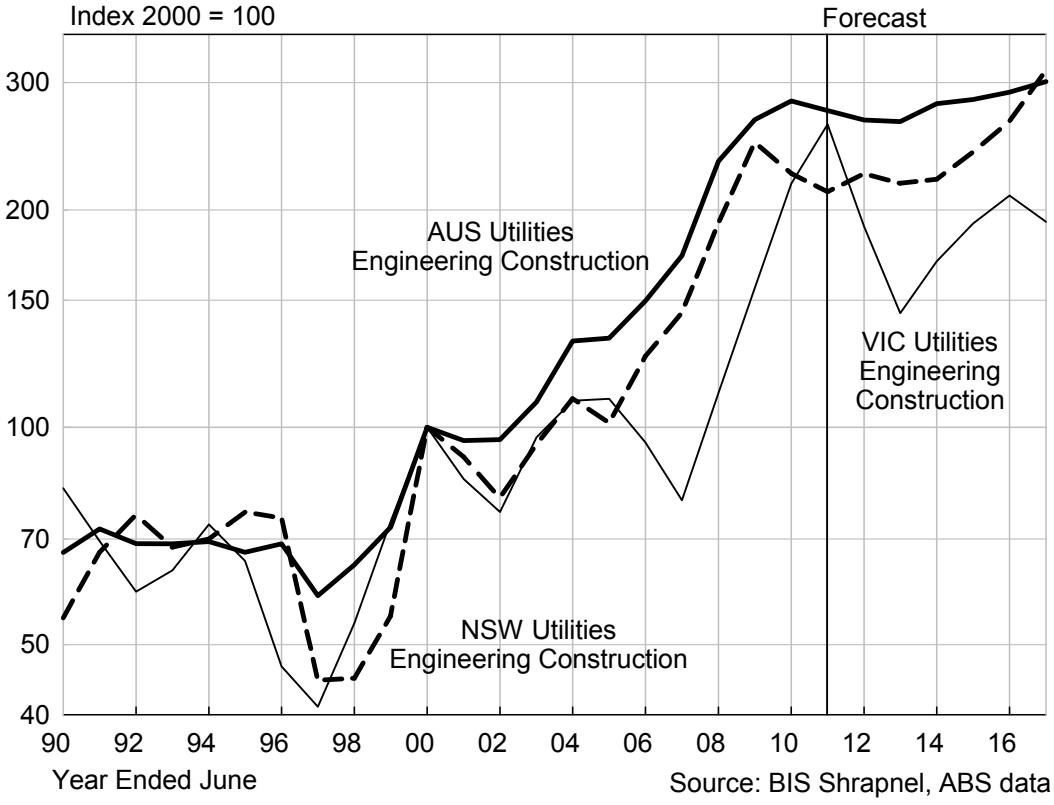


Chart 4.4: New South Wales – Utilities Employment, Output and Investment

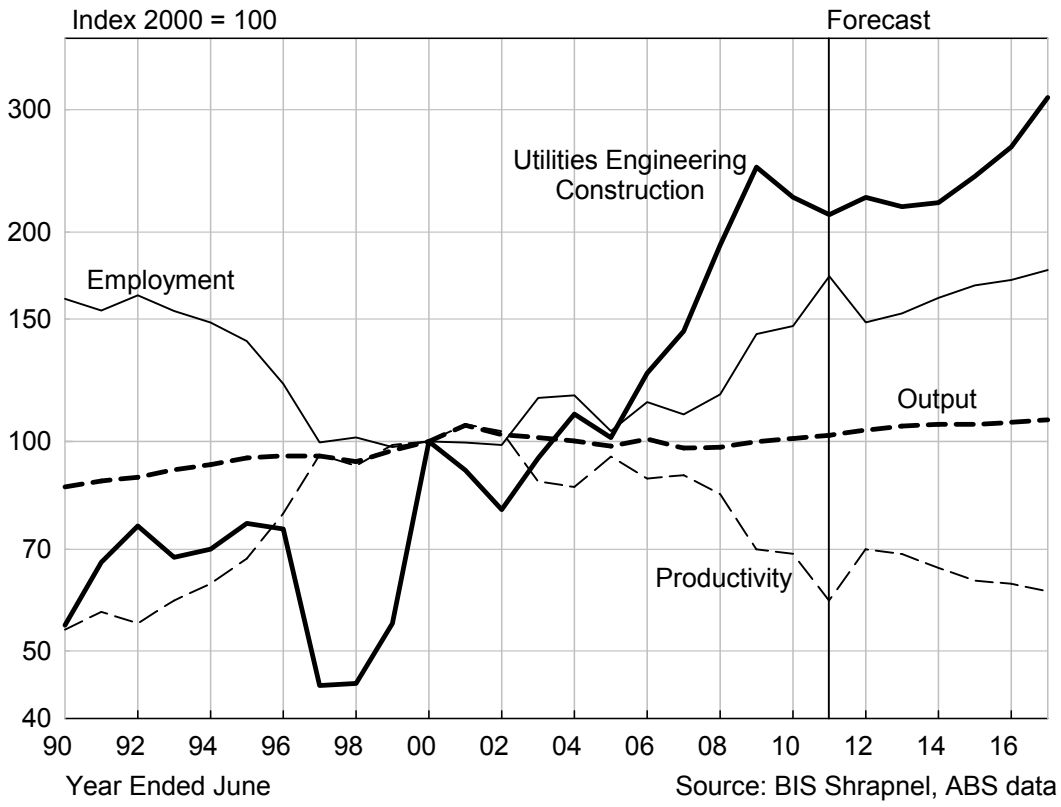
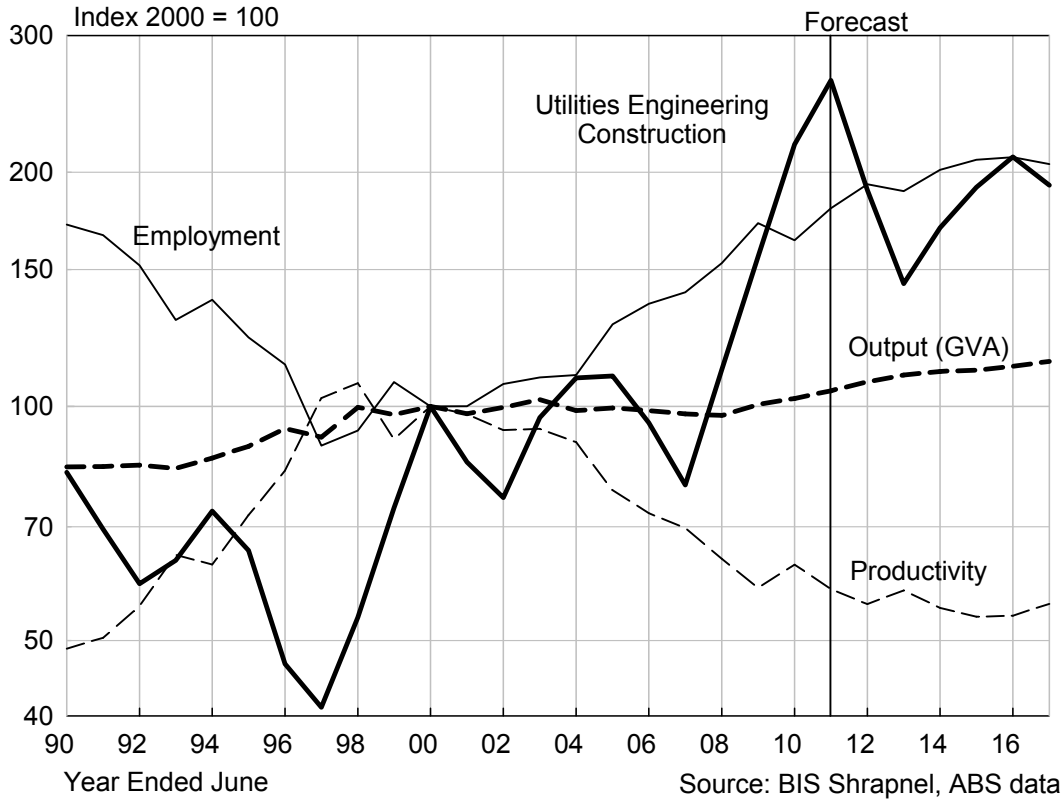


Chart 4.5: Victoria – Utilities Employment, Output and Investment



Increased competition from Mining and Construction for similarly skilled workers to push up utilities wages

After pausing briefly post GFC in 2009/10, mining-related investment increased significantly in 2010/11 and this next phase is now ramping up and will see a substantial increase over the next four years before easing over the second half of this decade, but remaining at very high levels. Mining sector investment is dominated by investment in 'buildings and structures', with new capital expenditure in this category (for total Australia) measuring $37.2 billion in 2010/11 compared to almost $10 billion for 'equipment, plant and machinery.' Mining investment in buildings and structures is, in turn, dominated by engineering construction and BIS Shrapnel's forecasts of 'Mining and Heavy Industry' engineering construction for total Australia are predicting a near doubling of M&HI engineering construction by 2014/15 from 2009/10 levels (see chart 4.6). Similar increases are also predicted for associated infrastructure, including railways, harbours, other transport infrastructure, energy (electricity and gas, including pipelines) and water. And these forecasts may prove to be conservative!

This huge increase in engineering construction activity will be undertaken by both internal Mining sector labour and by outsourced contracts to the construction sector. Employment of skilled labour in these two sectors will need to increase significantly, with the increased demand for skilled labour — where there are already shortages emerging — expected to push up wages in these sectors as they compete for a limited supply of skilled workers.

The Utilities sector will need to also push up utilities wages growth in order to retain (and increase) workers, whose skills will be in strong demand from the Mining and Construction sectors. This is particularly pertinent to the gas sub-sector, with a number of large LNG production 'trains' to be constructed over the next 4 to 5 years in particular (already committed or under construction) and more proposed for the following 5 to 10 years. The development and construction of associated gas fields and pipelines to feed these huge LNG plants will also add markedly to demand for labour with specialist gas-related skills.

4.3 Overall Growth in Labour Costs (AWOTE Growth)

While BIS Shrapnel believes the labour price index reflects movements in the *underlying price* of labour, the LPI does not fully capture movements in total labour *costs* per employee. As we pointed out in section 4.2, average weekly ordinary time earnings (AWOTE) is a better measure of the change in overall costs per employee, because it takes into account movements of employees to higher grades, changes in compositional effects from entry/exits of higher skilled/lower skilled (ie higher paid/lower paid) workers in an enterprise or industry, and also the payments *above* base rates of pay, such as bonuses, incentives, penalty rates and other allowances that are a *normal* part of an employees earnings over the quarter or year.

With regard to the latter, many enterprises in the utilities (and other industry) sectors(s) regularly include bonuses or incentive payments which are linked to a range of objectives, such as up skilling, additional training, productivity targets, safety targets, etc. These 'extra' payments — or changes in the quantum of payments — are not included in changes in the LPI, but can make a material difference to an enterprise's overall labour costs.

In table 4.4, the bottom line shows the calculation for the collective up skilling effects, compositional effects, bonuses, incentives, other allowances, etc. – which is simply growth in AWOTE minus the growth in the LPI. Given its volatility over the past decade, it makes more sense to take a longer term view of changes and use a period average to assess the overall up skilling effects, compositional effects, bonuses, incentives and other allowances. Over the past decade, these effects have added 1.1 per cent on average in total labour costs growth (AWOTE) compared to LPI growth over the period.

Table 4.7: Electricity, Gas and Water – Australia
Real and Productivity Adjusted Wages Growth

Year Ended December	Nominal				Real (3)				Nominal Adjusted Productivity (4)		Real Adjusted Productivity (3,4)	
	AWOTE		LPI		AWOTE		LPI		AWOTE	LPI	AWOTE	LPI
	$	A% CH	Index	A% CH	$	A% CH	Index	A% CH	A% CH	A% CH	A% CH	A% CH
2000	955.2		61.9		1,306.1		86.1					
2001	1,027.4	7.6	64.4	4.1	1,345.9	3.0	85.8	-0.3	8.3	4.8	3.8	0.4
2002	1,063.2	3.5	67.2	4.3	1,352.6	0.5	86.9	1.2	7.6	8.4	4.6	5.3
2003	1,121.1	5.4	70.0	4.2	1,387.8	2.6	88.1	1.4	9.4	8.1	6.5	5.3
2004	1,180.2	5.3	73.2	4.5	1,428.0	2.9	89.9	2.1	7.9	7.1	5.5	4.8
2005	1,205.3	2.1	76.4	4.4	1,420.9	-0.5	91.5	1.7	8.2	10.5	5.5	7.7
2006	1,234.5	2.4	81.1	6.1	1,405.3	-1.1	93.8	2.5	6.2	9.9	2.7	6.2
2007	1,284.9	4.1	84.4	4.1	1,429.2	1.7	95.4	1.7	6.9	6.9	4.5	4.6
2008	1,342.8	4.5	87.8	4.1	1,430.6	0.1	95.1	-0.3	14.6	14.1	10.2	9.8
2009	1,427.0	6.3	91.7	4.4	1,493.5	4.4	97.4	2.5	10.1	8.2	8.2	6.4
2010	1,566.8	9.8	96.0	4.7	1,598.1	7.0	99.3	1.9	12.5	7.4	9.7	4.6
2011e	1,680.7	7.3	100.0	4.1	1,658.8	3.8	100.0	0.6	10.9	7.7	7.4	4.2
Forecasts												
2012	1,774.8	5.6	104.9	4.9	1,693.6	2.1	101.4	1.4	3.7	3.0	0.2	-0.5
2013	1,879.5	5.9	110.4	5.3	1,739.4	2.7	103.4	2.0	7.1	6.5	3.9	3.2
2014	1,986.7	5.7	115.9	5.0	1,791.6	3.0	105.8	2.3	8.0	7.3	5.2	4.5
2015	2,101.9	5.8	121.6	4.9	1,850.7	3.3	108.3	2.4	6.8	6.0	4.3	3.4
2016	2,223.8	5.8	127.6	4.9	1,911.8	3.3	110.9	2.4	6.3	5.3	3.7	2.7
2017	2,352.8	5.8	134.2	5.2	1,974.8	3.3	113.9	2.7	7.4	6.8	4.8	4.2
Long Term Averages												
1990-2000												
2000-2010	5.1		4.5		2.0		1.4		9.2	8.5	6.1	5.5
2006-2011	6.4		4.3		3.4		1.3		11.0	8.9	8.0	5.9
2011-2017	5.8		5.0		2.9		2.2		6.6	5.8	3.7	2.9

e : estimate

Source: BIS Shrapnel, ABS

(1) Earnings of persons. Data is year ended May.

(2) Ordinary time hours excluding bonuses.

(3) Deflated by RBA/Treasury CPI projections.

(4) Productivity is outout (real GVA) divided by employment in the Electricity, Gas, Water and Waste Services sector.

Over the forecast period, we expect the collective up skilling effects, compositional effects, bonuses and incentives etc. to add 0.8 per cent on average to the AWOTE wage measure (compared to LPI growth) over the six years from 2012 to 2017 inclusive (see tables 4.4 and 4.5), with those effects appearing to boost wages growth numbers in the individual arrangements segment. The 0.8 per cent average is in line with the 'all industries' national average, where we have assumed the collective up skilling, incentives etc. to add 0.7 per cent per annum on average (see tables 3.3 and 4.5) to underlying wages inflation (i.e. the LPI).

We have included year-to-year movements for AWOTE in the electricity, gas and water sector over the six years to 2017, which are presented in Table 4.4. We have made an *indicative* allowance in AWOTE movements for compositional changes of employment within the sector through the cycle. A detailed analysis of the future structure of occupations within the sector would be required to accurately model compositional effects each year, but detailed information on the employment plans of *all* the utilities in Australia would be required. Such an analysis is outside the scope of this study. However, given our forecasts of Australian employment in the utilities sector is for relatively stable employment growth over the period from 2012/13 to 2016/17, we do not expect any large positive or negative compositional effects in any one year.

For Victoria and New South Wales, the addition to the underlying wage inflation measure (LPI) for up skilling, incentives, etc. is assumed to be similar to the national utilities average of 0.8 per cent.

4.4 Outlook for utilities wages growth in Victoria

Stronger growth in overall employment in Victoria over the past two years (and expected in 2011/12 – see table 2.2), combined with comparatively stronger growth in Victoria's construction sector over the past three years, has seen the emergence of skilled labour shortages in Victoria. Indeed, across Australia, skilled labour shortages in certain professions and trades are being widely reported. The 'Skills in Demand' lists released in June 2011 by the Department of Education, Employment and Workplace Relations shows that all states are currently experiencing shortages of skilled labour for engineers, other professionals and tradespeople who are in high demand by the electricity, gas and water sector — and who are also keenly sought in the mining, construction and manufacturing sectors. In Victoria, the DEEWR shows relevant shortages are being reported for:

- *engineering managers*
- *electrical engineers and electrical engineering draftspersons and technicians*
- *civil engineers and civil engineering draftspersons*
- *mechanical engineers*
- *surveyors and construction estimators*
- *gas fitters, welders and plumbers.*

Other surveys also indicate that skills shortages are already beginning to emerge in a number of professions. The 'Clarius Skills Index' — a quarterly index compiled by the Clarius Group (an employment services provider) and KPMG Econtech — reported in its December quarter 2010 report that the strong labour market demand over the last quarter has resulted in ongoing skill shortages in a number of occupational categories. Eleven of the 20 categories measured have an index over 100, representing shortages of labour. Building and Engineering professions are among these eleven categories with shortages of skilled labour, with three occupations relevant to the utilities sector included among the ten listed occupations with the 'highest levels of skills shortages':

- *building and engineering professionals*

Table 4.8: Electricity, Gas and Water – Victoria
Nominal, Real & Productivity Adjusted Wages

Year Ended December	Nominal				Real (3)				Nominal Adjusted Productivity (4)		Real Adjusted Productivity (3,4)	
	AWOTE		LPI		AWOTE		LPI		AWOTE	LPI	AWOTE	LPI
	$	A% CH	Index	A% CH	$	A% CH	Index	A% CH	A% CH	A% CH	A% CH	A% CH
2000	1,016.5		65.3		1,414.0		90.8					
2001	1,087.3	7.0	68.0	4.2	1,449.0	2.5	90.6	-0.2	10.4	7.7	5.9	3.3
2002	1,132.2	4.1	70.7	3.9	1,464.9	1.1	91.4	0.9	6.2	6.0	3.2	3.0
2003	1,149.7	1.5	73.2	3.6	1,447.4	-1.2	92.2	0.8	3.3	5.4	0.6	2.6
2004	1,142.4	-0.6	75.8	3.5	1,405.2	-2.9	93.3	1.2	7.9	12.1	5.7	9.7
2005	1,210.3	5.9	79.1	4.3	1,450.1	3.2	94.8	1.6	15.9	14.3	13.1	11.5
2006	1,207.7	-0.2	82.9	4.8	1,397.5	-3.6	95.9	1.2	5.3	10.2	1.8	6.7
2007	1,245.5	3.1	85.9	3.6	1,408.4	0.8	97.1	1.3	9.6	10.1	7.3	7.7
2008	1,271.6	2.1	89.6	4.3	1,378.0	-2.2	97.1	0.0	10.6	12.8	6.3	8.5
2009	1,414.2	11.2	92.5	3.3	1,505.1	9.2	98.5	1.4	11.8	3.9	9.8	2.0
2010	1,671.2	18.2	95.9	3.6	1,735.4	15.3	99.3	0.8	18.1	3.6	15.2	0.7
2011e	1,826.9	9.3	100.0	4.3	1,836.0	5.8	100.0	0.8	15.0	9.9	11.5	6.5
Forecasts												
2012	1,918.3	5.0	104.5	4.5	1,863.5	1.5	101.0	1.0	5.1	4.6	1.6	1.1
2013	2,029.5	5.8	109.6	4.8	1,912.0	2.6	102.6	1.6	6.3	5.3	3.0	2.0
2014	2,141.2	5.5	114.7	4.7	1,965.5	2.8	104.7	2.0	9.3	8.6	6.6	5.8
2015	2,261.1	5.6	120.0	4.6	2,026.5	3.1	106.9	2.1	6.7	5.7	4.1	3.2
2016	2,385.4	5.5	125.4	4.5	2,087.3	3.0	109.0	2.0	3.6	2.5	1.0	-0.1
2017	2,514.2	5.4	131.5	4.9	2,147.8	2.9	111.6	2.4	2.5	2.0	-0.1	-0.6
Long Term Averages												
1990-2000												
2000-2010	5.1		3.9		2.1		0.9		9.9	8.6	6.9	5.6
2006-2011	8.6		3.8		5.6		0.8		13.0	8.1	10.0	5.1
2011-2017	5.5		4.7		2.6		1.8		5.6	4.8	2.7	1.9

e : estimate

Source: BIS Shrapnel, ABS

(1) Earnings of persons. Data is year ended May.

(2) Ordinary time hours excluding bonuses.

(3) Deflated by RBA/Treasury CPI projections.

(4) Productivity is outout (real GVA) divided by employment in the Electricity, Gas, Water and Waste Services sector.

- *construction tradespersons*
- *metal related tradespersons.*

The existence of skilled labour shortages in professions and trades sought by the utilities and competitor sectors means wages growth is set to pick up in the utilities sector across Australia, including Victoria. Table 4.6 reveals that AWOTE growth in the utilities sectors across Australia over the past 25 years has been fairly uniform, with the states grouped around the Australian average of 5.4 per cent per annum and within 0.6 per cent of the national average,

We expect this uniformity to continue over the next six years. Base wages rate outcomes are likely to be similar across the states, particularly in the unionised collective bargaining segment as the outcomes in different state utilities are usually published (or are reported to unions in different states). The main differences in the forecast wages growth in each state's utilities sector will then be due to the strength of demand for local utilities and competitor industries' labour, with states with stronger labour demand realising higher wages growth, particularly in the individual arrangements segment and in terms of higher bonuses and incentives. Nevertheless, the utilities sector in Victoria and NSW will still need to offer competitive wages (in a national context) to prevent their existing and potential (desired) workers being poached by interstate utilities, mining and construction sectors.

Over the past decade, AWOTE growth in Victoria's utilities sector has averaged 5.1 per cent per annum (see table 4.8), the same as the Australian utilities AWOTE (see table 4.7 and 4.6). However, in underlying terms, Victoria's utilities LPI growth of 3.9 per cent per annum over the past decade (see table 4.8) has lagged the national utilities average of 4.5 per cent p.a. over the past decade (see tables 4.7 and 4.5).

Over the forecast period, Victoria's AWOTE growth is forecast to average 5.5 per cent per annum (0.3 percentage points slower than the national utilities average of 5.8 per cent p.a.) over the six years from 2012 to 2017 inclusive (see tables 4.7 and 4.8). Victoria's utilities LPI growth is forecast to average 4.7 per cent p.a. (also 0.3 percentage points lower than the national utilities average of 5.0 per cent per annum) over the six years from 2012 to 2017 inclusive (see tables 4.7 and 4.8).

The weaker utilities wages growth in Victoria is due to:

- The state's lower exposure to the responses investment boom, compared to Queensland and Western Australia in particular. A number of huge LNG and gas-field investments in those states (and the Northern Territory) will also add significantly to demand for labour with gas-related skills throughout Australia, and this will influence gas-network labour costs in Victoria, acting to push up wages growth in that skill area despite comparatively lower local demand for labour.

- Relatively weaker growth in utilities engineering construction, compared to the rest of Australia. Chart 4.3 shows indices for utilities engineering construction in Victoria, NSW and total Australia – where utilities engineering construction is the sum of engineering construction activity (work done in constant prices) for the categories ' water storage and supply', 'sewerage and drainage', 'electricity generation, transmission and supply', and 'pipelines' (the latter is mainly gas or oil pipelines).

  Chart 4.3 shows that utility engineering construction is expected to decline sharply over 2011/12 and 2012/13, before again growing strongly over the following four years. However, the fall over the next two year is due to the completion of the $1.6 billion Wonthaggi desalination plant and major sewerage works which pushed up utility

Table 4.9: Electricity, Gas and Water – New South Wales
Nominal, Real & Productivity Adjusted Wages

Year Ended December	Nominal				Real (3)				Nominal Adjusted Productivity (4)		Real Adjusted Productivity (3,4)	
	AWOTE		LPI		AWOTE		LPI		AWOTE	LPI	AWOTE	LPI
	$	A% CH	Index	A% CH	$	A% CH	Index	A% CH	A% CH	A% CH	A% CH	A% CH
2000	972.9				1,353.3							
2001	1,052.4	8.2			1,402.5	3.6			6.4		1.8	
2002	1,097.6	4.3			1,420.1	1.3			13.1		10.0	
2003	1,137.2	3.6			1,431.7	0.8			12.2		9.4	
2004	1,212.7	6.6			1,491.7	4.2			2.3		-0.1	
2005	1,202.6	-0.8			1,440.9	-3.4			-2.6		-5.2	
2006	1,257.7	4.6			1,455.4	1.0			7.5		3.9	
2007	1,319.8	4.9			1,492.4	2.5			7.4		5.0	
2008	1,366.2	3.5			1,480.4	-0.8			14.9		10.6	
2009	1,291.1	-5.5	93.0		1,374.1	-7.2	98.9		3.6		1.9	
2010	1,401.5	8.5	96.6	3.9	1,452.5	5.7	100.0	1.1	16.4	11.8	13.6	9.0
2011e	1,487.3	6.1	100.0	3.5	1,490.2	2.6	100.0	0.0	4.0	1.4	0.5	-2.1
Forecasts												
2012	1,572.0	5.7	104.9	4.9	1,523.0	2.2	101.4	1.4	-2.7	-3.5	-6.3	-7.1
2013	1,663.2	5.8	110.1	5.0	1,562.6	2.6	103.1	1.7	8.9	8.0	5.5	4.7
2014	1,751.4	5.3	115.4	4.8	1,603.2	2.6	105.3	2.1	9.6	9.1	6.8	6.4
2015	1,849.4	5.6	120.8	4.7	1,652.9	3.1	107.6	2.2	8.1	7.3	5.6	4.7
2016	1,954.9	5.7	126.6	4.8	1,705.8	3.2	110.1	2.3	7.5	6.5	4.9	4.0
2017	2,064.3	5.6	133.0	5.0	1,758.7	3.1	112.8	2.5	8.5	7.9	6.0	5.4
Long Term Averages												
1990-2000												
2000-2010	3.7				0.7				8.1		5.1	
2006-2011	3.4		3.7		0.5				9.3	6.6	6.3	3.5
2011-2017	5.6		4.9		2.8		2.0		6.7	5.9	3.8	3.0

e : estimate

Source: BIS Shrapnel, ABS

(1) Earnings of persons. Data is year ended May.

(2) Ordinary time hours excluding bonuses.

(3) Deflated by RBA/Treasury CPI projections.

(4) Productivity is outout (real GVA) divided by employment in the Electricity, Gas, Water and Waste Services sector.

engineering construction over the past three years. Nevertheless, average levels over the next six years will still be well above historical levels. Chart 4.5 shoes that utilities investment — proxied here by utilities engineering construction — influences wages growth. While utilities investment is still expected to be strong over the outlook period, the lower growth compared to other states is expected to add to lower wages pressure in Victoria's utilities sector.

- The comparative weakness of Victoria's overall construction sector over the next three years means there will be less pressure coming from the state's construction sector, although the projected bounce back in overall construction in 2016 and 2017 will see the re-emergence of wage pressures from the construction sector at that time. Section 8 has a detailed discussion of prospects for Victoria's construction sector and wages outlook.

4.5 Outlook for utilities wages growth in New South Wales

Similar to Victoria, the improvement in the overall construction sector in NSW over the past two years, coupled with a strengthening in mining investment in the state (see chart 4.6), has seen skilled labour shortages emerge in NSW among the professions and trades sought by the utilities, mining and construction sectors. The 'Skill Shortage List', released in June 2011 by the DEEWR, shows that in NSW, relevant shortages are being reported for:

- Engineering managers and construction project managers
- Civil engineers and civil engineering draftspersons and technicians
- Electrical, structural and mechanical engineers
- Surveyors, construction estimators and building associates
- Gas fitters, welders and plumbers
- Electricians and electrical line workers

The existence of these skill shortages in the professions and trades sought by utilities and competitor sectors means wages growth is set to pick up in the NSW (and other states') utilities sector(s).

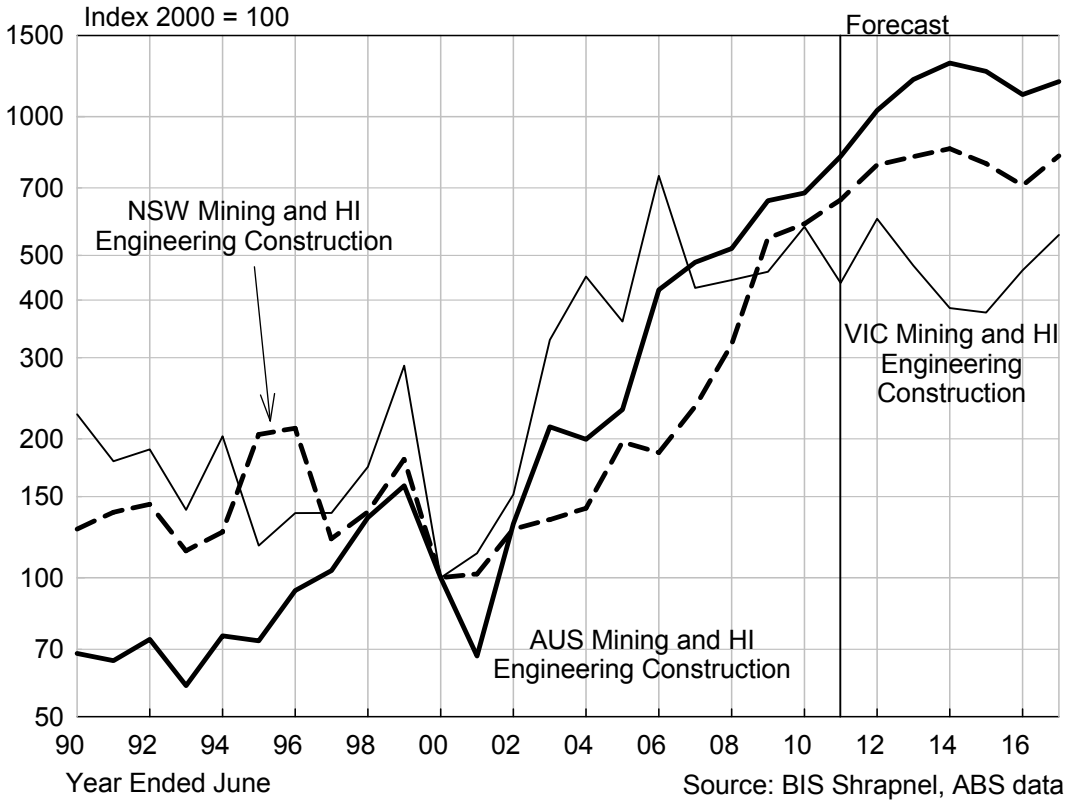
Over the forecast period, NSW utilities AWOTE growth is forecast to average 5.6 per cent per annum over the six years from 2012 to 2017 inclusive (see table 4.9) – or 0.2 percentage points lower than the national utilities average (see tables 4.5 and 4.7). In LPI terms, NSW utilities LPI growth is forecast to average 4.9 per cent p.a. (slightly lower than the national utilities LPI average of 5.0 per cent) over the six years from 2012 to 2017.

The utilities wage forecasts for NSW are slightly stronger than Victoria, but still lag the national average. Similar to Victoria, NSW will derive less benefit than other states from the resources investment boom, than Queensland, Western Australian and possibly South Australia. However, growth in resources investment in NSW will be stronger than Victoria (see chart 4.6), driven mainly by substantial coal-related investment and increasing activity in the coal-seam gas sector. This is expected to see pressure from the state's mining sector for similarly skilled labour that the utilities sector is seeking.

Meanwhile, the construction sector in NSW is forecast to strengthen appreciably from 2012/13 — after a set-back in 2011/12 — with growth over 2012/13 to 2017/18 outpacing national construction sector growth (in work done terms). The demand for skilled labour from the construction sector will also place upward pressure on NSW utilities wages, as utilities in NSW find they have to raise wages to 'meet the market'.

There will also be strong demand for labour from the state's utilities sector itself. Chart 4.3 shows BIS Shrapnel's engineering construction forecasts for the utilities-related segments. NSW utilities engineering construction is projected to remain around current levels, before increasing significantly from 2014/15 to 2016/17. Chart 4.4 shows that utilities investment is a key influence on employment growth in the utilities sector (even though some capital projects are outsourced to the construction sector). The combination of high levels of mining investment, utility engineering construction and overall construction in the state means increased wage pressures in the NSW utilities sector over the next six years at least.

Chart 4.6: Mining and Heavy Industry Engineering Construction Australia, New South Wales and Victoria



4.6 Productivity Adjustments

4.6.1 BIS Shrapnel's Forecasts of Productivity

BIS Shrapnel's productivity-adjusted AWOTE escalators are based on our annual labour productivity forecasts which, in turn, flow from our annual forecasts of output (i.e. real Gross Value Added) and employment in the different industries at the national and state level.

BIS Shrapnel forecasts that productivity growth in the Utilities sector will remain weak over the next six years. Going forward, we believe demand and output growth will be constrained in this sector for three key reasons:

- Higher utilities prices (including the possibility of a carbon tax) will keep demand muted.
- Population growth will be slower over next five years. Population and growth in households are key drivers of energy and water use in the utilities sector, so even if per capita growth remained at similar levels to the past five years, aggregate demand (i.e. including population) would be slower.

- Moreover, with the government announcing its intention to place a price of carbon, we do not expect a significant jump in energy intensive projects such as aluminium smelters. This will further contain demand for energy in the future.

Our forecasts assume moderate and fairly stable growth in employment in the utilities sector in Australia and the states beyond 2011. The combination of muted output and moderate employment growth means productivity growth will remain weak for the utilities sector at the national as well as state level over most of the next decade. Our forecasts are provided in Tables 4.10, 4.11 and 4.12.

At the Australian level, productivity growth in the utilities sector is forecast to decline by an average of -0.3 per cent per annum over the six years from 2011/12 to 2016/17 inclusive (see table 4.10). Note that the year-ended December productivity forecasts and historical data are a simple average of the financial year averages. Gross Value Added data for the states industry sectors is only available for financial years and this is the base on which BIS Shrapnel forecasts output by sector by state.

In Victoria, productivity growth per worker in the utilities sector is forecast to decline by an average of -0.7 per cent per annum over the six years from 2011/12 to 2016/17 (see table 4.12). In NSW, productivity growth in the utilities sector is forecast to increase by an average of 0.5 per cent per annum, although this increase is entirely attributable to the sharp fall in employment in 2011/12 – itself a partial reversal of the large growth in employment (and falls in productivity) over 2010/11 (see table 4.11). After 2011/12, we expect a steady decline in productivity as employment grows in line with higher levels of utilities engineering construction.

The end result is that once nominal AWOTE growth is adjusted for CPI inflation and productivity movements, the real productivity adjusted AWOTE for the EGW sector in Victoria is forecast to average 2.7 per cent per annum over the six years from 2012 to 2017 inclusive, and 1.9 per cent per annum for real productivity adjusted LPI in the Victorian utilities sector (see Table 4.8). For the NSW utilities sector, real productivity adjusted AWOTE is forecast to increase by an average of 3.8 per cent per annum over the six years from 2012 to 2017, and 3.0 per cent p.a. for real productivity-adjusted LPI (see table 4.9).

Note that while we have provided our productivity adjusted LPI forecasts to enable comparison with Access Economics' forecasts, we believe productivity adjustments cannot be strictly applied to the LPI. As discussed previously, the LPI is an underlying measure of wage inflation and does not incorporate effects of changes to skill levels (ie compositional effects), while the AWOTE measure does. Accordingly, changes to skill levels should be reflected in productivity changes per worker. The LPI does not incorporate any changes for skill levels and improved productivity. Hence, productivity cannot be omitted from this wage measure to give a productivity adjusted wage measure. As such, Access Economics is effectively twice adjusting for productivity. This, in turn, is producing a downward biased measure of labour costs to the firm. The upshot is that in deriving productivity adjusted measure of labour costs, the AWOTE is the only choice of measure that is logical.

4.6.2 Access Economics productivity growth forecasts are too optimistic

In their December 2010 report to the AER, Access Economics reported that they measure labour productivity growth over an entire economic cycle (p.106). In other words, Access Economics removes the inherent volatility in annual productivity growth by creating a composite labour productivity measure based on national, industry and state-specific productivity movements. As insufficient detail is provided by Access Economics on its underlying methodology for the construction of the composite index, we cannot replicate Access Economics' (composite) labour productivity forecasts.

Note that Access Economics did not provide specific forecasts of output, employment or productivity in its December 2010 or April 2011 reports for the AER, so we derived their productivity forecasts by deduction i.e. the difference between the productivity-adjusted wages growth and unadjusted wages growth. Access Economics numerical forecasts of productivity growth, as presented to the AER in its April 2011 report, show that future productivity growth will be strong in the utilities sector at the Australian level, with productivity gradually

Table 4.10: Electricity, Gas, Water and Waste Services
Output, Employment and Productivity: Australia

Australia						
Year Ended June	Gross Value Added		Employment		Productivity $/employee	
	$m	%CH	'000	%CH	('000)	%CH
1989	17898	7.2			92.6	7.3
1990	18765		120.4		155.9	
1991	19064	1.6	115.1	-4.4	165.6	6.3
1992	19228	0.9	118.3	2.8	162.6	-1.9
1993	19565	1.8	109.9	-7.1	178.0	9.5
1994	20185	3.2	105.5	-4.1	191.4	7.5
1995	20698	2.5	99.0	-6.1	209.1	9.2
1996	20899	1.0	92.5	-6.5	225.8	8.0
1997	20822	-0.4	79.2	-14.4	262.7	16.3
1998	21602	3.7	78.2	-1.3	276.2	5.1
1999	22082	2.2	78.9	0.9	279.7	1.3
2000	22537	2.1	79.5	0.8	283.3	1.3
2001	22972	1.9	80.5	1.2	285.4	0.7
2002	23203	1.0	83.1	3.2	279.3	-2.1
2003	23496	1.3	89.6	7.8	262.3	-6.1
2004	23562	0.3	91.5	2.1	257.6	-1.8
2005	23680	0.5	95.2	4.1	248.6	-3.5
2006	24076	1.7	106.0	11.2	227.2	-8.6
2007	24317	1.0	105.8	-0.1	229.8	1.2
2008	24365	0.2	113.8	7.5	214.2	-6.8
2009	25286	3.8	136.3	19.8	185.5	-13.4
2010	25924	2.5	132.2	-3.0	196.1	5.7
2011	26389	1.8	151.3	14.4	174.5	-11.0
Forecasts						
2012	26996	2.3	149.1	-1.4	181.1	3.8
2013	27509	1.9	151.9	1.9	181.1	0.0
2014	27784	1.0	157.4	3.6	176.5	-2.5
2015	28006	0.8	162.0	2.9	172.9	-2.0
2016	28314	1.1	163.9	1.2	172.8	-0.1
2017	28711	1.4	167.5	2.2	171.4	-0.8
Compound Annual Growth Rates						
1990-2000	1.8		-4.1		6.2	
2000-2010	1.4		5.2		-3.6	
2006-2011	1.9		7.4		-5.1	
2011-2017	1.4		1.7		-0.3	

Source: BIS Shrapnel, ABS data

Table 4.11: Electricity, Gas, Water and Waste Services Output, Employment and Productivity: New South Wales

New South Wales						
Year Ended June	Gross Value Added		Employment		Productivity $/employee	
	$m	%CH	'000	%CH	('000)	%CH
1989	6910	7.2			92.6	7.3
1990	6756		44.1		153.0	
1991	6891	2.0	42.5	-3.8	162.3	6.0
1992	6975	1.2	44.7	5.1	156.2	-3.7
1993	7149	2.5	42.4	-5.0	168.6	7.9
1994	7273	1.7	40.8	-3.7	178.1	5.7
1995	7436	2.2	38.4	-5.9	193.6	8.7
1996	7487	0.7	33.3	-13.2	224.7	16.1
1997	7484	0.0	27.4	-17.6	272.7	21.4
1998	7346	-1.8	27.9	1.7	263.2	-3.5
1999	7624	3.8	27.0	-3.1	282.0	7.2
2000	7853	3.0	27.5	1.8	285.2	1.1
2001	8284	5.5	27.4	-0.3	301.9	5.8
2002	8032	-3.0	27.2	-0.8	295.1	-2.3
2003	7954	-1.0	31.8	16.9	250.1	-15.3
2004	7866	-1.1	32.1	0.8	245.3	-1.9
2005	7730	-1.7	28.5	-11.1	271.3	10.6
2006	7915	2.4	31.4	10.1	252.3	-7.0
2007	7682	-2.9	30.1	-4.0	255.1	1.1
2008	7706	0.3	32.2	6.8	239.5	-6.1
2009	7844	1.8	39.3	22.1	199.7	-16.6
2010	7932	1.1	40.4	2.7	196.6	-1.6
2011	8018	1.1	47.6	17.9	168.6	-14.2
Forecasts						
2012	8156	1.7	40.8	-14.1	199.7	18.4
2013	8267	1.4	42.1	3.0	196.5	-1.6
2014	8314	0.6	44.3	5.3	187.7	-4.5
2015	8310	0.0	46.2	4.2	180.0	-4.1
2016	8367	0.7	47.0	1.8	178.0	-1.1
2017	8440	0.9	48.6	3.4	173.7	-2.4
Compound Annual Growth Rates						
1990-2000	1.5		-4.6		6.4	
2000-2010	0.1		3.9		-3.7	
2006-2011	0.3		8.7		-7.7	
2011-2017	0.9		0.4		0.5	

Source: BIS Shrapnel, ABS data

Table 4.12: Electricity, Gas, Water and Waste Services
Output, Employment and Productivity: Victoria

Victoria						
Year Ended June	Gross Value Added		Employment		Productivity $/employee	
	$m	%CH	'000	%CH	('000)	%CH
1989	4496	7.2			92.6	7.3
1990	4813		32.0		150.6	
1991	4819	0.1	31.0	-3.1	155.6	3.3
1992	4839	0.4	28.3	-8.6	170.9	9.9
1993	4793	-1.0	24.1	-14.9	198.9	16.4
1994	4941	3.1	25.6	6.2	193.2	-2.9
1995	5116	3.5	22.9	-10.5	223.6	15.7
1996	5389	5.3	21.1	-7.7	255.2	14.2
1997	5255	-2.5	16.6	-21.3	316.3	23.9
1998	5743	9.3	17.4	4.5	330.7	4.5
1999	5616	-2.2	20.0	15.4	280.1	-15.3
2000	5757	2.5	18.7	-7.0	308.7	10.2
2001	5631	-2.2	18.7	0.1	301.7	-2.3
2002	5737	1.9	19.9	6.8	287.7	-4.6
2003	5873	2.4	20.3	1.9	288.9	0.4
2004	5683	-3.2	20.5	0.7	277.6	-3.9
2005	5733	0.9	23.8	16.2	241.0	-13.2
2006	5686	-0.8	25.3	6.2	225.0	-6.6
2007	5630	-1.0	26.1	3.5	215.3	-4.3
2008	5604	-0.5	28.5	9.0	196.6	-8.7
2009	5788	3.3	32.1	12.6	180.3	-8.3
2010	5895	1.8	30.5	-4.9	193.2	7.1
2011	6030	2.3	33.6	10.0	179.7	-7.0
Forecasts						
2012	6189	2.6	36.0	7.3	171.9	-4.4
2013	6317	2.1	35.3	-2.0	179.0	4.2
2014	6385	1.1	37.6	6.5	169.9	-5.1
2015	6406	0.3	38.7	3.0	165.5	-2.6
2016	6481	1.2	39.0	0.8	166.1	0.4
2017	6578	1.5	38.2	-2.0	172.0	3.6
Compound Annual Growth Rates						
1990-2000	1.8		-5.2		7.4	
2000-2010	0.2		5.0		-4.6	
2006-2011	1.2		5.8		-4.4	
2011-2017	1.5		2.2		-0.7	

Source: BIS Shrapnel, ABS data

accelerating to 2.1 per cent per annum by 2015/16. Over the six years from 2011/12 to 2016/17, Access Economics expects the average productivity growth in the national utilities industry to be 1.5% per annum (annual forecasts derived from Table 7.1, page 44-45 of April 2011 report "Forecast growth in labour costs: update of December 2010 report", Deloitte Access Economics). This is in contrast to the observed productivity growth for the industry over the previous decade (see table 4.10).

Even discounting for the observed volatility in the EGW labour productivity growth, we view Access Economics' forecasts of productivity growth as too optimistic.

According to Access Economics, the sanguine productivity outlook is based on easing of drought conditions on the east coast as well as an unwinding of factors which they believe weighed down the productivity performance of the utilities sector over the previous decade. Access Economics lists the negative factors for the industry as follows (p.48 of December 2010 report):

- *The downswing in employment in the sector had arguably gone too far, requiring a degree of catch up (meaning that, in effect, relative productivity in the period 1997 to 2002 may have been unsustainably high). Spending on maintenance has lifted, and so too has spending on some new infrastructure (albeit with the latter still falling short of future requirements). That increased spending has added to employment without adding to output, hence weighing on measured productivity.*
- *A compositional switch in the sector away from water to electricity and gas has also worked to lower measured average productivity in the sector.*
- *Within the water sector, a series of droughts in a number of States also ate into measured productivity levels.*
- *Industry sources suggest that a reduction in outsourcing in recent years may also have raised employment without raising output.*
- *The reform momentum of earlier years faltered.*

However, Access Economics (AE) provides little discussion or evidence to support the claims that most of the negative factors from the last decade will actually reverse over the next six years. With reference to the first point above, AE basically agrees with our assessment (and that of most of the utilities in their submissions to the AER over recent years) that spending on new infrastructure is still well short of future requirements, and that high levels of infrastructure spending will continue over the next few years. This suggests that these higher levels will continue to "add to employment without adding to output"… and hence continue to" weigh down on measured productivity". It should also be noted that a significant portion of the recent and future infrastructure spending is related to network enhancement and maintenance for reliability, rather than for increasing capacity (i.e. future output).

With reference to the second point above, there is no evidence or discussion provided that a compositional switch back to water will occur over the next few years, let alone act to raise measured productivity in the overall sector. The output of the water sector may increase over the medium term compared to the drought-affected 2000s (given the construction of desalination plants around Australia), but given sharp rises in water prices and slower population growth, growth in water (and sewerage-related) demand and output is unlikely to be rapid, and significantly outpace the electricity and gas sub-sectors.

With reference to the fourth point above, no evidence or discussion has been provided to suggest there will be a reversal of the trend away from outsourcing (ie and therefore perform more work in-house). Indeed, our discussions with several utilities suggest that the major reason for the increase in employment in the sector over the past decade was to have less reliance on outsourced services, particularly maintenance and regular system enhancement capital programs. Having invested heavily in hiring and training these increased

numbers of employees, the utilities are unlikely to shed labour and increase outsourcing over the next few years.

With reference to the last AE point above, most of the easy reforms in terms of manning practices and enterprise bargained productivity enhancements occurred in the deregulation period of the 1990s – in effect, "all the low hanging fruit has been plucked". There are few reforms left which will significantly lift productivity in the utilities sector, and so we are unlikely to see a pick up in "reform momentum" over the next few years.

Overall, there is not a compelling case to believe there will be higher labour productivity in the utilities sector over the next few years.

4.7 Competitor Industry Wages Growth

This section analyses and forecasts underlying wages (LPI) growth in the industries that compete with the utilities sector for similarly skilled labour.

4.7.1 Construction Wages

The forecasts and rationale for Australian and Queensland construction sector wages growth is set out in section 8. The forecasts are also shown in tables 8.1 and 8.2.

4.7.2 Mining Wages

The mining investment boom over the second half of the 2000s resulted in rapid employment growth in the mining sector, strong demand for labour — particularly skilled labour — and an escalation in wages growth. Rapidly rising commodity prices and high profits also fuelled the escalation in mining wages. Over the 2005/06 to 2010/11 period, mining sector wages growth in AWOTE terms averaged 7.1 per cent per annum and 5.1 per cent p.a. in LPI terms, at the Australian level. In Queensland, the growth in mining sector AWOTE over the same past five years was 8.4 per cent per annum.

Wages growth in the mining sector in LPI terms slowed sharply in 2009/10 in a lagged response to the downturn in resource exports and output in 2008/09 and delays to the commencement of new investment projects, caused by the global financial crisis. Meanwhile, mining AWOTE growth in 2009–10 remained high (7.2 per cent) due to compositional effects — the cut backs in mining employment impacted disproportionately on lower paid workers, boosting the overall average wage. Employment growth has since bounced back and mining LPI growth picked-up to 4.3 per cent in 2010/11. AWOTE growth, meanwhile, eased to 6.5 per cent. Beyond 2010/11, both AWOTE and LPI growth is forecast to grow solidly over 2011/12 to 2013/14 before easing — but still exhibiting relatively high growth (compared to 'all industries' Australian average) in the second half of this decade.

Driving the high wages growth this decade will be strong demand for labour, and particularly skilled labour, as a result of the mining investment boom projected to occur over the forecast period. Projections for continued strong economic growth in China and India — with their long term programs of industrialisation and urbanisation, which are metals and energy intensive — plus ongoing growth throughout other parts of Asia and, by mid-decade, a sustained recovery in the US and European economies, will all combine to underpin healthy demand for minerals and energy. Commodity prices have already rebounded from the slump of 2008/09, and further price rises are forecast over the next few years. Prices over the next seven years are expected to be well above historical averages, both in real and nominal terms.

The strong outlook has locked-in another round of mining related projects over the next five years. The capital intensive nature of mining means not only that labour costs are usually a low proportion of total costs, but that the mining sector has a requirement for more highly skilled labour. Relatively high prices also mean that the mining sector can afford to offer higher wages.

Table 4.13: Wages Growth in Competitor Industries – Australia
All Industries, EGW, Mining, Manufacturing and Construction
(Year Average Growth)

Year Ended December	Labour Price Index (2)									
	All Industries		Electricity, Gas and Water		Construction		Mining		Manufacturing	
	$	%CH	$	%CH	Index	%CH	Index	%CH	Index	%CH
2000	66.9		61.9		63.7		62.2		68.0	
2001	69.3	3.6	64.5	4.1	66.1	3.7	64.4	3.5	70.3	3.4
2002	71.5	3.2	67.2	4.3	68.3	3.3	66.8	3.8	72.7	3.4
2003	74.1	3.7	70.0	4.2	70.5	3.3	68.8	2.9	75.2	3.5
2004	76.8	3.6	73.2	4.5	73.8	4.7	71.1	3.4	77.8	3.4
2005	79.9	4.0	76.4	4.4	77.3	4.7	74.3	4.6	80.9	4.0
2006	83.0	3.9	81.1	6.1	81.5	5.5	78.6	5.8	83.9	3.7
2007	86.4	4.1	84.5	4.1	85.2	4.6	83.0	5.5	87.4	4.2
2008	90.0	4.2	87.9	4.1	89.1	4.6	88.2	6.3	91.1	4.3
2009	93.2	3.6	91.7	4.4	92.8	4.2	92.0	4.3	93.5	2.7
2010	96.4	3.4	96.1	4.7	95.9	3.3	95.6	3.9	96.2	2.9
2011	100.0	3.8	100.0	4.1	100.0	4.2	100.0	4.6	100.0	3.9
Forecasts										
2012	104.2	4.2	104.9	4.9	105.4	5.4	105.5	5.5	103.9	3.9
2013	109.1	4.7	110.5	5.3	111.5	5.8	112.0	6.1	108.6	4.5
2014	114.0	4.5	116.1	5.1	117.5	5.4	118.8	6.0	113.1	4.1
2015	118.4	3.8	121.8	4.9	122.6	4.3	124.9	5.2	117.2	3.6
2016	123.5	4.3	127.7	4.9	128.7	4.9	131.7	5.4	122.1	4.1
2017	129.1	4.6	134.3	5.2	135.7	5.5	139.3	5.8	127.7	4.6
Long Term Averages										
2000-2010	3.7		4.5		4.2		4.4		3.5	
2006-2011	3.8		4.3		4.2		4.9		3.6	
2011-2017	4.4		5.0		5.2		5.7		4.2	

(1) Earnings of persons. Data is year ended May. Source: BIS Shrapnel, ABS
(2) Ordinary time hours excluding bonuses.

Overall, mining sector wages in LPI terms are forecast to average 5.7 per cent per annum over the six years from 2011/12 to 2016/17 at the Australian level (see table 10.3), higher than the electricity, gas and water sector, adding to pressure for higher wages in the utilities sector across Australia.

4.7.3 Manufacturing Wages

Growth in manufacturing has lagged the growth in all industries wages over the last decade, both in AWOTE and LPI terms, at the Australian level. Employment and output growth have been weak overall, with the manufacturing sector one of the sectors hardest hit by the global financial crisis. Output (real gross value added – GVA) declined by 5.9 per cent in 2008/09. Output recovered from the GFC lows, rising 1.3 per cent in 2009/10 but has since managed to edge only an estimated 0.2 per cent higher in 2010/11. Momentum built in the previous year began to stall over 2010/11 as the boost provided by government stimulus to the building sectors started to reverse, non-mining business investment remained weak and population growth slowed, resulting in a slower pace of growth in domestic demand. In addition, the higher Australian dollar (12 per cent higher than 2009/10) affected competitiveness and saw imports take a greater share from local manufacturers and export growth stall.

Future prospects for the manufacturing sector will be shaped by three factors: the outlook for export markets which in turn is directly correlated with the prospects for the global economy; the strength of domestic demand for goods, in particular the performance of the construction sector; and the level of the A$.

The key drivers of growth are expected to be the resumption of the upswing in domestic dwelling construction, supplying inputs to the booming mining sector, a higher plane of privately funded engineering construction and the continued recovery in business investment at home and overseas. In turn, this will boost demand for construction materials, housing fit-out goods, machinery and equipment as well as releasing a considerable amount of pent-up demand for consumer and capital goods. However, higher interest rates over 2013/14 are expected to affect dwelling building and consumer demand, and cause manufacturing output growth to slow in 2013/14 and 2014/15, before picking up from 2015/16. The major negative for Manufacturing will be the very high A$ (averaging close to US$1 over the next five years) which will impact heavily on competitiveness and lead to a further 'hollowing out' of industry.

Overall, only modest growth in output is expected over the next two years, before growth eases over 2013/14 and 2014/15 due to the expected rise in interest rates in 2013/14. Growth in output and employment is subsequently expected to strengthen over 2015/16 to 2017/18, boosted by a rebound in dwelling and non-dwelling building activity and (initially) a lower dollar.

Overall, manufacturing sector wages growth in LPI terms is forecast to average 4.2 per cent p.a. over the six years from 2012 to 2017 inclusive at the Australian level (see table 4.11). The slower wage growth compared to the All Industries average is in line with historical trends over the past decade. Note that wages growth in the overall manufacturing sector does not weaken significantly, despite further declines in manufacturing employment over the next few years, because most of the employment losses are expected to be in the lower wage segments of manufacturing such as Textiles, Leather, Clothing and Footwear Manufacturing; Furniture and Other Manufacturing; Wood Products Manufacturing; and Printing. Average wages per employee in the first two subdivisions are around two-thirds of the overall manufacturing average, while average wages in the latter two subdivisions are 85% and 83% of the overall manufacturing average respectively (data sourced from ABS catalogue number 8155.0).

5. GENERAL LABOUR COST ESCALATION

Envestra, SP-AusNet and Multinet Gas (the distributors) 'general labour' includes mainly clerical/administration, professionals and managerial staff, who provide administration and corporate support services.

The escalator BIS Shrapnel used for 'General Labour' are wage movements in Victoria and NSW for the following two industry sectors:

- Administration and Support Services (ASS) which includes units mainly engaged in performing routine support activities for day-to-day operations of other businesses and organisations; and
- Professional, Scientific and Technical Services (PSTS) which, as the name suggests, includes units mainly engaged in providing professional, scientific and technical services including engineering, legal, accountancy, management and other consultancy services.

These two sectors combined cover the majority of the 'general' labour for the distributors' ie both internal and services contracted out (such as legal services, auditing, consulting, engineering design consultancies, etc.). As such, the wage movements in the above two sectors would be a better escalator for Envestra, SP-AusNet and Multinet Gas than the 'all industries' AWOTE or LPI for the whole state. The all industries state (or Australian) average includes lower skilled occupations such as retail, hospitality etc. services, which have nothing to do with 'general labour' functions.

We note that the Australian Energy Regulator's consultant Deloitte Access Economics uses forecasts of wage movements in the Administration and Support Services (ASS) sector as the escalator for 'general labour'.[3] The ASS classification does not take into account the higher skilled management and specialist professions (such as accountants, lawyers, etc.) within Envestra, SP-AusNet and Multinet Gas who are classified to 'general labour' and who are in high demand (and therefore have higher wages growth). As such, a 'general labour' wage escalator solely based on the ASS sector is likely to understate the 'true' general labour costs for the distributors.

Based on our discussions with Envestra, SP-AusNet and Multinet Gas staff, we understand 80 per cent of the distributors' general labour belong to the PSTS sector with the remaining 20 per cent providing mainly administrative and support services. We applied these proportions to the Victoria and NSW PSTS and the ASS sectors to derive a weighted average escalator for 'general labour' for the distributors.

At the Australian level, PSTS wages are forecast to average 5.8 per cent per annum (in nominal AWOTE terms) over the six years from 2012 to 2017 inclusive, remaining above the national All Industries average of 5.1 per cent per annum over the same six year period (see Table 5.1). ASS AWOTE growth is forecast to average 4.9 per cent per annum over the same six year period at the national level.

The PSTS sector experienced a sustained period of high demand for their services and labour between 2001 and 2008, boosted initially by residential property and construction and then from strong business investment and jobs growth. This fuelled above average growth in wages. However the credit crisis and GFC hit employment growth in late 2008 and 2009 and, in a lagged response, hit wages growth in 2010 and 2011.

[3] AER, *Draft Decision for Envestra Ltd's Access Arrangement Proposal for the period 1 July 2011 to 30 June 2016*, February 2011, p.141.

Table 5.1: PSTS, ASS and Total All Industries Wages Growth - Australia

Year Ended December	Average Weekly Ordinary Time Earnings (1)						Labour Price Index (2)					
	All Industries		Admin and Support Services		Professional, Scientific, Technical Services		All Industries		Admin and Support Services		Professional, Scientific, Technical Services	
	$	%CH	$	%CH	$	%CH	Index	%CH	Index	%CH	Index	%CH
2000	785.9		726.6		908.5		66.9		68.6		65.0	
2001	825.1	5.0	794.6	9.4	984.7	8.4	69.3	3.6	71.1	3.6	68.2	5.0
2002	867.1	5.1	836.0	5.2	1049.1	6.5	71.5	3.2	73.3	3.2	70.2	2.9
2003	913.7	5.4	845.2	1.1	1074.6	2.4	74.1	3.7	76.4	4.2	72.3	3.0
2004	948.5	3.8	865.7	2.4	1086.3	1.1	76.8	3.6	79.1	3.5	74.6	3.2
2005	998.9	5.3	928.6	7.3	1157.0	6.5	79.9	4.0	81.3	2.8	77.6	4.0
2006	1 032.6	3.4	956.1	3.0	1210.3	4.6	83.0	3.9	83.7	2.9	81.2	4.5
2007	1 081.8	4.8	1001.9	4.8	1270.6	5.0	86.4	4.1	87.0	4.0	84.6	4.2
2008	1 133.8	4.8	1072.9	7.1	1358.7	6.9	90.0	4.2	91.2	4.9	88.8	5.0
2009	1 198.6	5.7	1149.7	7.2	1428.7	5.2	93.2	3.6	93.8	2.8	92.5	4.2
2010	1 257.0	4.9	1204.8	4.8	1519.4	6.3	96.4	3.4	96.6	3.0	95.9	3.6
2011	1 308.5	4.1	1202.3	-0.2	1574.3	3.6	100.0	3.8	100.0	3.6	100.0	4.3
Forecasts												
2012	1 370.4	4.7	1264.5	5.2	1,660.0	5.4	104.2	4.2	103.8	3.8	104.9	4.9
2013	1 445.6	5.5	1328.6	5.1	1,762.7	6.2	109.1	4.7	108.4	4.4	110.3	5.1
2014	1 522.2	5.3	1395.7	5.1	1,873.5	6.3	114.0	4.5	112.7	4.0	115.9	5.1
2015	1,597.7	5.0	1,455.2	4.3	1,974.7	5.4	118.4	3.8	116.7	3.5	120.4	3.8
2016	1,673.4	4.7	1,519.5	4.4	2,079.4	5.3	123.5	4.3	121.1	3.8	126.4	5.0
2017	1,762.7	5.3	1,599.6	5.3	2,209.7	6.3	129.1	4.6	126.4	4.3	133.1	5.3
Compound Annual Growth Rates												
2000-2010	4.8		5.2		5.3		3.7		3.5		4.0	
2006-2011	4.8		4.7		5.4		3.8		3.6		4.3	
2011-2017	5.1		4.9		5.8		4.4		4.0		4.9	

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

(2) Ordinary time hours excluding bonuses.

Wages growth in the PSTS and ASS sectors picked up (in LPI terms) over 2010 and early 2011 following the ending of wage freezes in early 2010. With strong demand for labour in 2009/10 continuing into 2010/11 and 2011/12 (although easing this year due to the current soft patch), wages growth is expected to strengthen further in 2012 (in both LPI and AWOTE terms).

Given 65 per cent of employees are on individual arrangements, domestic activity, the demand for labour, profits and any potential labour shortages in the sector will be key drivers of overall wages. Another key factor driving the demand for labour and wages growth in the PSTS sector is the strength of business and residential investment in the overall economy. With labour shortages expected to be apparent by late 2012 — when the national unemployment rate falls below 4.5% — plus the prospect of healthier profits, wages growth is forecast to accelerate toward and above 6 per cent per annum (in AWOTE terms) over both 2013 and 2014, before easing (see Table 5.1). We expect wage pressures to re-emerge in the second half of this decade as the economy rebounds from a mild downturn in 2015. Meanwhile, wages growth in the ASS sector will tend to track the cycle in PSTS wages growth, but wages growth in the ASS sector will still lag national wages growth (in AWOTE terms) for most of the period.

5.1 State Wage forecasts for General Labour

The weighted Victoria and NSW forecasts for PSTS and ASS wages are set out in Table 5.2 and Table 5.3, respectively. The year-to-year forecasts tend to follow the investment cycle and relative strength of the state's Gross State Product (GSP), State Final Demand (SFD) and overall employment this decade.

The weighted 'general labour' escalator (in AWOTE terms) for both Victoria and NSW, on average, is expected to be weaker than the national (PSTS) average over the next six years. We believe the Australian PSTS wages is expected to be boosted by robust growth in PSTS wages in strong mining states such as Queensland and WA.

Table 5.2: PSTS and ASS (Weighted) Wages Growth – Victoria

	Nominal				Real (3)				Nominal Adjusted Productivity (4)		Real Adjusted Productivity (3,4)	
	AWOTE (1)		LPI (2)		AWOTE (1)		LPI (2)		AWOTE (1)	LPI (2)	AWOTE (1)	LPI (2)
Year Ended December	$	A% CH	Index	A% CH	$	A% CH	Index	A% CH	A% CH	A% CH	A% CH	A% CH
2000	..	..	..	..	..	..	..	..	..	..	..	..
2001	..	..	..	..	..	..	..	..	..	..	..	..
2002	..	..	..	..	..	..	..	..	..	..	..	..
2003	..	..	..	..	..	..	..	..	..	..	..	..
2004	..	..	..	..	..	..	..	..	..	..	..	..
2005	..	..	..	..	..	..	..	..	..	..	..	..
2006	..	..	..	..	..	..	..	..	..	..	..	..
2007	..	..	..	..	..	..	..	..	..	..	..	..
2008	..	..	..	..	..	..	..	..	..	..	..	..
2009		..	92.6	..	..	..	98.5	..	..	..	..	..
2010	1404.4	..	95.5	3.1	1,453	..	98.8	0.3	..	3.0	..	0.2
2011e	1389.2	-1.1	100.0	4.8	1,389	-4.6	100.0	1.3	4.6	10.5	1.1	7.0
Forecasts												
2012	1463.4	5.3	104.4	4.4	1,414	1.8	100.9	0.9	5.4	4.5	1.9	1.0
2013	1547.5	5.7	109.3	4.7	1,450	2.5	102.3	1.4	6.2	5.2	3.0	1.9
2014	1636.1	5.7	114.3	4.6	1,493	3.0	104.3	1.9	9.5	8.4	6.8	5.7
2015	1718.5	5.0	118.7	3.8	1,530	2.5	105.6	1.3	6.1	4.9	3.6	2.4
2016	1807.6	5.2	124.5	4.9	1,572	2.7	108.1	2.4	3.2	2.9	0.7	0.4
2017	1916.9	6.0	130.8	5.1	1,627	3.5	111.0	2.6	3.1	2.2	0.6	-0.3
Long Term Averages												
2000-2010												
2006-2011												
2011-2017	5.5		4.6		2.7		1.7		5.6	4.7	2.8	1.9

e : estimate
Source: BIS Shrapnel, ABS

(1) Earnings of persons. Data is year ended May.
(2) Ordinary time hours excluding bonuses.
(3) Deflated by RBA/Treasury CPI projections
(4) Productivity is output (real GVA) divided by employment in the Electricity, Gas, Water and Waste Services sector.

Table 5.3: PSTS and ASS (Weighted) Wages Growth – New South Wales

	Nominal				Real (3)				Nominal Adjusted Productivity (4)		Real Adjusted Productivity (3,4)	
	AWOTE (1)		LPI (2)		AWOTE (1)		LPI (2)		AWOTE (1)	LPI (2)	AWOTE (1)	LPI (2)
Year Ended December	$	A% CH	Index	A% CH	$	A% CH	Index	A% CH	A% CH	A% CH	A% CH	A% CH
2000	..	..	..	..	..	..	..	..	..	..	..	..
2001	..	..	..	..	..	..	..	..	..	..	..	..
2002	..	..	..	..	..	..	..	..	..	..	..	..
2003	..	..	..	..	..	..	..	..	..	..	..	..
2004	..	..	..	..	..	..	..	..	..	..	..	..
2005	..	..	..	..	..	..	..	..	..	..	..	..
2006	..	..	..	..	..	..	..	..	..	..	..	..
2007	..	..	..	..	..	..	..	..	..	..	..	..
2008	..	..	..	..	..	..	..	..	..	..	..	..
2009	..	..	93.0	..	..	..	99.0	..	..	..	..	..
2010	1542.6	..	96.5	3.7	1,596	..	99.8	0.8	..	11.6	..	8.7
2011e	1634.0	5.9	100.0	3.7	1,634	2.4	100.0	0.2	3.8	1.6	0.3	-1.9
Forecasts												
2012	1710.6	4.7	104.8	4.8	1,653	1.2	101.3	1.3	-3.7	-3.6	-7.2	-7.1
2013	1812.6	6.0	110.1	5.1	1,697	2.7	103.1	1.8	9.0	8.1	5.7	4.8
2014	1922.7	6.1	115.6	4.9	1,755	3.4	105.3	2.2	10.4	9.2	7.7	6.5
2015	2024.7	5.3	120.1	3.9	1,804	2.8	106.8	1.4	7.9	6.5	5.4	4.0
2016	2132.4	5.3	125.9	4.8	1,855	2.8	109.2	2.3	7.1	6.6	4.6	4.1
2017	2264.6	6.2	132.4	5.2	1,923	3.7	112.1	2.7	9.2	8.2	6.7	5.7
Long Term Averages												
2000-2010												
2006-2011												
2011-2017	5.6		4.8		2.8		1.9		6.7	5.8	3.8	3.0

e : estimate
Source: BIS Shrapnel, ABS

(1) Earnings of persons. Data is year ended May.
(2) Ordinary time hours excluding bonuses.
(3) Deflated by RBA/Treasury CPI projections
(4) Productivity is output (real GVA) divided by employment in the Electricity, Gas, Water and Waste Services sector.

5.2 Productivity-Adjusted Wage Forecasts for General Labour

Productivity adjusted wage forecasts for 'general labour' in Victoria and NSW were derived by subtracting the productivity growth forecast for each state's utilities sector from the state's 'general labour' wages growth over the forecast period. Note that we applied the productivity growth for the utilities sector as opposed to that observed for PSTS or the ASS sector. The general labour under investigation is employed in the utilities sector hence contribute to the overall improvement in productivity for that sector. As a result, we believe the productivity measure for the utilities sector is the most appropriate if one were to adjust 'general labour' wages for productivity improvements.

At the Australian and state levels, the combination of muted output and moderate employment growth means productivity growth will remain weak for the utilities sector over the six years to 2017. Productivity growth in the utilities sector, at the Australian level, is forecast to decline by an average of 0.3 per cent per annum over the six years from 2012 to 2017 inclusive.

Productivity growth in the Victorian utilities sector is expected to be slightly weaker than the national utilities average over the next six years, mainly because of stronger employment growth in that state. Meanwhile, productivity growth in the NSW utilities sector is forecast to average 0.5 per cent over the next six years, significantly better than the national utilities average over the same period although most of this is attributable to the robust 18.4 per cent growth in 2011/12, with only weak growth expected after that.

The upshot is that once nominal AWOTE is adjusted for CPI inflation and (utilities) productivity movements, real productivity adjusted AWOTE for 'general labour' is forecast to average 2.8 and 3.8 per cent per annum for Victoria and NSW, respectively over the six years from 2012 to 2017 inclusive. The productivity adjusted wage forecasts for PSTS and ASS at the Victoria and NSW level are presented in Tables 5.4 to 5.7.

Table 5.4: PSTS, Nominal, Real & Productivity Adjusted Wages – Victoria

	Nominal				Real				Nominal Adjusted Productivity		Real Adjusted Productivity	
Year Ended	AWOTE		LPI		AWOTE		LPI		AWOTE	LPI	AWOTE	LPI
December	$	A% CH	Index	A% CH	$	A% CH	Index	A% CH	A% CH	A% CH	A% CH	A% CH
2000	..	..	..	..	..	..	..	..	..	..	..	..
2001	..	..	..	..	..	..	..	..	..	..	..	..
2002	..	..	..	..	..	..	..	..	..	..	..	..
2003	..	..	..	..	..	..	..	..	..	..	..	..
2004	..	..	..	..	..	..	..	..	..	..	..	..
2005	..	..	..	..	..	..	..	..	..	..	..	..
2006	..	..	..	..	..	..	..	..	..	..	..	..
2007	..	..	..	..	..	..	..	..	..	..	..	..
2008	..	..	..	..	..	..	..	..	..	..	..	..
2009	..	..	92.4	..	..	..	98.3	..	..	..	..	..
2010	1460.8	..	95.3	3.2	1,512	..	98.7	0.4	..	3.1	..	0.3
2011e	1467.8	0.5	100.0	4.9	1,466	-3.0	100.0	1.4	6.2	10.6	2.7	7.1
Forecasts												
2012	1544.8	5.2	104.6	4.6	1,491	1.7	101.1	1.1	5.3	4.7	1.8	1.2
2013	1635.8	5.9	109.6	4.8	1,530	2.6	102.6	1.5	6.4	5.3	3.1	2.0
2014	1732.1	5.9	114.9	4.8	1,579	3.2	104.8	2.1	9.7	8.6	7.0	5.9
2015	1822.1	5.2	119.3	3.8	1,622	2.7	106.2	1.3	6.3	4.9	3.8	2.4
2016	1918.7	5.3	125.4	5.1	1,667	2.8	108.9	2.6	3.3	3.1	0.8	0.6
2017	2037.0	6.2	132.1	5.3	1,728	3.7	112.0	2.8	3.3	2.4	0.8	-0.1
Long Term Averages												
2000-2010												
2006-2011												
2011-2017	5.6		4.7		2.8		1.9		5.7	4.8	2.9	2.0

e : estimate Source: BIS Shrapnel, ABS

(1) Earnings of persons. Data is year ended May.

(2) Ordinary time hours excluding bonuses.

(3) Deflated by RBA/Treasury CPI projections

(4) Productivity is output (real GVA) divided by employment in the Electricity, Gas, Water and Waste Services sector.

Table 5.5: ASS, Nominal, Real & Productivity Adjusted Wages – Victoria

	Nominal				Real				Nominal Adjusted Productivity		Real Adjusted Productivity	
Year Ended	AWOTE		LPI		AWOTE		LPI		AWOTE	LPI	AWOTE	LPI
December	$	A% CH	Index	A% CH	$	A% CH	Index	A% CH	A% CH	A% CH	A% CH	A% CH
2000	..	..	..	..	..	..	..	..	..	..	..	..
2001	..	..	..	..	..	..	..	..	..	..	..	..
2002	..	..	..	..	..	..	..	..	..	..	..	..
2003	..	..	..	..	..	..	..	..	..	..	..	..
2004	..	..	..	..	..	..	..	..	..	..	..	..
2005	..	..	..	..	..	..	..	..	..	..	..	..
2006	..	..	..	..	..	..	..	..	..	..	..	..
2007	..	..	..	..	..	..	..	..	..	..	..	..
2008	..	..	..	..	..	..	..	..	..	..	..	..
2009	..	..	93.3	..	..	..	99.3	..	..	..	..	..
2010	1178.7	..	96.0	2.9	1,220	..	99.4	0.1	..	2.8	..	0.0
2011e	1074.5	-8.8	100.0	4.1	1,069	-12.3	100.0	0.6	-3.1	9.8	-6.6	6.3
Forecasts												
2012	1137.7	5.9	103.8	3.8	1,095	2.4	100.2	0.3	6.0	3.9	2.5	0.4
2013	1194.2	5.0	108.1	4.2	1,113	1.7	101.1	0.9	5.5	4.7	2.2	1.4
2014	1252.2	4.9	112.2	3.8	1,137	2.2	102.2	1.1	8.7	7.6	6.0	4.9
2015	1304.3	4.2	116.0	3.4	1,156	1.7	103.2	0.9	5.3	4.5	2.8	2.0
2016	1363.2	4.5	120.6	3.9	1,179	2.0	104.6	1.4	2.5	1.9	0.0	-0.6
2017	1436.4	5.4	125.9	4.4	1,213	2.9	106.6	1.9	2.5	1.5	0.0	-1.0
Long Term Averages												
2000-2010												
2006-2011												
2011-2017	5.0		3.9		2.1		1.1		5.1	4.0	2.2	1.2

e : estimate Source: BIS Shrapnel, ABS

(1) Earnings of persons. Data is year ended May.

(2) Ordinary time hours excluding bonuses.

(3) Deflated by RBA/Treasury CPI projections

(4) Productivity is output (real GVA) divided by employment in the Electricity, Gas, Water and Waste Services sector.

Table 5.6: PSTS, Nominal, Real & Productivity Adjusted Wages – New South Wales

	Nominal				Real				Nominal Adjusted Productivity		Real Adjusted Productivity	
Year Ended	AWOTE		LPI		AWOTE		LPI		AWOTE	LPI	AWOTE	LPI
December	$	A% CH	Index	A% CH	$	A% CH	Index	A% CH	A% CH	A% CH	A% CH	A% CH
2000	..	..	..	..	..	..	..	..	..	..	..	..
2001	..	..	..	..	..	..	..	..	..	..	..	..
2002	..	..	..	..	..	..	..	..	..	..	..	..
2003	..	..	..	..	..	..	..	..	..	..	..	..
2004	..	..	..	..	..	..	..	..	..	..	..	..
2005	..	..	..	..	..	..	..	..	..	..	..	..
2006	..	..	..	..	..	..	..	..	..	..	..	..
2007	..	..	..	..	..	..	..	..	..	..	..	..
2008	..	..	..	..	..	..	..	..	..	..	..	..
2009	..	..	92.7	..	..	..	98.7	..	..	..	..	..
2010	1605.6	..	96.3	3.9	1,662	..	99.7	1.1	..	11.8	..	9.0
2011e	1713.8	6.7	100.0	3.8	1,715	3.2	100.0	0.3	4.6	1.7	1.1	-1.8
Forecasts												
2012	1796.8	4.8	105.0	5.0	1,738	1.3	101.5	1.5	-3.6	-3.4	-7.1	-6.9
2013	1908.0	6.2	110.6	5.3	1,789	2.9	103.6	2.0	9.2	8.3	5.9	5.0
2014	2027.9	6.3	116.4	5.2	1,853	3.6	106.2	2.5	10.6	9.5	7.9	6.8
2015	2139.4	5.5	121.1	4.0	1,908	3.0	107.8	1.5	8.1	6.6	5.6	4.1
2016	2257.2	5.5	127.3	5.1	1,966	3.0	110.6	2.6	7.3	6.9	4.8	4.4
2017	2400.9	6.4	134.1	5.4	2,042	3.9	113.8	2.9	9.4	8.4	6.9	5.9
Long Term Averages												
2000-2010												
2006-2011												
2011-2017	5.8		5.0		2.9		2.2		6.8	6.1	4.0	3.2

e : estimate
Source: BIS Shrapnel, ABS
(1) Earnings of persons. Data is year ended May.
(2) Ordinary time hours excluding bonuses.
(3) Deflated by RBA/Treasury CPI projections
(4) Productivity is output (real GVA) divided by employment in the Electricity, Gas, Water and Waste Services sector.

Table 5.7: ASS, Nominal, Real & Productivity Adjusted Wages – New South Wales

	Nominal				Real				Nominal Adjusted Productivity		Real Adjusted Productivity	
Year Ended	AWOTE		LPI		AWOTE		LPI		AWOTE	LPI	AWOTE	LPI
December	$	A% CH	Index	A% CH	$	A% CH	Index	A% CH	A% CH	A% CH	A% CH	A% CH
2000	..	..	..	..	..	..	..	..	..	..	..	..
2001	..	..	..	..	..	..	..	..	..	..	..	..
2002	..	..	..	..	..	..	..	..	..	..	..	..
2003	..	..	..	..	..	..	..	..	..	..	..	..
2004	..	..	..	..	..	..	..	..	..	..	..	..
2005	..	..	..	..	..	..	..	..	..	..	..	..
2006	..	..	..	..	..	..	..	..	..	..	..	..
2007	..	..	..	..	..	..	..	..	..	..	..	..
2008	..	..	..	..	..	..	..	..	..	..	..	..
2009	..	..	94.4	..	..	..	100.5	..	..	..	..	..
2010	1290.7	..	97.0	2.8	1,336	..	100.4	0.0	..	10.7	..	7.9
2011e	1314.9	1.9	100.0	3.1	1,314	-1.6	100.0	-0.4	-0.2	1.0	-3.7	-2.5
Forecasts												
2012	1365.9	3.9	103.9	3.9	1,319	0.4	100.4	0.4	-4.5	-4.5	-8.0	-8.0
2013	1430.9	4.8	108.3	4.2	1,338	1.5	101.3	0.9	7.8	7.2	4.5	3.9
2014	1501.9	5.0	112.2	3.7	1,368	2.3	102.3	1.0	9.3	8.0	6.6	5.3
2015	1565.8	4.3	116.0	3.4	1,393	1.8	103.2	0.9	6.9	6.0	4.4	3.5
2016	1633.4	4.3	120.3	3.7	1,418	1.8	104.5	1.2	6.1	5.5	3.6	3.0
2017	1719.5	5.3	125.4	4.2	1,457	2.8	106.3	1.7	8.3	7.2	5.8	4.7
Long Term Averages												
2000-2010												
2006-2011												
2011-2017	4.6		3.9		1.7		1.0		5.6	4.9	2.8	2.1

e : estimate
Source: BIS Shrapnel, ABS
(1) Earnings of persons. Data is year ended May.
(2) Ordinary time hours excluding bonuses.
(3) Deflated by RBA/Treasury CPI projections
(4) Productivity is output (real GVA) divided by employment in the Electricity, Gas, Water and Waste Services sector.

6. GENERAL MATERIALS COST ESCALATION

The general materials include a range of items used in most businesses and organisations, such as stationary, office furniture, electricity, water, fuel, rent, etc. 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). The forecasts are set out in Table 1 and Table 2.1.

7. GAS NETWORK RELATED MATERIALS

The main material used by Envestra, SP-AusNet and Multinet Gas for their gas distribution networks is polyethylene pipe.

To the best of our knowledge, there isn't any readily available long term price data for polyethylene pipe that one can model to understand its key drivers. We have therefore chosen to use an input cost model to derive an escalator for polyethylene pipe prices.

Our literature search and industry liaison revealed that polyethylene (PE) resin, in particular the PE80 and PE100 compounds, is the key raw material used in the manufacture of polyethylene pipe used in gas distribution networks. Labour and transport (including other overheads) costs are the other two main charges incurred in the production of polyethylene pipes. In terms of the distribution of costs, we were able to ascertain the following information from two local manufacturers of polyethylene pipe:

- One manufacturer (denoted as Manufacturer I) estimated raw materials costs ie PE80 and PE100 compound costs at 80 per cent of total manufacturing costs while the second manufacturer (Manufacturer II) approximated his raw material costs at 70 per cent of total costs. We believe an average of the two manufacturers' raw material costs represents a reasonable approximation of the industry average raw material costs.
- With respect to labour costs, the proportions were 15 per cent and 25 per cent for Manufacturer I and Manufacturer II, respectively. We believe industry average labour costs to be closer to 15 per cent as this figure is consistent with the ABS estimate of labour costs for the Basic Chemical Manufacturing Industry, which is the broader industry sector for polyethylene pipe manufacturing.[4]
- Transport and other overhead costs accounted for 3 to 5 per cent of Manufacturer I's total costs while Manufacturer II's transport costs were between 5 to 10 per cent of total production cost. Based on this information we attributed 10 per cent of total costs to transportation and other overhead costs.

Having identified the main inputs required for the manufacture of polyethylene pipe (as well as their cost shares) we applied the input cost shares to the escalators for key input prices to ascertain movements in polyethylene pipe prices. The escalators used for the key inputs were manufacturing wages (a proxy for labour c osts), CPI inflation (proxy for increases in transportation and overhead costs) and crude oil as a proxy for raw material costs.

Note that we used prices for thermoplastic resins as a proxy for raw material costs. The thermoplastic resin prices, in turn, are proxied by crude oil prices. This is done for two reasons.

Firstly, data on polyethylene resins or compounds is not widely published. Hence, we chose to find a reasonable alternate series. Given polyethylene resin is a type of thermoplastic resin, we used producer price index for thermoplastic resins as a proxy for polyethylene compounds.

Secondly, thermoplastic resins are produced from the distillation and 'cracking' of crude oil. As a result, there is a close correlation between movements in crude oil prices and thermoplastic resin prices (see chart 7.1). This relationship was empirically estimated by the application of a GARCH (generalised autoregressive conditional heterosckedasticity) model.

[4] See Table 6 of ABS Cat No. 5209.0.55.001 – Australian National Accounts: Input-Output Tables – Electronic Publication, Final Release 2006-07 tables.

Chart 7.1: US PPI for Thermoplastic Resins and Crude Oil

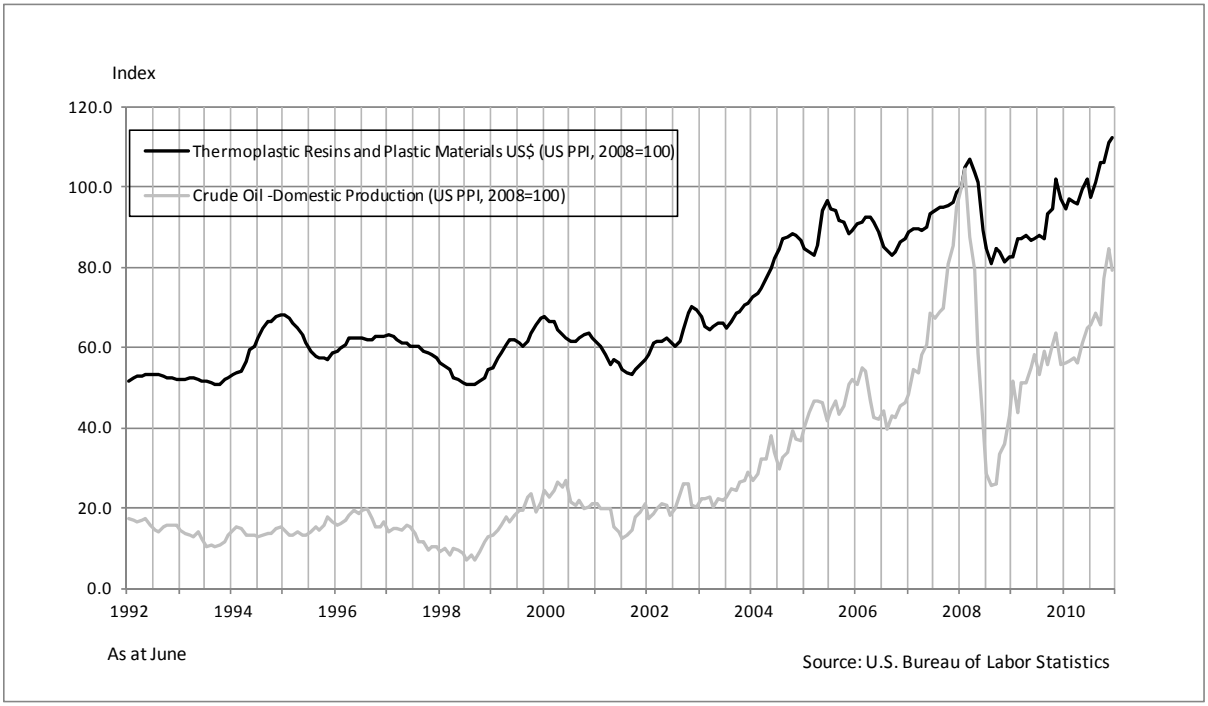
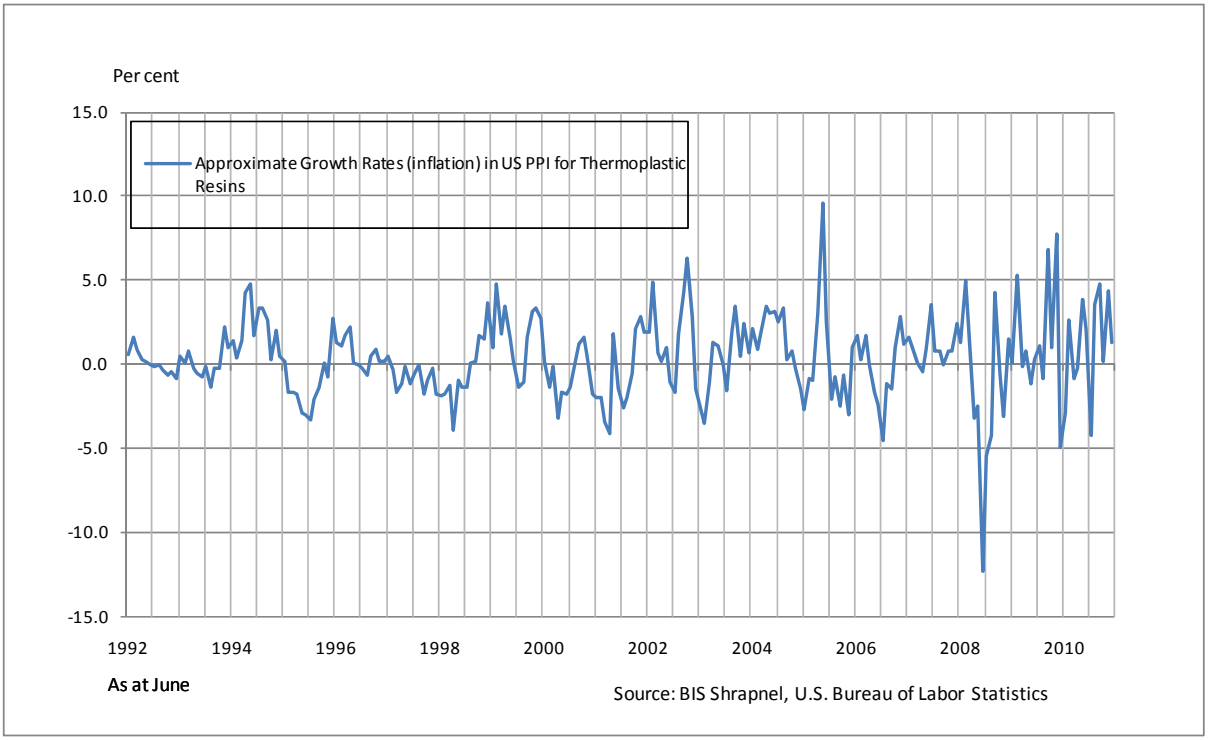


Chart 7.2: Growth in US PPI Inflation for Thermoplastic Resins



Our empirical results revealed that changes in thermoplastic resin prices are heavily influenced by changes in crude oil prices. This relationship is statistically significant and is valid for both the US and Australian markets. Finally, the input cost proportions were applied to forecasts of oil prices (based on futures contracts), manufacturing wages and CPI inflation to generate forecasts of polyethylene pipe prices to 2017 (see Table 7.1).

7.1 Modelling the responsiveness of thermoplastic resin prices to changes in crude oil prices – an application of a GARCH model

Chart 7.1 plots the US PPI (producer price index) for thermoplastic resins and crude oil. The plot shows a close correlation between the two series although there is an evident, and not unexpected, lag between increases in crude oil prices and thermoplastic resin prices. Chart 7.1 also shows that both thermoplastic resin and crude oil prices exhibit considerable volatility throughout the sample period.

To capture the volatility features of thermoplastic resin prices, we take the lead from the established literature and adopt a popular and robust member of the family of GARCH models. According to Bollerslev *et al* (1992),[5] many empirical studies find the GARCH(1,1) model to be a parsimonious and adequate model of conditional volatility, so we chose to adopt this model. The choice of GARCH(1,1) is also motivated on the grounds of simulation evidence provided by Deb(1997),[6] who argues that the performance of the GARCH(1,1) is comparable to more general stochastic volatility models as it provides better smoothed estimates than methods of moments and quasi-maximum likelihood estimators of the true model.

However, it is clear from a visual inspection of chart 7.1 that the thermoplastic resin prices exhibit a clear upward trend. This means that the unconditional, or long-run mean of this series, is non-constant. As GARCH models are built on the premise that the series under consideration is covariance stationary, (i.e., the mean, variance and auto-covariance's of the underlying series exist and are time invariant), we cannot implement a GARCH model to the data in level form. To allow us to deal with series that are stationary, the thermoplastic resins price series p_t is transformed by taking differences in natural logs to yield $y_t = 100 \times (\ln p_t - \ln p_{t-1})$, with the resulting series y_t defined as the (approximate, percentage) growth rate of the price of thermoplastic resin. The transformed series for aggregate PPI for thermoplastic resins is plotted in chart 7.2. From a visual inspection, the transformed series appears to be stationary. There appears to be a positive long run average level about which the series fluctuates and, moreover, the plot does not suggest that the unconditional variance may be time varying. In other words, the underlying series appears to be stationary.

Stationarity tests. The stationarity of the growth rates for thermoplastic resin prices can be confirmed statistically by undertaking the conventional Augmented Dickey-Fuller (ADF) test for a unit root (Dickey and Fuller, 1981).[7] The null hypothesis is that the series has a unit root or, equivalently, that it is non-stationary. The MacKinnon *p*-values as given by E-Views (version 7.0) are effectively zero. Accordingly, the test results indicate that the null hypothesis (that the transformed price series has a unit root) cannot be supported at any reasonable level of significance. We conclude that the growth in thermoplastic resin prices (expressed as the first

[5] Bollerslev, T., R.Y. Chou, and K.F. Kroner (1992): "ARCH Modelling in Finance: A Review of the Theory and Empirical Evidence," *Journal of Econometrics*, 52, 5-59.
[6] Deb, P. (1997): "Finite Sample Properties of the ARCH Class of Models with Stochastic Volatility," *Economic Letters*, 55, 27-34.
[7] Dickey, D.A., and W.A. Fuller (1981): "Likelihood Ratio Statistics for Auto Regressive Time Series with a Unit Root," *Econometrica*, 49, 1057-1072.

differences in natural logs) is stationary. Hence, a GARCH model can be applied to the transformed series.

Specification of the mean. The conditional mean for growth in thermoplastic resin prices is specified as a function of the price of oil, the key component used in the production of polyethylene compounds and by extension the main material used in the manufacture of thermoplastic resins. Given our main objective is to numerically estimate the percentage change in price of thermoplastic resin prices that is associated with a 1% change in the price of oil (i.e. the elasticity of price for thermoplastic resins with respect to price of oil), we have included the price of oil as differences in natural logs (i.e. as the approximate percentage changes). Hence, our model becomes a log-log specification with the coefficients of the explanatory variables (excluding the intercept) representing the percentage change in thermoplastic resin price inflation that is associated with a 1% change in oil prices.

In addition, to allow for a lagged response in the price of thermoplastic resins following shifts in the price of crude oil, we have included the price of oil lagged for four previous periods (months) as explanatory variables in the conditional mean specification of the model. This will allow us to derive the four-period cumulative (long-run) impact of a 1% change in the price of oil on thermoplastic resin prices. The long-run impact will simply be the sum of the estimated coefficients in the mean component of the model.

Accordingly, the GARCH(1,1) model is specified as

$$\begin{aligned} y_t &= 100(\ln p_t - \ln p_{t-1}) = \beta_0 100(\ln OIL\_P_t - \ln Oil\_P_{t-1}) + \beta_1(\ln Oil\_P_t - \ln Oil\_P_{t-2}) \\ &\quad + \beta_3(\ln Oil\_P_t - \ln Oil\_P_{t-3}) + \beta_4(\ln OIL\_P_t - \ln Oil\_P_{t-4}) + \varepsilon_t \\ \text{var}(\varepsilon_t) &= h_t = \alpha_0 + \alpha_1 \varepsilon_{t-1}^2 + \gamma_1 h_{t-1} \end{aligned}$$

where ε_t represents the disturbance term, β*'s,* α*'s* and γ are the regression parameters, y denotes thermoplastic resin price growth while Oil_P represents crude oil price.

Empirical Results. Given the primary data originates from the US, we first applied the GARCH(1,1) model to the US thermoplastic resin prices. The model was estimated in E-Views (version 7.0) using the method of maximum likelihood. The sample included monthly PPI for Thermoplastic Resins and Plastic Materials from July 1991 to August 2011 (230 observations) published by the US Bureau of Labor Statistics. The estimated model is produced below (standard errors are in parenthesis). Results of model diagnostics are provided in the accompanying table.

$$y_t = \underset{(0.011)}{0.2079}\ln\left(\frac{Oil\_P}{Oil\_P_{t-1}}\right) + \underset{(0.012)}{0.045}\ln\left(\frac{Oil\_P_t}{Oil\_P_{t-2}}\right) + \underset{(0.010)}{0.051}\ln\left(\frac{Oil\_P_t}{Oil\_P_{t-3}}\right) + \underset{(0.011)}{0.031}\ln\left(\frac{Oil\_P_t}{Oil\_P_{t-4}}\right)$$

$$h_t = \underset{(0.046)}{0.061} + \underset{(0.042)}{0.212}\,\varepsilon_{t-1}^2 + \underset{(0.034)}{0.825}\,h_{t-1}$$

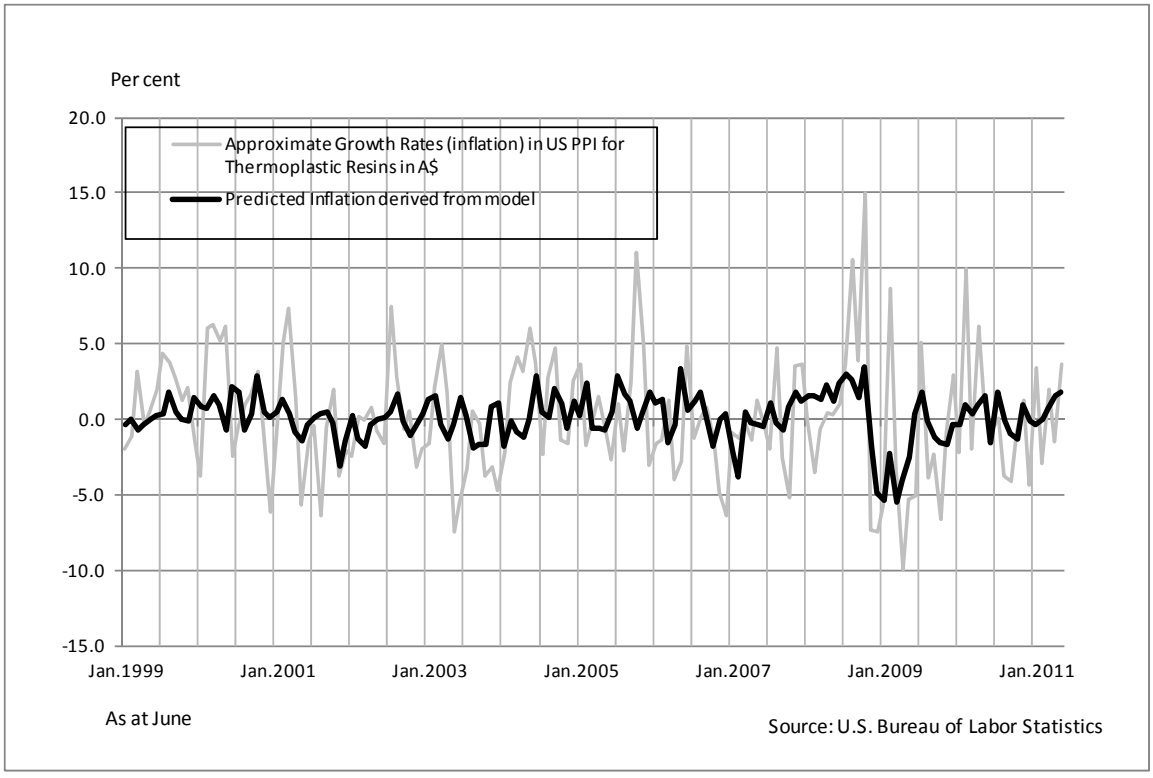
The results shows that the parameter estimates are correctly signed, meaning that they retain their implied theoretical relationships. That is, an increase in the price of oil will result in a higher price of thermoplastic resins.

Mean dependent variable	0.394432	S.D dependent variable	2.30855
Sum of squard residuals	548.6704	S.E of regression	1.945234
R-squared	0.304381	Adjusted R-squared	0.289989
F (3, 145)	21.14917	P-value (F)	2.02E-11
Log likeliheoood	-308.5364	Akaike criterion	625.0729
Scwarz criterion	637.0886	Hannan-Quinn	629.9547
rho	0.174517	Durbin-Watson	1.6462

In addition, all coefficients are statistically significant meaning that the hypothesis that they are zero is not supported by the data. Importantly, our modelling indicates a four-period cumulative elasticity of 0.3. This suggests that a 1% change in the price of oil will lead to a 0.3% change in the price of thermoplastic resins.

Overall, we believe that our model approximates the observed data well (see chart 7.3).

Chart 7.3: US$ PPI Inflation for Thermoplastic Resins – Actual V Predicted



We estimated a similar model using Australian data. The US producer prices for thermoplastic resins were converted to Australian dollars using the (monthly average) exchange rate as the deflator. Local manufacturers still import a significant portion of thermoplastic resins from overseas hence the US PPI for thermoplastic resins is a good benchmark for international thermoplastic resin prices faced by domestic manufacturers. For crude oil prices, we used the West Texas Intermediate (WTI) price which we denominated in Australian dollars. For Australia, the long-run thermoplastic resin price elasticity was estimated at 0.8.

This means that a 1% change in domestic crude oil prices would result in a 0.8% change in the price of thermoplastic resins. The estimated equation is produced below.[8] Results of diagnostic tests are presented in the accompanying table.

$$y_t = \underset{(0.3403)}{-0.1020} + \underset{(0.0810)}{0.2041}\ln\left(\frac{Oil\_P_t}{Oil\_P_{t-1}}\right) + \underset{(0.0863)}{0.1991}\ln\left(\frac{Oil\_P_{t-4}}{Oil\_P_{t-3}}\right) + \underset{(0.0873)}{0.2184}\ln\left(\frac{Oil\_P_{t-5}}{Oil\_P_{t-4}}\right) + \underset{(0.0858)}{0.1686}\ln\left(\frac{Oil\_P_{t-11}}{Oil\_P_{t-10}}\right)$$

Mean dependent variable	0.146311	S.D dependent variable	4.338575
Sum of squard residuals	2419.862	S.E of regression	4.099241
R-squared	0.131371	Adjusted R-squared	0.107242
F (4, 144)	5.444599	P-value (F)	0.000413
Log likeliheoood	-419.092	Akaike criterion	848.1841
Scwarz criterion	863.2038	Hannan-Quinn	854.2864
rho	0.112166	Durbin-Watson	1.774177

The upshot is that through an application of an appropriate econometric model, we have demonstrated that changes in thermoplastic resin prices are heavily influenced by changes in crude oil prices. This relationship is statistically significant and is valid for both the US and Australian markets.

7.2 Outlook for Polyethylene Pipe Prices

BIS Shrapnel's forecasts of polyethylene pipe prices are presented in Table 7.1. As mentioned, our escalator for polyethylene pipe prices represents a linear combination of the key input price escalators and is predominantly driven by oil price forecasts. As preferred by the Australian Energy Regulator,[9] we have used the Chicago Mercantile Exchange's (CME) oil futures contract prices to 2017 to derive our final polyethylene pipe prices.

According to CME, oil futures contract prices are expected to increase over the next four years before easing. We concur with CME's forecasts of oil prices.

BIS Shrapnel expects global oil prices to increase over the medium term as global demand increases in line with economic recovery overseas. Furthermore, with many oil fields reaching maturity, additional supply constraints will emerge despite new fields coming online.

Subsequently, we are forecasting oil prices to rise to back over US$100/barrel by the second half of 2012 and to increase further to a peak of US$114/barrel around the second half of 2013 before easing.

The exchange rate will also play a key role in the domestic price of crude oil. We expect the currency to remain close to parity with the US$ over the next three years. Thereafter, exchange rates are projected to ease over 2015 and 2016 as Australian interest rates are lowered and commodity prices ease back. The end result of these exchange rate and US$ crude oil price

[8] Note that for Australia, the lag structure is different to the US model. Our general to specific modelling revealed that current movements in thermoplastic resins were influenced by near term oil price changes as well oil price changes several previous periods.
[9] AER, *Envestra Ltd*, Final Decision, June 2011, p.228.

movements is the predicted increase in the A$ crude oil price (to A$120/bbl) in 2015/16 before easing to around A$110 per barrel band over the following year (see table 7.1).

Polyethylene pipe prices are expected to trace the cycle in A$ crude oil prices. On average, the price of polyethylene pipe (under CME oil futures prices) is expected to grow by 5.7 per cent per annum over the six years to 2017, see last column of Table 7.1.

Table 7.1: Polyethylene Pipe Price Forecasts

Year	Key Determinants of Polyethylene Pipe Prices								Growth in Polyethylene Pipe Prices (b,d)	Growth in Polyethylene Pipe Prices (c,d)	Growth in Polyethylene Pipe Prices (b)	Growth in Polyethylene Pipe Prices (c)
	Raw Material				Labour Costs		Transport & Other Overhead Costs					
Ended	Crude Oil (b) (BIS Shrapnel Oil forecasts)		Crude Oil (c) (CME Futures forecasts)		AWOTE for Manufacturing				(BIS Shrapnel Oil forecasts)	(CME Futures forecasts)	**Calendar Year** (e) (BIS Shrapnel Oil forecasts)	**Calendar Year** (e) (CME Futures forecasts)
June	WTI $A/bbl(f)	%CH	WTI $A/bbl (e)	%CH	($)	%CH	CPI	%CH	%CH	%CH	%CH	%CH
1995	24.9	2.7	24.9	2.7	594.2	n.a.	113.9	3.2	n.a.	n.a.	n.a.	n.a
1996	25.5	2.6	25.5	2.6	619.8	4.3	118.7	4.2	2.6	2.6	5.2	5.2
1997	28.7	12.4	28.7	12.4	630.5	1.7	120.3	1.3	7.8	7.8	1.4	1.4
1998	25.9	-9.9	25.9	-9.9	666.1	5.7	120.3	0.0	-5.1	-5.1	-5.6	-5.6
1999	22.8	-11.7	22.8	-11.7	697.1	4.7	121.8	1.3	-6.2	-6.2	21.9	21.9
2000	41.6	82.2	41.6	82.2	716.0	2.7	124.7	2.4	49.9	49.9	34.9	34.9
2001	54.7	31.5	54.7	31.5	731.6	2.2	132.2	6.0	19.8	19.8	5.5	5.5
2002	45.5	-16.9	45.5	-16.9	779.1	6.5	136.0	2.9	-8.9	-8.9	0.2	0.2
2003	51.1	12.4	51.1	12.4	855.2	9.8	140.2	3.1	9.2	9.2	2.8	2.8
2004	47.3	-7.6	47.3	-7.6	892.2	4.3	143.5	2.4	-3.6	-3.6	9.6	9.6
2005	64.8	37.0	64.8	37.0	920.0	3.1	147.0	2.4	22.9	22.9	21.8	21.8
2006	86.0	32.7	86.0	32.7	960.3	4.4	151.7	3.2	20.6	20.6	8.9	8.9
2007	80.5	-6.3	80.5	-6.3	1005.8	4.7	156.1	2.9	-2.8	-2.8	9.3	9.3
2008	107.8	33.9	107.8	33.9	1048.2	4.2	161.4	3.4	21.3	21.3	6.9	6.9
2009	92.3	-14.4	92.3	-14.4	1103.9	5.3	166.4	3.1	-7.6	-7.6	-5.9	-5.9
2010	85.1	-7.8	85.1	-7.8	1123.7	1.8	170.3	2.3	-4.2	-4.2	0.2	0.2
2011	90.4	6.2	90.4	6.2	1155.1	2.8	175.6	3.1	4.5	4.5	2.0	1.3
Forecasts												
2012	88.2	-2.4	86.2	-4.7	1204.4	4.3	180.0	2.5	-0.5	-1.9	3.6	0.8
2013	98.0	11.1	89.8	4.2	1260.9	4.7	186.7	3.8	7.7	3.6	6.1	5.9
2014	103.6	5.7	100.5	12.0	1327.7	5.3	191.4	2.5	4.5	8.2	4.9	14.2
2015	111.3	7.4	132.8	32.1	1388.3	4.6	196.2	2.5	5.4	20.2	5.6	6.9
2016	120.6	8.3	116.5	-12.3	1458.8	4.3	201.1	2.5	5.9	-6.5	1.0	0.0
2017	110.9	-8.0	127.3	9.3	1525.5	4.6	206.1	2.5	-3.9	6.5	-3.9	6.5
	Compound Annual Growth Rates								Average Growth Rates			
1997-01	17.5		17.5		3.8		2.4		13.3	13.3	11.6	11.6
2002-06	17.2		17.2		5.4		2.8		8.0	8.0	8.6	8.6
2007-11	2.9		2.9		3.5		3.0		2.3	2.3	2.5	2.3
Forecasts												
2012-17	4.7		8.1		4.8		2.7		3.2	5.0	2.9	5.7

(a) The key raw materials used in the manufacture of polyethylene (PE) pipes, namely the PE80 and the PE100 polyethylene compounds (resins) are produced from the 'distillation' and 'cracking' of crude oil.
Hence, crude oil prices is a key determinant of changes in polyethylene pipe prices. Moreover, raw material costs account for about 75% of total production costs while labour and transport costs account for 15% and 10% of total costs, respectively.
(b) Forecasts based on BIS Shrapnel WTI oil price forecasts.
(c) WTI prices are forecast from end of June crude oil WTI contract prices, sourced from the Chicago Mercantile Exchange (CME).
(d) The historical data and forecasts were generated from BIS Shrapnel's input cost model for polyethylene pipe prices.
(e) Calendar year indices are derived from financial year estimates.
(f) West Texas Intermediate oil price per barrel in Australian dollars, exchange rate forecasts derived from BIS Shrapnel internal forecasts.

8. CONTRACTOR ESCALATION

There are two elements to the contractor cost escalation:

- An escalator for contractor related labour
- An escalator for totally outsourced contracts, which may be a 'turn-key' project or similar, and involves the contractor providing both labour and materials. In effect, the escalator here is a combined index of labour and materials.

As most contractor labour is assumed to undertake construction or maintenance related projects, they would be classified to the construction sector. Accordingly, the escalator used for contractor labour is Construction sector wages growth i.e. both AWOTE and LPI.

Our research has shown that construction activity (i.e. work done in the sector) normally has a strong influence on construction wages. BIS Shrapnel's forecasts of construction activity by state (which includes residential and non-residential building, plus engineering construction) were used to derive the wages forecasts.

For the combined index of materials and labour, we have used the 'Gas and Fuel' engineering construction implicit price deflator (IPD) – one of the components of the total engineering construction IPD. This price series relates to the 'pipelines' and 'oil and gas' categories within engineering construction, with the main components being wages, steel pipes, non-ferrous pipes and plant hire.

Key influences on movements in the cost index for the gas and fuel engineering construction IPD are:

- Construction wages
- The strength of activity in overall engineering construction or pipelines and oil and gas
- Cost of key construction related materials (such as steel, concrete, etc.)

8.1 Construction Sector Wages Growth in Victoria and NSW

Construction sector wages growth in Victoria tracks — or lags by around one to two years — the growth in total construction activity. Construction activity was extremely strong for most of the previous decade. In fact over the past three years, the overall strength of Victoria's construction sector underpinned the strength of the state economy. New dwelling building activity picked up quickly between 2008/09 and 2010/11 after interest rates tumbled and the first home owner grants (FHOG) scheme boosted demand. In addition, stronger population growth and the ready availability of reasonably priced residential land facilitated a much faster upswing compared to other states, which incidentally has a greater undersupply of dwellings.

In addition, public construction ramped up significantly over 2008/09 to 2010/11, partly because the Victorian government was able to get the Federal stimulus spending underway quickly and partly because the state government was already proceeding with its own major health, rail, harbour and sewerage projects. Private sector engineering construction also made a healthy contribution, thanks to substantial electricity, pipelines, oil and gas activity, and work on the $1.6 billion Wonthaggi desalination plant.

The strength of the construction sector fuelled strong growth in Victorian construction wages in the second half of the last decade. However, in 2010, construction sector wages eased in line with a relatively weaker (and peak) in construction activity over 2010/11.

Chart 6.1: Total Construction – Victoria
Value of Work Done, Constant 2008/09 Prices

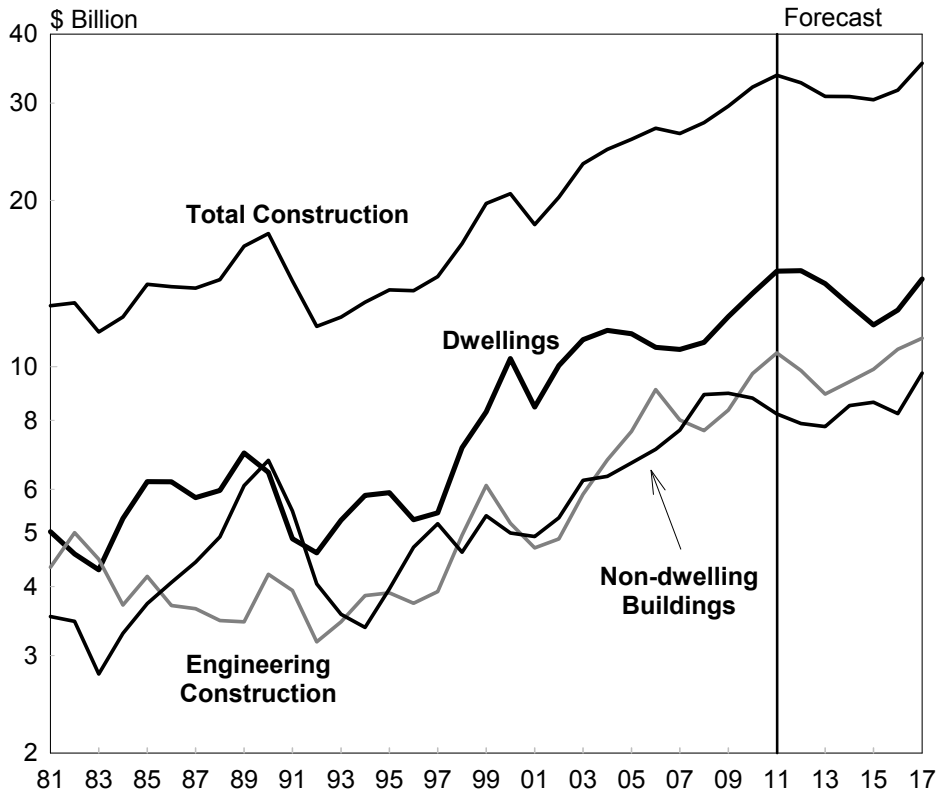
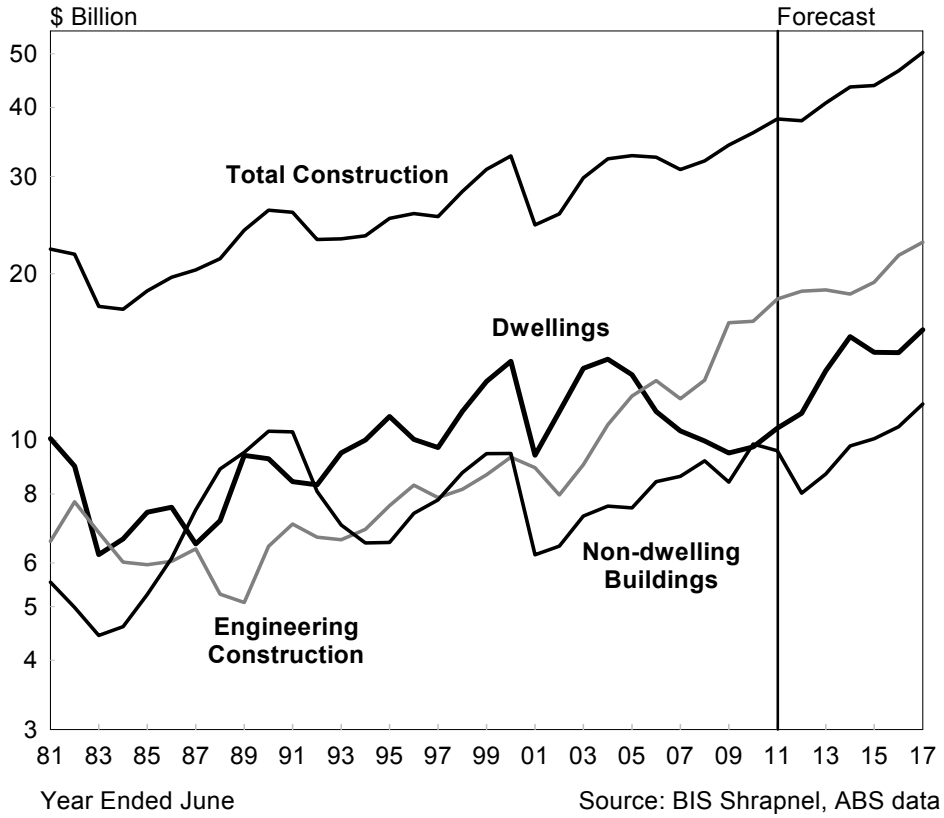


Chart 6.2: Total Construction – New South Wales
Value of Work Done, Constant 2008/09 Prices



Looking ahead, we believe engineering construction will decline over 2011/12 and 2012/13, as work is progressively completed on the desalination plant, major sewerage infrastructure and the current round of pipelines, oil and gas investments. Non-residential building will continue to decline, with the end of stimulus spending causing steep declines in schools construction and, later, health and other social and institutional buildings and more than offsetting a recovery in commercial and industrial building. Dwelling building is also forecast to decline over 2012/13 to 2014/15 with the deficiency of stock predominately eliminated by June 2013. Despite healthy growth in the underlying demand for dwellings, rising interest rates over 2012/13 and into 2013/14 will help trigger the downturn. A recovery in overall construction is projected from 2015/16 (see chart 6.1).

Construction wages growth therefore is expected to be weaker over the next six years. We expect construction wages (in AWOTE terms) to average 5.6 per cent per annum over the 2012 to 2017 period compared to the 8.0 per cent per annum average achieved in the second half of the previous decade (see table 8.2).

In contrast, NSW construction wages over the next six years are expected to be stronger (see chart 6.2). After underperforming the Australian average for most of the last decade, the NSW economy is on the cusp of recording moderate to solid growth over the next two years. And this will predominantly be driven by a relatively buoyant construction sector. Private dwelling construction will be the initial driver, followed by a new round of private infrastructure projects and industrial and commercial building.

NSW construction wages will follow the recovery in dwelling construction and the improvement in total construction. Construction wages (in AWOTE terms) is expected to peak at 7.8 per cent in 2013 before easing in line with a moderation in total construction activity.

Table 8.1: Construction Wages Growth – Australia
Nominal, Real & Productivity Adjusted Wages

	Nominal				Real (3)				Nominal Adjusted Productivity (4)		Real Adjusted Productivity (3,4)	
Year Ended	AWOTE (1)		LPI (2)		AWOTE (1)		LPI (2)		AWOTE (1)	LPI (2)	AWOTE (1)	LPI (2)
December	$	A% CH	Index	A% CH	$	A% CH	Index	A% CH	A% CH	A% CH	A% CH	A% CH
2000	735.3		63.7		1,022.9		88.7					
2001	741.9	0.9	66.1	3.7	988.7	-3.3	88.1	-0.6	2.8	5.6	-1.5	1.2
2002	790.3	6.5	68.3	3.3	1,022.5	3.4	88.3	0.3	-3.8	-7.0	-6.9	-10.0
2003	859.6	8.8	70.5	3.3	1,082.2	5.8	88.8	0.5	3.1	-2.4	0.2	-5.2
2004	894.7	4.1	73.8	4.7	1,100.6	1.7	90.8	2.3	6.0	6.5	3.6	4.2
2005	941.2	5.2	77.3	4.7	1,127.7	2.5	92.6	2.0	5.3	4.8	2.6	2.1
2006	957.2	1.7	81.5	5.5	1,107.7	-1.8	94.3	1.9	1.3	5.1	-2.2	1.5
2007	1041.2	8.8	85.2	4.6	1,177.4	6.3	96.4	2.2	7.8	3.6	5.3	1.2
2008	1111.9	6.8	89.1	4.6	1,204.9	2.3	96.6	0.2	4.9	2.7	0.5	-1.6
2009	1205.1	8.4	92.8	4.2	1,282.5	6.4	98.8	2.3	8.6	4.4	6.6	2.5
2010	1283.8	6.5	95.9	3.3	1,330.0	3.7	99.3	0.5	5.4	2.2	2.6	-0.6
2011e	1347.1	4.9	100.0	4.2	1,348.6	1.4	100.0	0.7	3.0	2.2	-0.6	-1.3
Forecasts												
2012	1423.3	5.7	105.4	5.4	1,378.3	2.2	101.9	1.9	4.0	3.8	0.5	0.2
2013	1522.0	6.9	111.5	5.8	1,429.3	3.7	104.4	2.5	5.8	4.6	2.4	1.3
2014	1625.2	6.8	117.5	5.4	1,487.9	4.1	107.2	2.7	7.8	6.4	5.0	3.7
2015	1712.9	5.4	122.6	4.3	1,531.0	2.9	109.1	1.8	6.2	5.1	3.6	2.6
2016	1804.2	5.3	128.7	4.9	1,573.9	2.8	111.7	2.4	4.3	3.9	1.7	1.3
2017	1914.8	6.1	135.7	5.5	1,630.6	3.6	115.1	3.0	5.9	5.2	3.1	2.4
Long Term Averages												
2000-2010	5.7		4.2		2.7		1.1		4.1	2.6	1.1	-0.5
2006-2011	7.1		4.2		4.0		1.2		6.0	3.0	2.9	0.0
2011-2017	6.0		5.2		3.2		2.4		5.7	4.9	2.7	1.9

e : estimate
Source: BIS Shrapnel, ABS
(1) Earnings of persons. Data is year ended May.
(2) Ordinary time hours excluding bonuses.
(3) Deflated by RBA/Treasury CPI projections
(4) Productivity is output (real GVA) divided by employment in the Construction sector.

The weakening in construction, however, is likely to be brief with another round of private infrastructure projects combined with a pick-up in commercial and industrial building driving total construction towards $50 billion by the middle of this decade. This will see a lift in construction wages from the middle of the decade. Overall, construction wages is expected to average 5.9 per cent per annum over 2012 to 2017 inclusive, 1.6 percentage points higher than the average over 2006 to 2011 (see table 8.3).

8.2 Productivity-Adjusted Wage Forecasts for Construction

Historically, annual productivity changes in the construction industry (at the Australian level) have been quite volatile although, on average, it remained in the positive territory over the 1990s and in the previous decade.

Going forward, at the Australian level, productivity growth in the construction sector is forecast to increase by an average of 0.5 per cent per annum over the next six years from 2012 to 2017 inclusive (see table 8.4). In contrast, productivity growth in the Victorian construction sector is forecast to be flat as the growth in employment is expected to fully account for the increase in output (see table 8.5). Meanwhile, productivity growth in the NSW construction sector is forecast to fall by an average of 0.5 per cent per annum over the next six years due to faster pace growth in employment relative to output. Our forecasts of growth in construction sector output, employment and productivity projections for Australia, Victoria and NSW are presented in tables 8.4 to 8.6.

The stronger labour productivity performance predicted for NSW over the next six years means that the actual or true construction labour costs to businesses operating in NSW will be lower over the forecast period. The end result is that once nominal AWOTE is adjusted for CPI inflation and productivity movements, the real productivity adjusted AWOTE for construction is forecast to average 3.2 per cent per annum over the five years from 2011to 2017 inclusive for the NSW construction sector (see table 8.3).For Victoria, the real productivity adjusted AWOTE for construction is forecast to average 2.4 per cent per annum over the 2011 to 2017 period.

Table 8.2: Construction Wages Growth – Victoria
Nominal, Real & Productivity Adjusted Wages

	Nominal				Real (3)				Nominal Adjusted Productivity (4)		Real Adjusted Productivity (3,4)	
Year Ended	AWOTE (1)		LPI (2)		AWOTE (1)		LPI (2)		AWOTE (1)	LPI (2)	AWOTE (1)	LPI (2)
December	$	A% CH	Index	A% CH	$	A% CH	Index	A% CH	A% CH	A% CH	A% CH	A% CH
2000	659.4		61.5		917.2		85.5					
2001	669.9	1.6	64.2	4.4	892.8	-2.7	85.5	0.0	8.1	10.9	3.9	6.5
2002	723.1	7.9	66.6	3.8	935.6	4.8	86.2	0.8	0.6	-3.5	-2.5	-6.5
2003	796.2	10.1	68.9	3.4	1,002.3	7.1	86.8	0.7	1.6	-5.1	-1.4	-7.9
2004	824.4	3.5	72.4	5.0	1,014.1	1.2	89.0	2.6	1.4	2.9	-0.9	0.5
2005	880.1	6.8	75.7	4.6	1,054.5	4.0	90.7	1.9	8.9	6.8	6.2	4.1
2006	872.9	-0.8	79.8	5.4	1,010.1	-4.2	92.3	1.8	3.2	9.4	-0.2	5.8
2007	969.4	11.1	82.9	3.9	1,096.3	8.5	93.7	1.5	9.0	1.9	6.5	-0.5
2008	1 073.7	10.8	86.6	4.5	1,163.5	6.1	93.9	0.2	5.8	-0.4	1.2	-4.8
2009	1 208.9	12.6	91.3	5.4	1,286.7	10.6	97.2	3.6	12.9	5.8	10.9	3.9
2010	1 274.2	5.4	95.7	4.7	1,320.1	2.6	99.1	1.9	7.5	6.8	4.7	4.0
2011e	1 280.2	0.5	100.0	4.5	1,280.5	-3.0	100.0	1.0	2.4	6.4	-1.1	2.9
Forecasts												
2012	1 353.0	5.7	104.9	4.9	1,308.7	2.2	101.4	1.4	7.4	6.6	3.9	3.1
2013	1 437.8	6.3	110.2	5.0	1,347.9	3.0	103.2	1.8	6.3	5.0	2.9	1.7
2014	1,521.2	5.8	115.2	4.6	1,389.7	3.1	105.1	1.9	5.6	4.4	2.8	1.7
2015	1,595.8	4.9	119.8	4.0	1,423.1	2.4	106.7	1.5	4.8	3.9	2.2	1.4
2016	1,675.6	5.0	125.2	4.5	1,458.6	2.5	108.9	2.0	3.4	2.9	0.8	0.3
2017	1,772.7	5.8	131.9	5.3	1,506.8	3.3	111.9	2.8	4.4	3.9	1.8	1.3
Long Term Averages												
2000-2010	6.8		4.5		3.7		1.5		5.9	3.5	2.8	0.5
2006-2011	8.0		4.6		4.9		1.6		7.5	4.1	4.4	1.1
2011-2017	5.6		4.7		2.7		1.9		5.3	4.4	2.4	1.6

e : estimate
Source: BIS Shrapnel, ABS
(1) Earnings of persons. Data is year ended May.
(2) Ordinary time hours excluding bonuses.
(3) Deflated by RBA/Treasury CPI projections
(4) Productivity is output (real GVA) divided by employment in the Construction sector.

Table 8.3: Construction Wages Growth – New South Wales
Nominal, Real & Productivity Adjusted Wages

	Nominal				Real (3)				Nominal Adjusted Productivity (4)		Real Adjusted Productivity (3,4)	
Year Ended	AWOTE (1)		LPI (2)		AWOTE (1)		LPI (2)		AWOTE (1)	LPI (2)	AWOTE (1)	LPI (2)
December	$	A% CH	Index	A% CH	$	A% CH	Index	A% CH	A% CH	A% CH	A% CH	A% CH
2000	795.5		67.0		1,106.6		93.1					
2001	785.5	-1.3	69.7	4.2	1,046.8	-5.4	92.9	-0.2	-0.2	5.3	-4.3	0.9
2002	866.7	10.3	71.4	2.3	1,121.4	7.1	92.3	-0.6	-0.9	-8.9	-4.1	-11.9
2003	948.1	9.4	74.2	3.9	1,193.6	6.4	93.4	1.1	4.3	-1.2	1.3	-4.0
2004	948.7	0.1	76.7	3.5	1,167.1	-2.2	94.4	1.1	2.2	5.6	-0.1	3.2
2005	994.5	4.8	79.6	3.7	1,191.6	2.1	95.3	1.0	2.0	0.9	-0.7	-1.8
2006	969.9	-2.5	83.6	5.1	1,122.4	-5.8	96.7	1.5	-4.9	2.6	-8.2	-1.0
2007	1 076.8	11.0	87.2	4.3	1,217.6	8.5	98.6	1.9	9.1	2.3	6.6	0.0
2008	1 154.7	7.2	90.4	3.7	1,251.3	2.8	97.9	-0.6	4.8	1.2	0.3	-3.1
2009	1 189.1	3.0	92.9	2.8	1,265.5	1.1	98.8	0.9	1.8	1.6	-0.1	-0.3
2010	1 172.9	-1.4	96.0	3.3	1,212.4	-4.2	99.3	0.5	-8.1	-3.5	-11.0	-6.3
2011e	1 195.2	1.9	100.0	4.1	1,193.0	-1.6	100.0	0.6	-0.9	1.2	-4.4	-2.2
Forecasts												
2012	1 250.2	4.6	104.7	4.7	1,206.1	1.1	101.2	1.2	6.2	6.3	2.8	2.8
2013	1 347.7	7.8	110.0	5.1	1,260.4	4.5	103.1	1.9	7.3	4.7	3.9	1.4
2014	1 436.7	6.6	115.9	5.3	1,309.5	3.9	105.8	2.6	7.7	6.4	4.9	3.6
2015	1 514.2	5.4	121.0	4.4	1,347.5	2.9	107.8	1.9	5.2	4.2	2.6	1.7
2016	1 594.5	5.3	127.0	5.0	1,385.2	2.8	110.5	2.5	4.1	3.8	1.5	1.2
2017	1 688.6	5.9	133.9	5.4	1,432.3	3.4	113.7	2.9	6.1	5.6	3.5	3.0
Long Term Averages												
2000-2010	4.0		3.7		0.9		0.6		1.0	0.6	-2.0	-2.4
2006-2011	4.3		3.6		1.2		0.7		1.3	0.6	-1.7	-2.4
2011-2017	5.9		5.0		3.1		2.2		6.1	5.2	3.2	2.3

e : estimate

Source: BIS Shrapnel, ABS

(1) Earnings of persons. Data is year ended May.

(2) Ordinary time hours excluding bonuses.

(3) Deflated by RBA/Treasury CPI projections

(4) Productivity is output (real GVA) divided by employment in the Construction sector.

Table 8.4: Construction
Output, Employment and Productivity: Australia

Australia						
Year Ended June	Gross Value Added		Employment		Productivity $/employee	
	$m	%CH	'000	%CH	('000)	%CH
1989						
1990	42480		603.3		70.4	
1991	39712	-6.5	573.0	-5.0	69.3	-1.6
1992	36423	-8.3	517.6	-9.7	70.4	1.5
1993	38542	5.8	534.1	3.2	72.2	2.6
1994	40897	6.1	558.6	4.6	73.2	1.4
1995	43159	5.5	590.8	5.8	73.1	-0.2
1996	43916	1.8	601.0	1.7	73.1	0.0
1997	45084	2.7	586.4	-2.4	76.9	5.2
1998	49575	10.0	599.3	2.2	82.7	7.6
1999	54065	9.1	632.6	5.5	85.5	3.3
2000	57566	6.5	688.0	8.8	83.7	-2.1
2001	49302	-14.4	670.6	-2.5	73.5	-12.1
2002	55253	12.1	693.3	3.4	79.7	8.4
2003	64193	16.2	717.9	3.6	89.4	12.2
2004	68574	6.8	773.8	7.8	88.6	-0.9
2005	71679	4.5	832.9	7.6	86.1	-2.9
2006	77526	8.2	877.5	5.3	88.4	2.7
2007	81794	5.5	943.4	7.5	86.7	-1.9
2008	87485	7.0	971.7	3.0	90.0	3.8
2009	90087	3.0	1 001.8	3.1	89.9	-0.1
2010	89872	-0.2	1 003.9	0.2	89.5	-0.4
2011	95074	5.8	1 033.9	3.0	92.0	2.7
Forecasts						
2012	99333	4.5	1 066.8	3.2	93.1	1.3
2013	106531	7.2	1 121.7	5.1	95.0	2.0
2014	112449	5.6	1 180.5	5.2	95.3	0.3
2015	109002	-3.1	1 172.4	-0.7	93.0	-2.4
2016	111452	2.2	1 189.3	1.4	93.7	0.8
2017	119269	7.0	1 256.4	5.6	94.9	1.3
Compound Annual Growth Rates						
1990-2000	3.1		1.3		1.7	
2000-2010	4.6		3.9		0.7	
2006-2011	4.2		3.3		0.8	
2011-2017	3.9		3.3		0.5	

Source: BIS Shrapnel, ABS data

Table 8.5: Construction
Output, Employment and Productivity: Victoria

	Victoria					
Year Ended June	Gross Value Added		Employment		Productivity $/employee	
	$m	%CH	'000	%CH	('000)	%CH
1989						
1990	8809		157.4		56.0	
1991	7900	-10.3	138.9	-11.7	56.9	1.6
1992	7208	-8.8	118.0	-15.1	61.1	7.4
1993	7510	4.2	119.0	0.9	63.1	3.3
1994	8062	7.4	116.4	-2.2	69.3	9.8
1995	8441	4.7	127.6	9.7	66.1	-4.5
1996	8431	-0.1	131.3	2.9	64.2	-2.9
1997	8848	4.9	127.7	-2.7	69.3	7.9
1998	9922	12.1	135.4	6.0	73.3	5.8
1999	10862	9.5	145.2	7.2	74.8	2.1
2000	11577	6.6	153.4	5.7	75.5	0.9
2001	10079	-12.9	156.6	2.1	64.4	-14.7
2002	11449	13.6	175.0	11.8	65.4	1.6
2003	13145	14.8	177.7	1.6	74.0	13.0
2004	14148	7.6	183.9	3.5	76.9	4.0
2005	14671	3.7	190.3	3.5	77.1	0.2
2006	15513	5.7	211.0	10.8	73.5	-4.6
2007	16137	4.0	227.1	7.7	71.0	-3.4
2008	17016	5.4	222.9	-1.9	76.3	7.4
2009	17716	4.1	226.5	1.6	78.2	2.5
2010	18023	1.7	237.9	5.0	75.7	-3.1
2011e	19212	6.6	256.2	7.7	75.0	-1.0
Forecasts						
2012	18980	-1.2	260.4	1.6	72.9	-2.8
2013	17997	-5.2	248.6	-4.5	72.4	-0.7
2014	17938	-0.3	246.1	-1.0	72.9	0.7
2015	17819	-0.7	245.2	-0.4	72.7	-0.3
2016	18645	4.6	255.3	4.1	73.0	0.5
2017	20479	9.8	272.8	6.8	75.1	2.8
	Compound Annual Growth Rates					
1990-2000	2.8		-0.3		3.0	
2000-2010	4.5		4.5		0.0	
2006-2011	4.4		4.0		0.4	
2011-2017	1.1		1.1		0.0	

e : estimate Source: BIS Shrapnel, ABS data

Table 8.6: Construction
Output, Employment and Productivity: New South Wales

Year Ended June	New South Wales					
	Gross Value Added		Employment		Productivity $/employee	
	$m	%CH	'000	%CH	('000)	%CH
1990	12294		208.1		59.1	
1991	11627	-5.4	207.7	-0.2	56.0	-5.3
1992	10686	-8.1	177.4	-14.6	60.2	7.6
1993	11147	4.3	176.0	-0.7	63.3	5.1
1994	11783	5.7	184.8	5.0	63.7	0.7
1995	12746	8.2	188.7	2.1	67.6	6.0
1996	12803	0.4	208.1	10.3	61.5	-8.9
1997	12928	1.0	194.8	-6.4	66.4	7.9
1998	14272	10.4	201.2	3.3	70.9	6.9
1999	15677	9.8	216.6	7.6	72.4	2.1
2000	16691	6.5	243.4	12.4	68.6	-5.3
2001	14064	-15.7	230.4	-5.3	61.0	-11.0
2002	15471	10.0	233.0	1.1	66.4	8.8
2003	17998	16.3	238.5	2.3	75.5	13.7
2004	19161	6.5	262.9	10.2	72.9	-3.4
2005	19981	4.3	276.3	5.1	72.3	-0.8
2006	20699	3.6	269.2	-2.6	76.9	6.3
2007	21669	4.7	286.0	6.2	75.8	-1.5
2008	23320	7.6	292.3	2.2	79.8	5.3
2009	23746	1.8	298.8	2.2	79.5	-0.4
2010	23897	0.6	292.6	-2.1	81.7	2.8
2011e	25990	8.8	287.3	-1.8	90.5	10.8
Forecasts						
2012	25567	-1.6	297.8	3.7	85.9	-5.1
2013	27542	7.7	315.1	5.8	87.4	1.8
2014	29580	7.4	341.5	8.4	86.6	-0.9
2015	30207	2.1	353.0	3.4	85.6	-1.2
2016	32048	6.1	368.6	4.4	87.0	1.6
2017	35626	11.2	406.5	10.3	87.6	0.8
	Compound Annual Growth Rates					
1990-2000	3.1		1.6		1.5	
2000-2010	3.7		1.9		1.8	
2006-2011	4.7		1.3		3.3	
2011-2017	5.4		6.0		-0.5	

e : estimate

Source: BIS Shrapnel, ABS data

8.3 Gas and Fuel Construction Escalator

The gas and fuel engineering construction price deflator measures changes in the construction costs of gas and fuel infrastructure and pipelines as well as other distribution lines. The gas and fuel engineering construction price deflator is measured by the ABS using an input pricing basis where the major components are made up of 30% wages, 35% steel pipes and tubing, 15% plant hire and equipment, 15% non-ferrous piping (which includes polyethylene piping) and the remaining 5% being attributed to other residual components. This is one of six unpublished IPD's (obtained under ABS subscription service) which make up the total engineering construction price deflator. Only total Australia IPDs are available for these unpublished IPDs – state breakdowns are unavailable.

As outlined above, construction sector wages tends to track construction activity (in work done terms). Total construction activity within Australia will experience a series of rolling investment cycles over the next 6 years. We expect residential markets to improve over the next two years as the economic recovery broadens and as confidence picks up. Private non-dwelling construction has passed the trough of the cycle and begun the long road to recovery. Meanwhile investment in the resources sector has already picked up strongly with buoyant minerals prices locking in the second phase of resources investment.

The nature of these rolling investment cycles will see solid growth in total construction activity over 2011/12, with stronger growth over 2012/13 and 2013/14 before moderating thereafter.

Construction sector wages will likely mirror this cycle with the construction sector Labour Price Index increasing over the next two years, with growth peaking at 5.8 per cent in 2013 before growth weakens in the two years to 2015. With wages forming a significant portion of the gas and fuel IPD, this strong wages growth will be reflected by higher gas and fuel engineering construction costs.

Steel pipes and tubing form the largest component of the gas and fuel IPD and can be attributed to 35% of the indices movement. Steel prices showed phenomenal growth over 2008/09, but then declined sharply in 2009/10. Growth over the coming six years is expected to slightly more subdued, with growth declining over the next three years. However, the broad depreciating of the A$ and rising demand for steel in line with the recoveries in the US and Euro economies will see steel prices rise steadily from 2014.

Plant hire and equipment is expected to broadly track a combination of the machinery and equipment IPD obtained from the Australian National Accounts and the broader CPI index. Growth in the plant hire and equipment component of the gas and fuel IPD will record consistent growth over the coming seven years with growth peaking in the 2014/15 financial year at 3.2 per cent.

The gas and fuel IPD also includes non-ferrous piping, which we assume mainly includes polyethylene pipes and copper pipes. The outlook for polyethylene pipes has been discussed extensively in Section 7. Copper prices are expected to increase over the next four years and peak in 2013/14 in line with the increasing global demand for resources. This will lead the non-ferrous pipe component of the gas and fuel IPD to peak in 2013/14 and moderate over 2014/15 and 2015/16.

Overall, gas and fuel engineering construction costs are expected to experience moderate growth over the next 6 years, averaging around 4.0 per cent per annum. Growth will peak in 2013/14 at 7.0 per cent as strong domestic wages growth overlap with the peak in steel and non-ferrous piping prices. Beyond 2013/14 a moderation in wages growth as well as declines in the price of non-ferrous piping products will see growth in the cost of gas and fuel engineering construction moderate.

Table 8.7: Construction Price Indices

Year Ended June	Gas & Fuel Engineering Construction IPD- Australia		Total Engineering Construction IPD[(1)] Australia	
	Index 2011=100	%CH	Index 2011=100	%CH
2000	72.4		67.1	
2001	74.2	2.5	69.4	3.3
2002	74.6	0.6	70.6	1.7
2003	76.8	2.8	72.6	2.8
2004	78.8	2.5	74.9	3.1
2005	85.4	7.7	79.1	5.2
2006	88.0	3.0	83.8	5.7
2007	103.0	14.6	94.0	10.8
2008	107.9	4.5	99.8	5.8
2009	111.9	3.6	100.6	0.8
2010	108.2	-3.5	95.8	-5.0
2011e	100.0	-8.2	100.0	4.2
Forecasts				
2012	103.9	3.9	103.7	3.7
2013	110.9	6.7	109.0	5.2
2014	118.6	7.0	115.7	6.1
2015	123.8	4.4	121.4	4.9
2016	124.8	0.8	125.0	3.0
2017	126.8	1.6	127.8	2.3
Compound Annual Average Growth Rates				
2000-2010	4.1		3.6	
2006-2011	2.6		3.6	
2011-2017	4.0		4.2	

e : estimate

[(1)]Total Engineering Construction includes work done by the Private and Public sector. This includes work done by the Private sector for the Public sector and Public day labour.

9. REVIEW OF DELOITTE ACCESS ECONOMICS PAST FORECASTING RECORD

In this section we review the forecasting record of the utilities wage model of the AER's consultant for utilities wage forecasts, Deloitte Access Economics (DAE, previously known as Access Economics'). To the best of our knowledge, DAE first set of utilities wage forecasts used by the AER were dated November 2006. Accordingly, we trace DAE utilities wage forecasts since November 2006 and compare them with actual outcomes.

The main conclusions we can draw from our analysis is:

- Over the medium-to-long term (i.e. beyond the first two years of the forecast period), DAE has consistently forecast — in each of its successive projections provided to the AER — that utilities wages growth will ease back and its growth will fall below the 'All Industries' average. This easing has not been borne out in actual growth as utilities wages growth has consistently remained above (or equal to) the 'All Industries' average.
- DAEs utilities wages forecasts are too pessimistic, particularly in relation to the All Industries average.

Review of DAE individual sets of forecasts

In 2006, DAE expected utilities wages growth to remain above 'All Industries' wages growth over the short-term (next two years i.e. over 2006/07 to 2008/09) before collapsing to well below the 'All Industries' average in 2009/10 (see chart 9.1). Utilities wages growth was then expected to remain below the 'All Industries' average for the rest of the forecast period. Overall, wages growth in the utilities sector was forecast to average 0.8 percentage points lower (per annum) than 'All Industries' wages growth over the seven years to 2015/16.

DAE projected collapse in utilities wages growth in 2009/10 as well its forecast for the subsequent year failed to materialise as utilities wages growth has remained above the 'All Industries' average over 2009/10 and 2010/11 (see chart 9.1).

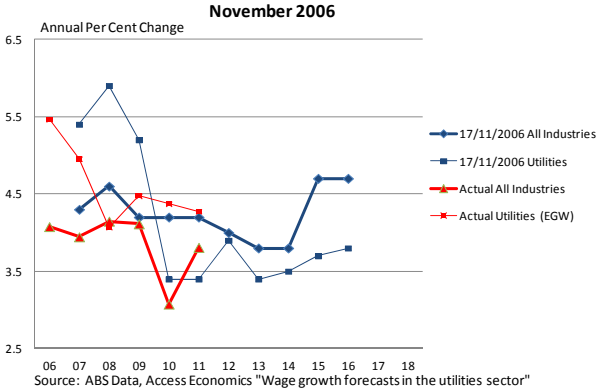
DAE updated their wage forecasts in April 2007. While the shape of the forecast curves changed in April 2007, the underlying story remained unchanged (see chart 9.2). DAE once again expected utilities wage inflation to remain higher than the Australia 'All Industries' average over the short-term but fall below the national average for the rest of the forecast horizon. In addition, DAE projected a bigger difference between 'All Industries' and the utilities sector wages growth.

Once again, as can be seen in chart 9.2, DAE easing and 'drop off' in utilities wages growth was not borne out as utilities wages growth remained above the 'All Industries' average.

The AER then used forecasts provided by Econtech, before reverting back to DAE in 2009. DAE September 2009 wage forecasts (covering the 2008/09 to 2017/18 period) tell a similar story to their 2006 and 2007 projections, but the orders of magnitude were a little different, see chart 9.3. DAE expected utilities wages growth to fall to the 'All Industries' level in 2009/10 and then, dip below the national average over the next two years before converging to the 'All Industries' average in 2012/13. Beyond 2012/13, DAE expected utilities wages growth to be close to but lower than the 'All Industries' average for the rest of the forecast period i.e. through to 2017/18. DAE more recent forecasts tell a similar story, see charts 9.4 to 9.6.

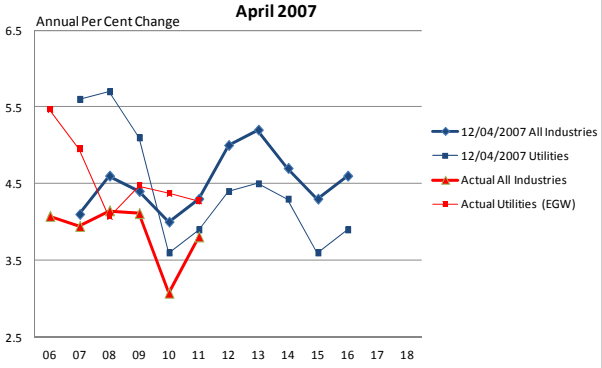
To date utilities sector wages growth (measured by the LPI) has been above or equal to the national average since the index began in 1997. DAE, however, has consistently viewed higher utilities wage escalation (i.e. relative to the 'All Industries' average) as not sustainable. As a result, DAE has consistently projected utilities wage inflation to fall below the national 'All

Chart 9.1: Access Economics LPI Forecasts
November 2006



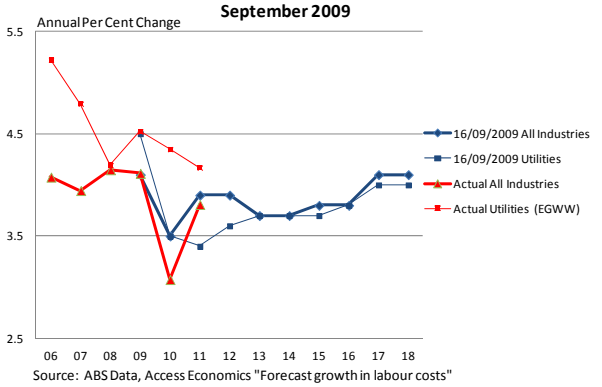
Source: ABS Data, Access Economics "Wage growth forecasts in the utilities sector"

Chart 9.2 Access Economics LPI Forecasts
April 2007



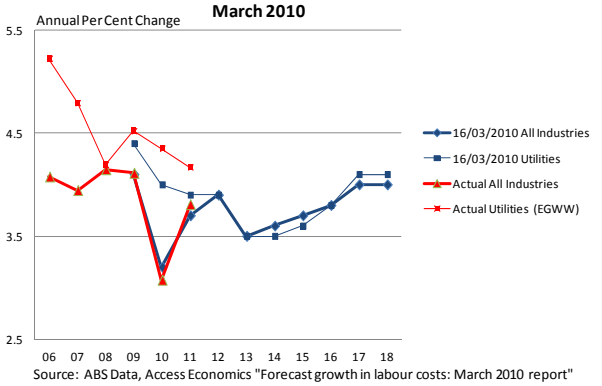
Source: ABS Data, Access Economics "Labour Cost Indices for the energy sector"

Chart 9.3 Access Economics LPI Forecasts
September 2009



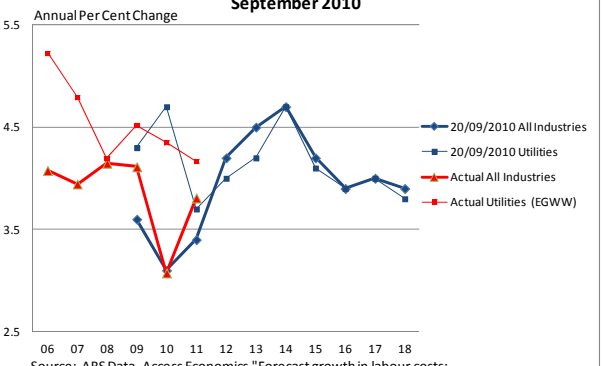
Source: ABS Data, Access Economics "Forecast growth in labour costs"

Chart 9.4 Access Economics LPI Forecasts
March 2010



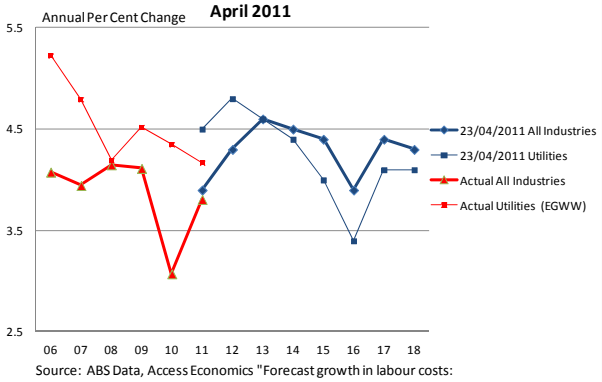
Source: ABS Data, Access Economics "Forecast growth in labour costs: March 2010 report"

Chart 9.5 Access Economics LPI Forecasts
September 2010



Source: ABS Data, Access Economics "Forecast growth in labour costs: update of March 2010 report"

Chart 9.6 Access Economics LPI Forecasts
April 2011



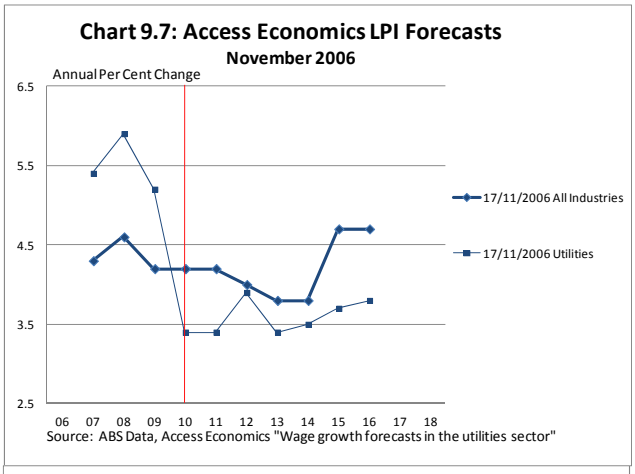
Source: ABS Data, Access Economics "Forecast growth in labour costs: update for December 2010 report"

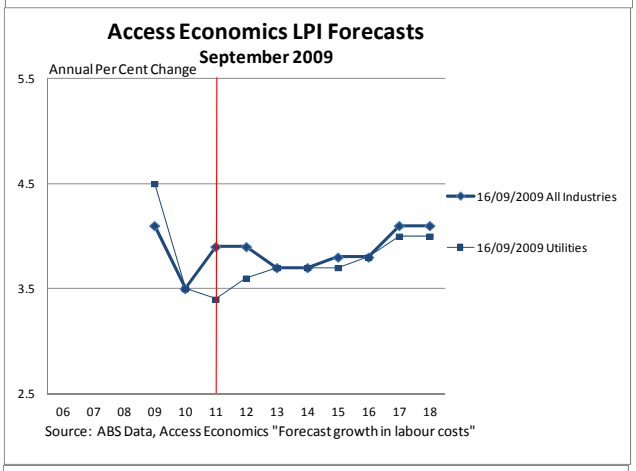
Industries' average within two years (on average) and remain lower than the national average for the rest of the forecast period i.e. over the medium-to-long-term. This is the consistent theme in all of DAE forecasts. However, whenever it becomes apparent that this expected 'drop-off' in utilities wages would fail to materialise (given stronger utilities wage inflation relative to the 'All Industries' average), the 'drop-off' in utilities wages growth were simply delayed.

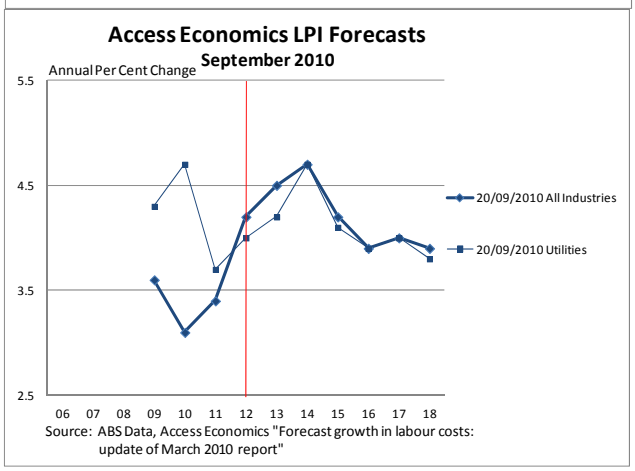
For example, over the current sample, the first year in which utilities wages growth was forecast to be lower than 'All Industries' wages growth was 2009/10. When this did not eventuate, the 'drop-off' was delayed to 2010/11. DAE predicted another delay in utilities wages 'drop-off' in September 2010 when utilities wages growth was expected to fall below the national 'All Industries' average in 2011/12. Seven months later (in April 2011) the 'drop-off' was delayed once again to the 2013/14 financial year. The sequential shifting of utilities wages slow-down can be seen in Chart 9.7. The timing of the expected drop in wages growth is pushed further along as it becomes increasingly evident that such a weakening in the sector is unlikely.

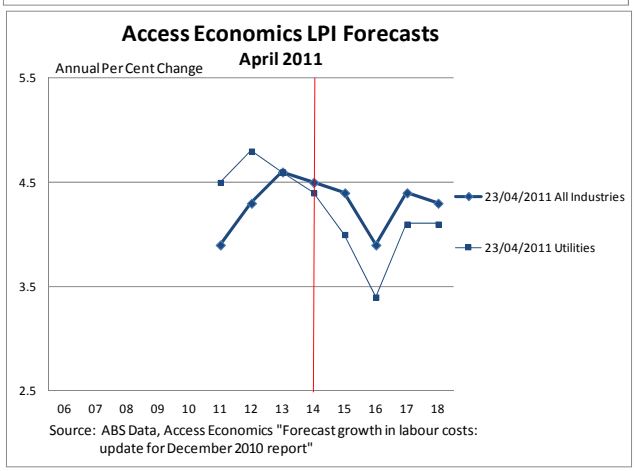
Overall, we believe that DAE is too pessimistic on wages growth in the utilities sector, and that DAE does not appear to have had regard to evidence that their pessimism is unfounded. Deloitte Access Economics argument as to why utilities wages will eventually fall below the national average revolves around the eventual easing of wage growth in competing industries (such as mining and construction). According to DAE, this will limit the necessity for the utilities sector to increase wage growth to attract skilled labour, and make it difficult for utilities wage growth to exceed 'All Industries' wage growth over the medium-to-long-term. We believe the opposite of their argument as more likely.

As per the discussion in Section 4.7, BIS Shrapnel believes that strong demand for skilled labour in the mining, construction, and parts of the manufacturing sector, combined with a tight general labour market, will result in strong wages growth across all of these industries. The utilities sector will be forced to follow suit, in order to attract the necessary quantity of skilled labour. A deeper discussion of the outlook for utilities sector wages can be found in Section 4.









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 Labour Price Index (LPI) — a CPI-style measure of changes in wage and salary costs based on a weighted combination of a surveyed 'basket' of jobs. The LPI used in this report excludes bonuses. The LPI 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 LPI 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 labour price index relates 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 (i.e. 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 labour 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 LPI 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 LPI 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 labour 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 labour 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, net of productivity increases) for business and the public sector across the economy. On the other hand, labour 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 LPI) 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 3.1 and 3.2):

- 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 (i.e. dollar value) increases, rather than as a proportional increase. At the all industries level, 15.2% of all employees (data excludes those in agriculture, forestry and fishing) have their pay rises determined by this method. In the electricity, gas and water sector, only 0.9% of workers have their pay set by this method.
- Collective agreements negotiated under enterprise bargaining account for 43.4% of all employees, but 84.4% of electricity, gas and water employees' wage increases are determined by this method.
- The remaining 41.4% 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 and water is 14.7%.

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 3.1, wage increases under 'individual arrangements' are calculated by deduction. Data from DEWR (Department of Employment and Workforce Relations) are used for wage increases under collective agreements. Award increases are calculated by applying the flat $ increase provided in each annual national pay decision to the relevant AWOTE $ value to give the percentage increase.

For example, the $17 per week increase granted in mid-2005 was equal to a 1.8 per cent contribution to the all industries AWOTE in 2005–06. Using the proportions of the workforce under each pay setting method (and with total AWOTE measured at 4.6 per cent), then the individual arrangements is calculated (as a residual) at 6.5 per cent in 2005/06. The same methodology was used to calculate individual arrangements using the labour price index.

The limitation of this methodology is that because individual arrangements are calculated as a residual, all of the compositional effects in terms of AWOTE (i.e. 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 LPI, 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 and water supply).

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

We believe that BIS Shrapnel's institution-based wage model for the EGW 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 EGW 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 and our expertise and knowledge of key influences.

APPENDIX B: ELECTRICITY, GAS AND WATER SUPPLY (EGW) VERSUS ELECTRICITY, GAS, WATER AND WASTE SERVICES (EGWWS)

Potential Impact of the Recent Change to ABS Industry Classification ie Adding Waste Services to EGW

The reclassification of the industry sectors by the ABS which has been underway for more than a year has seen 'waste services' added to the EGW sector. Wages data classified under the new ANZSIC 2006 industry classification first became available in November 2009 — providing August 2009 for AWOTE and September quarter 2009 for LPI. Up to the June quarter 2009, industry wages data was still classified under the previous ANZSIC 1993 industry classification. Industry employment data has been classified under the new ANZSIC 2006 code since February 2009, while output (Gross Value Added) was reclassified from the September quarter 2009 (released early December 2009). All historical data (for wages, GVA, etc.) was also reclassified.

The inclusion of the waste services sub-sector has led to lower wage growth outcomes for the combined EGW and Waste Services sector. Hence, it is not an accurate indicator for the mostly higher skilled (and more highly demanded) occupations in the EGW sector. Using a comparison of the historical wages and employment data of EGW versus EGW and Waste Services at the national (Australian) level, annual growth in the combined EGWWS sector is 0.1% *less* on average than the EGW sector over the period from 1998/99 to 2008/09, and 0.6% less on average over the same period for AWOTE. The overall wages growth average has also been dragged down by the fact that employment growth in the lower paid waste services sub-sector has outstripped growth in the higher paid EGW sector over the eleven years to November 2008 — 4.8% p.a. for waste services compared to 3.8% p.a. for EGW.

The problem for Envestra Limited, SP-AusNet and Multinet Gas Pty Limited (and indeed all the electricity and gas utilities dealing with the Australian Energy Regulator) is that the inclusion of waste services understates the growth in labour costs, both historically and going forward. The AER is supposed to deliver a ruling on labour and other cost escalators pertinent to the electricity and gas utilities, hence should use the wages escalator for EGW services rather than the labour costs growth for the EGWWS industry.

Table B–1: EGW V. EGWWS

Year	AWOTE					LPI					EMPLOYMENT				
Ended	EGW		EGWWS		Difference	EGW		EGWWS		Difference	EGW		EGWWS		Difference
June	$/week	%CH	$/week	%CH	%CH	2004=100	%CH	2009=100	%CH	%CH	'000	%CH	'000	%CH	%CH
1998	832	7.5	796	6.3	1.2	79		64			64.5	-2.9	78.4	-2.5	-0.5
1999	867	4.2	827	3.9	0.3	82	3.2	66	3.0	0.2	64.8	0.6	78.9	0.6	-0.1
2000	923	6.4	867	4.8	1.6	85	3.8	68	3.8	0.0	64.2	-0.9	79.5	0.8	-1.7
2001	982	6.4	918	6.0	0.5	88	3.9	71	3.8	0.2	65.4	1.9	80.5	1.2	0.7
2002	1 055	7.4	981	6.8	0.6	92	4.2	74	4.2	0.0	67.5	3.1	83.1	3.2	-0.1
2003	1 085	2.8	1 001	2.1	0.8	96	4.3	77	4.1	0.1	72.8	7.9	89.6	7.8	0.1
2004	1 156	6.5	1 057	5.5	1.0	100	4.3	80	4.0	0.3	75.3	3.4	91.5	2.1	1.3
2005	1 195	3.4	1 091	3.2	0.2	104	4.4	83	4.3	0.1	76.7	1.9	95.2	4.1	-2.3
2006	1 214	1.6	1 111	1.9	-0.2	110	5.5	88	5.3	0.2	87.4	14.0	106.0	11.2	2.7
2007	1 262	4.0	1 152	3.7	0.3	115	5.0	92	4.8	0.1	85.1	-2.6	105.7	-0.3	-2.3
2008	1 304	3.3	1 183	2.7	0.6	120	4.1	96	4.1	-0.1	89.9	5.6	113.1	7.0	-1.4
2009	1 389	6.5	1 255	6.1	0.3	126	4.5	100	4.4	0.1	na	na	134.8	19.2	na
Average Growth Rates															
1998-09		4.8		4.2	0.6		4.3		4.2	0.1		3.8		4.6	-0.3

Source: BIS Shrapnel, ABS data

APPENDIX C: TERMS OF REFERENCE

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23 March 2012

Mr Richard Robinson
Associate Director – Economics
BIS Shrapnel Pty Limited
Level 8, 99 Walker Street
NORTH SYDNEY NSW 2060

Dear Sir

Victorian Gas Access Arrangement Review 2013 – 2017: Envestra, Multinet and SP AusNet

We act for Envestra Limited (**Envestra**), Multinet Gas (DB No. 1) Pty Ltd and Multinet Gas (DB No. 2) Pty Ltd (together, **Multinet**) and SPI Networks (Gas) Pty Ltd (**SP AusNet**) in relation to the AER's review of each of Envestra's, Multinet's and SP AusNet's Access Arrangements for Victoria.

Envestra, Multinet and SP AusNet (**the Distributors**) wish to jointly engage you to prepare an expert report in connection with the AER's review of the Victorian Access Arrangements. The report will also be used by Envestra for the AER's review of Envestra's Access Arrangement for its Albury Distribution Network.

This letter sets out the matters which the Distributors wish you to address in your report and the requirements with which the report must comply.

Terms of Reference

The terms and conditions upon which each of the Distributors provides access to their respective networks are subject to five yearly reviews by the AER.

The AER undertakes that review by considering the terms and conditions proposed by each of the Distributors against criteria set out in the National Gas Law and National Gas Rules. The

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matters that will be considered by the AER include how the Distributors' proposed costs of provision of services (and consequent prices for services) compare against those criteria.

It is anticipated that one aspect of the Distributors' costs which the AER may wish to consider is the outlook for certain cost escalators.

In this context, the Distributors wish to engage you to provide an expert report setting out your forecasts of labour, materials and contractor cost escalators relevant to forecasting the operating and capital expenditure of natural gas networks in Victoria and New South Wales over the six year period from 2012 to 2017 (inclusive).

In providing your opinion, you should have regard to the requirements of Rule 74(2) of the National Gas Rules, which provides:

> *"A forecast or estimate:*
>
> *(a) must be arrived at on a reasonable basis; and*
>
> *(b) must represent the best forecast or estimate possible in the circumstances."*

Use of Report

It is intended that your report will be included by each of the Distributors in their respective access arrangement revision proposals for their Victorian networks (and in the case of Envestra, Albury network) for the access arrangement period from 1 January 2013 to 31 December 2017. The report may be provided by the AER to its own advisers. The report must be expressed so that it may be relied upon both by the Distributors and by the AER.

The AER may ask queries in respect of the report and you will be required to assist each of the Distributors in answering these queries. The AER may choose to interview you and if so, you will be required to participate in any such interviews.

The report will be reviewed by the Distributors' legal advisers and will be used by them to provide legal advice to the Distributors as to their respective rights and obligations under the National Gas Law and National Gas Rules. You will be required to work with these legal advisers and the Distributors' personnel to assist them to prepare the Distributors' respective access arrangement revision proposals and submissions in response to the draft and final decisions made by the AER.

If any of the Distributors choose to challenge any decision made by the AER, that appeal will be made to the Australian Competition Tribunal and the report will be considered by the Tribunal. The Distributors may also seek review by a court and the report would be subject to consideration by such court. You should therefore be conscious that the report may be used in the resolution of a dispute between the AER and any or all of the Distributors as to the appropriate level of the respective Distributor's distribution tariffs. Due to this, the report will need to comply with the Federal Court requirements for expert reports, which are outlined below.

You must ensure you are available to assist the Distributors until such time as the Access Arrangement Review and any subsequent appeal is finalised.

Time Frame

Each of the Distributors' access arrangement revision proposals is due by 30 March 2012. We request that you provide your report to us or to each of the Distributors by 28 March 2012 so that the Distributors may finalise their submissions in advance of the due date.

Compliance with the Code of Conduct for Expert Witnesses

Attached 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**).

Please read and familiarise yourself with the Code of Conduct and comply with it at all times in the course of your engagement by the Distributors.

In particular, your report prepared for the Distributors 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.

Your report must also:

1 contain particulars of the training, study or experience by which the expert has acquired specialised knowledge;

2 identify the questions that the expert has been asked to address;

3 set out separately each of the factual findings or assumptions on which the expert's opinion is based;

4 set out each of the expert's opinions separately from the factual findings or assumptions;

5 set out the reasons for each of the expert's opinions; and

6 otherwise comply with the Code of Conduct.

The expert is also required to 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 include a declaration that *"[the expert] has made all the inquiries 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."*

Please also attach a copy of these terms of reference to the report.

Terms of Engagement

Your contract for the provision of the report will be directly with the Distributors. You should forward to each of the Distributors any terms you propose govern that contract as well as your fee proposal.

Please sign a counterpart of this letter and forward it to each of the Distributors to confirm your acceptance of the engagement by the Distributors.

Yours faithfully

Johnson Winter & Slattery

Enc: Federal Court of Australia Practice Note CM 7, "Expert Witnesses in Proceedings in the Federal Court of Australia"

……
Signed and acknowledged by Mr Richard Robinson

Date ……26/03/2012 ……..

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APPENDIX D: 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.

APPENDIX E: CURRICULUM VITAES OF KEY PERSONNEL

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

Kishti joined BIS Shrapnel in 2007, where he works across both the Economics and Infrastructure and Mining units. Since joining the company, Kishti has worked on a number of projects, including contributing the analysis of inflation, wages, interest rates and the world economic outlook to BIS Shrapnel's annual *Long Term Forecasts* publication and analysis and forecasts to *Engineering Construction in Australia* and *Maintenance in Australia* reports.

In terms of private client projects, Kishti has undertaken analysis of inflation and wage trends at the state level for reports required in state wage cases, and provided a discussion of state economic trends. Kishti has also been involved in the design and implementation of econometric methodologies for private economic research projects.

Kishti holds a PhD in Economics from the University of Sydney and Bachelors Degree in Economics and Mathematics from Massey University. Prior to joining BIS Shrapnel, Kishti was Senior Economist (Policy & Research) at the Reserve Bank of Fiji.

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

Daniel joined BIS Shrapnel in 2010, having recently obtained his degree, and works across both the Economics and Infrastructure and Mining units. Daniel focused on trade and the current account deficit in the Economic department's recent *Long Term Forecasts* report, and is a contributor to the monthly *Economic Outlook* publication. Within the Infrastructure and Mining unit, Daniel contributed to the *Maintenance in Australia* report, where he forecasted construction and maintenance expenditure for both the gas and electricity industries.

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

