Real Cost Escalation Forecasts to 2015/16 – Queensland and South Australia

Prepared by BIS Shrapnel for Envestra Ltd

FINAL REPORT MARCH 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: E5332

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

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

Contents

Tables

Charts

SUMMARY

- BIS Shrapnel was engaged by Envestra Ltd. to provide an expert opinion regarding the outlook for a range of labour, materials and contractor cost escalation relevant to gas networks in Queensland and South Australia over the six year period from 2010/11 to 2015/16. 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 adjusted for BIS Shrapnel's forecasts of CPI inflation. Headline CPI inflation is forecast to pick up from current low levels and peak at 3.4 per cent (year-average terms) in 2012/13, before easing. It is projected to average 3.0 per cent over the next six years.

- The escalator chosen for general labour – which includes mainly clerical/administration, professionals and managerial staff providing mainly administration and corporate services – is movements in average weekly ordinary time earnings (AWOTE) in the Property and Business Services (PBS) sector. Wages growth in the PBS sector slowed abruptly in 2009/10 as the global financial crisis (GFC) hit profits and the demand for labour in the sector during 2008/09. There is usually a lag of around a year in the response of wages to a weakening/strengthening of relevant economic conditions in the PBS sector. Following a recovery in the overall economy and PBS employment in 2009/10, PBS wages growth is forecast to pick up (in LPI terms) in 2010/11, before accelerating thereafter. With the demand for labour to strengthen over the medium term as firstly residential investment and then business investment recovers, PBS wages growth is forecast to accelerate and peak in 2013/14 before easing.

- Over the next six years, PBS wages are forecast to average 5.2 per cent per annum for total Australia. Queensland PBS wages growth is forecast to be weaker than the national average over 2010/11 due to relatively weaker investment and economic growth in that state. Subsequently, Queensland PBS wages growth will outpace the national average due to stronger economic and investment growth, largely due to flood reconstruction activity and another major round of resources investment. Conversely, PBS wages growth in South Australia will initially be close to the Australian average due to stronger economic and investment growth in the short term, but then underperforms the Australian average due to a comparatively weaker economic performance later in the period.

- The escalator for gas network-related labour – who include a range of skilled labour involved in construction, maintenance, design and operation of the gas network – is movements in AWOTE for the electricity, gas and water (EGW) sector. As over 80% 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. Overall, Australian EGW AWOTE growth is projected to average 5.9 per cent per annum over the next six years, with South Australia marginally below the national average and Queensland almost matching the national average at 5.8 per cent pa.

- For general materials – which include items such as stationary, office furniture, electricity, water, fuel, rent, etc – the escalator is CPI inflation, as the average inflation across these items would be close to CPI inflation.

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

(percent change, year average, year ended June)

	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	7yr Avg (k)	6 yr Avg (l)
	Actuals	Forecasts							
NOMINAL PRICE CHANGES									
1. General Labour									
P & BS AWOTE - South Australia (a)	**3.6**	**2.7**	**4.9**	**6.0**	**6.2**	**5.3**	**4.7**	**4.8**	**4.9**
P & BS LPI - South Australia (a)	**2.8**	**3.8**	**4.1**	**4.8**	**4.8**	**3.9**	**4.0**	**4.0**	**4.2**
P & BS AWOTE - Queensland (a)	**2.3**	**2.0**	**5.0**	**6.3**	**6.7**	**5.5**	**4.8**	**4.7**	**5.0**
P & BS LPI - Queensland (a)	**3.2**	**3.3**	**4.1**	**4.3**	**4.4**	**3.8**	**4.0**	**3.9**	**4.0**
P & BS AWOTE - Australia (b)	6.1	3.5	5.0	6.0	6.5	5.5	4.9	5.4	5.2
P & BS LPI - Australia (b)	2.9	4.1	4.3	4.7	4.7	3.9	4.1	4.1	4.3
2. Gas Network related Labour									
EGW AWOTE - South Australia (c)	**5.2**	**6.1**	**5.1**	**5.5**	**5.9**	**5.2**	**5.2**	**5.4**	**5.5**
EGW LPI - South Australia (c)	**5.1**	**4.8**	**4.9**	**5.2**	**5.3**	**4.8**	**4.9**	**5.0**	**5.0**
EGW AWOTE - Queensland (c)	**4.6**	**7.3**	**5.5**	**5.7**	**5.9**	**5.3**	**5.1**	**5.6**	**5.8**
EGW LPI - Queensland (c)	**5.4**	**4.7**	**5.2**	**5.4**	**5.4**	**4.9**	**4.8**	**5.1**	**5.1**
EGW AWOTE - Australia (b)	7.4	8.3	5.2	5.6	5.9	5.3	5.3	6.1	5.9
EGW LPI - Australia (b)	4.4	4.8	4.9	5.3	5.4	4.9	5.0	5.0	5.0
3. General Materials Prices									
General Materials Prices (d)	**2.3**	**2.7**	**3.0**	**3.4**	**3.2**	**2.6**	**2.9**	**2.9**	**3.0**
4. Gas Network Related Materials									
Crude Oil Price	**-7.8**	**4.2**	**7.1**	**12.1**	**3.7**	**1.1**	**-2.6**	**2.6**	**4.3**
Polyethylene Prices (e)	**-15.6**	**5.8**	**13.4**	**12.4**	**5.7**	**0.2**	**0.5**	**3.2**	**6.4**
Polyethelyne Pipe Price (f)	**-14.3**	**4.1**	**9.4**	**8.7**	**4.0**	**0.0**	**0.0**	**1.7**	**4.4**
5. Contractor Escalation									
Construction AWOTE - Sth Aust (g)	**11.9**	**7.2**	**5.2**	**6.8**	**7.6**	**5.8**	**4.7**	**7.0**	**6.2**
Construction LPI - Sth Aust (g)	**3.5**	**4.4**	**4.6**	**5.5**	**5.4**	**4.6**	**4.6**	**4.7**	**4.9**
Construction AWOTE - Queensland (g)	**8.7**	**8.5**	**5.5**	**6.6**	**7.5**	**6.1**	**4.8**	**6.8**	**6.5**
Construction LPI - Queensland (g)	**2.9**	**3.8**	**5.2**	**6.1**	**6.0**	**4.7**	**4.6**	**4.8**	**5.1**
Construction AWOTE - Australia (b)	7.7	4.9	5.4	6.3	7.3	6.1	5.0	6.1	5.8
Construction LPI - Australia (b)	3.3	4.1	4.9	5.8	5.8	4.7	4.8	4.8	5.0
Gas & Fuel Construction Price Index (h)	**-1.5**	**2.1**	**3.9**	**5.0**	**5.4**	**2.7**	**2.4**	**2.9**	**3.6**
Engineering Construction Price Index (i)	*-5.0*	*4.2*	*2.8*	*4.1*	*5.0*	*2.8*	*2.9*	2.4	3.7
Consumer Price Index (headline) (j)	2.3	2.7	3.0	3.4	3.2	2.6	2.9	2.9	3.0
REAL PRICE CHANGES									
1. General Labour									
P & BS AWOTE - South Australia (a)	**1.3**	**-0.1**	**1.9**	**2.5**	**3.0**	**2.7**	**1.8**	**1.9**	**2.0**
P & BS LPI - South Australia (a)	**0.5**	**1.1**	**1.1**	**1.4**	**1.6**	**1.3**	**1.1**	**1.1**	**1.3**
P & BS LPI - Queensland (a)	**0.0**	**-0.7**	**2.0**	**2.8**	**3.5**	**2.9**	**1.9**	**1.8**	**2.1**
P & BS LPI - Queensland (a)	**0.9**	**0.6**	**1.1**	**0.9**	**1.2**	**1.2**	**1.1**	**1.0**	**1.0**
P & BS AWOTE - Australia (b)	3.8	0.8	2.0	2.5	3.3	2.9	2.0	2.5	2.3
P & BS LPI - Australia (b)	0.6	1.3	1.3	1.2	1.6	1.3	1.3	1.2	1.3
2. Gas Network related Labour									
EGW AWOTE - South Australia (c)	**2.9**	**3.4**	**2.0**	**2.0**	**2.7**	**2.6**	**2.3**	**2.6**	**2.5**
EGW LPI - South Australia (c)	**2.8**	**2.1**	**1.9**	**1.8**	**2.1**	**2.2**	**2.0**	**2.1**	**2.0**
EGW AWOTE - Queensland (c)	**2.3**	**4.5**	**2.5**	**2.3**	**2.7**	**2.7**	**2.2**	**2.7**	**2.8**
EGW LPI - Queensland (c)	**3.1**	**2.0**	**2.2**	**2.0**	**2.2**	**2.3**	**1.9**	**2.2**	**2.1**
EGW AWOTE - Australia (b)	5.0	5.5	2.2	2.1	2.7	2.7	2.4	3.2	2.9
EGW LPI - Australia (b)	2.0	2.1	1.9	1.9	2.2	2.3	2.1	2.1	2.1
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	**-10.1**	**1.5**	**4.1**	**8.7**	**0.6**	**-1.5**	**-5.4**	**-0.3**	**1.3**
Polyethylene Price (e)	**-17.9**	**3.1**	**10.4**	**9.0**	**2.6**	**-2.4**	**-2.4**	**0.3**	**3.4**
Polyethelyne Pipe Price (f)	**-16.7**	**1.4**	**6.4**	**5.2**	**0.9**	**-2.6**	**-2.9**	**-1.2**	**1.4**
5. Contractor Escalation									
Construction AWOTE - Sth Aust (g)	**9.5**	**4.5**	**2.2**	**3.3**	**4.5**	**3.2**	**1.8**	**4.2**	**3.3**
Construction LPI - Sth Aust (g)	**1.2**	**1.7**	**1.6**	**2.1**	**2.2**	**2.0**	**1.7**	**1.8**	**1.9**
Construction AWOTE - Queensland (g)	**6.4**	**5.7**	**2.5**	**3.2**	**4.3**	**3.5**	**1.9**	**3.9**	**3.5**
Construction LPI - Queensland (g)	**0.6**	**1.1**	**2.2**	**2.7**	**2.8**	**2.1**	**1.7**	**1.9**	**2.1**
Construction AWOTE - Australia (b)	5.3	2.1	2.4	2.9	4.1	3.5	2.2	3.2	2.9
Construction LPI - Australia (b)	0.9	1.4	1.9	2.3	2.7	2.0	2.0	1.9	2.0
Gas & Fuel Construction Price Index (h)	**-3.8**	**-0.6**	**0.9**	**1.6**	**2.2**	**0.1**	**-0.5**	**0.0**	**0.6**
Engineering Construction Price Index (i)	-7.3	1.5	-0.2	0.7	1.8	0.2	0.0	-0.5	0.7

(a) Property & Business Services (P&BS) Average Weekly Ordinary Time Earnings (AWOTE) for South Australia and Queensland. Movements in P&BS wages were used rather than wage movements for Administrative and Support Services (ASS) and Professional, Scientific and Technical Services (PSTS) because the state data for ASS and PSTS only started in June quarter 2009. The ASS and PSTS sectors are 'new' sectors under the revised 2006 ANZSIC classifications and comprised the bulk oo the P&BS sector (the 'old' classification under the previous 1993 ANZSIC classification).

(b) Australian sector wage forecasts provided for comparison

(c) Electricity, Gas & Water (EGW) Average Weekly Ordinary Time Earnings (AWOTE) for South Australia and Queensland. EGW LPI (Labour Price Index) not available by state so forecasts are based on national EGW LPI forecasts, and are provided for comparison.

(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 Price. Note that Polyethylene is a type of Thermoplastic Resin.

(f) Based on weighted usage by Envestra. Forecasts are based on our projections for crude oil prices and pipeline activity.

(g) Construction Sector AWOTE for Sth Aust & Queensland. Alternative is Qld and SA Construction sector LPI (SA LPI estimated for last 4 quarters - not avail after March 2009).

(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) Weighted Average of 8 Capital Cities

(k) Average Annual Growth Rate for 2009/10 to 2015/16 inclusive

(l) For next regulatory period. Average Annual Growth Rate for 2010/11 to 2015/16 inclusive

- For gas-related materials – which is mainly polyethylene piping – BIS Shrapnel derived an escalator based on movements in polyethylene prices — the key raw material used in the manufacture of polyethylene pipes. BIS Shrapnel's outlook for polyethylene pipe prices therefore is based on our forecasts of polyethylene which in turn is dependant on the price of crude oil (cost component) and pipeline activity. The latter represents a 'catch-all' for demand condition which we believe is another important consideration in the overall price setting of polyethylene pipes. Given pipeline activity is expected to be the strongest over 2011/12 to 2012/13, our expectation is that polyethylene pipe prices (over the forecast period) will experience its fastest pace growth in the two years to 2012/13.
- For contractor escalation, construction sector AWOTE was chosen for contractor related labour and the 'Gas and Fuel' engineering construction price index was chosen for 'turn-key' or similar projects incorporating both labour and materials. Construction AWOTE normally tracks or lags (by around a year) total construction activity. Currently, construction activity is being held up by public construction, with modest growth expected in 2010/11 as rising dwelling building offsets weaker public construction activity. Subsequently, construction activity is forecast to strengthen as private non-dwelling construction joins strongly rising dwelling construction to result in solid rises in total activity over 2011/12 to 2013/14, before easing. Construction wages growth will track this cycle, although there will be differences between Queensland and South Australia depending on the strength of their respective construction cycles. Over the next six years, construction AWOTE growth is forecast to average 6.2% and 6.5% respectively in South Australia and Queensland, ie higher than the national average of 5.8%.
- The gas and fuel price index measures changes in the construction costs of gas and fuel infrastructure and pipelines. Forecasts of the index were compiled from predicted price movements in the main components of construction wages, steel pipes, plant hire and non-ferrous piping, although an allowance was also made for the strength of demand influences, i.e. construction activity related to pipelines, oil and gas investment. After declining over 2009/10, the price index is forecast to pick up over 2010/11 and accelerate over 2011/12 to 2013/14 before easing. It is projected to average 3.6 per cent per annum over the next six years.
- 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 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 aluminum smelters. This will further contain demand for energy in the future. On the other hand, we expect employment growth to remain elevated for the utilities sector. The combination of muted output and moderate employment growth means productivity growth will be remain weak for the utilities sector at the national as well as state level over the six years to 2015/16.
- The end result is that once nominal AWOTE is adjusted for CPI inflation and productivity movements, the real productivity adjusted AWOTE for Business Services is forecast to average -0.6 per cent per annum over the six years from 2010/11 to 2015/16 for the South Australian business services sector and 1.0 per cent per annum for the Queensland business services sector. The real productivity adjusted AWOTE for EGW is forecast to average 1.2 per cent per annum over the six years from 2010/11 to 2015/16 for South Australia and 4.7 per cent per annum for Queensland. Meanwhile, the weaker labour productivity performance over the next six years means that the actual or true construction labour costs to businesses will be higher over the forecast period. The real productivity adjusted AWOTE for construction is forecast to average 6.1 per cent per annum over the

Table 1b: Forecasts of (AWOTE) Wage Escalators Adjusted for Productivity

(percent change, year average, year ended June)

	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	7yr Avg (f)	6 yr Avg (g)
	Actuals	Forecasts							
PRODUCTIVITY GROWTH									
P & BS - South Australia	**-5.8**	**11.4**	**0.9**	**-0.6**	**1.0**	**2.6**	**0.1**	**1.4**	**2.6**
P & BS - Queensland	**-6.4**	**1.4**	**0.8**	**-0.7**	**0.4**	**3.6**	**1.2**	**0.0**	**1.1**
P & BS - Australia	-2.1	-1.0	1.0	-0.7	0.3	3.5	1.1	**0.3**	**0.7**
EGW - South Australia	**8.2**	**6.6**	**-0.8**	**-0.2**	**-0.6**	**2.4**	**0.5**	**2.3**	**1.3**
EGW - Queensland	**0.3**	**-7.5**	**-2.2**	**-0.1**	**-1.8**	**-0.2**	**0.3**	**-1.6**	**-1.9**
EGW - Australia	5.7	-11.0	0.7	-0.6	-1.7	0.2	-0.2	**-1.0**	**-2.1**
Construction - Sth Aust	**-5.5**	**-19.8**	**-0.7**	**8.1**	**-5.9**	**1.5**	**-0.1**	**-3.2**	**-2.8**
Construction - Queensland	**2.8**	**-4.7**	**3.4**	**0.4**	**0.0**	**-3.7**	**1.9**	**0.0**	**-0.5**
Construction - Australia	-0.3	-3.0	-0.6	1.2	-0.3	-1.6	1.4	**-0.5**	**-0.5**
NOMINAL WAGE ESCALATORS									
1. General Labour									
P & BS AWOTE - South Australia (a)	**3.6**	**2.7**	**4.9**	**6.0**	**6.2**	**5.3**	**4.7**	**4.8**	**4.9**
P & BS LPI - South Australia (a)	**2.8**	**3.8**	**4.1**	**4.8**	**4.8**	**3.9**	**4.0**	**4.0**	**4.2**
P & BS AWOTE - Queensland (a)	**2.3**	**2.0**	**5.0**	**6.3**	**6.7**	**5.5**	**4.8**	**4.7**	**5.0**
P & BS LPI - Queensland (a)	**3.2**	**3.3**	**4.1**	**4.3**	**4.4**	**3.8**	**4.0**	**3.9**	**4.0**
P & BS AWOTE - Australia (b)	6.1	3.5	5.0	6.0	6.5	5.5	4.9	5.4	5.2
P & BS LPI - Australia (b)	2.9	4.1	4.3	4.7	4.7	3.9	4.1	4.1	4.3
2. Gas Network related Labour									
EGW AWOTE - South Australia (c)	**5.2**	**6.1**	**5.1**	**5.5**	**5.9**	**5.2**	**5.2**	**5.4**	**5.5**
EGW LPI - South Australia (c)	**5.1**	**4.8**	**4.9**	**5.2**	**5.3**	**4.8**	**4.9**	**5.0**	**5.0**
EGW AWOTE - Queensland (c)	**4.6**	**7.3**	**5.5**	**5.7**	**5.9**	**5.3**	**5.1**	**5.6**	**5.8**
EGW LPI - Queensland (c)	**5.4**	**4.7**	**5.2**	**5.4**	**5.4**	**4.9**	**4.8**	**5.1**	**5.1**
EGW AWOTE - Australia (b)	7.4	8.3	5.2	5.6	5.9	5.3	5.3	6.1	5.9
EGW LPI - Australia (b)	4.4	4.8	4.9	5.3	5.4	4.9	5.0	5.0	5.0
3. Contractor Escalation									
Construction AWOTE - Sth Aust (g)	**11.9**	**7.2**	**5.2**	**6.8**	**7.6**	**5.8**	**4.7**	**7.0**	**6.2**
Construction LPI - Sth Aust (g)	**3.5**	**4.4**	**4.6**	**5.5**	**5.4**	**4.6**	**4.6**	**4.7**	**4.9**
Construction AWOTE - Queensland (g)	**8.7**	**8.5**	**5.5**	**6.6**	**7.5**	**6.1**	**4.8**	**6.8**	**6.5**
Construction LPI - Queensland (g)	**2.9**	**3.8**	**5.2**	**6.1**	**6.0**	**4.7**	**4.6**	**4.8**	**5.1**
Construction AWOTE - Australia (b)	7.7	4.9	5.4	6.3	7.3	6.1	5.0	6.1	5.8
Construction LPI - Australia (b)	3.3	4.1	4.9	5.8	5.8	4.7	4.8	4.8	5.0
4. Productivity Adjusted AWOTE									
General Labour									
P & BS AWOTE - South Australia (a)	**9.4**	**-8.7**	**4.0**	**6.5**	**5.2**	**2.7**	**4.6**	**3.4**	**2.4**
P & BS AWOTE - Queensland (a)	**8.7**	**0.6**	**4.2**	**7.0**	**6.3**	**1.9**	**3.6**	**4.6**	**3.9**
P & BS AWOTE - Australia (b)	**8.2**	**4.5**	**4.0**	**6.6**	**6.2**	**2.0**	**3.8**	5.1	4.5
Gas Network related Labour									
EGW AWOTE - South Australia (c)	**-3.0**	**-0.5**	**5.8**	**5.7**	**6.5**	**2.8**	**4.7**	**3.2**	**4.2**
EGW AWOTE - Queensland (c)	**4.3**	**14.8**	**7.6**	**5.9**	**7.7**	**5.5**	**4.8**	**7.2**	**7.7**
EGW AWOTE - Australia (b)	1.7	19.3	4.5	6.1	7.5	5.1	5.5	7.1	8.0
Contractor Escalation									
Construction AWOTE - Sth Aust (d)	**17.4**	**27.0**	**6.0**	**-1.3**	**13.5**	**4.3**	**4.8**	**10.2**	**9.0**
Construction AWOTE - Queensland (d)	**5.9**	**13.2**	**2.1**	**6.2**	**7.5**	**9.8**	**2.9**	**6.8**	**7.0**
Construction AWOTE - Australia (d)	7.9	7.9	6.0	5.1	7.6	7.7	3.6	6.6	6.3
Consumer Price Index (headline) (e)	2.3	2.7	3.0	3.4	3.2	2.6	2.9	2.9	3.0

six years from 2010/11 to 2015/16 for the South Australian construction sector and 4.0 per cent per annum for the Queensland construction sector.

- Access Economics' preferred wage escalator is LPI inflation. Access Economics productivity adjusted wage escalator is derived by deducting productivity growth from the nominal LPI escalator. However, 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. Changes to skill levels should therefore be reflected in productivity changes per worker. The LPI does not incorporate any changes for skill levels and improved productivity. Hence, productivity cannot be deleted 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 wage measure that is logical.

Table 1b: Forecasts of (AWOTE) Wage Escalators Adjusted for Productivity (continued)

REAL WAGE ESCALATORS	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	7yr Avg (f)	6 yr Avg (g)
1. General Labour									
P & BS AWOTE - South Australia (a)	**1.3**	**-0.1**	**1.9**	**2.5**	**3.0**	**2.7**	**1.8**	**1.9**	**2.0**
P & BS LPI - South Australia (a)	**0.5**	**1.1**	**1.1**	**1.4**	**1.6**	**1.3**	**1.1**	**1.1**	**1.3**
P & BS LPI - Queensland (a)	**0.0**	**-0.7**	**2.0**	**2.8**	**3.5**	**2.9**	**1.9**	**1.8**	**2.1**
P & BS LPI - Queensland (a)	**0.9**	**0.6**	**1.1**	**0.9**	**1.2**	**1.2**	**1.1**	**1.0**	**1.0**
P & BS AWOTE - Australia (b)	3.8	0.8	2.0	2.5	3.3	2.9	2.0	2.5	2.3
P & BS LPI - Australia (b)	0.6	1.3	1.3	1.2	1.6	1.3	1.3	1.2	1.3
2. Gas Network related Labour									
EGW AWOTE - South Australia (c)	**2.9**	**3.4**	**2.0**	**2.0**	**2.7**	**2.6**	**2.3**	**2.6**	**2.5**
EGW LPI - South Australia (c)	**2.8**	**2.1**	**1.9**	**1.8**	**2.1**	**2.2**	**2.0**	**2.1**	**2.0**
EGW AWOTE - Queensland (c)	**2.3**	**4.5**	**2.5**	**2.3**	**2.7**	**2.7**	**2.2**	**2.7**	**2.8**
EGW LPI - Queensland (c)	**3.1**	**2.0**	**2.2**	**2.0**	**2.2**	**2.3**	**1.9**	**2.2**	**2.1**
EGW AWOTE - Australia (b)	5.0	5.5	2.2	2.1	2.7	2.7	2.4	3.2	2.9
EGW LPI - Australia (b)	2.0	2.1	1.9	1.9	2.2	2.3	2.1	2.1	2.1
3. Contractor Escalation									
Construction AWOTE - Sth Aust (d)	**9.5**	**4.5**	**2.2**	**3.3**	**4.5**	**3.2**	**1.8**	**4.2**	**3.3**
Construction LPI - Sth Aust (d)	**1.2**	**1.7**	**1.6**	**2.1**	**2.2**	**2.0**	**1.7**	**1.8**	**1.9**
Construction AWOTE - Queensland (d)	**6.4**	**5.7**	**2.5**	**3.2**	**4.3**	**3.5**	**1.9**	**3.9**	**3.5**
Construction LPI - Queensland (d)	**0.6**	**1.1**	**2.2**	**2.7**	**2.8**	**2.1**	**1.7**	**1.9**	**2.1**
Construction AWOTE - Australia (b)	5.3	2.1	2.4	2.9	4.1	3.5	2.2	3.2	2.9
Construction LPI - Australia (b)	0.9	1.4	1.9	2.3	2.7	2.0	2.0	1.9	2.0
4. Productivty Adjusted AWOTE									
General Labour									
P & BS AWOTE - South Australia (a)	**7.0**	**-11.4**	**1.0**	**3.1**	**2.0**	**0.1**	**1.7**	**0.5**	**-0.6**
P & BS AWOTE - Queensland (a)	**6.4**	**-2.2**	**1.2**	**3.6**	**3.1**	**-0.7**	**0.7**	**1.7**	**1.0**
P & BS AWOTE - Australia (b)	5.9	1.8	1.0	3.2	3.1	-0.6	0.9	2.2	1.6
Gas Network related Labour									
EGW AWOTE - South Australia (c)	**-5.3**	**-3.2**	**2.8**	**2.3**	**3.3**	**0.2**	**1.8**	**0.3**	**1.2**
EGW AWOTE - Queensland (c)	**2.0**	**12.1**	**4.6**	**2.4**	**4.5**	**2.9**	**2.0**	**4.4**	**4.7**
EGW AWOTE - Australia (b)	**-0.7**	**16.6**	**1.5**	**2.7**	**4.4**	**2.5**	**2.6**	4.2	5.0
Contractor Escalation									
Construction AWOTE - Sth Aust (d)	**15.0**	**24.3**	**3.0**	**-4.8**	**10.3**	**1.6**	**1.9**	**7.3**	**6.1**
Construction AWOTE - Queensland (d)	**3.6**	**10.5**	**-0.9**	**2.8**	**4.3**	**7.2**	**0.0**	**3.9**	**4.0**
Construction AWOTE - Australia (b)	**5.6**	**5.1**	**3.0**	**1.7**	**4.4**	**5.1**	**0.8**	3.7	3.3

(a) Property & Business Services (P&BS) Average Weekly Ordinary Time Earnings (AWOTE) for South Australia and Queensland. Movements in P&BS wages were used rather than wage movements for Administrative and Support Services (ASS) and Professional, Scientific and Technical Services (PSTS) because the state data for ASS and PSTS only started in June quarter 2009. The ASS and PSTS sectors are 'new' sectors under the revised 2006 ANZSIC classifications and comprised the bulk oo the P&BS sector (the 'old' classification under the previous 1993 ANZSIC classification).

(b) Australian sector wage forecasts provided for comparison

(c) Electricity, Gas & Water (EGW) Average Weekly Ordinary Time Earnings (AWOTE) for South Australia and Queensland. EGW LPI (Labour Price Index) not available by state so forecasts are based on national EGW LPI forecasts, and are provided for comparison.

(d) Construction Sector AWOTE for Sth Aust & Queensland. Alternative is Qld and SA Construction sector LPI (SA LPI estimated for last 4 quarters - not avail after March 2009).

(e) Weighted Average of 8 Capital Cities

(f) Average Annual Growth Rate for 2009/10 to 2015/16 inclusive

(g) For next regulatory period. Average Annual Growth Rate for 2010/11 to 2015/16 inclusive

1. INTRODUCTION, OUTLINE OF REPORT & DATA SOURCES

In 2010, BIS Shrapnel was engaged by Envestra Limited to provide an expert opinion regarding the outlook for a range of labour, materials and contractor cost escalators relevant to operating and capital expenditure of natural gas networks in Queensland and South Australia over the six year period from 2010/11 to 2015/16.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 Envestra's regulatory submission to the Australian Energy Regulator (AER) on 1st October 2010.

In February 2011, I, Richard Robinson, Associate Director (Economics) of BIS Shrapnel was engaged to update the initial report to Envestra, in line with the specific request as per the Terms of Reference (see Appendix), to "please update the forecasts of labour and material costs set out in your August 2010 Report "*Real Cost Escalation Forecasts to 2015/16*." In doing so also please comment on any other matters relevant to the forecasting approach taken by the AER and Access Economics." In keeping with my instructions, I confirm that I have undertaken this engagement having regard to the Guidelines for Expert Witnesses in Proceedings in the Federal Court of Australia and the requisite statement to this effect is included in Appendix E. I have been assisted in the preparation of this report by Kishti Sen, an Economist at BIS Shrapnel and Rachael Logie, Senior Economist at BIS Shrapnel. Curriculum vitas of all relevant personnel are attached in Appendix F. 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 December quarter, 2010 was the latest available data for wages, industry employment, real gross value added (at the Australian level only), investment, engineering construction, specific engineering construction price indices and indeed most of the economic variables in Table 2.1. The latest data for 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 polyethylene prices was derived from the US Bureau of Labor Statistics, which publishes monthly Producer Price Index (PPI) for Thermoplastic Resins and Plastic Materials. Information on polyethylene pipe prices supplied to Envestra was provided by APA Group.

Forecasts of the economic variables in this report were mostly sourced from BIS Shrapnel reports, including *Economic Outlook, Long Term Forecasts: 2010 – 2025, 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, 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.

- **Section 4** provides an outlook for 'general labour' cost escalation, based on forecasts of wages growth for the Property and Business Services sector for Australia, Queensland and South Australia, including productivity adjusted wage escalators.
- **Section 5** 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, Queensland and South Australia, including productivity adjusted wage escalators.
- **Section 6** provides forecasts of 'general materials' cost escalation, assumed to be the same as LPI 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.

2. MACROECONOMIC OVERVIEW — AUSTRALIA

2.1 The Australian economy

2.1.1 Current state of play

The Australian economy emerged from a downturn over 2008/09 with only limited pockets of excess capacity across labour and product markets. Labour markets tightened rapidly as the economy regained momentum over 2009/10 and the strength of the recovery saw the RBA quickly unwind its expansionary monetary policy stance.

Confidence picked up with a run of good news, but the RBA arguably overcooked interest rates in 2010. Household debt to income ratios fell in the wake of the GFC as households took advantage of low interest rates and government handouts to pay down debt and build up a savings buffer. Household wealth also rebounded, supported by double digits gains in house prices over the year to March 2010, higher returns on savings and a recovery in the stock market. However, despite the comparative strength of household finances, households reacted to rising interest rates and living costs by pulling back on non-essential spending rather than running down their savings buffer.

Demand and profits did not reflect the strength of employment growth through 2010. Businesses are still largely in cost containment mode and will remain so until they seems an improvement in trading conditions.

Reflecting the sluggish economic conditions, growth in domestic demand slowed to 2.7 per cent through-the-year in the December quarter of 2010 from 4.4 per cent in the September quarter.

Economic growth will continue to drift over the first half of 2011. Mining investment activity is increasingly taking up the slack from public sector stimulus spending as the key driver of investment growth, but the interruptions to production and investment as a result of the floods will constrain overall economic activity in the March quarter. Production and investment will subsequently rebound in the June quarter but through-the-year growth in GDP will remain sub-par. Consumers will remain cautious and continue to fund consumption predominantly out of incomes until confidence and incomes are buoyed by strengthening output and wages from 2011/12.

Although job vacancies remain high, employment growth is expected to slow through 2011. Growth has been largely driven by the public sector and business administration & support services. Sluggish trading conditions for much of the business sector and the start of a phase of budget consolidation by the public sector should be reflected in a slowdown in employment growth. Subsequently, a broadening in employment, profits and investment is expected from 2012 as mining investment and incomes stimulates wider economic activity, lifting confidence and spending and encouraging businesses to switch out of cost-containment mode.

2.1.1 Outlook for the Australian economy

Beyond 2011, the medium term outlook is generally positive with strong growth expected to return from 2012. Mining investment has increasing taken up the baton of growth through 2010.The flooding in Queensland will have interrupted coal investment, but a ramping up of work on projects ongoing elsewhere will cushion the impact on overall activity in the March quarter, with a strong rebound to follow in the June quarter. From 2011/12 mining and associated infrastructure investment will drive a further strong phase of private engineering construction activity.

Confidence, both for consumers and businesses, will lift as mining investment, exports and incomes stimulate broader employment, profits and investment growth over 2012 and 2013.

Table 2.1: Australia – Key Economic Indicators, Financial Years

Year Ended June	2005	2006	2007	2008	2009	2010	Forecasts 2011	2012	2013	2014	2015	2016
EXPENDITURE ON REAL GDP												
Consumption												
– Private	4.5	2.8	4.3	4.7	0.2	2.1	3.0	3.7	3.8	2.3	2.9	4.3
– Government	3.2	2.5	3.7	3.2	2.8	1.7	3.9	3.5	2.2	2.7	3.2	3.2
Private Investment												
– Dwellings	-0.8	-4.3	1.9	1.2	-1.9	2.1	2.9	5.5	8.1	0.1	-4.0	6.8
– Real Estate Transfer Exp.	-16.6	2.4	-0.9	0.2	-15.6	10.7	-14.3	12.8	-7.8	-5.5	11.5	8.5
– New Non-Dwelling Building (+)	4.5	12.4	7.6	11.7	-5.3	-18.7	-1.4	3.4	8.6	0.9	7.1	9.1
– New Engineering Construction (+)	15.8	31.3	17.9	8.6	24.2	0.9	11.6	11.9	14.8	9.6	-2.2	-3.9
– New Equipment (+)	15.0	15.3	3.1	19.0	-3.3	-4.8	0.8	12.0	15.6	3.7	5.5	15.0
– Livestock	3.8	1.2	-20.5	-4.5	14.1	2.0	3.2	6.9	-5.7	7.0	-9.0	6.0
– Intangible Fixed Assets	7.6	8.3	15.8	15.1	-0.3	3.4	3.6	11.5	15.2	6.4	6.7	11.5
– New Business Investment (+)	11.3	15.7	7.9	14.5	1.9	-4.9	3.5	10.5	14.0	5.3	3.6	8.7
Total New Private Investment (+)	**4.8**	**8.5**	**5.6**	**10.1**	**-0.1**	**-2.4**	**2.3**	**9.3**	**11.5**	**3.6**	**2.2**	**8.3**
New Public Investment (+)	**11.2**	**7.9**	**4.7**	**10.5**	**5.9**	**26.3**	**3.7**	**-5.0**	**-3.4**	**-3.0**	**3.1**	**5.9**
Domestic Demand	**4.8**	**4.3**	**4.5**	**6.0**	**0.8**	**2.1**	**3.0**	**4.4**	**4.9**	**2.4**	**2.8**	**5.2**
Stock Contribution (*)	0.1	-0.3	0.2	0.0	-0.4	0.3	0.0	0.2	-0.1	-0.2	0.1	0.2
Gross National Expenditure (GNE)	**4.6**	**4.1**	**4.9**	**6.0**	**0.2**	**2.4**	**3.0**	**4.6**	**4.8**	**2.2**	**2.9**	**5.3**
Exports	**3.5**	**2.2**	**2.5**	**4.0**	**2.6**	**5.2**	**4.0**	**7.6**	**5.9**	**4.9**	**5.9**	**7.3**
Imports	**12.3**	**7.3**	**9.1**	**14.6**	**-3.3**	**4.9**	**8.1**	**9.2**	**10.9**	**3.2**	**3.5**	**10.4**
External Contribution (*)	-1.7	-1.0	-1.3	-2.2	1.2	0.0	-0.9	-0.4	-1.2	0.4	0.6	-0.9
Statistical Discrepancy (*)	0.0	0.0	0.0	0.0	0.0	-0.2	0.4	-0.2	0.0	0.0	0.0	0.0
GDP	**3.0**	**3.1**	**3.6**	**3.8**	**1.4**	**2.3**	**2.6**	**4.0**	**3.6**	**2.6**	**3.5**	**4.5**
Farm GDP	5.1	3.0	-22.0	9.3	23.9	1.5	26.7	7.2	-5.0	6.0	-8.0	7.0
Non-Farm GDP	2.9	3.1	4.1	3.7	1.1	2.3	2.1	3.9	3.8	2.5	3.8	4.4
Inflation												
CPI (Yr Avg)	2.4	3.2	2.9	3.4	3.1	2.3	2.8	2.8	3.4	3.2	2.8	2.9
CPI (Jun on Jun)	2.5	4.0	2.1	4.5	1.5	3.1	2.9	2.8	3.4	2.8	2.7	3.0
Baseline (Jun on Jun)	2.3	2.5	2.7	3.6	3.6	2.8	2.6	3.0	3.5	3.0	2.7	3.0
Labour Price Index (Jun on Jun)	4.0	4.2	4.0	4.2	3.8	3.1	4.0	4.4	5.0	4.5	4.1	4.2
Labour Price Index (Yr Avg)	3.7	4.1	3.9	4.1	4.1	3.1	3.9	4.1	4.8	4.8	4.1	4.17
Average Weekly Earnings (Yr Avg)	4.4	4.6	3.6	4.9	5.5	5.6	4.2	4.5	5.3	5.9	5.2	4.8
Employment												
– Employment Growth (Yr Avg)	2.9	2.9	3.1	3.0	1.6	1.4	2.9	2.2	2.9	1.9	0.9	2.3
– Employment Growth (May on May) (%)	3.4	2.5	3.3	2.7	0.9	2.2	2.5	2.6	3.0	0.8	1.6	2.7
– Unemployment Rate (May) (%)	5.1	4.8	4.3	4.3	5.8	5.2	5.2	4.6	3.8	4.3	4.5	4.2
Labour Productivity Growth												
– Total	0.1	0.2	0.5	0.8	-0.2	0.9	-0.3	1.7	0.6	0.7	2.6	2.1
– Non-farm	0.1	0.2	1.0	0.7	-0.5	0.9	-0.8	1.6	0.8	0.6	2.9	2.1
Interest Rates (30 June)												
– Cash Rate	5.5	5.8	6.3	7.3	3.0	4.5	4.8	5.5	6.5	6.0	4.8	nf
– 90–day Bank Bill	5.7	6.0	6.4	7.8	3.3	4.9	5.0	5.7	6.7	5.9	4.9	5.8
– 10–year Govt. Bonds	5.1	5.8	6.3	6.5	5.5	5.3	5.4	5.8	6.4	5.3	5.2	5.9
– Prime Overdraft (upper rate)	9.0	9.2	9.7	11.5	8.8	10.3	10.7	11.1	11.4	10.9	9.7	nf
– Housing (variable)	7.3	7.6	8.1	9.5	5.8	7.4	7.8	8.5	9.3	8.7	7.5	nf
Exchange Rates												
– US$ per A$ (Yr Avg)	0.75	0.75	0.79	0.90	0.75	0.88	0.97	1.00	1.01	0.95	0.86	0.91
– US$ per A$ (30 June)	0.76	0.74	0.85	0.96	0.81	0.85	1.00	1.00	1.02	0.86	0.89	nf
– SDRs per A$ (30 June)	0.52	0.51	0.56	0.59	0.52	0.58	0.63	0.65	0.68	0.58	0.59	nf
– Trade Weighted Index of A$: 1970 = 1000 (30 June)	64.5	62.2	68.9	73.4	64.7	67.3	74.1	75.7	78.5	68.4	69.0	nf

e: estimate Source: BIS Shrapnel 'Long Term Forecasts:2010-2025', ABS

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

*Contribution to growth in GDP

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 interest rate insensitive mining investment gathering momentum, which will be accompanied by strong growth in mining incomes underpinned by record high commodity prices. With the unemployment rate already pushing below 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 combination of a swift unwinding of the accommodative interest rate position in 2009 and double-digit house price growth undermined demand for housing and the earlier recovery was unable to sustain its momentum once the First Home Owners Grant boost had expired.

Household incomes are expected to gain momentum from 2012 underpinned by strengthening employment and wages growth, which should lift confidence and ameliorate the affordability issue. However, with economic growth pushing above the speed limit during this period, as the mining investment boom gathers momentum, the RBA will be moving to dampen demand and head off a run up in inflation by progressively raising interest rates. This would repeatedly undermine any improvement in housing affordability achieved through rising income growth.

We expect there is the potential for a modest recovery in housing activity over the next couple of years, even with comparatively modest accompanying gains in house prices, underpinned by the strength of underlying demand and high rental returns. However, the housing sector will ultimately end up collateral damage as the RBA continues to raise interest rates as wage and cost pressures build.

The current round of mining investment is expected to peak in 2013/14, with the main impetus to growth seen over 2011/12 and 2012/13. We are not expected 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.

The question is how the economy will fare over the next two to three years while the latest stage of the investment boom runs its course and what it will look like when it's over.

Mild downturn in 2014, but a quick rebound into a boom thereafter

An aggressive series of interest rates through 2013, taking the variable housing rate back over 9 per cent, will dampen consumer spending and send housing activity into a controlled downturn through 2014. However, the impact on employment and demand will be modest, with the unemployment rate expected to peak at around 4.5 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 property markets expected to drive growth.

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. 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 over 80% 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 5).
- 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 currently estimated to be around 17%.

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

	Year Average Percent Change													
							Forecast						Averages	
Year Ended June	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2000-10	2011-16
Proportion of Workforce by Pay setting Method														
Awards Only	19.5%	19.0%	17.8%	16.5%	15.8%	15.2%	15.2%	15.2%	15.2%	15.2%	15.2%	15.2%	19.1%	15.2%
Collective Agreements	41.0%	41.1%	40.5%	39.8%	41.6%	43.4%	43.4%	43.4%	43.4%	43.4%	43.4%	43.4%	40.0%	43.4%
Individual Arrangements	39.5%	39.9%	41.8%	43.7%	42.6%	41.4%	41.4%	41.4%	41.4%	41.4%	41.4%	41.4%	40.9%	41.4%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
AWOTE														
Awards Only	2.0	1.7	2.0	1.4	1.7	0.5	2.1	1.4	1.6	1.8	1.3	1.8	1.7	1.7
Collective Agreements	4.0	4.1	4.1	4.0	4.2	4.1	4.1	4.3	4.6	4.7	4.4	4.3	3.9	4.4
Individual Arrangements (a)	6.0	6.5	3.8	7.1	8.1	8.9	5.1	5.9	7.3	8.6	7.4	6.5	6.9	6.8
AWOTE (Persons)(b)	**4.4**	**4.6**	**3.6**	**4.9**	**5.5**	**5.6**	**4.2**	**4.5**	**5.3**	**5.9**	**5.2**	**4.8**	**4.7**	**5.0**
Labour Price Index														
Awards Only	2.0	1.7	2.0	1.4	1.7	0.5	2.1	1.4	1.6	1.8	1.3	1.8	1.7	1.7
Collective Agreements	4.0	4.1	4.1	4.0	4.2	4.1	4.1	4.3	4.6	4.7	4.4	4.3	3.9	4.4
Individual Arrangements (a)	4.3	5.2	4.6	5.3	4.9	3.0	4.3	4.8	6.1	6.0	4.7	4.9	4.2	5.1
Labour Price Index (Ord. Time)	**3.7**	**4.1**	**3.9**	**4.1**	**4.1**	**3.1**	**3.9**	**4.1**	**4.8**	**4.8**	**4.1**	**4.2**	**3.6**	**4.3**
Compositional Effects + Bonuses,etc	0.7	0.5	-0.3	0.8	1.3	2.5	0.3	0.5	0.5	1.1	1.1	0.7	1.1	0.7

(a) Calculated as a residual - affected by compositional effects and the payments of bonuses, incentive payments, etc Source:BIS Shrapnel,ABS,DEWR
(b) 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)	**0.9%**	**82.0%**	**17.1%**	**100.0%**
Property and Business Services (2006)[1]	**23.2%**	**15.5%**	**61.3%**	**100.0%**
Property and Business Services (2010)	**17.3%**	**17.5%**	**65.2%**	**100.0%**

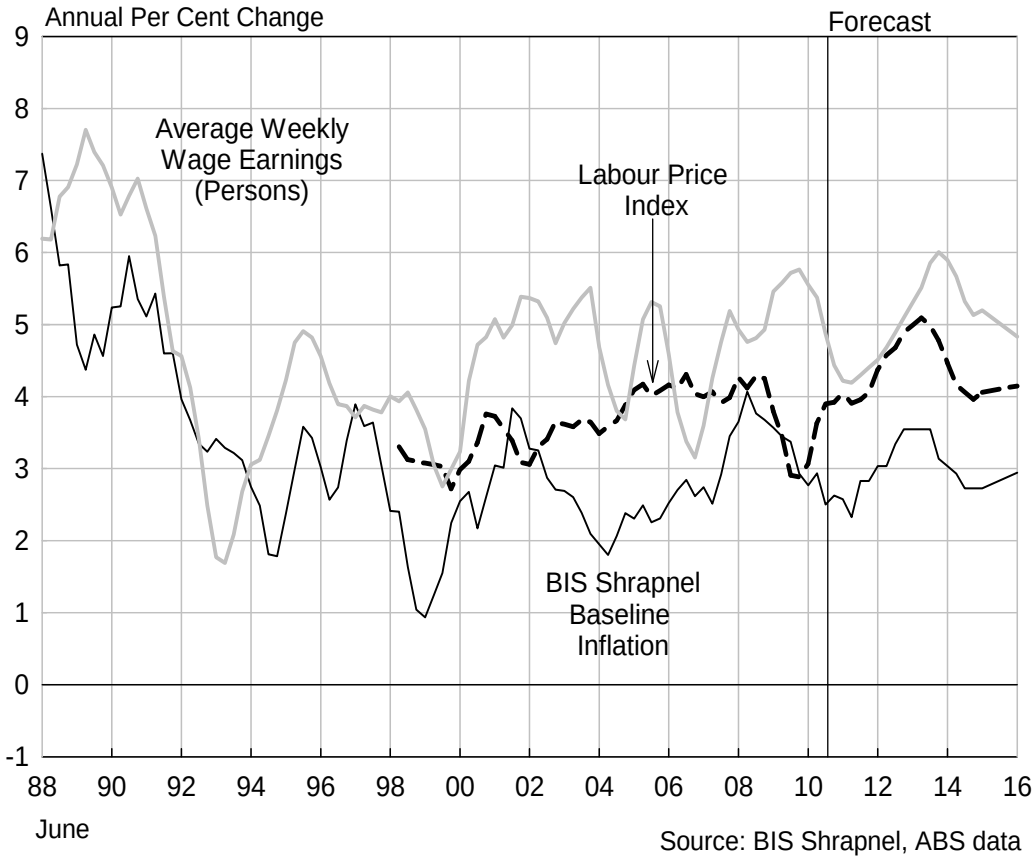
Source: Australian Bureau of Statistics, Employees Earnings and Hours, cat. No. 6306, Table 15
(1) Previous ANZSIC 1993 industry calssification, which was used for May 2006 survey (and all previous surveys). August 2008 was the first survey using new ANZSIC 2006 categories. Updated survey May 2010. PBS and EGW proportions 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 Pay Commission (and by the AIRC previously) each year are usually set in relation to recent increases in the CPI and with regard to the Commission's view of both current and short-term future economic conditions. For instance, the $26.00 increase granted by the Commission in its decision in mid-2010 (effective July 2010) amounted to a 1.2 per cent increase in real terms over the last increase in 2008 and lifted the Federal Minimum Wage to $569.90/week.

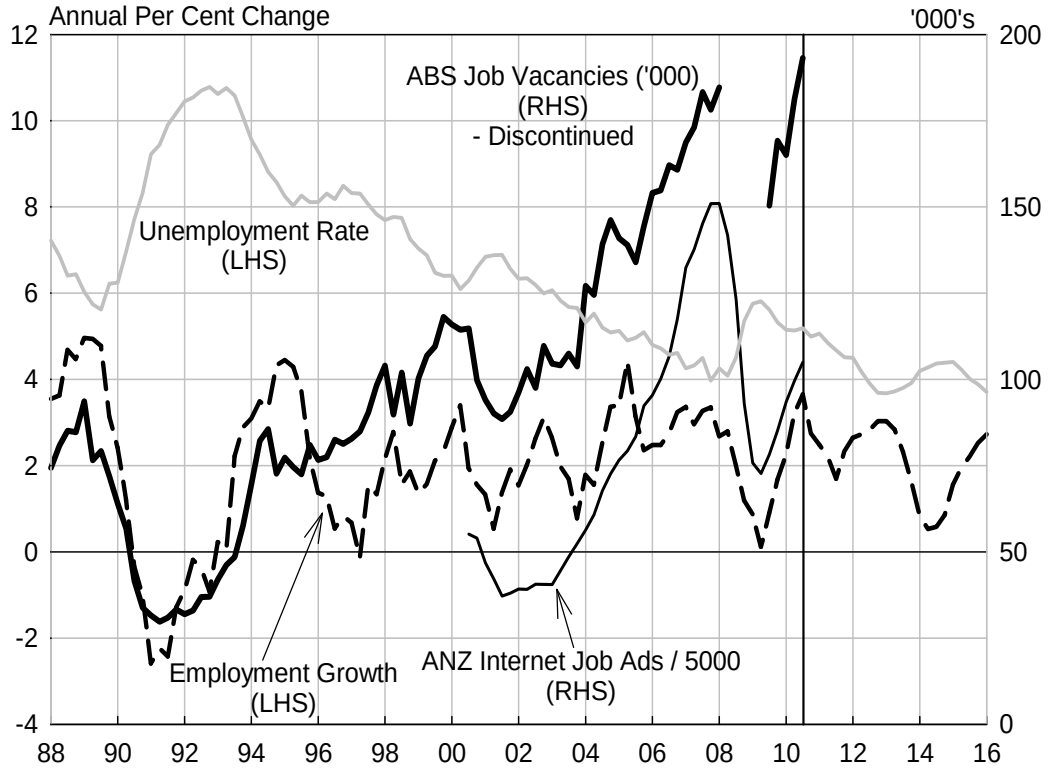
- Increases in collective agreements under enterprise bargaining are influenced by a combination of recent CPI increases, inflationary expectations, the recent profitability of relevant enterprises, current business conditions and the short-term economic outlook, and by the industrial relations 'strength' 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.

Chart 3.1: Australia – Wages and Prices



Source: BIS Shrapnel, ABS data

Chart 3.2: Employment and Unemployment



Source: BIS Shrapnel, ABS data

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

3.1 Outlook for Australian All Industries Wages

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

Wage inflation, as measured by the 'All Industries' LPI (labour price index), accelerated through 2010 from 2.9 per cent through-the-year in the March quarter to 3.9 per cent in the December quarter. In contrast, AWOTE (average weekly ordinary time earnings) lost momentum through the year easing back from growth of 5.8 per cent through-the-year to the March quarter of 2010 to 3.9 per cent through-the-year to the December quarter of 2010. Strong growth in the employment of lower skilled (and lower paid) employees pushed down growth in average wages.

The acceleration in the LPI was driven by a catch-up for workers on the minimum wage (after receiving no increase in entitlement in 2009), the 'normalisation' of trading conditions and the strength of competition for skilled workers. Overall wages growth is not yet a major cause for concern for inflation, with pressures largely contained to the mining, construction and electricity, gas & water sectors where the resumption of the mining investment boom is quickly leading to the re-emergence of skills shortages.

Employment growth has been strong, but demand and profits have not reflected this strength. Although job vacancies remain high, employment growth is expected to slow through 2011, with unemployment expected to be around 4.7 per cent entering 2012. Employment growth through 2010 was largely driven by the public sector and business administration & support services. Sluggish trading conditions for much of the business sector and the start of a phase of budget consolidation by the public sector should be reflected in a slowing in employment growth. This will take pressure off wages growth, which we expect to average around 4.0 per cent through 2011.

However, from 2012 we expect to see a broader pick up in employment, profits and investment with the unemployment rate pushing back towards 4.5 by the start of 2012/13 and LPI wage inflation accelerating to 4.4 per cent through-the-year in the June quarter of 2012. Wage escalation over the next 18 months will be shaped by a moderation in wages growth for award-reliant workers – following the catch-up in 2010 – a modest build in wages growth for those on enterprise bargaining and an acceleration in wages for those on individual agreements, particularly skilled workers.

Recent collective agreements data from the Department of Education, Employment and Workplace Relations (DEEWR) shows that average annualised wage increases (AAWIs) regained momentum in the December quarter of 2009. Growth recovered to around 4 per cent, after losing momentum earlier in the year, and remained around this level in the first two quarters of 2010, boosted by the catch-up in the minimum wage – the annual increase is used as a benchmark for some enterprise bargaining decisions. The divergent outlook for industry sectors will dampen growth in all industry AAWIs for agreements reached in 2011, but the

recovery in growth for 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 GFC 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 3.9 per cent in 2010/11 to 4.1 percent in 2011/12. Subsequently, growth is expected to accelerate to 4.8 per cent over 2012/13 as employment growth regains momentum, the unemployment rate falls below 4% and the pick up in economic activity broadens (see tables 3.1 and 3.3). AWOTE wages growth is expected to reach 4.5 per cent in 2011/12, up from 4.2 per cent in 2010/11, and subsequently accelerate to 5.3 per cent in 2012/13.

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 exceed 5.0 per cent and growth in the LPI just under 5 per cent.

Wages growth (in year average terms) is expected to subsequently rise further and peak at 5.9 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 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 with to 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 2014/15, with wages growth in the individual arrangements and award segments slowing first and the LPI easing back to 4.1 per cent from 4.8 per cent in 2013/14. But with only a small rise expected in the unemployment rate (to 4.4%) because of the deceleration in labour force growth, wage pressures are expected to rise again in 2015/16, with the LPI rising marginally to 4.1 per cent.

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 2025 (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

Calendar 2010 ended on a 'good' note for consumers. A high dollar and subdued consumer demand prompted aggressive discounting by retailers. This, in turn, saw consumer price index increase by a weak 0.4% in the December 2010 quarter bringing the annual headline CPI inflation rate to 2.7%, compared to 2.8% through the year to September 2010. Broad-based price pressures also eased in the quarter. The RBA's indicator of underlying price inflation (the average of the weighted median and the trimmed mean) rose by a modest 0.4% in the December 2010 quarter. In through the year terms, underlying inflation moderated to 2.3% from 2.5% in September 2010 quarter. Annual underlying inflation is now in the bottom half of the RBA's target band.

Despite subdued demand from households following the global financial crisis, broad-based price pressures were sticky downwards. Nonetheless, the recent moderation in annual underlying inflation (from 3.6% in December quarter 2009 to 2.3% in December 2010) reflects the lagged effects of a weak economy over 2009 and the associated easing of capacity pressures and wage growth.

Household budgets have come under pressure from rising living costs. Regulated retail electricity prices jumped in 2010 and are set to rise further in 2011. Petrol prices have also climbed steadily and, given limited supply and a recovering world economy, look set to continue rising in the near term. World food prices are also riding high on the back of strong demand for consumption and ethanol production, as well as a result of volatile supply. However, the combination of an appreciation A$, which has helped offset rising import prices, and sluggish household spending, which has encouraged discounting to protect market shares, has helped dampen overall inflation.

Inflation to remain contained in 2011

We believe underlying inflation will remain weak in the first half of calendar 2011. A high dollar and expected subdued growth in retail spending by households, as consumers show restraint following the recent floods and cyclones, means retailers will continue to have scope to undertake further discounting over the next two quarters. This, in turn, will put downward pressure on prices for a range of consumer goods through to June 2011. In contrast, headline inflation will be higher in the first half of 2011 due to the expected spike in fruit and vegetables prices (due to the floods in the Eastern States and Cyclone Yasi) and higher oil prices as a result of the turmoil in the Middle East.

After remaining weak over 2009, upstream price pressures picked up in 2010. Final-stage producer prices rose 1.0% and 0.3% in the March and June quarters, respectively and strengthened to 1.3% in the September quarter. Although final-stage prices moderated to 0.1% in the December quarter, it increased in annual terms to 2.7% from 2.2% in the September quarter. The pick- up in producer price data over 2010 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 and economic recovery to resume after a pause following the floods), we expect a greater proportion of the lift in producer prices to be passed onto consumers in the second half of 2011.

Overall, we are forecasting underlying CPI inflation to rise to 2.8% (through the year) in December 2011. Meanwhile, headline consumer price inflation — which is expected to rise to 3.0% in March quarter 2011 due to the spike in fruits and vegetables prices — is forecast to fall back (albeit marginally) to 2.9% in December 2011 as the higher fruit and vegetable prices drop out of calculations.

Table 3.3: Wages and Prices – Australia
Year Average Growth

Year Ended June	Average Weekly Ordinary Time Earnings[1]		Labour Price Index	CPI Headline Inflation (BIS Shrapnel forecasts)		Official Headline CPI [2]
	$/week	%CH	2008/09=100	89/90=100	%CH	%CH
1990	521.0	6.9		100.0	8.0	8.0
1991	555.4	6.6		105.3	5.3	5.3
1992	580.8	4.6		107.3	1.9	1.9
1993	591.0	1.8		108.4	1.0	1.0
1994	609.1	3.1		110.4	1.8	1.8
1995	634.9	4.2		113.9	3.2	3.2
1996	663.8	4.6		118.7	4.2	4.2
1997	688.5	3.7		120.3	1.3	1.3
1998	716.0	4.0		120.3	0.0	0.0
1999	741.4	3.5	3.1	121.8	1.3	1.3
2000	765.4	3.2	3.0	124.7	2.4	2.4
2001	804.2	5.1	3.5	132.2	6.0	6.0
2002	847.4	5.4	3.3	136.0	2.9	2.9
2003	890.0	5.0	3.5	140.2	3.1	3.1
2004	931.6	4.7	3.6	143.5	2.4	2.4
2005	972.9	4.4	3.7	147.0	2.4	2.4
2006	1 017.5	4.6	4.1	151.7	3.2	3.2
2007	1 054.1	3.6	3.9	156.1	2.9	2.9
2008	1 106.1	4.9	4.1	161.4	3.4	3.4
2009	1 166.5	5.5	4.1	166.4	3.1	3.1
2010	1 231.3	5.6	3.1	170.3	2.3	2.3
Forecasts						
2011	1 283.2	4.2	3.9	175.1	2.8	2.5
2012	1 341.1	4.5	4.1	180.1	2.8	2.9
2013	1 412.2	5.3	4.8	186.2	3.4	3.0
2014	1 495.5	5.9	4.8	192.1	3.2	2.5
2015	1 572.9	5.2	4.1	197.1	2.6	2.5
2016	1 648.9	4.8	4.2	202.8	2.9	2.5
Compound Annual Growth Rates						
1990-2000	3.9			2.2		2.2
2000-2010	4.9		3.7	3.2		3.2
2005-2010	4.8		3.9	3.0		3.0
2010-2016	5.0		4.3	3.0		2.6

Source: BIS Shrapnel, ABS data

(1) Earnings per person for full-time adults. Data is year ended May (available only mid month of quarter).
(2) RBA Forecasts to December 2012. Beyond 2012, Commonwealth Treasury's forecasts are used.

. . .but pressures will start to build through 2012

The Australian economy is entering the next cyclical upturn with limited spare resources. Employment has grown strongly over the past year and the unemployment rate has fallen back from its peak of 5.8 per cent reached in mid 2009, to 5.0 per cent in December 2010. In addition, surveys of business capacity utilisation indicate that the levels of capacity utilisation are now back above long-run average levels and continues to trend upward.

Meanwhile, Asia and China's strong demand for resources has underpinned substantial rises in the prices of Australia's main commodity exports, namely iron ore and coking coal. The surge in iron ore and coal prices will again provide a large stimulus to Australia's terms of trade boosting Australian incomes and spending capacity. With the economy expected to hit full productive capacity within two years and the terms of trade likely to regain its peak of a couple of years ago, the strong demand inflationary pressures of pre global financial crisis is expected to come through in 2012.

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 the end of 2011. An appreciating A$ will take some pressure off commodity prices, while 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$.

Employment growth will follow this recovery in demand and output, with accelerating growth in employment over 2012 producing a decline in the unemployment rate, falling below 5 per cent by mid 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 the demand inflationary pressures during 2012. Wages growth is also expected to pick up over these two years, with an accompanying slowing in productivity growth also adding to the rise in unit labour costs and non-tradeables inflation.

We are forecasting that both underlying and headline consumer price inflation will push above 3% by the end of 2012. Pressures will be broad-based, but labour shortages will be the key constrain 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 pressures will be sticky downward. However, underlying inflation is projected to return to the top end of the RBA's 2-3 per cent target range over the first half of 2014.

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 current economic upswing. 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 February 'Statement on Monetary Policy' is similar to BIS Shrapnel's CPI forecast to 2012 (RBA current forecasts only extend to June 2013) with the headline CPI rate rising to 3 by December 2010, and remaining within a 2.75 per cent to 3.0 per cent band until December 2013. The Federal Treasury revised up its estimate for through-the-year growth in the June quarter of 2012 from 2.5 to 3.0 per cent in its Mid Year Economic and Fiscal Outlook for 2010-11.

4. GENERAL LABOUR COST ESCALATION

General labour includes mainly clerical/administration, professionals and managerial staff, who provide mainly administration and corporate support services.

The escalator BIS Shrapnel originally proposed to use for 'General Labour' was wage movements in each of South Australia and Queensland for the two industry sectors:

- Administration and Support Services (ASS)
- Professional, Scientific and Technical Services (PSTS)

These two sectors combined cover the majority of the 'general' labour — both internal and services contracted out (such as legal services, auditing, consulting, engineering design consultancies, etc). As such, the wage movements in these two sectors would be a better escalator for Envestra Limited than the 'all industries' (total state) 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 used Access Economics' forecasts of wage movements in the Administrative and Support Services (ASS) sector as the escalator for 'general labour'. The ASS classification does not take into account the higher skilled 'professionals and managerial staff' within Envestra Limited. As such, a 'general labour' wage escalator solely based on the ASS sector is likely to understate the 'true' general labour costs for Envestra Limited. We have used a weighted average of PSTS and ASS to derive our escalator forecasts for 'general labour'.

However, because the state wage data for the ASS and PSTS only started in the June quarter, 2009, we reverted to the 'old' ANZSIC1993 industry classification 'Property and Business Services' (PBS). We have a long time series of data for PBS at the national and state levels (see Tables 4.2 and 4.3). Under the new ABS industry ANZSIC2006 classifications (August

Table 4.1: Property & Business Services Wages Growth – Australia

	Year Average Percent Change													
							Forecast						Averages	
Year Ended June	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2000-10	2011-16
Proportion of Workforce by Pay setting Method														
Awards Only	21.5%	23.2%	19.2%	15.1%	16.2%	17.3%	17.3%	17.3%	17.3%	17.3%	17.3%	17.3%	19.0%	17.3%
Collective Agreements	14.2%	15.5%	13.3%	11.0%	14.3%	17.5%	17.5%	17.5%	17.5%	17.5%	17.5%	17.5%	13.2%	17.5%
Individual Arrangements	64.4%	61.3%	67.6%	73.9%	69.6%	65.2%	65.2%	65.2%	65.2%	65.2%	65.2%	65.2%	67.8%	65.2%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
AWOTE														
Awards Only (a)	1.9	1.7	1.9	1.3	1.5	0.4	1.9	1.3	1.4	1.6	1.2	1.6	1.6	1.5
Collective Agreements	4.1	3.8	4.0	4.0	4.2	3.8	3.9	4.1	4.4	4.5	4.2	4.1	3.9	4.2
Individual Arrangements (b)	3.2	10.8	2.0	10.4	8.1	8.2	3.8	6.3	7.6	8.3	7.0	6.0	6.9	6.5
AWOTE (Persons)(c)	**3.1**	**7.6**	**2.3**	**8.3**	**6.4**	**6.1**	**3.5**	**5.0**	**6.0**	**6.5**	**5.5**	**4.9**	**5.5**	**5.2**
Labour Price Index														
Awards Only (a)	1.9	1.7	1.9	1.3	1.5	0.4	1.9	1.3	1.4	1.6	1.2	1.6	1.6	1.5
Collective Agreements	4.1	3.8	4.0	4.0	4.2	3.8	3.9	4.1	4.4	4.5	4.2	4.1	3.9	4.2
Individual Arrangements (b)	3.1	4.9	4.4	4.6	5.2	3.3	4.7	5.1	5.6	5.6	4.5	4.8	3.7	5.1
Labour Price Index (Ord. Time)	**3.0**	**4.0**	**3.9**	**4.0**	**4.5**	**2.9**	**4.1**	**4.3**	**4.7**	**4.7**	**3.9**	**4.1**	**3.3**	**4.3**
Compositional Effects + Bonuses,etc	0.1	3.6	-1.6	4.3	2.0	3.2	-0.6	0.8	1.3	1.8	1.6	0.8	2.1	0.9

Source: BIS Shrapnel, ABS, DEEWR

(a) Contribution of nominal award wage increas to total wages growth, rather than percent change in award wages
(b) Calculated as a residual - affected by compositional effects and the payments of bonuses, incentive payments, etc
(c) Full-time Adult Persons, excluding overtime

Table 4.2: Average Weekly Ordinary Time Earnings and Labour Price Index Total Australia (All Industries) and Property & Business Services

(Year Average Growth)

Year Ended June	Average Weekly Ordinary Time Earnings ([1])				Labour Price Index ([2])			
	All Industries		Property & Business Services		All Industries		Property & Business Services	
	$	%CH	$	%CH	Index	%CH	Index	%CH
1989	487.3	7.2	535.6	7.1				
1990	521.0	6.9	573.8	7.1				
1991	555.4	6.6	611.3	6.5				
1992	580.8	4.6	649.4	6.2				
1993	591.0	1.8	634.4	-2.3				
1994	609.1	3.1	664.1	2.9				
1995	634.9	4.2	664.1	1.8				
1996	663.8	4.6	710.1	6.9				
1997	688.5	3.7	717.1	1.0				
1998	716.0	4.0	731.9	3.1	67.5		69.8	
1999	741.4	3.5	764.6	4.5	69.6	3.1	71.7	2.7
2000	765.4	3.2	793.9	3.8	71.7	3.0	73.6	2.7
2001	804.2	5.1	870.6	9.7	74.2	3.5	75.9	3.1
2002	847.4	5.4	945.9	8.6	76.7	3.3	77.7	2.4
2003	890.0	5.0	974.2	3.0	79.3	3.5	80.0	3.0
2004	931.6	4.7	987.8	1.4	82.2	3.6	82.7	3.4
2005	972.9	4.4	1018.1	3.1	85.3	3.7	85.2	3.0
2006	1 017.5	4.6	1095.6	7.6	88.7	4.1	88.6	4.0
2007	1 054.1	3.6	1120.4	2.3	92.2	3.9	92.0	3.9
2008	1 106.1	4.9	1213.8	8.3	96.1	4.1	95.7	4.0
2009	1 166.5	5.5	1292.0	6.4	100.0	4.1	100.0	4.5
2010	1 231.3	5.6	1370.6	6.1	103.1	3.1	102.9	2.9
Forecasts								
2011	1 283.2	4.2	1,418.5	3.5	107.1	3.9	107.1	4.1
2012	1 341.1	4.5	1,490.0	5.0	111.4	4.1	111.6	4.3
2013	1 412.2	5.3	1,579.0	6.0	116.8	4.8	116.9	4.7
2014	1 495.5	5.9	1,681.2	6.5	122.4	4.8	122.4	4.7
2015	1 572.9	5.2	1,773.8	5.5	127.4	4.1	127.1	3.9
2016	1 648.9	4.8	1,860.8	4.9	132.7	4.2	132.3	4.1
Compound Annual Growth Rates								
1990-2000	3.9		3.3					
2000-2010	4.9		5.6		3.7		3.4	
2005-2010	4.8		6.1		3.9		3.9	
2010-2016	5.0		5.2		4.3		4.3	

Source: BIS Shrapnel, ABS

(1) Earnings of persons. Data is year ended May.
(2) Ordinary time hours excluding bonuses.

2009 was the first quarter where wages data was classified under the ANZSIC2006) PBS has effectively been split into three sectors, but ASS and PSTS comprise the bulk (over 80%) of employment in the old PBS (the other 'new' sector is 'Rental, Hiring and Leasing Services'), so PBS is a very good proxy for general labour.

Property and business services wages at the national level are forecast to average 5.2 per cent per annum (in nominal terms) over the six years from 2010/11 to 2015/16, in AWOTE terms (see Table 4.2). In Labour Price Index (LPI) terms, the average growth is forecast to be 4.3 per cent at the national level. The components and rationale for this sector are set out in Table 4.1.

The PBS sector experienced a sustained period of high demand for their services and labour between 2001/02 and 2007/08, boosted initially by residential property and construction and then from strong business investment and jobs growth. This fuelled above average growth in wages (on an AWOTE basis). However the credit crisis and GFC hit employment growth in 2008/09 and, in a lagged response, hit wages growth in 2009/10.

Wages growth in the PSTS and ASS sectors picked up (in LPI terms) over 2010/11 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 next year), wages growth is expected to strengthen further in 2011/12. Meanwhile, AWOTE growth is expected to strengthen from 2011/12 in line with the gathering momentum in business and residential investment. Given 65% 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. With labour shortages expected to be apparent by 2012/13 – when the national unemployment rate is sustained below 4% - plus the prospect of healthier profits, wages growth is forecast to accelerate and outstrip the national average (in AWOTE terms), before easing later in the period (see Table 4.2).

4.1 State Wage forecasts for Property and Business Services

The state forecasts for PBS wages are set out in Table 4.3. The year-to-year forecasts tend to follow the investment cycle and relative strength of each state's Gross State Product (GSP), State Final Demand (SFD) and overall employment over the next 6 years. PBS wages growth in South Australia is close to the national average over the next two-to-three years before it dips below the national average in 2013/14 – but is nevertheless still strong over 2012/13 to 2014/15.

PBS wages growth in Queensland, meanwhile, is expected to be weaker than the national average over 2010/11, before accelerating and outstripping the national average from 2012/13. Demand for PBS labour is expected to strengthen significantly over 2011/12 and over the following two years as demand for those with professional, technical and engineering skills are required firstly for the reconstruction efforts and subsequently for the upturn in residential and business investment, the latter including the major LNG and coal-related projects.

Over the next six years from 2010/11 to 2015/16, PBS wages growth in South Australia and Queensland is forecast to average 5.0% per annum – slightly lower than the national average.

Table 4.3: AWOTE Persons by State – Property & Business Services (Year Average Growth)

	NSW		VIC		QLD		SA		WA		TAS		NT		ACT		AUSTRALIA	
Year Ended	Year Avg		Year Avg		Year Avg		Year Avg		Year Avg		Year Avg		Year Avg		Year Avg		Year Avg	
May	$	A%Ch	$	A%Ch	$	A%Ch	$	A%Ch	$	A%Ch	$	A%Ch	$	A%Ch	$	A%Ch	$	A%Ch
1985	363		395		362		365		371		366		411		460		374	
1986	391	7.9	432	9.2	410	13.2	393	7.9	436	17.4	425	16.0	457	11.3	487	5.9	411	10.0
1987	436	11.5	493	14.0	463	12.9	434	10.4	452	3.7	454	6.8	469	2.6	529	8.6	459	11.5
1988	483	10.6	538	9.2	497	7.3	447	3.0	512	13.2	468	3.1	463	-1.4	580	9.7	500	9.0
1989	527	9.1	585	8.7	483	-2.7	482	7.8	542	5.8	491	4.9	519	12.1	604	4.1	536	7.1
1990	585	11.2	603	3.1	520	7.6	511	6.0	541	-0.2	559	13.8	569	9.8	610	1.1	574	7.1
1991	624	6.5	643	6.7	514	-1.2	597	16.9	637	17.7	621	11.1	653	14.8	674	10.5	611	6.5
1992	709	13.7	646	0.5	529	2.9	620	3.8	636	-0.1	557	-10.2	702	7.5	716	6.2	649	6.2
1993	661	-6.7	638	-1.2	542	2.6	610	-1.7	638	0.3	555	-0.5	674	-4.0	736	2.9	634	-2.3
1994	666	0.7	685	7.3	567	4.6	642	5.4	625	-2.0	524	-5.5	620	-8.0	726	-1.4	652	2.9
1995	722	8.4	664	-3.0	556	-1.9	626	-2.6	671	7.4	631	20.5	643	3.7	708	-2.6	664	1.8
1996	759	5.1	729	9.8	581	4.4	721	15.2	702	4.6	586	-7.2	648	0.8	791	11.8	710	6.9
1997	730	-3.7	774	6.1	634	9.1	665	-7.8	724	3.1	511	-12.8	695	7.2	721	-8.9	717	1.0
1998	739	1.2	782	1.1	655	3.4	691	3.9	708	-2.3	600	17.5	745	7.2	907	25.7	732	2.1
1999	784	6.2	792	1.2	691	5.4	660	-4.4	795	12.4	532	-11.3	691	-7.2	883	-2.6	765	4.5
2000	856	9.1	801	1.1	679	-1.7	616	-6.7	821	3.2	704	32.3	674	-2.5	1016	15.0	794	3.8
2001	923	7.9	834	4.2	792	16.6	746	21.1	953	16.1	741	5.1	784	16.3	1020	0.5	871	9.7
2002	1007	9.1	945	13.2	834	5.3	808	8.3	951	-0.3	740	0.0	863	10.2	1047	2.6	946	8.6
2003	988	-1.9	1011	7.1	834	0.0	943	16.8	968	1.8	838	13.2	841	-2.5	1274	21.7	974	3.0
2004	980	-0.7	1048	3.6	889	6.7	937	-0.7	969	0.1	863	2.9	890	5.8	1238	-2.8	988	1.4
2005	1026	4.6	1070	2.1	984	10.7	944	0.8	950	-2.0	886	2.8	922	3.5	1311	5.9	1018	3.1
2006	1100	7.2	1125	5.1	1052	6.9	1040	10.2	1067	12.4	839	-5.4	1074	16.5	1277	-2.6	1096	7.6
2007	1116	1.5	1090	-3.0	1111	5.6	1065	2.4	1284	20.3	923	10.1	1061	-1.2	1290	1.0	1120	2.3
2008	1182	5.9	1208	10.8	1170	5.3	1082	1.6	1426	11.1	1126	22.0	1096	3.3	1436	11.3	1214	8.3
2009	1282	8.4	1243	2.9	1255	7.2	1193	10.3	1482	3.9	1313	16.6	1088	-0.8	1524	6.1	1292	6.4
2010	1410	10.0	1230	-1.0	1284	2.3	1235	3.6	1755	18.4	1476	12.4	1147	5.4	1621	6.4	1371	6.1
Forecast																		
2011					1309	2.0	1308	2.7									1418	3.4
2012					1375	5.0	1365	4.9									1489	5.0
2013					1461	6.3	1437	6.0									1578	6.0
2014					1558	6.7	1514	6.2									1680	6.5
2015					1645	5.5	1586	5.3									1773	5.5
2016					1724	4.8	1657	4.7									1860	4.9
Compound Annual Average Growth Rates																		
1985-2010	5.6		4.6		5.2		5.0		6.4		5.7		4.2		5.2		5.3	
1990-2000	3.9		2.9		2.7		1.9		4.3		2.3		1.7		5.2		3.3	
2000-2010	5.1		4.4		6.6		7.2		7.9		7.7		5.5		4.8		5.6	
2005-2010	5.5		3.5		7.1		4.9		8.9		8.8		4.1		4.2		5.5	
2010-2016					5.0		5.0										5.2	

Source: BIS Shrapnel, ABS Data

4.2 Productivity-Adjusted Wage Forecasts for Business Services

At the Australian level, productivity growth in the business services sector is forecast to increase by an average of 0.7% over the next six years from 2010/11 to 2015/16 inclusive, slightly faster than the previous decade. In Queensland, business services productivity is forecast to increase at an annual average rate of 1.1% pa, faster than the last decade mainly because of slower employment growth and modest output growth (see table 4.5). Productivity growth is expected to improve in the forecast period as predicted labour shortages force employers to utilise their labour better, much of it obtained over the last few years.

Productivity growth in the South Australian business services sector is forecast to average 2.5% per annum, but most of this is attributable to the robust 11.4% growth in 2010/11, with only weak growth expected after that. Productivity appears to surge in the South Australian business services sector in 2010/11, but this is largely due to a sharp fall in employment growth (see table 4.6). The steep fall in employment largely reverses the strong increases in 2008/09 and 2009/10, with particularly large falls in the professional, scientific and technical services sub-sector in over the six months to August mainly responsible for the overall decline. However, it should be noted that industry employment data in South Australia can be quite volatile. As discussed in section 5.4.2, it may be better to use an average productivity growth over a cycle to smooth the volatility.

The end result is that once nominal AWOTE is adjusted for CPI inflation and productivity movements, the real productivity adjusted AWOTE for Business Services is forecast to average -0.6 per cent per annum over the six years from 2010/11 to 2015/16 for the South Australian business services sector and 1.0 per cent per annum for the Queensland business services sector (see table 1b in the Summary).

Table 4.4: Property and Business Services
Output, Employment and Productivity: Australia

Australia						
Year Ended June	Gross Value Added		Employment		Productivity $/employee	
	$m	%CH	'000	%CH	('000)	%CH
1990	56140		664.9		84.4	
1991	56776	1.1	667.2	0.3	85.1	0.8
1992	57918	2.0	683.5	2.5	84.7	-0.4
1993	59132	2.1	678.2	-0.8	87.2	2.9
1994	62043	4.9	700.1	3.2	88.6	1.6
1995	70778	14.1	807.4	15.3	87.7	-1.1
1996	73883	4.4	853.7	5.7	86.5	-1.3
1997	79938	8.2	888.6	4.1	90.0	3.9
1998	87120	9.0	951.7	7.1	91.5	1.8
1999	95362	9.5	994.1	4.5	95.9	4.8
2000	101099	6.0	1 027.8	3.4	98.4	2.5
2001	110113	8.9	1 102.5	7.3	99.9	1.5
2002	116763	6.0	1 072.2	-2.7	108.9	9.0
2003	120565	3.3	1 116.4	4.1	108.0	-0.8
2004	125324	3.9	1 153.8	3.3	108.6	0.6
2005	127642	1.8	1 179.6	2.2	108.2	-0.4
2006	131507	3.0	1 259.3	6.8	104.4	-3.5
2007	131556	0.0	1 301.3	3.3	101.1	-3.2
2008	134430	2.2	1 335.7	2.6	100.6	-0.4
2009	137432	2.2	1 326.3	-0.7	103.6	3.0
2010	141344	2.8	1 393.6	5.1	101.4	-2.1
Forecasts						
2011	147466	4.3	1 468.9	5.4	100.4	-1.0
2012	153611	4.2	1 514.9	3.1	101.4	1.0
2013	159875	4.1	1 587.3	4.8	100.7	-0.7
2014	163828	2.5	1 622.3	2.2	101.0	0.3
2015	170095	3.8	1 627.6	0.3	104.5	3.5
2016	177922	4.6	1 683.1	3.4	105.7	1.1
Compound Annual Growth Rates						
1990-2000	6.1		4.5		1.5	
2000-2010	3.4		3.1		0.3	
2005-2010	2.1		3.4		-1.3	
2010-2016	3.9		3.2		0.7	

Source: BIS Shrapnel, ABS data

Table 4.5: Property and Business Services
Output, Employment and Productivity: Queensland

Queensland						
Year Ended June	Gross Value Added		Employment		Productivity $/employee	
	$m	%CH	'000	%CH	('000)	%CH
1990	8234		106.9		77.1	
1991	8374	1.7	111.4	4.2	75.2	-2.4
1992	8532	1.9	112.3	0.8	76.0	1.0
1993	8776	2.9	114.6	2.1	76.6	0.8
1994	9298	5.9	118.9	3.7	78.2	2.2
1995	11360	22.2	149.5	25.7	76.0	-2.8
1996	11591	2.0	154.0	3.0	75.3	-1.0
1997	11873	2.4	152.7	-0.9	77.8	3.3
1998	13014	9.6	171.0	12.0	76.1	-2.2
1999	13131	0.9	163.6	-4.3	80.2	5.5
2000	14284	8.8	174.8	6.8	81.7	1.8
2001	15772	10.4	189.9	8.7	83.0	1.6
2002	18066	14.5	183.8	-3.3	98.3	18.4
2003	19404	7.4	201.2	9.5	96.4	-1.9
2004	21867	12.7	208.5	3.6	104.9	8.7
2005	22503	2.9	224.0	7.4	100.5	-4.2
2006	22973	2.1	244.9	9.3	93.8	-6.6
2007	23414	1.9	262.1	7.0	89.3	-4.8
2008	23704	1.2	268.0	2.3	88.4	-1.0
2009	23591	-0.5	265.8	-0.8	88.8	0.4
2010	23277	-1.3	280.1	5.4	83.1	-6.4
Forecasts						
2011	23819	2.3	282.6	0.9	84.3	1.4
2012	24874	4.4	292.8	3.6	85.0	0.8
2013	25997	4.5	308.3	5.3	84.3	-0.7
2014	26921	3.6	318.0	3.1	84.7	0.4
2015	28006	4.0	319.2	0.4	87.7	3.6
2016	29348	4.8	330.5	3.5	88.8	1.2
	Compound Annual Growth Rates					
1990-2000	5.7		5.0		0.6	
2000-2010	5.0		4.8		0.2	
2005-2010	0.7		4.6		-3.7	
2010-2016	3.9		2.8		1.1	

Source: BIS Shrapnel, ABS data

Table 4.6: Property and Business Services
Output, Employment and Productivity: South Australia

	South Australia					
Year Ended June	Gross Value Added		Employment		Productivity $/employee	
	$m	%CH	'000	%CH	('000)	%CH
1990	3357		48.2		69.7	
1991	3571	6.4	52.0	7.8	68.7	-1.4
1992	3468	-2.9	49.7	-4.4	69.8	1.6
1993	3290	-5.1	47.0	-5.5	70.0	0.4
1994	3526	7.2	52.3	11.3	67.4	-3.7
1995	3826	8.5	57.8	10.6	66.2	-1.9
1996	4105	7.3	60.9	5.4	67.4	1.8
1997	4610	12.3	63.7	4.5	72.4	7.5
1998	4743	2.9	63.6	-0.1	74.5	2.9
1999	5314	12.0	68.3	7.3	77.8	4.4
2000	5419	2.0	69.5	1.8	78.0	0.2
2001	5749	6.1	72.5	4.3	79.4	1.7
2002	6061	5.4	72.8	0.5	83.2	4.9
2003	6272	3.5	73.0	0.2	86.0	3.3
2004	6478	3.3	75.5	3.4	85.8	-0.2
2005	6323	-2.4	78.9	4.5	80.2	-6.6
2006	6577	4.0	76.4	-3.1	86.1	7.3
2007	6561	-0.2	83.6	9.4	78.4	-8.9
2008	6806	3.7	80.2	-4.1	84.9	8.2
2009	7112	4.5	86.6	8.0	82.1	-3.2
2010	7279	2.3	94.0	8.6	77.4	-5.8
Forecasts						
2011	7399	1.6	85.8	-8.7	86.2	11.4
2012	7651	3.4	88.0	2.5	86.9	0.9
2013	7925	3.6	91.7	4.2	86.4	-0.6
2014	8061	1.7	92.4	0.7	87.3	1.0
2015	8262	2.5	92.2	-0.1	89.6	2.6
2016	8515	3.1	95.0	3.0	89.6	0.1
Compound Annual Growth Rates						
1990-2000	4.9		3.7		1.1	
2000-2010	3.0		3.1		-0.1	
2005-2010	2.9		3.6		-0.7	
2010-2016	2.6		0.2		2.5	

Source: BIS Shrapnel, ABS data

5. GAS NETWORK-RELATED LABOUR COST ESCALATION

5.1 Wage forecasts for the utilities sector – Australia

Overall, it is BIS Shrapnel's opinion that wages growth in the electricity, gas and water sector for total Australia — expressed in average weekly ordinary time earnings (AWOTE) — will average 5.9 per cent per annum (0.9 per cent higher than the national AWOTE average of 5.0 per cent per annum) over the six years from 2010/11 to 2015/16. Meanwhile, growth in the labour price index (LPI) for the Australian electricity, gas and water sector is forecast to average 5.0 per cent per annum (0.7 per cent higher than national LPI growth of 4.3 per cent per annum) over the six years to 2015/16. The faster wages growth expected in the electricity, gas and water sector over the next six years is in line with historical movements over the past 15 years (see Table 5.5).

5.1.1 AWOTE better reflects changes in labour costs for Electricity, Gas and Water Enterprises

BIS Shrapnel notes that in its recent draft decision for the Victorian Draft Determination, the Australian Energy Regulator (AER) stated that "consistent with previous AER determinations, the AER considers that the LPI is the measure that most reasonably reflects the labour costs that a Victorian DNSP is likely to incur".

We disagree with this statement from the AER. Changes in labour costs for an enterprise (such as Envestra Limited) or an industry (such as the Electricity, Gas and Water Supply sector) are driven both by changes in the price of grades of specific labour and by changes in skill levels (for which employees are promoted to higher grades, at a higher cost to the enterprise).

The labour price index only measures changes in the *price* of labour, or wage rates, for specific occupations or job classification, 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. That is, the labour price index is a measure of *underlying* wage inflation in the economy. The LPI, therefore, reflects pure price changes, but does not measure variations in quality of the quantity of work performed. The LPI also does not reliably measure the changes in total labour costs which the Victorian DNSP incur, because the LPI does not reflect 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.

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. Nonetheless, to enable comparisons with the Access Economics' forecasts provided to the AER, we have included forecasts of the LPI for the EGW sector in Queensland and South Australia. This is based on the national EGW LPI forecasts as the LPI data is not available for the EGW sector by state.

5.1.2 Electricity, gas and water sector wages growth will continue to be much higher than All Industries average due to a stronger demand for skilled labour

Wages growth in the electricity, gas and water sector is usually 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 (except in 1998/99 and 2007/08, when it was within 0.1% of the national average) and has averaged 0.6 per cent higher over the decade to 2009/10 (see Table 5.5). While growth in average weekly ordinary time earnings of the

Table 5.1: Labour Price Index Growth by Industry Sector and by State

Sector	% of Total Employment Dec 2010	Labour Price Index[1] Annual Percent Change									Five-Year Average
		Jun '06	Jun'07	Jun'08	Jun'09	Dec'09	Mar'10	Jun'10	Sep'10	Dec'10	
Private		4.0	3.9	4.4	3.6	2.5	2.6	2.7	3.5	3.9	3.8
Public		4.3	4.2	3.9	4.4	4.0	4.3	4.0	4.0	4.0	4.1
Industry											
Mining	1.8%	5.9	5.5	6.7	4.2	3.6	3.4	3.8	3.9	4.5	5.2
Manufacturing	8.7%	3.9	4.1	4.6	2.5	2.1	2.2	2.6	3.2	3.7	3.6
Electricity, Gas, Water and Waste Services	1.3%	6.4	4.0	3.5	4.7	3.7	4.6	4.7	4.5	4.8	4.7
Construction	9.3%	5.9	4.2	4.7	4.5	3.5	2.9	2.9	3.7	3.9	4.4
Wholesale Trade	3.5%	3.7	3.7	4.6	3.3	2.5	2.1	1.7	2.4	3.5	3.5
Retail Trade	10.9%	3.4	3.1	4.5	3.5	2.4	2.4	2.8	3.5	3.3	3.5
Accommodation and Food Services	6.7%	3.3	3.0	2.3	3.4	1.9	1.8	2.0	3.4	3.5	2.8
Transport, Postal and Warehousing	5.1%	4.2	4.1	3.9	4.4	4.1	3.4	3.2	3.1	2.8	3.9
Information Media and Telecommunications	1.9%	2.8	3.6	3.9	3.0	2.0	2.0	2.0	2.3	3.0	3.0
Finance and Insurance Services	3.4%	4.0	4.3	3.6	3.2	2.1	2.9	3.1	4.2	4.4	3.7
Rental, Hiring and Real Estate services	1.9%	3.9	3.0	4.1	3.6	2.0	2.2	2.5	2.6	2.9	3.5
Professional, Scientific and Technical Services	7.4%	4.3	4.3	5.1	5.1	2.9	3.0	2.9	4.0	4.6	4.3
Administration and Support Services	3.8%	3.3	3.6	4.9	2.9	1.9	1.9	2.5	3.4	4.0	3.7
Public Administration and Safety	6.0%	4.2	4.3	3.9	4.5	3.7	3.9	3.7	3.9	4.0	4.1
Education	7.7%	4.4	4.1	4.0	4.5	3.9	4.3	3.9	4.4	4.4	4.2
Health Care and Social Assistance	11.4%	4.5	4.3	3.6	3.9	3.9	3.7	4.0	3.7	3.6	3.9
Arts and Recreation Services	1.7%	3.0	4.4	3.4	3.9	2.5	3.0	2.8	3.3	3.1	3.5
Other Services	4.1%	3.2	4.0	3.3	3.3	2.1	2.5	2.3	3.3	3.1	3.1
State/Territory											
New South Wales	31.6	3.9	3.8	4.0	3.6	2.9	3.2	3.1	3.4	3.8	3.7
Victoria	25.1	3.7	3.6	4.2	3.4	2.7	2.7	2.7	3.5	3.7	3.6
Queensland	20.5	4.7	4.6	3.9	4.1	3.1	3.2	3.3	3.9	4.2	4.1
South Australia	7.1	3.7	4.3	4.6	3.7	2.4	2.5	2.9	3.3	3.9	3.8
Western Australia	10.7	4.6	5.2	5.6	4.6	3.0	3.0	3.4	3.9	4.0	4.6
Tasmania	2.1	4.1	4.5	3.6	4.2	3.6	3.6	3.6	3.2	3.4	3.9
Northern Territory	1.1	3.9	4.3	4.2	3.8	3.4	3.2	3.4	3.8	3.8	3.9
Australian Capital Territory (ACT)	1.8	3.8	4.3	4.0	4.1	3.7	3.4	3.0	3.8	3.7	3.9
Total All[2]	100	4.2	4.0	4.1	4.2	2.9	2.9	3.1	3.6	3.9	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 5.2: Australia
AWOTE Growth by Industry Sector

Industry Sector	% of Total Employment Nov 2010	Average Weekly Earnings[1] $ / Week Nov '10	Annual Percent Change								Five-Year Average
			May '06	May '07	May '08	May'09	Nov,09	Feb'10	May'10	Aug'10	Nov'10	
Mining	1.8%	2 077	5.3	5.8	9.5	6.4	7.8	7.8	6.4	8.2	6.8	7.6
Manufacturing	8.7%	1 144	3.8	4.5	4.1	4.5	1.7	1.4	1.5	2.2	1.7	3.8
Electricity, gas, water and waste services	1.3%	1 461	1.0	4.2	2.2	7.0	6.8	8.2	9.5	10.7	9.1	5.6
Construction	9.3%	1 299	-1.4	8.0	7.1	9.0	7.8	8.7	6.8	6.4	4.4	6.6
Wholesale trade	3.5%	1 199	3.2	5.9	3.9	4.8	3.1	3.8	0.8	2.9	2.5	4.0
Retail trade	10.9%	945	8.3	4.0	2.5	4.8	5.6	5.7	6.3	2.9	1.4	3.9
Accommodation and food services	6.7%	925	7.3	8.9	0.1	3.5	5.7	3.4	4.5	3.9	3.4	4.8
Transport, postal and warehousing	5.1%	1 228	4.5	-0.5	1.8	3.4	4.1	7.8	7.5	11.5	10.3	4.1
Information media and telecommunications	1.9%	1 511	1.9	10.8	4.2	5.2	6.3	5.6	5.6	5.5	4.2	5.5
Finance and insurance	3.4%	1 549	3.7	3.7	4.9	1.4	2.4	6.6	7.5	7.5	8.8	4.1
Rental hiring and real estate services	1.9%	1 206	5.9	3.9	7.7	6.4	4.4	1.2	1.8	-3.7	-2.6	3.9
Professional, scientific and technical services	7.4%	1 538	4.7	5.0	6.5	5.6	4.7	6.1	7.1	6.4	5.8	5.4
Administration and support services	3.8%	1 211	3.1	4.5	7.7	6.4	8.2	7.9	7.3	2.9	1.3	5.1
Public administration and defence	6.0%	1 538	4.5	3.5	3.8	6.0	7.2	7.2	7.2	8.5	5.8	5.1
Education and training	7.7%	1 211	3.9	4.4	2.3	5.3	5.7	5.5	5.6	5.6	5.2	4.3
Health and social assistance	11.4%	1 370	-0.7	6.5	2.5	7.0	7.7	5.8	2.9	-0.1	2.2	5.1
Arts and recreational services	1.7%	1 350	-5.9	6.9	2.3	5.3	7.7	2.7	2.2	6.3	4.5	4.0
Other services	4.1%	1 213	2.7	1.9	2.5	7.0	4.6	0.5	0.5	2.0	4.9	3.9
Total All Industries[2]	100%	1 275	3.2	5.0	3.7	10.5	5.9	5.8	5.2	4.5	3.9	4.7

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

Source: BIS Shrapnel, ABS data

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 (see Tables 5.2 and 5.5).

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. 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 5.1 and 5.2). 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.

Chart 5.1: AWOTE & LPI
Total Australia (All Industries) and Electricity, Gas and Water

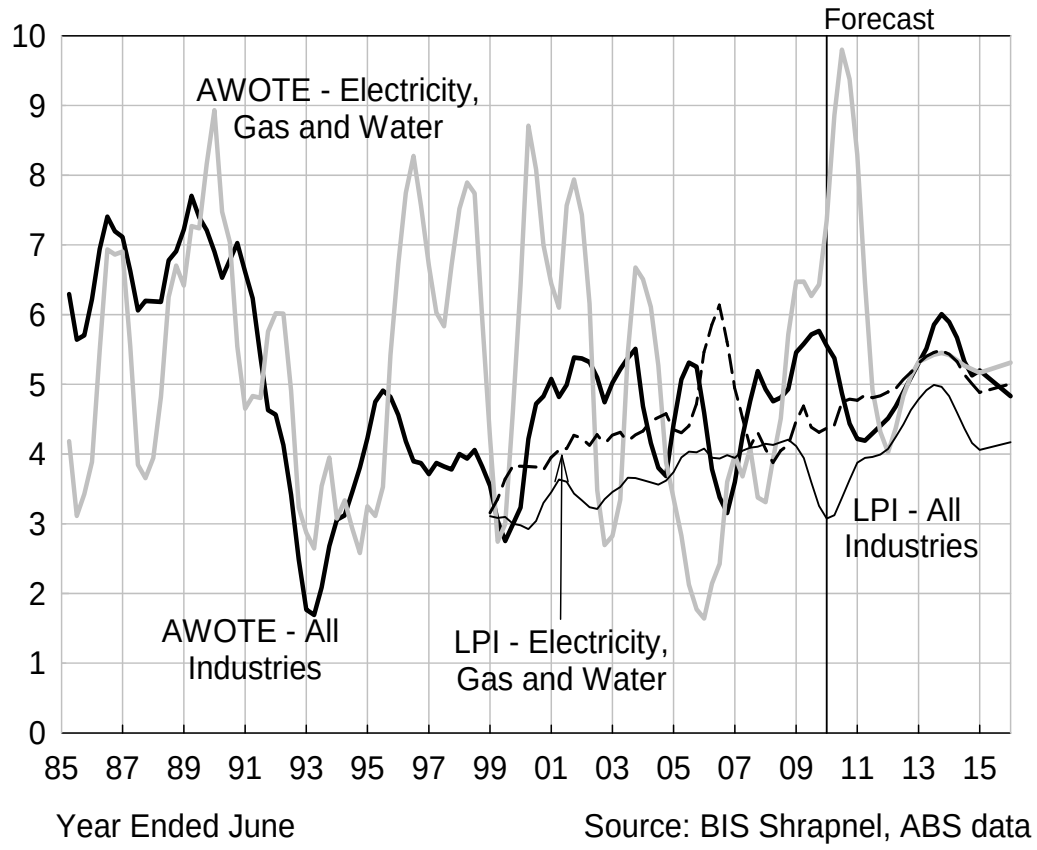


Table 5.3: Federal Wage Agreements – Collective Agreements by Industry (Average Annualised Wage Increase)

Selected Industry	Collective Agreements									
	Average Annualised Wage Increase[1]									Average
	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	4.1	**3.9**
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	3.6	**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	4.1	**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)

Table 5.4: Electricity, Gas & Water Supply Wage Forecasts – Australia

	Year Average Percent Change																
										Forecast						Averages	
Year Ended June	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2000-10	2011-16
Proportion of Workforce by Pay setting Method																	
Awards Only	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%	1.1%	0.9%
Collective Agreements	78.1%	79.0%	79.9%	82.2%	84.4%	83.2%	82.0%	82.0%	82.0%	82.0%	82.0%	82.0%	82.0%	82.0%	82.0%	80.6%	82.0%
Individual Arrangements	20.9%	19.6%	18.4%	16.6%	14.7%	15.9%	17.1%	17.1%	17.1%	17.1%	17.1%	17.1%	17.1%	17.1%	17.1%	18.3%	17.1%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
AWOTE																	
Awards Only (a)	1.3	1.7	1.6	1.6	1.4	1.7	1.2	1.4	0.4	1.8	1.1	1.3	1.4	1.1	1.5	1.4	1.3
Collective Agreements	3.9	4.2	4.3	4.2	4.6	4.5	4.7	4.8	4.9	4.8	4.9	5.1	5.3	4.9	5.0	4.3	5.0
Individual Arrangements (b)	21.0	-2.6	16.5	-0.7	-15.3	1.4	-3.2	14.7	19.5	25.2	6.8	8.0	8.8	7.4	7.0	7.8	10.5
AWOTE (Persons)(c)	**7.4**	**2.8**	**6.5**	**3.4**	**1.6**	**4.0**	**3.3**	**6.5**	**7.4**	**8.3**	**5.2**	**5.6**	**5.9**	**5.3**	**5.3**	**5.1**	**5.9**
Labour Price Index																	
Awards Only (a)	1.3	1.7	1.6	1.6	1.4	1.7	1.2	1.4	0.4	1.8	1.1	1.3	1.4	1.1	1.5	1.4	1.3
Collective Agreements	3.9	4.2	4.3	4.2	4.6	4.5	4.7	4.8	4.9	4.8	4.9	5.1	5.3	4.9	5.0	4.3	5.0
Individual Arrangements (b)	5.6	4.7	4.7	5.3	10.7	7.5	1.2	3.1	2.0	4.9	5.1	6.5	6.1	5.1	5.2	5.1	5.5
Labour Price Index (Ord. Time)	**4.2**	**4.3**	**4.3**	**4.4**	**5.5**	**5.0**	**4.1**	**4.5**	**4.4**	**4.8**	**4.9**	**5.3**	**5.4**	**4.9**	**5.0**	**4.4**	**5.0**
Compositional Effects + Bonuses,etc	3.2	-1.4	2.2	-1.0	-3.8	-1.0	-0.8	2.0	3.0	3.5	0.3	0.3	0.5	0.4	0.3	0.7	0.9

Source: BIS Shrapnel, ABS, DEEWR

(a) Contribution of nominal award wage increas to total wages growth, rather than percent change in award wages

(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

The key elements of the utilities wage forecast are set out in Table 5.4. Table 5.4 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 5.3 shows that the utilities sector has consistently had higher wage increase under collective agreements than the all industries average. Over the past 7 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 seven years to 2015/16, with the all industries average to also continue to be dragged down by the retail and hospitality industries.

The analysis in Table 5.4 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 5.4.

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% in 2006 (the last survey conducted under the ANZSIC1993 industry classification) to around 82% 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 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 annum on average in the combined EGWWS compared to EGW over 1998/99 to 2008/09, with AWOTE growth in EGWWS 0.6% 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.[1] A comparison of EGW and EGWWS wages and employment growth is provided in Appendix B.

The 'Skills in Demand' lists released in June 2010 (December 2010 for South Australia) 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 Queensland, the DEEWR shows relevant shortages are being reported for:

- electrical engineers and electrical engineering draftspersons and technicians
- structural engineers, civil engineers and civil engineering draftspersons and technicians
- mechanical engineers, and mechanical engineering draftpersons and technicians
- construction estimators and building associates

[1] 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.

- gas fitters
- plumbers.

In South Australia, skilled labour shortages in December 2010 are being reported in broadly the same professions. Specifically, the DEEWR reports shortages for:

- electrical engineers and electrical engineering draftspersons and technicians
- structural engineers, civil engineers and civil engineering draftspersons and technicians
- gas fitters
- electricians and electrical lines workers
- metal machinists

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
- construction tradespersons
- metal related tradespersons.

Skills shortages and sustained strong demand for skilled labour will lead to higher wages growth in the sector. The sharp rise in vacancies and strengthening demand for labour resulted in an escalation of wages growth — in underlying or labour price index (LPI) terms — over 2005/06 and 2006/07, with the LPI accelerating to 5.5 per cent and 5.0 per cent respectively from around 4.3 per cent over 2002/03 to 2004/05. LPI growth in the electricity, gas and water sector over 2005/06 and 2006/07 was the fastest rate of growth since its inception in 1997. LPI growth surprisingly slowed to 4.1 per cent in 2007/08, but accelerated over the second half of calendar 2008, with the average LPI growth of 4.5 per cent in 2008/09. Wage increases in the EGW sector remained well above the national average of 3.1 per cent in 2009/10, with LPI growth in EGW estimated to be 4.4 per cent.

Growth in average weekly earnings in the electricity, gas and water sector also accelerated sharply over 2008/09 and 2009/10, after compositional effects of strong employment growth muted AWOTE growth over the previous four years - it is likely the biggest growth in employment was in the lower paid segments in the industry, which pushed down the average wage for the whole sector over 2005/06 to 2007/08. Conversely, the strong 6.5 per cent growth in AWOTE in 2008/09 was despite employment growth of 20 per cent in that year – suggesting that the EGW sector may have attracted higher skilled (and paid) workers in a year where labour demand in construction and mining eased due to the GFC-inspired economic downturn.

The divergent growth patterns of average weekly ordinary time earnings (AWOTE) and the labour price index over the past decade highlight the problems associated with changes in the composition of employment within industries.

This strong growth in 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 has also exacerbated this situation as it has increased demand for all occupations within this 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 5 to 6 years at least. Electricity, gas and water utilities in virtually every state across Australia have embarked on major network refurbishment, extension and augmentation programs. These programs are directed at improving reliability levels and address ageing asset profiles. 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 seven years, although the rate of growth is forecast to be much 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.

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.

5.1.3 Tightening Labour Markets and Strong Unions to Push Up EGW Wages Over Medium-term

Overall, we expect outcomes under both collective agreements and individual arrangements to be much higher over the next six years, compared to the last five years. There are basically three reasons for the high outcomes (with details discussed below):

- with the economy recovering, employment growth outpacing population and labour force growth and the unemployment rate now around 5% and expected to fall below 4% 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 under both collective bargaining and by those 17% of employees under individual arrangements. Added to this is that utilities across Australia are themselves in the midst of strong long-term phase of construction,

Table 5.5: Average Weekly Ordinary Time Earnings and Labour Price Index
Total Australia and Electricity, Gas & Water
(Year Average Growth)

Year Ended June	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
1990	521.0	6.9	559.2	8.9				
1991	555.4	6.6	585.2	4.7				
1992	580.8	4.6	620.5	6.0				
1993	591.0	1.8	638.3	2.9				
1994	609.1	3.1	657.9	3.1				
1995	634.9	4.2	679.3	3.2				
1996	663.8	4.6	725.0	6.7				
1997	688.5	3.7	773.6	6.7				
1998	716.0	4.0	831.8	7.5	67.5		79.2	
1999	741.4	3.5	867.1	4.2	69.6	3.1	81.7	3.2
2000	765.4	3.2	922.8	6.4	71.7	3.0	68.2	3.8
2001	804.2	5.1	982.3	6.4	74.2	3.5	70.8	3.9
2002	847.4	5.4	1,055.3	7.4	76.7	3.3	73.8	4.2
2003	890.0	5.0	1,085.1	2.8	79.3	3.5	76.8	4.3
2004	931.6	4.7	1,155.7	6.5	82.2	3.6	79.9	4.3
2005	972.9	4.4	1,194.5	3.4	85.3	3.7	83.3	4.4
2006	1 017.5	4.6	1,214.1	1.6	88.7	4.1	87.6	5.5
2007	1 054.1	3.6	1,262.4	4.0	92.2	3.9	91.8	5.0
2008	1 106.1	4.9	1,304.2	3.3	96.1	4.1	95.7	4.1
2009	1 166.5	5.5	1,388.6	6.5	100.0	4.1	100.0	4.5
2010	1 231.3	5.6	1,490.7	7.4	103.1	3.1	104.4	4.4
Forecasts								
2011	1 283.2	4.2	1,613.8	8.3	107.1	3.9	109.3	4.8
2012	1 341.1	4.5	1,697.6	5.2	111.4	4.1	114.6	4.9
2013	1 412.2	5.3	1,792.0	5.6	116.8	4.8	120.2	5.3
2014	1 495.5	5.9	1,897.1	5.9	122.4	4.8	126.6	5.4
2015	1 572.9	5.2	1,997.5	5.3	127.4	4.1	132.8	4.9
2016	1 648.9	4.8	2,103.6	5.3	132.7	4.2	139.4	5.0
Compound Annual Growth Rates								
1990-2000	3.9		5.1					
2000-2010	4.9		4.9		3.7		4.3	
2005-2010	4.8		4.5		3.9		4.6	
2010-2016	5.0		5.9		4.3		4.9	

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.

maintenance and augmentation programs, which will not only hold up utilities engineering construction at high (and often higher) levels, but will also realise strong competition for similarly skilled workers in high demand from the mining and construction sectors.

- the upskilling (and associated higher wages) of the large influx of apprentices and other skilled workers hired over the second half of last decade (whose lower relative pay drove down the utilities AWOTE average over the 2005/06 to 2007/08 period) will push up the utilities average over the next few years. This positive compositional effect will boost the individual arrangements segment AWOTE calculations (in Table 5.4).
- fewer negative compositional effects, given slower employment growth (compared to recent years) and a fairly stable employment profile predicted over the five years to 2015/16, following employment growth of around 15 per cent in 2010/11. This implies no large influxes or exits of low-paid workers.

The 8.3 per cent increase forecast for AWOTE in 2010/11 (and the 4.8 per cent rise for the LPI) is based on two quarters of actual data, which showed an acceleration in wages growth through calendar 2010. We have included year-to-year movements for AWOTE in the electricity, gas and water sector over the five years to 2015/16, which are presented in table 5.4 and chart 5.1. We have made an *indicative* allowance in AWOTE movements for compositional changes of employment within the sector through the cycle, which can distort year-to-year movements. We have not, however, carried out a detailed analysis of occupations within the sector. Such an analysis is outside the scope of this study.

As previously mentioned, collective bargaining dominates the pay setting arrangements in the EGW sector. 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 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 4.7 per cent in 2007/08. Growth in formalised agreements slowed to an average of 4.5 per cent in 2009/10, but are expected to pick up again during 2010/11 given the tightening in the labour market and the high enterprise agreement outcomes in the construction sector in 2009/10 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% to 0.2 % higher per annum on average compared to the newly combined EGWWS sector.

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 in 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 be even further above the CPI (ie higher real wages) 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 DEWR "Skills in Demand Lists" and Clarius Index still revealed ongoing shortages of key professionals and tradepersons in the utilities sector. These shortages are expected to continue over the next 6 years 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 upskilling 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, both among the electricity distributors and electricity, gas and water sector generally. Given slower growth in employment numbers over the next 6 years, it is likely that there will be overall upskilling of the existing workforce, which will see a commensurate movement by much of the workforce into higher grades (i.e 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 upskilling is expected to result in much stronger growth in individual arrangements over the five years to 2016 (averaging 7.5 per cent per annum), compared to the last ten years from 2000–2010 (where growth averaged 7.8 per cent). All the compositional effects from the upskilling of the workforce will fall into the individual arrangements wage setting method. Note we have excluded the 2010/11 year as the high AWOTE in that year distorts the forecast analysis going forward.

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.

As the bottom line in table 5.4 indicates, these compositional effects, together with bonuses and incentives, added an average of 0.7 per cent to AWOTE growth compared to LPI growth over the 2000–2010 period. Over the forecast period, we expect compositional effects (including bonuses and incentives) to add 0.3 per cent on average to the AWOTE wage measure (compared to LPI growth) over the 5 years to 2016, with those effects appearing to boost wages growth numbers in the individual arrangements segment.

We have included year-to-year movements for AWOTE in the electricity, gas and water sector over the six years to 2015/16, which are presented in Table 5.4. 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 2010/11 to 2015/16, we do not expect any large positive or negative compositional effects in any one year.

5.2 Outlook for utilities wages growth in South Australia

With regard to wage pressures in the electricity, gas and water sectors in each state, the current demand for labour across virtually all states is quite strong. Employment growth in the sector has been particularly robust over recent years Australia-wide, with strong growth occurring in the South Australian utilities sector over the five years to 2008/09, before declining in 2009/10. Further growth in employment in the sector is expected in most states over the six years, with continued strong demand for labour maintaining relatively high wage pressures within each state's utilities sector.

Table 5.6 shows the history of wage movements in the electricity, gas and water sector by state from 1985 to 2010 for Average Weekly Ordinary Time Earnings (AWOTE) for full-time adult persons. Table 5.6 shows that long term wages growth in the utilities sector across the states has been fairly uniform — most of the states are close to the 5.1 per cent annual average over 1985 to 2009, except for Western Australia, which has averaged 6.0 per cent. It is likely that the wide year-to-year divergences between states are mostly due to compositional effects.

Over the next six years, we have assumed that the historical uniformity of wages growth in the utilities sector across the states will continue, with AWOTE growth in Western Australia expected to 'come back to the pack' in the short term, before again outpacing the other states as the resource investment boom regathers momentum. The mining boom has been a key factor driving higher growth in wages in that state over recent years.

Although South Australia was not directly affected by the floods or LNG plant construction (see section 5.2), wage rates in the EGW and construction sector in South Australia are still likely to be indirectly affected by the higher national demand for labour in these two sectors and associated increased wage pressures across the states. The South Australian utilities sector, therefore, will need to offer competitive wages to retain its existing workforce and attract new recruits. Our forecasts assume that wages growth in the South Australian electricity, gas and water sector will average 5.5 per cent per annum over the next six years to 2015/16, 0.4 per cent less than the Australian utilities AWOTE average.

Table 5.6: AWOTE Persons by State - Electricity, Gas and Water Supply

Year Ended	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	
May	$	A%Ch	$	A%Ch	$	A%Ch	$	A%Ch	$	A%Ch	$	A%Ch	$	A%Ch	$	A%Ch	$	A%Ch
1985	423		420		429		393		404		400		455		394		418	
1986	437	3.4	438	4.3	449	4.6	407	3.7	427	5.5	420	4.9	484	6.4	434	10.1	434	3.9
1987	471	7.6	468	6.8	480	7.0	433	6.4	441	3.5	438	4.4	513	5.9	434	0.0	464	6.9
1988	484	2.9	492	5.2	491	2.3	460	6.2	461	4.3	462	5.3	507	-1.1	440	1.4	482	3.9
1989	517	6.8	516	4.8	537	9.2	484	5.1	500	8.6	495	7.2	513	1.2	498	13.3	513	6.4
1990	547	5.7	598	15.8	552	2.8	517	6.9	547	9.3	506	2.2	613	19.5	549	10.2	559	8.9
1991	576	5.3	623	4.3	565	2.5	558	7.9	565	3.4	551	8.9	615	0.2	558	1.6	585	4.7
1992	622	8.1	658	5.6	585	3.4	578	3.5	599	6.0	565	2.7	641	4.3	605	8.3	620	6.0
1993	631	1.4	698	6.2	598	2.2	585	1.1	613	2.3	605	6.9	664	3.6	599	-0.9	638	2.9
1994	657	4.2	711	1.9	619	3.6	616	5.5	624	1.9	661	9.4	666	0.4	612	2.1	658	3.1
1995	673	2.4	723	1.6	651	5.2	644	4.5	673	7.8	695	5.1	700	5.0	637	4.0	679	3.2
1996	740	9.9	751	3.9	694	6.6	654	1.6	726	7.8	714	2.7	701	0.2	712	11.8	725	6.7
1997	787	6.5	803	7.0	746	7.5	721	10.2	778	7.2	724	1.4	731	4.3	758	6.5	774	6.7
1998	851	8.1	874	8.7	778	4.2	793	10.1	836	7.6	790	9.1	771	5.5	812	7.1	832	7.5
1999	883	3.8	892	2.1	820	5.4	817	3.0	881	5.3	889	12.5	804	4.2	884	8.8	867	4.2
2000	938	6.2	976	9.4	883	7.7	863	5.6	933	5.9	880	-1.0	1054	31.1	931	5.4	923	6.4
2001	995	6.1	1048	7.4	926	4.8	906	5.0	993	6.4	979	11.2	968	-8.1	990	6.2	982	6.4
2002	1095	10.0	1113	6.2	978	5.7	956	5.6	1065	7.3	1042	6.4	1004	3.7	1049	6.0	1055	7.4
2003	1100	0.4	1150	3.4	1018	4.1	1030	7.7	1121	5.3	1075	3.2	998	-0.6	1082	3.2	1085	2.8
2004	1197	8.8	1140	-0.9	1151	13.1	1071	4.0	1164	3.8	1137	5.8	1004	0.6	1174	8.5	1156	6.5
2005	1197	0.1	1180	3.5	1268	10.1	1070	-0.1	1194	2.6	1182	4.0	1070	6.6	1221	4.0	1195	3.4
2006	1224	2.2	1200	1.7	1218	-3.9	1091	1.9	1301	8.9	1264	6.9	1175	9.9	1157	-5.2	1214	1.6
2007	1290	5.3	1239	3.2	1227	0.7	1160	6.3	1389	6.8	1286	1.8	1286	9.5	1245	7.6	1262	4.0
2008	1336	3.6	1245	0.6	1260	2.7	1211	4.4	1479	6.4	1290	0.3	1340	4.1	1375	10.4	1304	3.3
2009	1396	4.5	1330	6.8	1347	6.9	1230	1.6	1618	9.4	1368	6.0	1392	3.9	1423	3.5	1389	6.5
2010	1270	-9.1	1517	14.1	1409	4.6	1294	5.2	1718	6.2	1364	-0.3					1491	7.4
Forecast																		
2011					1511	7.3	1373	6.1									1614	8.3
2012					1594	5.5	1442	5.1									1698	5.2
2013					1686	5.7	1521	5.5									1793	5.6
2014					1785	5.9	1610	5.9									1898	5.9
2015					1879	5.3	1694	5.2									1998	5.3
2016					1975	5.1	1782	5.2									2104	5.3
Compound Annual Average Growth Rates																		
1985-2010[1]	4.5		5.3		4.9		4.9		6.0		5.0		4.8		5.5		5.2	
1990-2000	5.5		5.0		4.8		5.3		5.5		5.7		5.6		5.4		5.1	
2000-2010[2]	3.1		4.5		4.8		4.1		6.3		4.5		3.1		4.8		4.9	
2005-2010[3]	1.2		5.2		2.1		3.9		7.5		2.9		6.8		3.9		4.5	
2010-2016					5.8		5.5										5.9	

e: estimate

Source: BIS Shrapnel, ABS Data

1,2 and 3: Average growth rates for NT and ACT are 1985-2009, 2000 to 2009 and 2004 to 2009 respectively.

This situation is in line with historical relativities, when South Australian utilities AWOTE growth lagged the national average, partly due to compositional effects (although compositional effects affected a number of states as well as South Australia), but probably due more to relatively weaker economic and employment growth in the state. South Australia did not experience the enormity of the resources investment which occurred in other states, while the state's (relatively more important) manufacturing sector suffered from the high Australian dollar, with the severe drought of 2006/07 also having a serious effect on the local economy.

While South Australia utilities wages growth will continue to lag the national average, wages growth will still be strong and higher than the previous two decades, driven by relatively strong demand for skilled labour. Three key reasons underpin our forecast of strong wages growth in the South Australian utilities sector:

a) High Levels of Utilities and Total Engineering Construction

Charts 5.2 and 5.3 compare engineering construction work done for Australia, Queensland and South Australia in total engineering construction and utilities construction (the latter includes electricity generation, transmission and supply, water storage and supply, sewerage and drainage and pipelines construction). The charts show that South Australia has mostly lagged national growth in activity from 2002/03 to 2007/08, but growing rapidly over 2008/09 and 2009/10 as a boost in federal funding (under the economic stimulus plan) drove a surge in publically funded construction. Meanwhile, South Australian total engineering construction is forecast to decline in 2010/11 (as some major public sector projects reach completion), but then show sustained increases over the five years to 2015/16.

A key project underpinning these sustained increases in the $15 billion expansion of the Olympic Dam copper-gold-uranium mine. Assuming all government approvals are in place by the middle of 2011, the Board of BHP Billiton is expected to make a decision on its proposed expansion of the Olympic Dam mine sometime in November this year. Currently, the Federal, South Australia and Northern Territory governments are putting BHP Billiton's Draft Supplementary EIS (Environmental Impact Statement) through an adequacy test. If all of government's concerns are addressed, then the supplementary statement will be released for public comment in March 2011. Following public submissions, the SA government will make its final assessment of the EIS. Once a final decision is made (which can be one of approval, rejection or approval with conditions), the process will not be reopened for further public input.

In light of the recent developments, and given favourable technical reports and a sustained rebound in mineral prices (due to the rapid industrialisation and urbanisation in China and India) our forecasts assume that the BHP Billiton's Board will sanction the expansion of mining at Olympic Dam.[2] We have timed the development of the proposed $15 billion expansion to commence in late 2012 (ie in the 2012/13 financial year and continue through to 2024/25). The mine expansion will underwrite more than one fifth of annual total engineering construction during the construction phase.

High levels of utilities engineering construction are also projected in South Australia over the next six years, although levels will be mostly below the recent peak in 2009/10 which was boosted by construction of the desalination plant. Nevertheless, the average level of utilities construction over the next six years will be well above the average of the last five years.

These strong growth periods and high levels of utilities and overall engineering construction for South Australia compared to Australia are expected to add to pressures to raise utilities wages growth in the state above the national average over at least the 2012/13 to 2013/14 period.

[2] This assumes the three governments give the green light for the project.

Chart 5.2: Total Engineering Construction
Australia, Queensland & South Australia

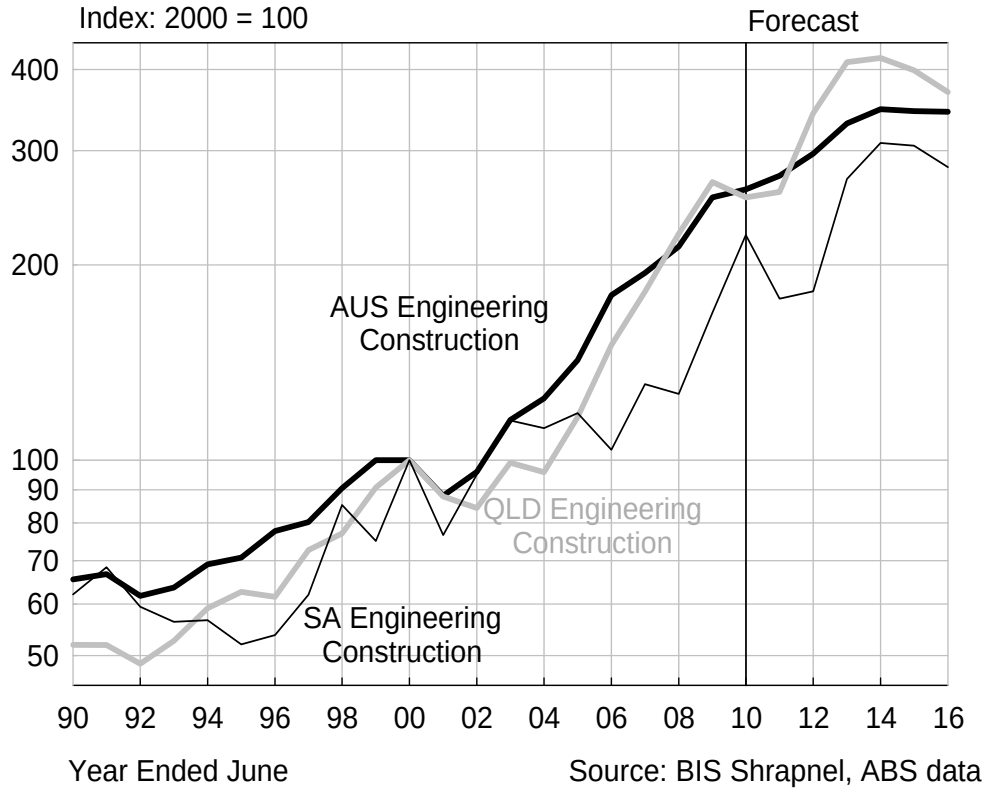
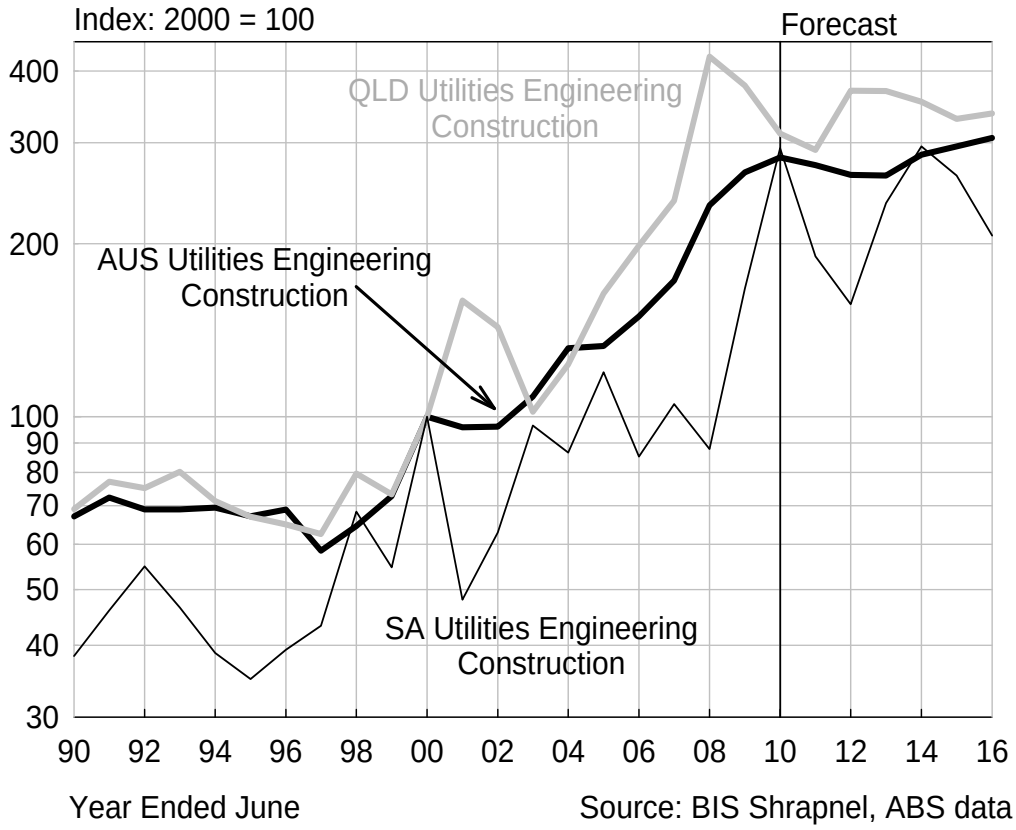


Chart 5.3: Utilities Engineering Construction
Australia, Queensland and South Australia



b) Strong Intrastate Demand for Similarly Skilled Labour

South Australia is forecast to experience relatively strong demand for skilled workers in the mining, construction and manufacturing sectors over the 2010/11 to 2015/16 period. As previously mentioned, these sectors are the main competitors to the utilities sector for workers with similarly desired skills, particularly tradespersons. To compete with these other industry sectors within the state, the utilities sector may need to offer higher wage increases to attract and retain the necessary labour.

In addition, labour demand from South Australia's manufacturing sector is also expected to outstrip the national manufacturing average, particularly over the 2011/12 to 2012/13 period when the $7 billion air warfare destroyer (AWD) project's operational (ship construction) phase ramps up. Other companies will also be investing in upgraded systems and infrastructure as contracts are awarded, both for the AWD and other large defence contracts. Other defence-related projects over the next few years include a $500 million project to accommodate a 1200-strong mechanised army battalion, an $80 million project involving the construction of ground support facilities at the Edinburgh RAAF airbase and a $51 million staged redevelopment of Edinburgh airbase. The state government estimated in August 2006 that over the 10 year life of the AWD project, it will make a direct impact of $574 million with another $609 million in spin-off benefits. They estimated that this will create 3,000 jobs, 1,700 directly attributable to the project and 1,300 jobs from the flow-on effects. More recent estimates from the state government (March, 2007) put the contribution from the AWD project at 4,000 direct and indirect jobs created. Furthermore, a new report from the SA Centre for Economic Studies forecast 2,700 new jobs in the defence-related sector by 2010.

The direct impacts will be predominantly in the Machinery and Equipment Manufacturing (M & EM) sub-sector — the largest manufacturing sub-sector in South Australia — and these positive impacts should more than outweigh ongoing problems in the significant motor vehicle segment in M & EM, although conditions are now improving in that sub-segment.

As South Australia builds its capabilities in defence-related manufacturing, it is also likely to win at least one of the multi-million contracts to be decided in coming years — the $3.5 billion land 121 replacement field vehicles, the $1.5 billion Air 7000 Maritime Patrol and the $1 billion satellite communications project. Indeed, the SA government has a 'State Defence Sector Plan' which aims to increase the number of defence related jobs in SA from 16,000 to 28,000 by 2013 and double the economic contribution at the State's defence sector to $2 billion in the same time frame.

It is important to note that the AWD and other defence-related projects need workers with higher skill levels than the overall manufacturing average. The SA Centre for Economic Studies' press release regarding their report on "Building a Local Defence Industry: Workforce Requirements 2006-2010",[3] claimed the majority of jobs would be professionals and managers, although the biggest increase in jobs would be among tradespeople.

BIS Shrapnel is forecasting an improved performance from the manufacturing sector over the next decade. The Food, Beverages and Tobacco (FBT) sub-sector (which accounts for around one-quarter of total Manufacturing GVA) is estimated to have been seriously impacted by the severe drought in 2006/07, especially affecting the key wine sector. However, we estimated the FBT sub-sector bounced back in 2007/08, and should maintain good growth over the next decade — drought notwithstanding. Meanwhile, building materials manufacturers will follow the building and construction cycle. The Metal Products manufacturing sub-sector will also be influenced by the construction cycle (especially the non-dwelling construction segment both for South Australia and Australia), and be boosted by new capacity coming onstream at OneSteel's Whyalla operations (i.e. Project Magnet) and Olympic Dam (i.e. refined copper production will increase).

[3] March 2007, (http://www.adelaide.edu.au/saces/publications/issues/SACES_EconomicIssues20.pdf)

Chart 5.4: Queensland – Utilities Employment, Output and Investment

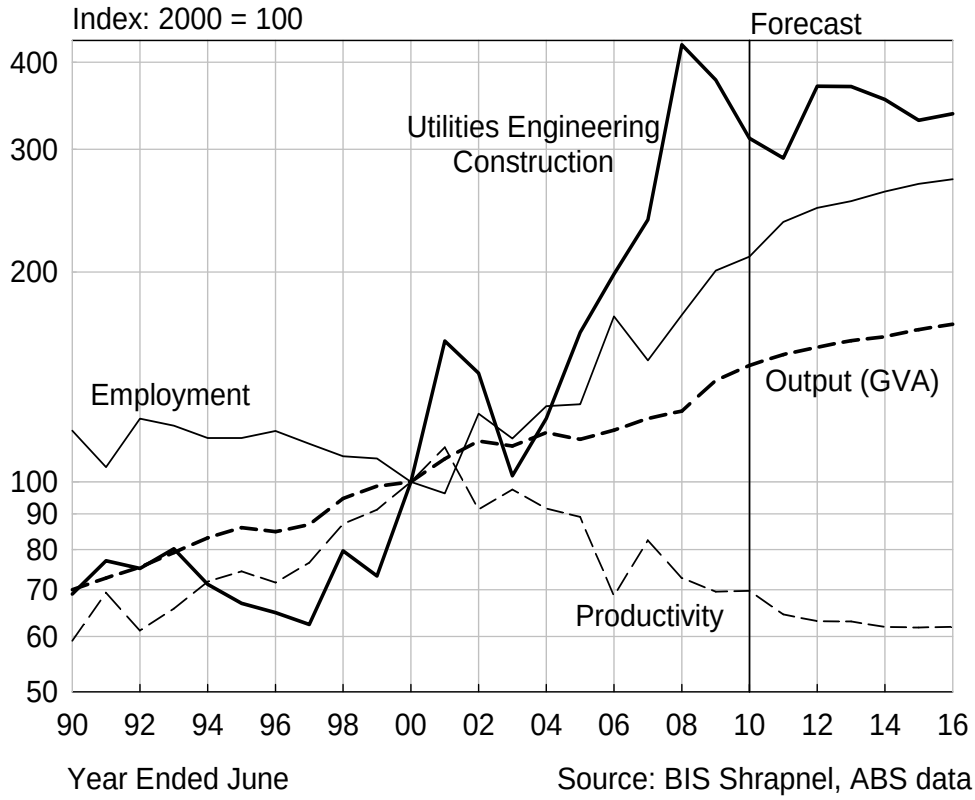
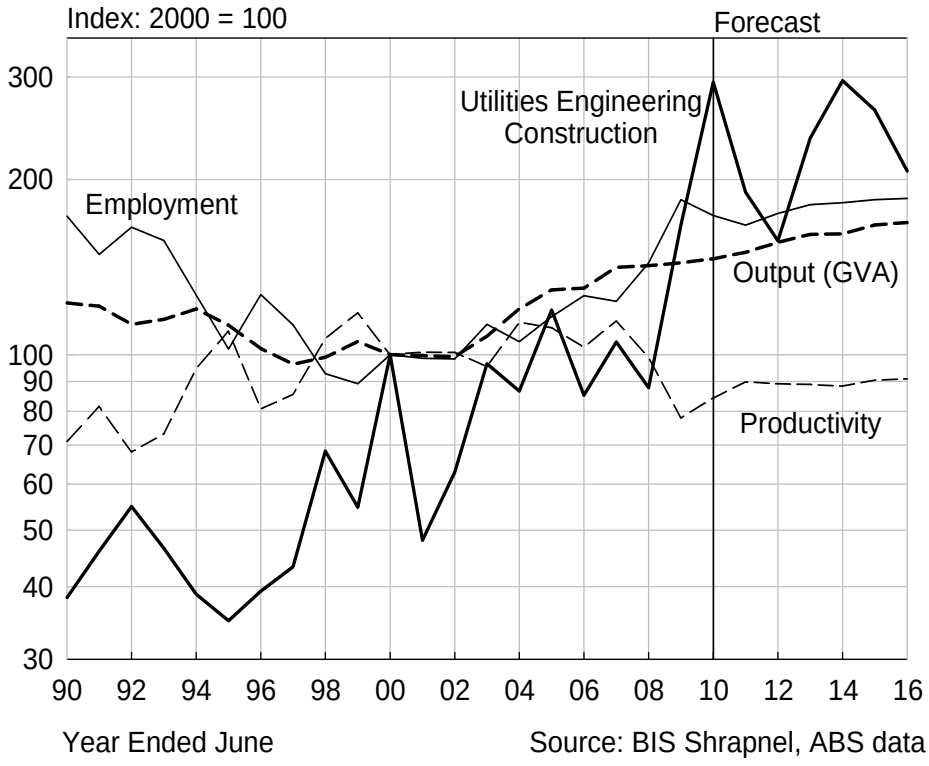


Chart 5.5: South Australia – Utilities Employment, Output and Investment



c) Interstate Relativities

The South Australian utilities sector has the lowest AWOTE of all the states (see table 5.6). While this has been partly justified in the past by South Australia's lower cost of living (particularly housing), the increased competition across the states for workers with skills relevant to the utilities sector means that the South Australian utilities sector may have to offer increased wages to compete with other states' utilities sectors, let alone other South Australian industries. A relevant example (or precedent) could be Queensland. Average wages in the Queensland utilities sector were lower than the South Australian equivalent in 2002/03 (see table 5.6), but then experienced substantial rises over 2003/04 and 2004/05 as competition for skilled workers from other sectors increased – particularly from the construction and resources sectors in Queensland.

5.3 Outlook for utilities wages growth in Queensland

Similar to the situation in South Australia, utilities AWOTE wages growth in Queensland lagged the national average over the past five years, due to compositional effects from very strong employment growth resulting in more lower paid workers entering the workforce. This offset what we understand were rising wages in the sector, bid up by heightened competition for skilled workers from Queensland's mining and construction sectors.

The catastrophic Queensland floods and the subsequent reconstruction will add significantly to the demand for construction sector labour in Queensland. In addition, the recent announcement of the go-ahead for two major coal seam LNG projects in Gladstone — which will require a large number of gas wells and related networks to be built — will add to the demand for gas network related labour. Pressure from competitor sectors — the construction and mining sector competes with the utilities sector for some types of skilled labour — means Queensland utilities sector wages will be pushed up over the short-term by the post flood reconstruction and the next stages of resources investment in the state ie much earlier than previously anticipated. Accordingly, utilities AWOTE growth in Queensland is forecast to be higher than the national utilities average over 2011/12 to 2012/13.

With slower growth in construction activity, manufacturing production and resources investment from 2014/15, there will be less intense competition for those skilled workers sought by the utilities sector. In addition, utilities engineering construction activity in Queensland is forecast to weaken (albeit marginally) from 2013/14 (see chart 5.2). This means an easing in the overall demand for skilled labour in the utilities sector towards the end of the forecast period. As a result, AWOTE growth is forecast to converge to the national average from 2013/14.

Overall, utilities wages growth in Queensland is forecast to average 5.8% per annum over the six years from 2010/11 to 2015/16 – slightly below the national average of 5.9% p.a.

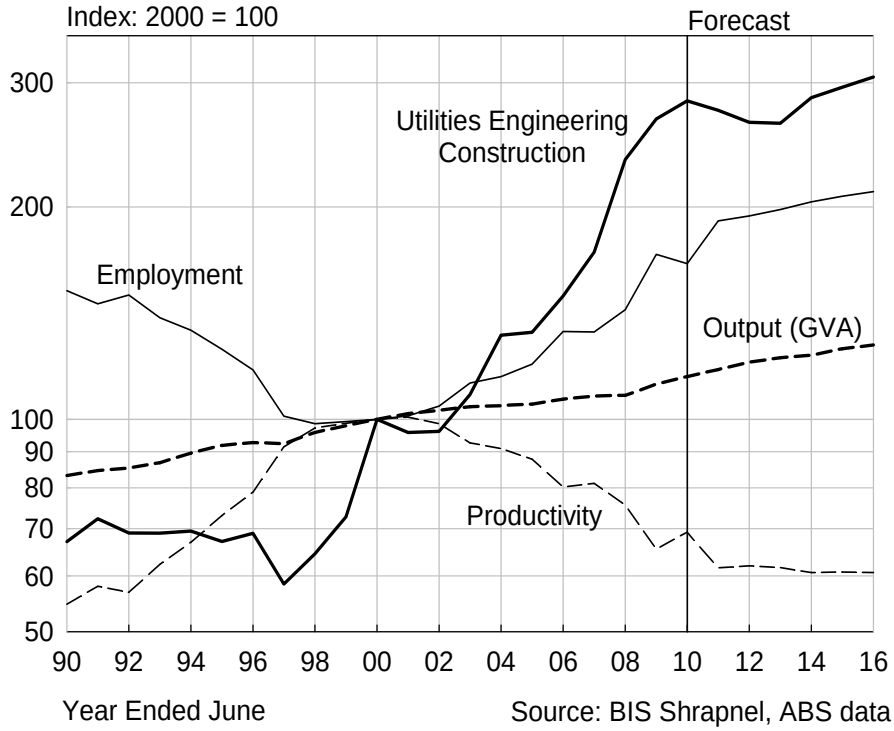
5.4 Productivity Adjustments

5.4.1 Access Economics productivity growth forecasts are too optimistic

In their report to the AER, Access Economics measures 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. We, therefore, calculate our productivity-adjusted AWOTE escalators based on our annual labour productivity forecasts which, in turn, flow from our annual forecasts of output and employment in the different industries at the national and state level.

Access Economics numerical forecasts of productivity growth, as presented to the AER, show that future productivity growth will be strong in the utilities sector at the Australian and state (Queensland and South Australia) level. This is in contrast to the observed productivity growth for the industry over the previous decade. Over the six years from 2010/11 to 2015/16, Access Economics expects the average productivity growth in the national utilities industry to be 1.8% per annum. For Queensland and South Australia, Access Economics predicts average productivity growth of 1.6% and 1.9%, respectively. This compares with an average productivity growth of -3.6%, -3.5% and -1.7% per annum for Australia, Queensland and South Australia, respectively over the previous decade (see tables 5.7 to 5.9).

Chart 5.6: Australia – Utilities Employment, Output and Investment



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):

- *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 (ie 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.

5.4.2 BIS Shrapnel's Forecasts of Productivity

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 (ie 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 aluminum smelters. This will further contain demand for energy in the future.

We believe investment in the sector, particularly engineering construction, has been the key driver of employment growth in the sector over the past decade. Charts 5.4 and 5.5 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 chart 5.3). 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.

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 the six years to 2015/16. Our forecasts are provided in Tables 5.7 to 5.9. Note that Access Economics did not provide specific forecasts of output, employment or productivity in its report for the AER, so we derived their productivity forecasts by deduction ie the difference between the productivity-adjusted wages growth and unadjusted wages growth.

At the Australian level, productivity growth in the utilities sector is forecast to decline by an average of -2.2% over the next six years from 2010/11 to 2015/16 inclusive, with a large -11% decline in labour productivity in 2010/11, followed by only modest declines or modest increases over the following five years. A similar pattern occurs in Queensland, with a large -7.5% decline in 2010/11, followed by mostly small declines over the following five years to 2015/16, with the average over the next six years an annual decline of -2.0% per annum. Conversely, productivity growth in the South Australian utilities sector is forecast to average a positive 1.3% per annum, but most of this is attributable to the robust 6.6% growth in 2010/11, with only weak growth after that.

Our forecasts assume moderate and fairly stable growth in employment in Australia and the states beyond 2010/11. The productivity estimates are large in 2010/11 for a number of reasons:

1. Firstly, it needs to be remembered that labour productivity in each industry sector is calculated, rather than directly measured, from output (real Gross Value Added, which is estimated by the ABS) divided by employment (estimated from the labour force survey by the ABS). Output by industry by state is only released annually (usually late November), although quarterly data is available for Australia only. The ABS releases employment data by industry by state four times per year, as at the mid-month of each quarter (the same release schedule as AWOTE). For 2010/11, we had employment data for the first half of the year (ie August and November 2010). With regard to utilities employment, both Queensland and Australia showed very strong employment through-the-year (ie compared to the same month the previous year), while South Australia showed an overall decline. After allowing for the normal seasonal pattern of employment in February and May in Australia and the two states, we then came up with an estimate for employment growth in 2010/11. As we did not assume any dramatic (ie 'out of the ordinary') employment movements over February and May 2011, the year average employment growth for 2010/11 was thus largely shaped by what was already evident in the first half of the year. In terms of state utilities output forecasts, the relatively modest growth reported by the ABS at the Australian level in the September and December quarters, suggests our forecasts of modest output growth for Queensland and South Australia in 2010/11 are also likely to be realised. These forecasts can be found in tables 5.7 to 5.9, with a graphical representation in charts 5.4 to 5.6.

2. ABS employment data shows considerable volatility in industry sectors at the state level. Utilities employment estimates are particularly volatile, because as the smallest industry sector, it often has the largest sampling error. And this is magnified at the state level for a relatively small state like South Australia. But volatility is also reported for some of the larger sectors such as Construction and PBS. In addition, some of the quarter-to-quarter volatility often results from incorrect allocation between industry sectors - households are surveyed, not businesses.

3. In some cases, the large increases/decreases in employment in 2010/11 appear to be a reversal of large decreases/increases in the previous year or two. In other words, over a cycle (or a few years) these large variations tend to even out, and a clear trend in employment growth and productivity can usually be gleaned from averaging the growth over a few years, such as over an economic cycle or say 5 years, such as over 2011/12 to 2015/16.

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 1.2 per cent per annum over the six years from 2010/11 to 2015/16 for the South Australian utilities sector and 4.7 per cent p.a. for the Queensland utilities sector (see table 1b in the Summary).

5.4.3 Productivity Adjustments cannot be applied to the LPI

Access Economics' preferred wage escalator is LPI inflation. Access Economics productivity adjusted wage escalator is derived by deducting productivity growth from the nominal LPI escalator. However, 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. Changes to skill levels should therefore be reflected in productivity changes per worker. The LPI does **not** incorporate any changes for skill levels and improved productivity. Hence, productivity cannot be deleted 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.

Table 5.7: 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
1990	18765		121.1		155.0	
1991	19064	1.6	116.0	-4.2	164.3	6.0
1992	19228	0.9	119.4	2.9	161.0	-2.0
1993	19565	1.8	110.9	-7.2	176.5	9.6
1994	20185	3.2	106.4	-4.0	189.7	7.5
1995	20698	2.5	100.0	-6.1	207.1	9.2
1996	20899	1.0	93.5	-6.4	223.5	7.9
1997	20822	-0.4	80.4	-14.0	258.9	15.9
1998	21602	3.7	78.4	-2.5	275.4	6.4
1999	22082	2.2	78.9	0.6	279.7	1.6
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	24366	0.2	113.8	7.5	214.2	-6.8
2009	25286	3.8	136.3	19.8	185.5	-13.4
2010	25925	2.5	132.2	-3.0	196.1	5.7
Forecasts						
2011	26521	2.3	152.0	15.0	174.5	-11.0
2012	27158	2.4	154.6	1.7	175.7	0.7
2013	27565	1.5	157.8	2.1	174.7	-0.6
2014	27786	0.8	161.8	2.5	171.8	-1.7
2015	28369	2.1	164.8	1.9	172.1	0.2
2016	28738	1.3	167.3	1.5	171.8	-0.2
Compound Annual Growth Rates						
1990-2000	1.8		-4.1		6.2	
2000-2010	1.4		5.2		-3.6	
2005-2010	1.8		6.8		-4.6	
2010-2016	1.7		4.0		-2.2	

Source: BIS Shrapnel, ABS data

Table 5.8: Electricity, Gas, Water and Waste Services Output, Employment and Productivity: Queensland

Queensland						
Year Ended June	Gross Value Added		Employment		Productivity $/employee	
	$m	%CH	'000	%CH	('000)	%CH
1990	2542		16.0		158.5	
1991	2643	4.0	14.2	-11.3	185.8	17.2
1992	2737	3.6	16.7	17.4	164.0	-11.8
1993	2873	5.0	16.3	-2.3	176.2	7.5
1994	3017	5.0	15.7	-4.0	192.7	9.4
1995	3121	3.4	15.7	0.0	199.4	3.4
1996	3077	-1.4	16.0	2.4	192.0	-3.7
1997	3152	2.4	15.4	-4.1	205.1	6.8
1998	3436	9.0	14.7	-4.1	233.1	13.6
1999	3577	4.1	14.6	-0.7	244.4	4.9
2000	3630	1.5	13.5	-7.5	268.0	9.7
2001	3916	7.9	13.0	-3.8	300.4	12.1
2002	4152	6.0	17.0	30.2	244.6	-18.6
2003	4085	-1.6	15.6	-7.9	261.3	6.8
2004	4270	4.5	17.4	11.3	245.4	-6.1
2005	4175	-2.2	17.5	0.6	238.6	-2.8
2006	4305	3.1	23.4	33.7	183.9	-22.9
2007	4473	3.9	20.2	-13.5	221.0	20.1
2008	4588	2.6	23.5	16.2	195.1	-11.7
2009	5074	10.6	27.2	15.7	186.4	-4.5
2010	5332	5.1	28.5	4.7	187.0	0.3
Forecasts						
2011	5528	3.7	32.0	12.1	172.9	-7.5
2012	5663	2.4	33.5	4.7	169.2	-2.2
2013	5786	2.2	34.2	2.3	169.0	-0.1
2014	5864	1.3	35.3	3.2	165.9	-1.8
2015	6003	2.4	36.3	2.6	165.5	-0.2
2016	6110	1.8	36.8	1.5	166.0	0.3
Compound Annual Growth Rates						
1990-2000	3.6		-1.7		5.4	
2000-2010	3.9		7.7		-3.5	
2005-2010	5.0		10.3		-4.8	
2010-2016	2.3		4.3		-2.0	

Source: BIS Shrapnel, ABS data

Table 5.9: Electricity, Gas, Water and Waste Services Output, Employment and Productivity: South Australia

	South Australia					
Year Ended June	Gross Value Added		Employment		Productivity $/employee	
	$m	%CH	'000	%CH	('000)	%CH
1990	1708		11.1		154.2	
1991	1685	-1.3	9.5	-14.1	177.0	14.8
1992	1568	-6.9	10.6	11.4	147.9	-16.4
1993	1600	2.0	10.1	-5.0	158.9	7.5
1994	1667	4.2	8.1	-19.4	205.6	29.3
1995	1563	-6.2	6.6	-19.2	238.5	16.0
1996	1425	-8.8	8.1	24.0	175.4	-26.5
1997	1340	-6.0	7.2	-11.2	185.8	5.9
1998	1377	2.8	5.9	-17.6	231.8	24.8
1999	1465	6.4	5.7	-3.8	256.5	10.6
2000	1391	-5.1	6.4	12.1	217.2	-15.3
2001	1386	-0.4	6.3	-1.4	219.5	1.0
2002	1381	-0.4	6.3	-0.3	219.3	-0.1
2003	1497	8.4	7.2	14.7	207.3	-5.5
2004	1667	11.4	6.7	-6.6	247.0	19.2
2005	1798	7.9	7.4	10.3	241.6	-2.2
2006	1811	0.7	8.1	8.7	223.9	-7.3
2007	1965	8.5	7.9	-2.2	248.3	10.9
2008	1979	0.7	9.2	16.4	214.9	-13.5
2009	2000	1.1	11.8	28.3	169.2	-21.3
2010	2033	1.7	11.1	-6.0	183.1	8.2
Forecasts						
2011	2085	2.6	10.7	-3.8	195.1	6.6
2012	2168	4.0	11.2	4.8	193.6	-0.8
2013	2239	3.3	11.6	3.5	193.1	-0.2
2014	2243	0.2	11.7	0.8	191.9	-0.6
2015	2324	3.6	11.8	1.2	196.5	2.4
2016	2347	1.0	11.9	0.5	197.5	0.5
Compound Annual Growth Rates						
1990-2000	-2.0		-5.3		3.5	
2000-2010	3.9		5.7		-1.7	
2005-2010	2.5		8.3		-5.4	
2010-2016	2.4		1.1		1.3	

Source: BIS Shrapnel, ABS data

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.

Chart 7.1: US PPI for Crude Oil and Thermoplastic Resins

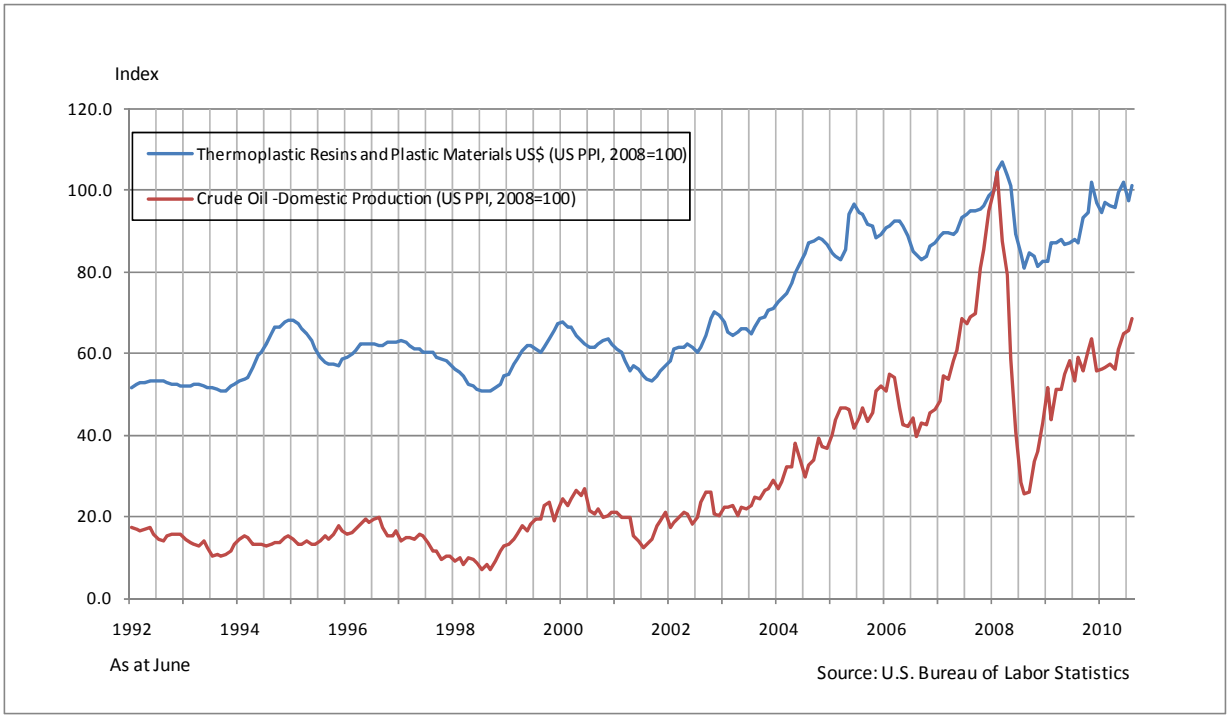
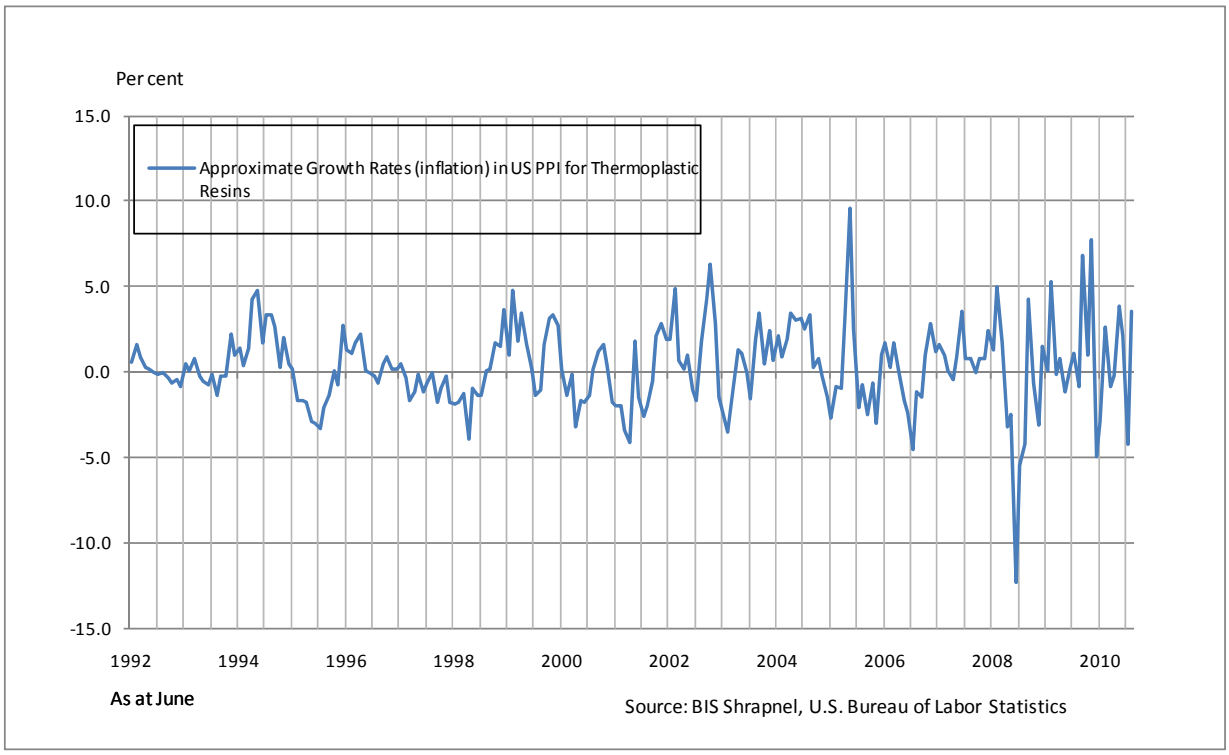


Chart 7.2: US PPI Inflation for Thermoplastic Resins



7. GAS NETWORK RELATED MATERIALS

The main material used for the gas network by Envestra Limited is polyethylene pipe.

7.1 The price of polyethylene

To the best of our knowledge, there isn't a long term data series on polyethylene pipe prices that we can model in order to understand its key drivers. Envestra Limited provided us with recent data but the series has only a few observations. Hence econometric techniques cannot be applied to better understand the stochastic processes generating the price of polyethylene pipes. Nonetheless, from our discussion with the APA Group (Australian Pipeline Trust and APT Investment Trust), we understand that polyethylene is the key input into the production of polyethylene pipes.

The US Bureau of Labor Statistics publishes monthly Producer Price Index (PPI) for Thermoplastic Resins and Plastic Materials. The dataset extends from July 1991 to January 2011, or 223 observations. As polyethylene is one of the thermoplastic resins, we believe the producer prices for thermoplastic resins and plastic materials are a good proxy for polyethylene prices. We strongly believe that this data series is the best representation of longer term data series that is available to allow for meaningful analysis of polyethylene prices and, by extension, polyethylene pipe prices.

7.1.1 Modelling the price of polyethylene

Crude oil is the key raw material used in the manufacture of polyethylene. Hence a key driver in the price of polyethylene is the cost of crude oil. A plot of the two series (see chart 7.1) reveals the close relationship (correlation), although there is an evident lag between increases in crude oil prices and polyethylene prices (as proxied by thermoplastic resins prices). For the purposes of this report, we will first quantify the historical relationship in the US context as the US is the primary source of our data. We will then replicate the analysis for Australia to see if the historical relationship seen for the US is maintained in Australia and whether the relationship is statistically significant.

A GARCH model of polyethylene price escalation for the US

The series that is of interest to us is the price index for polyethylene, which we have proxied with the price of thermoplastic resins. The polyethylene and crude oil price indices sourced from the Bureau of Labor Statistics are plotted in Chart 7.1.[4] The series exhibits substantial swings and fluctuations, particularly in the later years. This is consistent with the established view that crude oil prices are volatile. And as crude oil price is the key driver of polyethylene prices, the price of polyethylene also fluctuates constantly over the sample period.

To capture the volatility features of polyethylene prices, we take the lead from the established literature and adopt a popular and robust member of the family of Generalised Auto-Regressive Conditional Heterosckedasticity (GARCH) models. According to Bollerslev *et al* (1992), many empirical studies find the GARCH(1,1) model to be a parsimonious and adequate model of conditional volatility so we adopt this model. The choice of GARCH(1,1) is also motivated on the grounds of simulation evidence provided by DEB(1997), 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.

[4] These data may be downloaded from the Bureau of Labor Statistics website (www.bls.gov) using producer price index codes 056 (Crude Petroleum – domestic production) and 0662 (Thermoplastic Resins and Plastic Materials).

It is clear from a visual inspection of this chart 7.1 that the polyethylene price series exhibits a clear upward trend and, hence, that the unconditional or long-run means are non-constant. However, GARCH models are built on the premise that the series under consideration are covariance stationary; that is, the mean, variance and auto-covariance's of the underlying series exist and are time invariant. To allow us to deal with series that are stationary, the polyethylene price series p_t is transformed by taking differences in natural logs to yield $y_t = 100(\ln p_t - \ln p_{t-1})$, with the resulting series y_t is defined as the (approximate, percentage) growth rate of the price of polyethylene. The transformed series for aggregate PPI for polyethylene is plotted in chart 7.2. The transformed series appear to be stationary from a visual inspection. There appears to be a positive long run average level about which the series fluctuates and, moreover, the plot do not suggest that the unconditional variance may be time varying.

Stationarity tests. The stationarity of the growth rates for polyethylene prices can be confirmed statistically by undertaking the conventional Augmented Dickey-Fuller (ADF) test for a unit root (Dickey and Fuller, 1981). 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, therefore, that the growth in polyethylene prices (expressed as the first 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 polyethylene price escalation is specified as a function of the price of oil, the key component in the manufacture of polyethylene. As our main objective in this section is to numerically estimate the percentage change in price of polyethylene that is associated with a 1% change in price of oil, we have included the price of oil as differences in natural logs (ie as the approximate percentage changes). Hence, our model becomes a log-log specification with the coefficients of the explanatory variables representing the elasticity of polyethylene price inflation to oil price escalation. In addition, to allow for a lagged response in the price of polyethylene following shifts in the price of crude oil, we have included the price of oil lagged four periods (months) as explanatory variables in the mean component of the model. This will allow us to derive the 4-period cumulative elasticity of a 1% change in the price of oil on polyethylene prices.

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

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

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

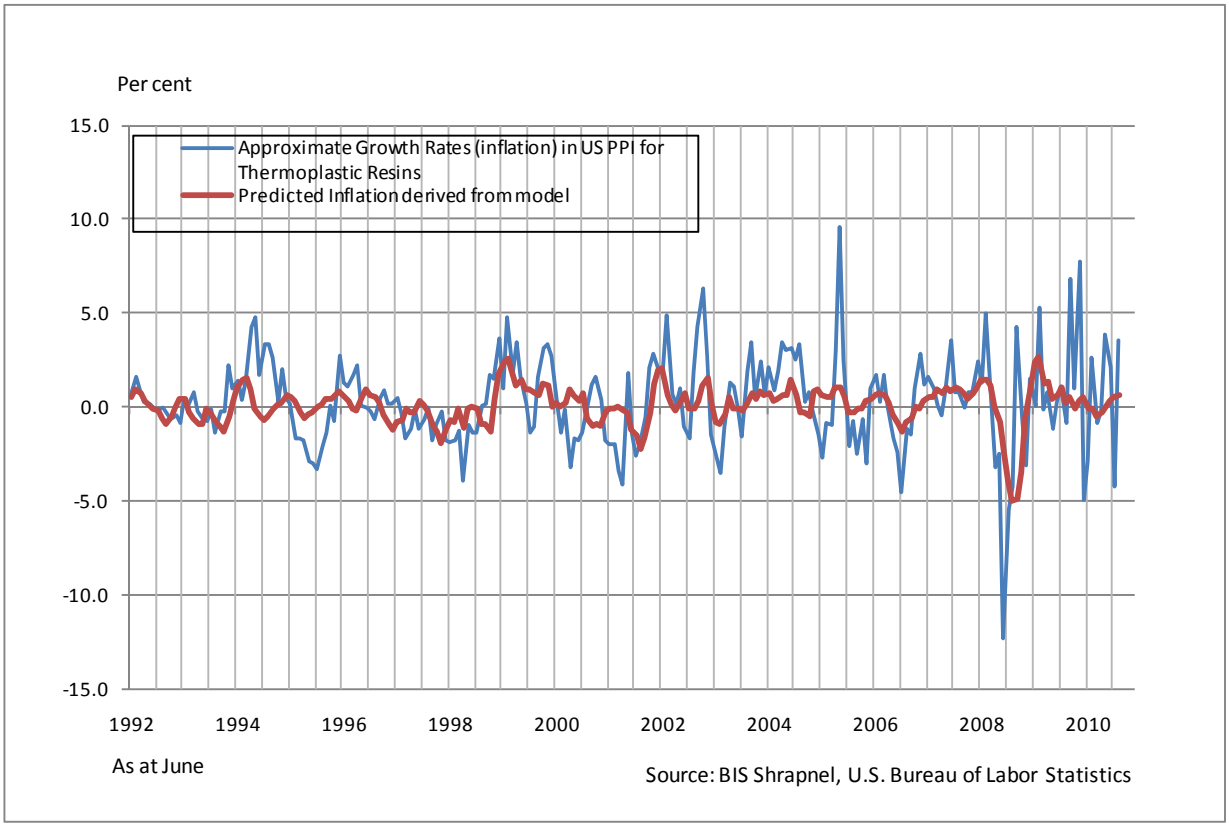
Empirical Results. The GARCH(1,1) model was estimated in E-Views (version 7.0) using the method of maximum likelihood. The estimated model along with estimates of the standard errors of the parameters are produced below (standard errors are in parenthesis)

$$y_t = \underset{(0.011)}{0.041}\ln\left(\frac{Oil\_P}{Oil\_P_{t-1}}\right) + \underset{(0.012)}{0.045}\ln\left(\frac{Oil\_P_t}{Oil\_P_{t-2}}\right) + \underset{(0.010)}{0.051}\ln\left(\frac{Oil\_P_t}{Oil\_P_{t-3}}\right) + \underset{(0.011)}{0.031}\ln\left(\frac{Oil\_P_t}{Oil\_P_{t-4}}\right)$$

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

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 higher price of polyethylene. 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 4-period cumulative elasticity of 0.2. This suggests that a 1% change in the price of oil will lead to a 0.2% change in the price of polyethylene. Overall, we believe our model approximates the observed data reasonably well (see chart 7.3).

Chart 7.3: US PPI Inflation for Polyethylene – Actual v Model Predictions



Polyethylene price model for Australia

We estimated a similar GARCH model using Australian data. The US producer prices for polyethylene were converted to Australian dollars using the exchange rate as the deflator. Note that local manufacturers still import a significant portion of polyethylene from overseas hence the US PPI for polyethylene is a good benchmark for international polyethylene prices faced by domestic manufacturers. For crude oil prices, we used the West Texas Intermediate (WTI) price which we denominated in Australian dollars.

The empirical results were very similar to the US findings although we found that the crude oil prices lagged two were statistically significant in the Australian model. We also found that the long-run polyethylene price elasticity was 0.2 (similar to the US).

The upshot is that through an application of an appropriate econometric model, we have demonstrated that oil prices are a key determinant of polyethylene prices. This relationship is statistically significant and is valid for both the US and Australian markets. As our model is specified in double-log form, we have also empirically estimated the long-run cumulative dynamic elasticities which measure the cumulative effect on polyethylene prices of a change in crude oil prices.

7.2 Polyethylene pipe prices

BIS Shrapnel's outlook for polyethylene pipe prices is based on our forecasts of polyethylene which in turn is dependant on the price of crude oil (cost component) and pipeline activity. The latter represents a 'catch-all' for demand condition which we believe is another important consideration in the overall price setting of polyethylene pipes.

The final forecasts are derived in two stages. We first apply the price elasticities to our forecasts of oil prices. This combined with our estimate of the demand escalator gives an initial forecast for polyethylene price. The derived price of polyethylene is then 'fed into' the price formula that is used during the six monthly reviews of polyethylene prices. We understand that a new price is set at each review if the cost of the raw material (polyethylene) varies by more than +/-5% since the commencement date of the existing contract. Hence, we only change the price of polyethylene pipes if the there is variation of 5% (in either direction) in the price of polyethylene. Otherwise, the price of polyethylene pipes remains unchanged. The new price will be determined by applying the following formula:

Rise and Fall Formula: C=0.70{(M1/M0) x R} +0.30R, where

C= New unit price, R= Price at the Commencement Date, M0= Cost of raw material (polyethylene) at the Commencement Date, M1=Cost of raw material (polyethylene) at the Review Date. Our forecasts of polyethylene pipes are provided in Table 7.1.

Chart 7.4: Australian Pipeline Activity, Value of Work Done – 2008/09 Prices

Table 7.1: Polyethylene and Polyethylene Pipe Prices

Year Ended June	Determinants of Polyethylene Prices: Crude Oil WTI $A/bbl(c)	Crude Oil %CH	Demand Factor (Pipeline Activity) Index 2000=100	Demand Factor %CH	Polyethylene Price Index(a) $A/bbl	Polyethylene Price Index(a) %CH	Polyethylene Pipe Prices(b) $A	Polyethylene Pipe Prices(b) %CH
1991	32.0	23.9	42.2					
1992	27.1	-15.2	36.5	-13.7	63.8			
1993	28.9	6.7	58.5	60.3	71.4	11.9		
1994	24.3	-16.2	61.7	5.6	71.5	0.2		
1995	24.9	2.7	70.1	13.5	80.0	11.8		
1996	25.5	2.6	135.2	93.0	76.2	-4.7		
1997	28.7	12.4	77.5	-42.7	75.5	-1.0		
1998	25.9	-9.9	82.8	6.9	83.7	10.9		
1999	22.8	-11.7	113.5	37.1	79.9	-4.5		
2000	41.6	82.2	100.0	-11.9	94.6	18.3		
2001	54.7	31.5	60.1	-39.9	112.2	18.6		
2002	45.5	-16.9	112.8	87.8	102.0	-9.1		
2003	51.1	12.4	187.7	66.4	104.5	2.4		
2004	47.3	-7.6	275.6	46.8	90.3	-13.6	2.78	
2005	64.8	37.0	129.9	-52.9	104.6	15.9	3.29	18.6
2006	86.0	32.7	176.7	36.0	114.9	9.8	3.49	5.9
2007	80.5	-6.3	157.6	-10.8	106.5	-7.3	3.84	10.2
2008	107.8	33.9	99.1	-37.1	99.6	-6.5	3.97	3.3
2009	92.3	-14.4	126.9	28.0	116.3	16.8	3.97	0.0
2010	85.1	-7.8	138.6	9.2	98.2	-15.6	3.40	-14.3
Forecasts								
2011	88.7	4.2	112.0	-19.2	104.0	5.8	3.54	4.1
2012	95.0	7.1	159.4	42.3	117.9	13.4	3.87	9.4
2013	106.5	12.1	196.4	23.2	132.6	12.4	4.21	8.7
2014	110.5	3.7	181.6	-7.5	140.2	5.7	4.38	4.0
2015	111.7	1.1	183.2	0.9	140.5	0.2	4.38	0.0
2016	108.8	-2.6	191.5	4.6	141.2	0.5	4.38	0.0
Compound Annual Growth Rates								
1995-00	10.8		7.4		3.4		..	
2000-05	9.2		5.4		2.0		..	
2005-10	5.6		1.3		-1.3		0.6	
Forecasts								
2010-16	4.2		5.5		6.2		4.3	

Source: BIS Shrapnel, ABS Data, Envestra, U.S. Bureau of Labor Statistics

(a) We have used thermoplastic resins prices (published by the Bureau of Labor Statistics) as a proxy for polyethylene pric
(b) Forecasts of polyethylene pipe prices are derived by BIS Shrapnel. Historical data represent weighted average
across the four pipe categories using data provided by Envestra.
(c) West Texas Intermediate.

The price of West Texas Intermediate (WTI) (and most other grades of oil) has showed extreme volatility over recent years with the price peaking at over US$145/bbl (A$150/bbl) midway through 2008. The onset of the global financial crisis saw global demand for crude oil subside and subsequently the price of WTI fell below US$33/bbl (A$50/bbl) by the end of 2008. Throughout 2009 and the beginning of 2010 crude oil prices regained some of these losses, and have maintained its levels between US$75/bbl and US$85/bbl (A$80 – A$90) since the December quarter, 2009. However, through May and early June 2010, US$ prices moderated by nearly 20 per cent on the back of record high oil stocks and markets questioning the strength of the global economic recovery.

We believe that oil prices will see modest increases over the coming financial year in line with modest growth in the world economy. There is still excess capacity and relatively high inventory levels in oil and some metals markets, but as economic conditions stabilise and global economic growth gradually picks up, the growth in demand will support modest rises in prices from here. Short term volatility will continue to persist, however, as large speculative flows move into and out of commodity markets. We expect the average price of crude oil in the US$90/bbl–US$100bbl range throughout the 2011 financial year, and with the A$ expected to remain near parity with the US$, the cost of crude oil will average close to A$95/bbl.

The 2012 financial year should see oil price growth continue. Strong demand out of China, the Middle East and the developing world will see OPEC increase production and decrease their spare capacity. Furthermore, with many oil fields reaching maturity, additional supply constraints will emerge despite new fields coming online. Subsequently, the US$ price of oil will increase and peak at around US$112/bbl during 2013 before moderating in the years up to 2016.

Exchange rate will also play a role in the domestic price of crude oil

Although polyethylene pipes supplied to Envestra are manufactured domestically, the local manufacturers are still exposed to the international price of thermoplastic resins, as a significant proportion of these resins are imported. Therefore, the exchange rate will be of integral importance in determining the price of polyethylene pipe. The onset of the GFC saw the A$ fall from US$0.97 in July 2008 to US$0.62 in November 2008. Subsequently, during 2009 the A$ surged back to around US$0.90 in line with increasing demand for commodities, greater confidence in the global economy and Australia's relatively high interest rates (compared to overseas). This led to a substantial increase in the average exchange rate for the 2010 financial year. This more than offset the increase in the US$ price of crude oil and saw A$ oil prices decrease further.

Over 2011, the global economic recovery will see a sustained increase in demand for commodities. This should see the currency remain close to parity with the US$ over the next two years. Thereafter, exchange rates are projected to ease over 2014 and 2015 as Australian interest rates are lowered and commodity prices ease back.

The end result of these exchange rate and US$ crude oil price movements is the predicted increase in A$ crude oil price rise (close to A$90/bbl) in 2010/11 and subsequently remain around the A$100 to A$115 per barrel band over the following five years (see table 7.1). Given pipeline activity is expected to be the strongest over 2011/12 to 2012/13, our expectation is that polyethylene pipe prices will see its fastest pace growth in the two years to 2012/13.

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 ie. AWOTE.

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.)

Table 8.1: Construction Wages Growth– Australia

	Year Average Percent Change													
							Forecast						**Averages**	
Year Ended June	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2000-10	2011-16
Proportion of Workforce by Pay setting Method														
Awards Only	13.6%	12.0%	10.6%	9.1%	9.5%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	13.1%	10.0%
Collective Agreements	25.9%	27.7%	26.7%	25.6%	24.4%	23.1%	23.1%	23.1%	23.1%	23.1%	23.1%	23.1%	24.7%	23.1%
Individual Arrangements	60.5%	60.3%	62.8%	65.3%	66.1%	66.9%	66.9%	66.9%	66.9%	66.9%	66.9%	66.9%	62.2%	66.9%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100.0%
AWOTE														
Awards Only (a)	2.2	1.8	2.2	1.5	1.7	0.5	2.1	1.4	1.5	1.7	1.3	1.7	1.8	1.6
Collective Agreements	4.4	4.9	4.9	4.6	5.3	5.4	5.1	5.2	5.5	5.6	5.1	5.1	4.7	5.3
Individual Arrangements (b)	7.0	0.5	5.3	12.0	9.5	9.5	5.2	6.1	7.3	8.7	7.2	5.5	5.9	6.7
AWOTE (Persons)(c)	**5.7**	**1.9**	**4.9**	**9.2**	**7.8**	**7.7**	**4.9**	**5.4**	**6.3**	**7.3**	**6.1**	**5.0**	**5.1**	**5.8**
Labour Price Index														
Awards Only (a)	2.2	1.8	2.2	1.5	1.7	0.5	2.1	1.4	1.5	1.7	1.3	1.7	1.8	1.6
Collective Agreements	4.4	4.9	4.9	4.6	5.3	5.4	5.1	5.2	5.5	5.6	5.1	5.1	4.7	5.3
Individual Arrangements (b)	6.2	5.5	5.3	5.2	4.8	2.9	4.1	5.3	6.5	6.5	5.0	5.2	4.3	5.4
Labour Price Index (Ord. Time)	**5.2**	**4.9**	**4.9**	**4.7**	**4.7**	**3.3**	**4.1**	**4.9**	**5.8**	**5.8**	**4.7**	**4.8**	**4.1**	**5.0**
Compositional Effects + Bonuses,etc	0.5	-3.0	0.0	4.4	3.1	4.4	0.7	0.5	0.5	1.5	1.5	0.2	1.1	0.8

(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 8.2: AWOTE Persons by State - Construction
(Year Average Growth)

Year Ended May	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	398		334		366		333		378		358		381		425		381	
1986	418	5.0	360	7.7	370	1.2	364	8.5	393	3.8	381	6.1	423	10.0	467	9.0	401	5.2
1987	443	6.0	395	9.5	399	7.6	375	3.0	442	12.5	403	5.8	466	10.2	501	7.2	432	7.9
1988	475	7.2	427	8.2	422	5.8	406	8.3	431	-2.4	411	2.1	485	4.1	514	2.7	456	5.6
1989	516	8.7	462	8.3	465	10.2	426	4.8	449	4.3	436	6.1	484	-0.3	546	6.3	492	7.9
1990	598	15.8	483	4.4	479	2.9	450	5.6	527	17.2	461	5.8	490	1.2	601	10.0	542	10.1
1991	584	-2.3	501	3.7	510	6.6	474	5.4	591	12.3	481	4.2	527	7.6	563	-6.3	558	2.8
1992	621	6.3	507	1.2	513	0.5	506	6.7	648	9.6	502	4.4	581	10.2	600	6.6	580	4.1
1993	609	-1.9	496	-2.0	510	-0.5	515	1.9	596	-8.0	504	0.3	578	-0.5	666	10.9	567	-2.3
1994	604	-0.8	546	10.0	556	9.0	498	-3.4	643	7.9	522	3.7	610	5.5	638	-4.2	593	4.6
1995	674	11.6	554	1.4	551	-0.9	479	-3.7	677	5.2	504	-3.6	701	14.9	676	5.9	618	4.2
1996	703	4.3	572	3.3	633	14.9	512	6.8	684	1.1	593	17.7	599	-14.6	768	13.6	652	5.5
1997	770	9.4	597	4.3	657	3.7	527	3.0	708	3.5	692	16.7	639	6.7	672	-12.5	682	4.6
1998	731	-5.0	676	13.2	650	-1.0	574	8.8	719	1.5	648	-6.4	683	7.0	702	4.4	704	3.2
1999	772	5.6	637	-5.7	698	7.4	633	10.3	766	6.6	681	5.1	699	2.3	750	6.9	725	2.9
2000	781	1.2	635	-0.4	637	-8.7	648	2.5	837	9.3	623	-8.4	855	22.4	764	1.8	722	-0.4
2001	771	-1.3	665	4.8	641	0.5	732	12.9	783	-6.5	609	-2.3	795	-7.0	797	4.4	731	1.2
2002	836	8.4	687	3.3	709	10.6	695	-5.1	784	0.1	651	6.9	794	-0.1	804	0.8	770	5.3
2003	922	10.3	773	12.4	796	12.3	619	-10.9	779	-0.6	659	1.4	886	11.5	864	7.6	832	8.2
2004	942	2.1	815	5.4	852	7.1	701	13.2	871	11.9	679	3.0	924	4.3	806	-6.8	875	5.1
2005	989	5.0	849	4.2	898	5.4	860	22.8	980	12.5	741	9.2	970	4.9	807	0.1	925	5.7
2006	965	-2.4	877	3.3	906	0.9	855	-0.6	1023	4.3	849	14.6	952	-1.8	1133	40.4	942	1.9
2007	1000	3.7	909	3.6	975	7.7	916	7.1	1145	12.0	917	8.0	975	2.4	1089	-3.8	988	4.9
2008	1121	12.0	1021	12.3	1060	8.7	977	6.6	1176	2.7	948	3.3	1132	16.1	1201	10.3	1078	9.2
2009	1185	5.8	1138	11.5	1137	7.3	968	-0.9	1298	10.4	989	4.3	1117	-1.3	1221	1.6	1162	7.8
2010	1210	2.1	1275	12.1	1236	8.7	1083	11.9	1400	7.8	1048	6.0	1200	7.4	1230	0.8	1251	7.7
Forecast																		
2011					1341	8.5	1162	7.2									1312	4.9
2012					1415	5.5	1223	5.2									1383	5.4
2013					1508	6.6	1306	6.8									1470	6.3
2014					1621	7.5	1405	7.6									1577	7.3
2015					1721	6.1	1487	5.8									1674	6.1
2016					1803	4.8	1557	4.7									1758	5.0
Compound Annual Average Growth Rates																		
1985-2010	4.6		5.5		5.0		4.8		5.4		4.4		4.7		4.3		4.9	
1990-2000	2.7		2.8		2.9		3.7		4.7		3.0		5.7		2.4		2.9	
2000-2010	4.5		7.2		6.8		5.3		5.3		5.3		3.4		4.9		5.6	
2005-2010	4.1		8.5		6.6		4.7		7.4		7.2		4.4		8.8		6.2	
2010-2016					6.5		6.2										5.8	

Source: BIS Shrapnel, ABS Data

8.1 Construction Sector Wages Growth in Queensland

Construction sector wages growth in Queensland tracks – or lags by around one or two years – the growth in total construction activity. Construction activity was extremely strong through most of the 2000s as the minerals investment boom and strong population growth (from both interstate and international migration) fuelled increased demand across all construction categories. However, since the onset of the global financial crisis and the subsequent weakening of the minerals boom, construction activity has been sustained mainly by significant public infrastructure investment. Total Queensland construction activity (measured in real 'work done' terms) fell in 2009/10 as heavy declines in dwelling construction overshadowed marginal growth in non-dwelling construction. This fall in activity saw Queensland construction wages growth in LPI terms slow to 2.9% in 2009/10 (after 5.7% growth in 2008/09), although AWOTE growth is estimated to have picked up to 8.7% from 7.1% in 2008/09. Beyond 2009/10, undersupplied property markets and an easing in credit availability will see dwelling construction activity grow significantly, although, declines across the other construction sectors will see overall construction decline again in 2010/11.

Despite the weakening in construction activity, Queensland construction LPI growth is forecast to pick up to 3.4% in 2010/11, partly due to a 'catch-up' from the wage pause in 2009/10. AWOTE growth, however, is expected to ease (albeit marginally) to 8.5% in 2010/11.

The reconstruction (costing well over $5 billion) following the floods and Cyclone Yasi will drive very strong growth in construction activity in 2011/12 and into 2012/13. In addition, recent announcements of major LNG and coal-related projects will boost resources investment over the near to short-term. Non-dwelling building will also begin increasing from 2013/14 as strong private sector investment overtakes weak public building activity, although this recovery will be partially offset by weaker dwelling building over 2013/14 and 2014/15. Overall, total construction activity will increase strongly in 2011/12 and 2012/13, before growth eases over the following three years.

The recovery in construction activity will lead to increasing wages growth, with growth in the QLD construction LPI predicted to peak in 2012/13 at 6.1%, in line with the peak in construction activity growth, before weakening over 2014/15 and 2015/16. Despite this weakening, LPI growth beyond 2012/13 will be close to the national average. Construction AWOTE growth will track the improvement in 'underlying wage inflation' (ie the LPI), and peak at 7.5% in 2013/14, before easing.

8.2 Construction Sector Wages Growth in South Australia

Much like the other states and territories, wages within the South Australian construction sector tracks total construction activity, although changes in wages tend to lag construction (in work done terms) by around one or two years. Construction activity within South Australia has shown very strong growth over the past two years with work done averaging around 19 per cent growth over 2008/09 and 2009/10. Much of this growth has occurred as the GFC saw both state and federal governments increase infrastructure spending to combat an expected fall in private investment. Subsequently, engineering and non-dwelling construction recorded exceptionally strong growth as road infrastructure saw significant investment, while public housing and construction work within the education sector saw growth increase in non-dwelling building. These increases in construction activity saw South Australian construction wages growth in AWOTE terms increase an estimated 11.9% in 2009/10, after compositional effects in 2008/09 saw average construction wages fall 0.9%.

In 2010/11, construction activity will decline as a range of publicly funded construction projects reach completion. However, this decline in activity will be short-lived as the expansion of the Olympic Dam mine is expected to begin in late 2012. The size of this project will overshadow

construction activity across the other sectors and lead total construction activity to record exceptionally strong growth over 2012/13 and 2013/14 and stabilise at these high levels over the two years to 2015/16. This heightened level of activity will see wages growth in LPI and AWOTE terms increase over the three years to 2012/13, with LPI growth expected to peak at 5.5 per cent in 2012/13 and AWOTE growth peaking at 7.6 per cent in 2013/14 before wages growth moderates over the following years.

8.3 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. More recently (ie since 2007/08), productivity growth in the construction industry has been negative due to faster pace growth in employment relative to output.

Going forward, at the Australian level, productivity growth in the construction sector is forecast to decline by an average of -0.5% over the next six years from 2010/11 to 2015/16 inclusive, with a significant -3% decline in labour productivity in 2010/11, followed by only modest declines or modest increases over the following five years. A similar pattern occurs for both Queensland and South Australia, although the declines in South Australia are expected to be more pronounced due to stronger employment growth in the state. A large -4.7% decline in forecast for Queensland in 2010/11 followed by a rebound in 2011/12 but we expect Queensland productivity growth on average to remain largely static over the following four years to 2015/16, with the average over the next six years an annual decline of –0.5% per annum. Productivity growth in the South Australian construction sector is forecast to decline by an average of -3.2% per annum over the next six years, but most of this is attributable to the large -19.8% decline in 2010/11 due to strong employment growth in the sector in this financial year. Our forecasts of construction sector output, employment and productivity for Australia, Queensland and South Australia are detailed in tables 8.3 to 8.5.

The weaker labour productivity performance predicted over the next six years means that the actual or true construction labour costs to businesses will be higher 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 6.1 per cent per annum over the six years from 2010/11 to 2015/16 for the South Australian construction sector and 4.0% per cent per annum for the Queensland construction sector (see table 1b in the Summary).

Table 8.3: Construction
Output, Employment and Productivity: Australia

Australia						
Year Ended June	Gross Value Added		Employment		Productivity $/employee	
	$m	%CH	'000	%CH	('000)	%CH
1990	42480		603.2		70.4	
1991	39712	-6.5	573.2	-5.0	69.3	-1.6
1992	36423	-8.3	518.0	-9.6	70.3	1.5
1993	38542	5.8	534.2	3.1	72.1	2.6
1994	40897	6.1	558.9	4.6	73.2	1.4
1995	43159	5.5	591.8	5.9	72.9	-0.3
1996	43916	1.8	602.0	1.7	73.0	0.0
1997	45084	2.7	587.6	-2.4	76.7	5.2
1998	49575	10.0	599.5	2.0	82.7	7.8
1999	54065	9.1	632.6	5.5	85.5	3.4
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	90024	-0.1	1 003.9	0.2	89.7	-0.3
Forecasts						
2011	91311	1.4	1 049.7	4.6	87.0	-3.0
2012	94319	3.3	1 090.8	3.9	86.5	-0.6
2013	101501	7.6	1 160.0	6.3	87.5	1.2
2014	103376	1.8	1 185.0	2.2	87.2	-0.3
2015	100704	-2.6	1 173.1	-1.0	85.8	-1.6
2016	105195	4.5	1 208.5	3.0	87.0	1.4
Compound Annual Growth Rates						
1990-2000	3.1		1.3		1.7	
2000-2010	4.6		3.9		0.7	
2005-2010	4.7		3.8		0.8	
2010-2016	2.6		3.1		-0.5	

Source: BIS Shrapnel, ABS data

Table 8.4: Construction
Output, Employment and Productivity: Queensland

Queensland						
Year Ended June	Gross Value Added		Employment		Productivity $/employee	
	$m	%CH	'000	%CH	('000)	%CH
1990	8932		115.5		77.3	
1991	8517	-4.6	109.2	-5.4	78.0	0.8
1992	7975	-6.4	101.7	-6.9	78.4	0.6
1993	8607	7.9	114.5	12.6	75.2	-4.1
1994	9220	7.1	126.6	10.6	72.8	-3.2
1995	9640	4.6	138.0	9.0	69.9	-4.0
1996	9697	0.6	126.9	-8.1	76.4	9.4
1997	10117	4.3	126.3	-0.5	80.1	4.8
1998	11070	9.4	124.6	-1.4	88.9	10.9
1999	12062	9.0	136.8	9.9	88.1	-0.8
2000	12887	6.8	142.3	4.0	90.6	2.8
2001	11236	-12.8	135.6	-4.7	82.8	-8.5
2002	12528	11.5	136.7	0.8	91.7	10.7
2003	14204	13.4	149.1	9.1	95.3	3.9
2004	15447	8.8	164.6	10.4	93.8	-1.5
2005	15523	0.5	187.2	13.7	82.9	-11.6
2006	17175	10.6	204.1	9.0	84.1	1.5
2007	18669	8.7	226.5	11.0	82.4	-2.0
2008	20218	8.3	237.6	4.9	85.1	3.3
2009	20327	0.5	247.6	4.2	82.1	-3.5
2010	19898	-2.1	235.7	-4.8	84.4	2.8
Forecasts						
2011	19526	-1.9	242.7	3.0	80.4	-4.7
2012	22359	14.5	268.8	10.7	83.2	3.4
2013	25240	12.9	302.2	12.4	83.5	0.4
2014	25551	1.2	305.9	1.2	83.5	0.0
2015	23818	-6.8	296.2	-3.2	80.4	-3.7
2016	24657	3.5	300.9	1.6	82.0	1.9
Compound Annual Growth Rates						
1990-2000	3.7		2.1		1.6	
2000-2010	4.4		5.2		-0.7	
2005-2010	5.1		4.7		0.4	
2010-2016	3.6		4.2		-0.5	

Source: BIS Shrapnel, ABS data

Table 8.5: Construction
Output, Employment and Productivity: South Australia

	South Australia					
Year Ended June	Gross Value Added		Employment		Productivity $/employee	
	$m	%CH	'000	%CH	('000)	%CH
1990	2399		37.3		64.4	
1991	2261	-5.8	39.2	5.3	57.6	-10.5
1992	1977	-12.6	41.4	5.5	47.8	-17.1
1993	2188	10.7	38.4	-7.3	57.0	19.4
1994	2167	-1.0	36.0	-6.2	60.2	5.6
1995	2255	4.1	36.5	1.4	61.8	2.6
1996	2284	1.3	35.0	-4.2	65.3	5.7
1997	2488	8.9	35.5	1.6	70.0	7.2
1998	2625	5.5	36.3	2.1	72.3	3.3
1999	2781	5.9	37.1	2.3	74.9	3.6
2000	3087	11.0	45.5	22.5	67.9	-9.4
2001	2720	-11.9	41.3	-9.1	65.8	-3.1
2002	3044	11.9	45.2	9.3	67.4	2.4
2003	3612	18.7	46.5	3.0	77.6	15.2
2004	3809	5.5	48.5	4.3	78.5	1.1
2005	3960	4.0	52.0	7.1	76.2	-2.9
2006	4062	2.6	51.7	-0.5	78.5	3.1
2007	4350	7.1	55.4	7.1	78.5	0.0
2008	4673	7.4	55.9	0.9	83.6	6.5
2009	5073	8.6	61.5	10.0	82.5	-1.3
2010	5171	1.9	66.3	7.9	78.0	-5.5
Forecasts						
2011	4528	-12.4	72.4	9.1	62.6	-19.8
2012	4744	4.8	76.3	5.5	62.1	-0.7
2013	5806	22.4	86.4	13.2	67.2	8.1
2014	5597	-3.6	88.5	2.4	63.2	-5.9
2015	5483	-2.0	85.4	-3.5	64.2	1.5
2016	5256	-4.1	81.9	-4.0	64.1	-0.1
Compound Annual Growth Rates						
1990-2000	2.6		2.0		0.5	
2000-2010	5.3		3.8		1.4	
2005-2010	5.5		5.0		0.5	
2010-2016	0.3		3.6		-3.2	

Source: BIS Shrapnel, ABS data

8.4 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 which have been outlined in section 2.1. The nature of these rolling investment cycles will see solid growth in total construction activity over 2010/11 and 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 in the years up to 2013/14, with growth peaking at 5.8%, before growth weakens in the two years to 2015/16. 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 stabilising in 2010/11 and increasing over the following three years to peak in 2013/14 at 6%, before easing.

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%.

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 3.6 % per annum. Growth will peak in 2013/14 at 5.4 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, an easing in the growth of steel prices 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 8.6: Construction Price Indices: Index 2007/08 = 100

Year Ended June	Gas & Fuel Engineering Construction IPD - Australia		Total Engineering Construction IPD[(1)] Australia	
	Index	%CH	Index	%CH
1988	51.2	5.6	50.5	5.8
1989	56.2	9.7	54.0	6.8
1990	59.5	6.0	57.3	6.1
1991	61.4	3.2	60.1	4.9
1992	63.1	2.7	61.7	2.7
1993	63.4	0.4	62.2	0.8
1994	62.3	-1.7	62.2	-0.1
1995	63.4	1.8	63.3	1.8
1996	65.0	2.5	64.8	2.3
1997	64.4	-0.9	65.3	0.8
1998	64.7	0.5	66.0	1.0
1999	66.1	2.2	66.6	0.9
2000	69.3	4.8	68.9	3.5
2001	71.0	2.5	71.2	3.3
2002	71.4	0.6	72.4	1.7
2003	73.4	2.8	74.4	2.8
2004	75.3	2.5	76.7	3.1
2005	81.1	7.7	80.7	5.2
2006	83.5	3.0	85.3	5.7
2007	95.7	14.6	94.5	10.8
2008	100.0	4.5	100.0	5.8
2009	103.6	3.6	100.8	0.8
2010	102.1	-1.5	95.8	-5.0
Forecasts				
2011	104.2	2.1	99.8	4.2
2012	108.3	3.9	102.7	2.8
2013	113.7	5.0	106.9	4.1
2014	119.9	5.4	112.3	5.0
2015	123.1	2.7	115.4	2.8
2016	126.1	2.4	118.8	2.9
Compound Annual Average Growth Rates				
1990-2000	1.5		1.9	
2000-2010	4.0		3.4	
2005-2010	4.7		3.5	
2010-2016	3.6		3.6	

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.

APPENDIX A: A NOTE ON DIFFERENT WAGE MEASURES AND BIS SHRAPEL'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 relate to the influence of compositional shifts in employment. The compositional effects include changes in the distribution of occupations within the same industry and across industries, and the distribution of employment between industries. For example, a large fall in the number of lower paid employees, or in employment in an industry with lower average wages, will increase average weekly earnings (all else being equal). While this is a true reflection of the average cost of labour to businesses, it is not necessarily the best measure of ongoing wage inflation (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, 16.5% 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 39.8% of all employees, but 84.4% of electricity, gas and water employees' wage increases are determined by this method.
- The remaining 43.7% 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 (ie from more or less lower-paid workers being employed in the relevant year) plus all (or most) of the bonuses and incentives from those under award or collective agreements end up in the individual arrangements residual, which distorts the pay increases in this segment. However, the methodology works well for the 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 methodology utilising purely econometric regression techniques, in particular linear regression models to forecast wages. This opinion is based on a number of factors. Consider the following:

- 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.

In addition, there can be a significant problem in measuring productivity in the Electricity, Gas and Water Sector — a key explanatory variable used in econometric models of wage determination in the utilities sector.

We argue that 'productivity' is difficult to measure and predict in the Electricity, Gas and Water Sector, firstly because output measures are affected by the weather and particularly the availability of water. Secondly, because reliability is essential in the utilities sector, utilities' workforces need to have sufficient labour to deal with both emergency and routine maintenance, as well as ongoing capital enhancement and reliability augmentation programs, rather than to actually produce the electricity, gas or water.

Nevertheless, the productivity and overall efficiency of the utilities sectors throughout Australia have improved over the past two decades (particularly during the 1990s). Most of the utilities are constantly undertaking improvements and are seeking to move to worlds 'best practice' (within the local geographic and other constraints).

All in all, the problem with accurately measuring productivity in the EGW sector can lead to biased coefficient estimates if the popular method of least squares is applied.

The theoretical arguments for an institution-based wage model for the EGW sector against an econometric model are reinforced when one considers the limitations of the results from an application of an econometric (wage) model for the utilities sector.

Access Economics' (AE) model for national utilities wage escalation — which has been relied upon by the Australian Energy Regulator in its recent determinations (such as the determinations for Victorian Electricity Distributors, Energex and Ergon Energy)[5] — is fundamentally an econometric model. Moreover, Access Economics forecasts of the wage escalation for a particular sector, for example the utilities sector Labour Price Index (LPI), uses econometric techniques. It is derived in three stages.[6]

The first step involves generating the national wage forecasts (as measured by the LPI) from their national wage model which is embedded within AE macroeconomic model of the Australian economy. The second step involves modelling (and forecasting) the deviations in sector wage inflation from the national wage inflation. We denote this as the intermediate or the sector wage deviation model. The deviations or differentials are modelled as a function of three factors which AE collectively describes as the 'component drivers'. They are:

- **Business cycle factors.** This is based on the deviations in industry performance from the national average. According to AE, faster growing industries will tend to see faster growth in wages and vice versa.
- **Productivity factors.** AE assumes that industries with faster growth in productivity will see faster growth in wages — workers across an industry being rewarded for increasing the average amount of output per employee faster than the national average.
- **Competition (relative wage) factors.** This is based on wage movements in sectors that would be competing with the EGW sector, because of readily transferable skills. As wage rates in (say) mining rise higher, companies in (say) the construction sector will be forced to pay higher wages to keep their staff. According to AE, the modelling here will see wages in competitor industries tend to move more closely together — with industries that are

[5] See AER, Final Decision, *Queensland Distribution Determination 2010-11 to 2014-15*, May 2010 p. 409 and AER Draft Decision, *Victorian Electricity Distribution Network Service Providers Distribution Determination 2011-15*, Appendices, June 2010 pp. 126-138.

[6] Access Economics' methodology for national utilities wage escalation is described in the Access Economics report "Forecast growth in labour costs: March 2010 report" prepared for the Australian Energy Regulator on 16 March, 2010.

benefiting from the two previous factors tending to be drawn back towards the average, and wages in otherwise slow growing industries boosted.

The final stage involves adding the predicted deviations — ascertained from the wage deviation or intermediate model — to the national wage forecasts in order to generate the sector wage escalation rates. However, it may be noted that AE does not strictly apply their model generated forecast deviations to the national forecasts in order to arrive at the wage escalation rates for the sector. AE applies a 'user adjustment' to the model predictions before settling on their final future model deviations. We presume the 'user adjustment' process takes into account the recent wage outcomes for the EGW sector.

In our report for the Victorian Electricity Distributors (see Appendix C), we empirically tested the validity of AE claim that utilities wage differentials from the national average can principally be explained by variations in its component drivers. To capture the variations in utilities sector wage differential with the national average, we followed in the footsteps of AE and prescribed a linear regression model. Specifically, we allowed the sector wage deviations to linearly depend on its explanatory variables, namely a cyclical (output) component, a productivity element and relative wage movements. Our model was estimated using published ABS data.

Our empirical results revealed that coefficients of output and productivity deviations were negatively signed — directly in contrast to AE a-priori expectations that they should have positive coefficients. Moreover, the coefficients of output and productivity deviations were not statistically significant either on an individual basis or jointly. Hence the hypothesis that the estimated coefficients were significantly different from zero was not supported by the data. This means that the claim that output and productivity deviations are the key drivers of utilities wage deviations was soundly rejected by the observed/empirical data. We therefore conclude that utilities wage inflation is time independent of these factors and hence they should not be considered as the key influences on utilities wage escalation. The inclusion of these variables as key explanatory variables makes the model a poor predictor of sector wage differentials, both to estimate historical data and for forecasting purposes.

According to the AE model, the negative productivity growth of the utilities sector over the decade to 2010 and relative lower output growth than GDP should have produced a lower than average LPI growth for the utilities sector. However, utilities LPI inflation was consistently above total Australia 'all industries' average, by an average of 0.6%.

It appears that the negative (or under-estimation) bias of the AE model has underpinned AE's forecasts of utilities inflation provided to the AER in December 2010. AE numerical forecasts of utilities wage escalation, as presented to the AER, show that — contrary to the recent past — future wage escalation in the utilities sector will only be marginally higher than the national average in 2010/11, but stronger in 2011/12 before again falling below the national average over 2013/14 to 2015/16 (see table v on page xviii of AE December 2010 report to the AER).[7] Over the six years from 2010/11 to 2015/16, the average growth in the utilities LPI is 4.3% per annum — 0.1 percentage points higher than the national (or 'all industries') LPI. This compares to the past decade when LPI growth in the electricity, gas and water supply (EGW) sector averaged 0.6 percentage points higher than growth in the national ('all industries) average.

The upshot is that econometric models for the EGW sector while theoretically coherent can have significant deficiencies in adequately capturing the realities of wage formation and determination in this sector. Hence, forecasts predominantly based on statistical of econometric models of wage determination for this sector will have serious shortcomings.

[7] Access Economics' national utilities wage escalation is described in the Access Economics report "Forecast growth in labour costs: December 2010 report" prepared for the Australian Energy Regulator on 13 December, 2010.

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.

Access Economics stated that the Australian Energy Regulator (AER) commissioned Access Economics to provide forecasts for labour costs growth for the Electricity, Gas, Water and Waste services (utilities) industry to 2017-18. The problem for Envestra Limited and indeed all the electricity and gas utilities dealing with the AER, 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.

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: REVIEW OF ACCESS ECONOMICS' UTILITIES WAGE MODEL – REPORT PREPARED BY BIS SHRAPNEL FOR THE VICTORIAN ELECTRICITY DISTRIBUTORS, JULY 2010

1. INTRODUCTION

In this report we review the Access Economics' (AE) model for national utilities wage escalation. Their model and methodology were described in the AE report "Forecast growth in labour costs: March 2010 report" prepared for the Australian Energy Regulator on 16 March, 2010.

We begin by summarising AE methodology for forecasting utilities labour price index inflation. This is followed by an empirical implementation and a critique of AE utilities wage model. The final section discusses the AE forecasts of utilities wage inflation and how AE appears to disregard the institutional realities of wage setting in the electricity, gas and water supply sector — basically their near term (2009/10 and 2010/11) forecasts are too low, given recent collective agreements negotiations. The overall conclusion is that AE utilities wage forecasting methodology is fundamentally flawed and as a result its forecasts should not be relied upon by the Australian Energy Regulator (AER) in determining the growth in labour costs for the enterprises in the electricity, gas and water supply sector.

2. ACCESS ECONOMICS WAGE FORECASTING METHODOLOGY

Access Economics forecasts of the wage escalation for a particular sector, for example the utilities sector Labour Price Index (LPI), is derived in three stages. The first step involves generating the national wage forecasts (as measured by the LPI) from their national wage model which is embedded within AE macroeconomic model of the Australian economy. The second step involves modelling (and forecasting) the deviations in sector wage inflation from the national wage inflation. We denote this as the intermediate or the sector wage deviation model. The deviations or differentials are modelled as a function of three factors which AE collectively describes as the 'component drivers'. They are:

- a **cyclical component**, which is based on the relative performance of the sector (in output terms) compared to the national average;
- a **productivity component**, based on the productivity differential between the relevant sector and aggregate economy; and
- **competition** (relative wage) factors, based on wage movements in sectors that would be competing with the sector, because of readily transferable skills. For utilities, this would be mainly relative wage movements in the construction, mining and manufacturing sectors.

The final stage involves adding the predicted deviations — ascertained from the wage deviation or intermediate model — to the national wage forecasts in order to generate the sector wage escalation rates. However, it may be noted that AE does not strictly apply their model generated forecast deviations to the national forecasts in order to arrive at the wage escalation rates for the sector. They apply a 'user adjustment' which is effectively tantamount to a 'fudge factor' to the model predictions before settling on their final future model deviations. These are then applied to the national wage forecasts to arrive at the sector wage escalation rates at the national level over the forecast horizon.

The AE report explains the above in a bit more detail in 'Appendix C: Macroeconomic and wage forecasting methodology' on page 105 to 106:

"Movements of specific labour price indices (LPIs) begins with the movements in the total Australian LPI – taken from Access Economics Macroeconomic Model…From this initial index,

the model adds in deviations from the average. Three key factors will drive these wage differentials:

- **Business cycle factors.** Deviations in industry (or State) performance from the national average. Faster growing industries and States will tend to see faster growth in wages and vice versa. In this model, the key factor is how fast the industry (or State) is growing relative both to the national average, as well as to historical averages. So, while manufacturing growth in the future may be below the national average, if the gap is relatively less that has been seen in recent years, this is view as an out-performance by the sector and would see some upward pressure on wages. In this model the methodology is forward-looking, with forecast growth across the next six months (as well as the past twelve) used to determine the current performance of an industry.
- **Productivity factors.** The model assumes that industries with faster growth in productivity will see faster growth in wages – workers across an industry being rewarded for increasing the average amount of output per employee faster than the national average. As these factors take some time to become evident (and due to the inherent volatility in productivity measures at the State and industry level) an average productivity trend across the past two years is used.
- **Competition (relative wage) factors.** Depending on the nature of the industry, workers will have skills that are relatively more or less transferable to other sectors where wages may be rising faster than in their own. Indeed, many workers will be performing effectively the same task (or same occupation – effectively their job description) across different industries (as their industry classification is determined by what their employer produces, rather than what they do). This will tend to limit the ability of wage rates to diverge. As wage rates in (say) mining rise higher, companies in (say) the construction sector will be forced to pay higher wages to keep their staff. Similar factor operate across States – although they are likely to be less significant (and react only to relatively larger discrepancies in wages). The modelling here will see wages in competitor industries tend to move more closely together – with industries that are benefiting from the two previous factors tending to be drawn back towards the average, and wages in otherwise slow growing industries boosted.

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

AE numerical forecasts of utilities wage escalation, as presented to the AER, show that — contrary to the recent past — future wage escalation in the utilities sector will only be marginally higher than the national average in 2009/10 before converging to and then falling below the national average in 2013/14 and 2014/15, before again only equalling the national average in 2015/16 (see table 5.1 on page 46 of AE March 2010 report to the AER. The table is reproduced on next page). Over the six years from 2010/11 to 2015/16, the average growth in the utilities LPI is 3.7 per cent per annum — the same as national (or 'all industries') LPI. This compares to the past decade when LPI growth in the electricity, gas and water supply (EGW) sector averaged 0.6 per cent higher than growth in the national ('all industries) average.

Table 5.1: National industry LPI forecasts – financial year basis

Financial year changes in nominal Labour Price aggregates

Annual % change	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
National LPI	4.1	3.2	3.7	3.9	3.5	3.6	3.7	3.8	4.0	4.0
Utilities	4.4	4.0	3.9	3.9	3.5	3.5	3.6	3.8	4.1	4.1
Mining	5.7	3.2	3.9	4.4	4.1	4.1	4.1	4.2	4.4	4.3
Construction	4.6	3.4	4.0	4.2	3.6	3.9	4.3	4.0	3.9	4.2
Manufacturing	3.7	2.7	4.5	4.3	4.0	3.8	3.8	4.0	4.2	4.1

Financial year changes in real Labour Price aggregates

Annual % change	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
National LPI	0.9	1.0	0.8	0.9	1.0	1.5	1.7	1.2	1.2	1.4
Utilities	1.2	1.9	1.0	0.9	1.0	1.4	1.6	1.3	1.3	1.5
Mining	2.4	1.1	1.0	1.4	1.5	2.0	2.1	1.6	1.6	1.8
Construction	1.4	1.2	1.1	1.2	1.0	1.9	2.3	1.5	1.1	1.6
Manufacturing	0.5	0.5	1.6	1.3	1.4	1.7	1.8	1.4	1.4	1.5

Without having access to AE's macroeconomic model of the national economy, we cannot assess the robustness of the AE national wage model. Nor can we estimate the model coefficients in order to check how closely the model approximates the national wage inflation. Second-guessing model construction (the way the variables are linked) and its underlying theoretical foundations, database used and the estimation technique employed in order to replicate the model estimates and to generate the forecasts would be a futile exercise. Descriptive background information that is provided in the report is not sufficient given the large number of variables that are considered in large-scale macroeconomic models.

We can, however, based on the information provided in the report, check for the consistency and how well AE intermediate or sector wage deviation model performs. This is done next.

3. ACCESS ECONOMICS UTILITIES SECTOR WAGE MODEL AND EMPIRICAL IMPLEMENTATION

In this section we will endeavour to generate the historical (in-sample) utilities wage escalation using the AE methodology. The objective is to determine how well the AE approximates the underlying (actual) data generating process. For the AE methodology to be credible, its model-generated historical estimates should show close resemblance to the actual observed data.

3.1 Linear regression model for utilities sector wage escalation

To capture the variations in utilities sector wage differential with the national average, we follow in the footsteps of AE and prescribe a linear regression model. Specifically, we allow the sector wage deviations to linearly depend on its explanatory variables, namely a cyclical (business cycle) component, a productivity element and relative wage movements. Leaving aside AE 'user adjustment' factor, AE claims that current and future sector wage deviations can be explained by variations in these three quantifiable factors. The utilities wage differential model may be expressed as

$$DEV\_LPI_t = \beta_0 + \beta_1 DEV\_GVA_t + \beta_2 DEV\_PROD_t + \beta_4 DEV\_REL_t + \varepsilon_t$$

where ε_t represents random disturbances,[8] β_0, is a constant, β's are the regression parameters. DEV_LPI represents the difference between the LPI for utilities and the national average, DEV_GVA is defined as the percentage points difference in the growth of gross value added for the utilities sector and the national average and represents the cyclical (output) factor used by AE. Similarly, DEV_PROD denotes the productivity growth deviations while DEV_REL represents the difference between the (average) LPI for the relative competitor sectors with the national LPI.

3.1.1 Preliminary examination of historical movements in variables of interest

In chart 3.1, we plot the historical data series (in level form) for all of the variables of interest for the utilities sector. The deviations (differential) in utilities wage LPI with the Australian average together with all its explanatory variables are plotted in chart 3.2.

It is clear from a visual inspection of both the charts that there is no clear relationship between utilities wage deviations and its cyclical (output) driver. Nor is their any close correlation between utilities wage differentials and the productivity differences. The AE drivers of wage escalation exhibit substantial swings and fluctuations (often falling below zero) over the previous decade while the average wage escalation remained steady at around 4 per cent. There is however a strong linear relationship between the utilities wages and the wage escalation of its competitor industries at both the level and deviation form.

To statistically determine the strength of any linear correlation between the utilities sector wages and its 'component drivers', we calculated the correlation coefficient between the dependant variable (sector wage differentials) and each of its explanatory variables. Apart from relative wages, we found the strength of the correlations to be very weak, contradicting AE claim that output and productivity variables are key influences on utilities wage escalation. The correlation coefficient for wage deviation/output and wage deviation/productivity was 0.2 and -0.1 respectively.

[8] They represent errors in data measurement and other exogenous factors (i.e. those variables which are not specified in the model) that may influence utilities wage deviations.

Chart 3.1: EGW LPI in Level Form

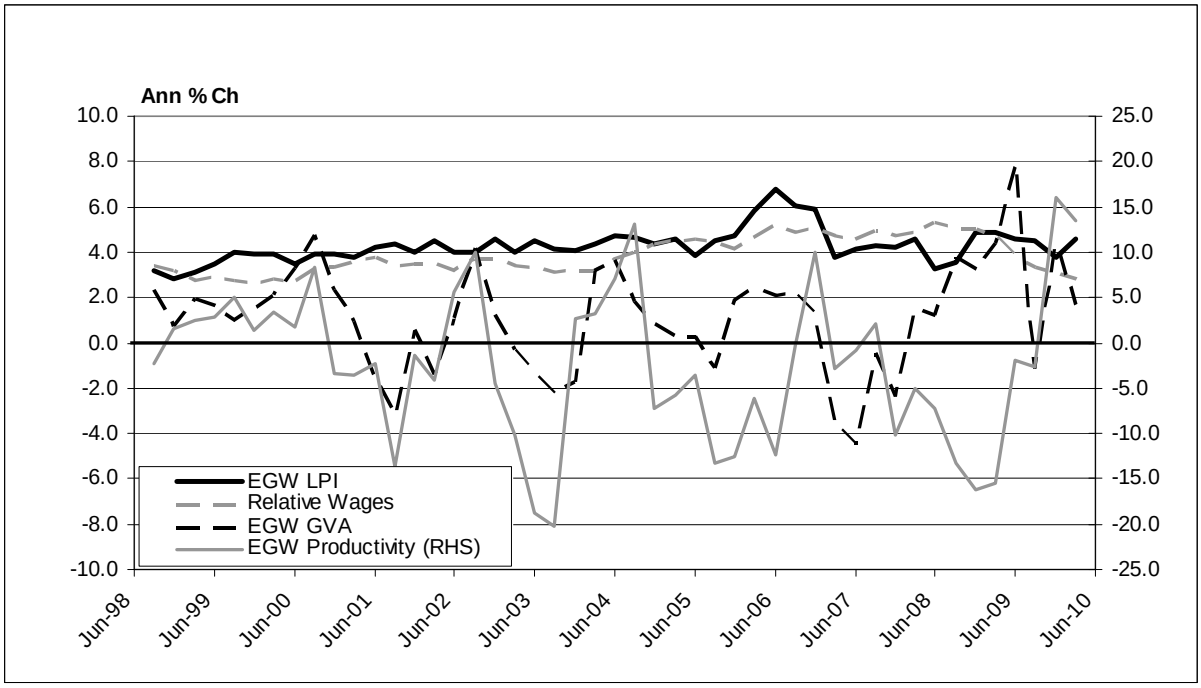
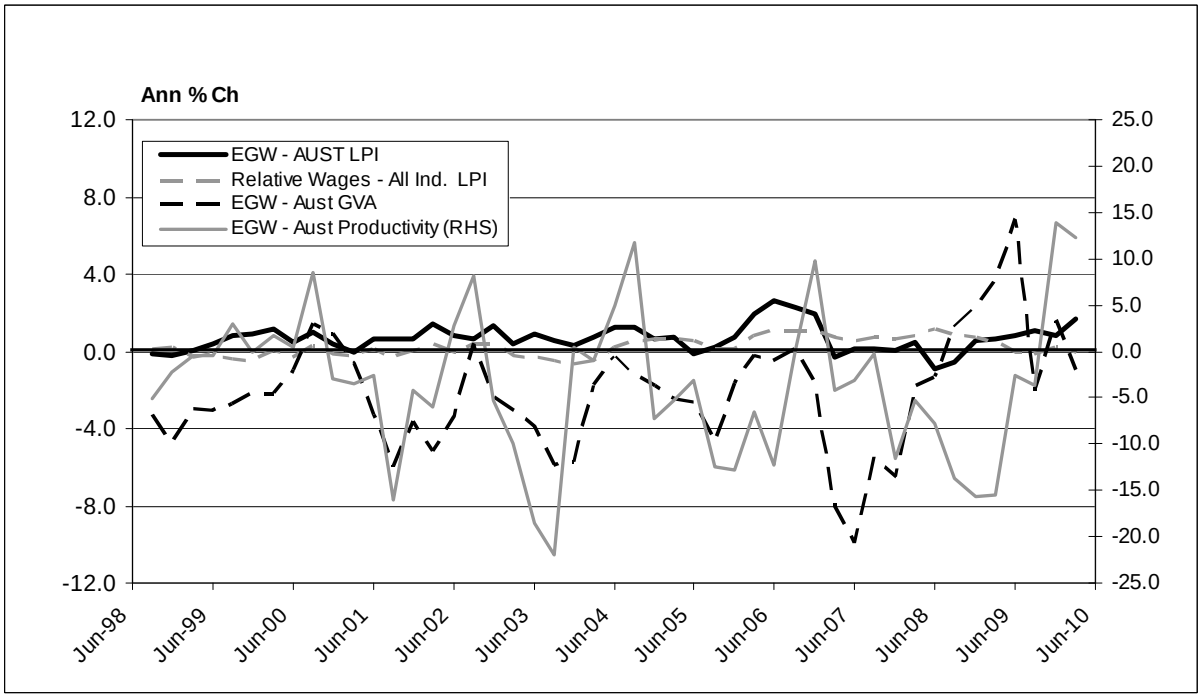


Chart 3.2: EGW LPI – Aust Differential



3.1.2 Empirical implementation of AE utilities wage escalation model

To further empirically test the validity of AE claim that utilities wage differentials from the national average can principally be explained by variations in its component drivers, we estimated AE utilities wage deviation model using published ABS data. We used historical data from 1998/99-2008/09. Assuming that the disturbances of the model are Gaussian — meaning they have a constant mean and variance — and to keep things simple, as the objective is to determine the suitability of the relationships and how well the model fits the data, we estimated the model by the method of least squares.

The estimated model along with estimates of the standard errors of the parameters are produced below (standard errors are in parenthesis)

$$DEV\_LPI_t = -0.25 - 0.04\ DEV\_GVA_t - 0.04\ DEV\_PROD_t - 1.43\ DEV\_REL_t$$

$$(0.45)\quad (0.06)\qquad (0.02)\qquad (0.24)$$

$$R^2_{TAB} = 0.51$$

Empirical results

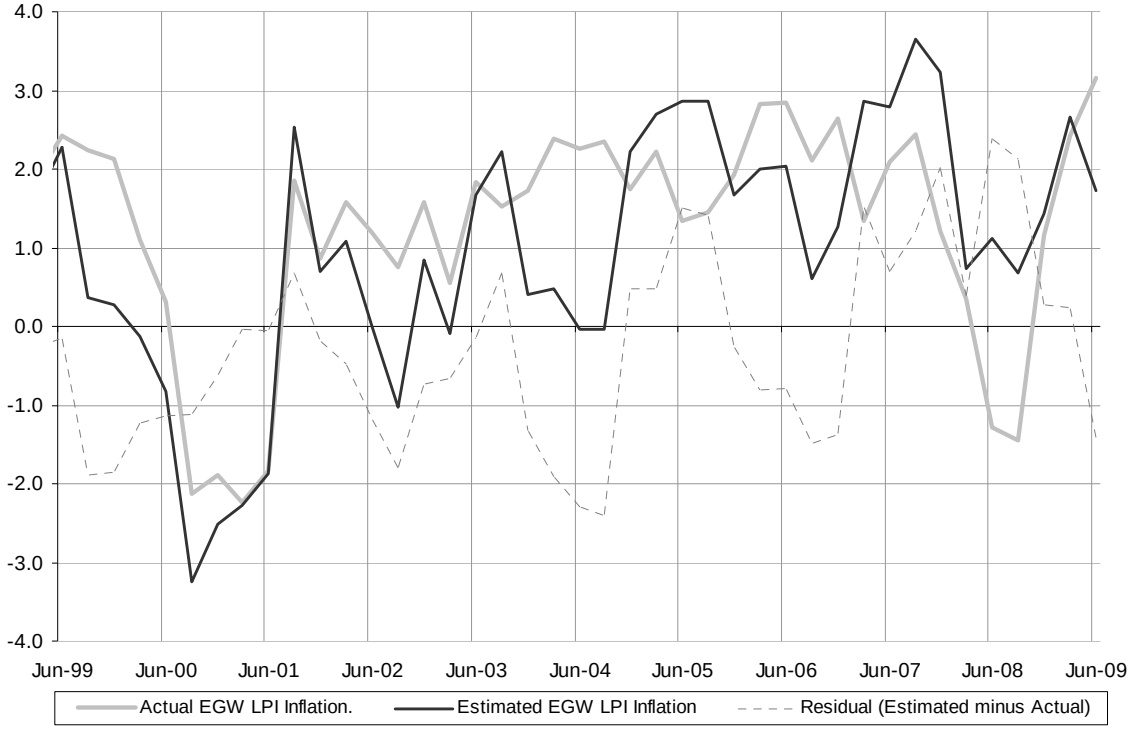
Our empirical results reveal that sector wage deviations are inversely related to both the cyclical (output) and productivity variables. This means that an increment in output (productivity) deviations, which can arise from stronger sector output growth, will lead to a fall in utilities LPI differential with the national average. As this differential has been negative throughout the sample, an improvement in sector productivity growth will lead to a larger negative differential between the two index points. This means that the final sector LPI, which is derived by adding the sector wage differential to the national LPI, will be lower and the wage escalation significantly underestimated. This finding is directly in contrast to AE a-priori expectations.

According to AE, faster growing industries and states will tend to see faster growth in wages and vice versa (see page 106 of AE March 2010 report to the regulator). AE also assumes that industries with faster growth in productivity will see faster growth in wages. A negative relationship between wage deviations and productivity growth means that AE hypothesis is once again rejected by empirical data. According to historical data, the higher are the output and productivity deviations (due to a stronger sector), the lower will be the utilities wage deviations and the lower will be the wage escalation for the sector.

Moreover, the coefficients of output and productivity deviations are not statistically significant on an individual basis. Likelihood ration tests of the joint significance of these variables were also undertaken. The hypothesis that the coefficients are all zero was not rejected at any level of significance. That is the hypothesis that the estimated coefficients were significantly different from zero was not supported by the data. This means that the claim that output and productivity deviations are key drivers of utilities was deviations was soundly rejected. We therefore conclude that utilities wage inflation is time independent of these factors and hence they should not be included in the model. The inclusion of these variables as key explanatory variables makes the model a poor predictor of sector wage differentials as further reinforced by a low r-squared value for the model.

While one can apply several diagnostic techniques to check how well the model fits the data, perhaps the best way to see how well AE model explains the underlying data generating process is by plotting the in-sample model estimates against the actual EGW wage escalation. A chart which plots these variables together with the forecast error (as estimated by model residuals) is provided below.

Chart 3.3: Real EGW LPI v Model Predictions



Source: BIS Shrapnel & ABS Data

As can be seen from chart 3.3, the AE model does a poor job in approximating the observed wage escalation in the EGW sector. Residuals are significantly different from zero and therefore cannot be dismissed as 'white-noise' or a zero mean process. Chart 3.3 also reveals that for the majority of the sample, AE model **understates** the actual wage escalation in the EGW sector. The sample average of the model generated average was 1.1 per cent per annum, 0.2 percentage points lower than the actual real LPI escalation of 1.3 per cent per annum.

Given AE choice of explanatory variables, this is not surprising. Notwithstanding that both cyclical and productivity are insignificant variables in the model, productivity growth (measured as real Gross Value Added divided by employment) was negative - averaging -4.3 per cent per annum compared to 0.9 per cent nationally - and output (real Gross Value Added) was also much lower then the national average – 1.4 per cent p.a. compared to 3.1 per cent nationally. Both these factors dragged down the sector wage deviations and by extension the overall wage escalation in the sector. But the average for LPI growth for the utilities sector during the 2000s was 0.7 per cent above the national LPI.

The limitations highlighted in AE modelling approach means that Access fails to adequately model the wage inflation in the EGW sector. AE model therefore should be dismissed as a forecasting tool for labour cost escalation for the EGW sector.

Table 4.1: Federal Wage Agreements – Collective Agreements by Industry (Average Annualised Wage Increase)

Selected Industry (ANZSIC1993)	Collective Agreements							
	Average Annualised Wage Increase[1]							Average
	2003	2004	2005	2006	2007	2008	2009	2003-2009
Electricity, Gas and Water Supply	**4.2**	**4.3**	**4.2**	**4.6**	**4.5**	**4.7**	**4.7**	**4.5**
Agriculture, Forestry & Fishing	3.4	3.3	3.0	3.0	3.1	3.0	3.7	3.2
Mining	3.2	3.3	3.6	3.7	3.9	4.2	4.3	3.7
Manufacturing	4.1	4.1	4.1	4.2	4.2	4.0	4.0	4.1
Construction	4.1	4.3	4.4	4.9	4.8	4.4	5.0	4.6
Wholesale Trade	3.8	3.9	4.0	3.7	3.6	3.8	4.0	3.8
Retail trade	3.2	3.2	3.4	3.5	3.9	3.8	3.9	3.6
Accommodation, Cafés & Restaurants	2.8	2.8	3.2	3.3	3.4	3.3	3.4	3.2
Transport & Storage	3.6	3.6	3.7	3.7	3.7	3.8	4.0	3.7
Communications Services	4.0	4.2	4.1	3.6	2.6	2.6	3.8	3.6
Finance & Insurance	4.1	4.2	4.1	4.1	3.9	3.6	3.9	4.0
Property & Business Services	3.8	4.1	4.1	3.8	3.8	3.7	4.0	3.9
Government Administration & Defense	4.4	4.4	4.3	4.0	4.0	4.0	4.1	4.2
Health & Community Services	3.9	4.0	4.1	4.0	3.9	3.9	3.9	4.0
Education	3.9	4.5	4.7	4.9	4.5	4.7	4.2	4.5
Cultural & Recreational Services	3.7	3.5	3.8	3.5	3.8	3.8	3.9	3.7
Personal & Other Services	4.5	4.4	4.0	4.0	4.1	4.1	4.0	4.2
ALL INDUSTRIES	3.8	3.9	4.0	4.1	4.1	4.0	4.1	4.0

[1)]Current agreements in June of each year. Source: Department of Employment & Workplace Relations (DEWR)

Table 4.2: Labour Price Index Growth by Industry Sector

Sector	% of Total Employment May 2010	Labour Price Index[1] Annual Percent Change								Five-Year Average
		Jun '05	Jun '06	Jun'07	Jun'08	Jun'09	Sep'09	Dec'09	Mar'09	
Private		3.8	4.0	3.9	4.4	3.6	3.1	2.5	2.6	3.7
Public		4.8	4.3	4.2	3.9	4.4	4.6	4.0	4.3	4.2
Industry										
Mining	1.6%	4.9	5.9	5.5	6.7	4.2	3.7	3.6	3.4	5.2
Manufacturing	8.8%	4.1	3.9	4.1	4.6	2.5	2.5	2.1	2.2	3.5
Electricity, Gas, Water and Waste Services	1.3%	3.9	6.4	4.0	3.5	4.7	4.4	3.7	4.6	4.6
Construction	9.2%	4.7	5.9	4.2	4.7	4.5	3.8	3.5	2.9	4.3
Wholesale Trade	3.7%	3.8	3.7	3.7	4.6	3.3	2.8	2.5	2.1	3.4
Retail Trade	10.7%	3.2	3.4	3.1	4.5	3.5	3.3	2.4	2.4	3.5
Accommodation and Food Services	6.9%	3.1	3.3	3.0	2.3	3.4	3.3	1.9	1.8	2.8
Transport, Postal and Warehousing	5.4%	3.2	4.2	4.1	3.9	4.4	4.5	4.1	3.4	4.0
Information Media and Telecommunications	2.0%	3.6	2.8	3.6	3.9	3.0	2.7	2.0	2.0	3.1
Finance and Insurance Services	3.5%	4.5	4.0	4.3	3.6	3.2	2.2	2.1	2.9	3.8
Rental, Hiring and Real Estate services	1.8%	3.4	3.9	3.0	4.1	3.6	3.7	2.0	2.2	3.4
Professional, Scientific and Technical Services	7.6%	3.9	4.3	4.3	5.1	5.1	3.5	2.9	3.0	4.3
Administration and Support Services	3.3%	3.0	3.3	3.6	4.9	2.9	2.5	1.9	1.9	3.4
Public Administration and Safety	6.3%	4.8	4.2	4.3	3.9	4.5	4.6	3.7	3.9	4.2
Education	7.6%	5.5	4.4	4.1	4.0	4.5	4.0	3.9	4.3	4.2
Health Care and Social Assistance	11.0%	4.0	4.5	4.3	3.6	3.9	4.5	3.9	3.7	4.0
Arts and Recreation Services	1.8%	3.7	3.0	4.4	3.4	3.9	3.7	2.5	3.0	3.6
Other Services	4.2%	4.4	3.2	4.0	3.3	3.3	2.5	2.1	2.5	3.5
Total All[2]	100	4.0	4.2	4.0	4.1	3.8	3.4	2.9	2.9	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

4. AE MODEL ALSO IGNORES THE REALITIES OF WAGE FORMATION IN THE EGW SECTOR

BIS Shrapnel believes that AE modelling of sector wage differential fails to incorporate the unique characteristics of wage formation within the utilities sector hence is not embedded on the realities of wage determination within the utilities sector.

Collective agreements account for over 80% of pay rises in terms of setting pay in the Electricity, Gas and Water sector. This means that collective agreements (usually Enterprise Bargaining Agreements) dominate the wage movements in the EGW sector. Furthermore, these agreements run for an average of 3 years (according to information from the Department of Education, Employment & Workplace Relations). This means recent EBA outcomes are a reasonable guide to overall wage movements in the EGW sector for the next one to two years.

DEEWR data on Enterprise Bargaining show that, over the year to June 2009 the agreements in the EGW sector lodged (formalised) with the DEEWR – in terms of average annualised wage increases (AAWI) per employee – have been in the range of 4.7 per cent to 5.9 per cent., with the average for the year at 5.0 per cent. The 3 year average of formalised agreements (ie for the 3 years to June 2009) was 4.5 per cent. This compares to the AAWI of current operating agreements of 4.7 per cent as at June quarter 2009 – where current agreements represent the actual average wage increases for the whole EGW sector as at the quarter. The movements in the formalised wage agreements tend to track and lead the movements in the current operating wage agreements, over the past decade, as shown in charts 4.1, 4.2 and 4.3. As the accompanying charts show, the movements in the lodged wage agreements track the movements in the current wage agreements, with the 2nd chart showing a moving annual average to remove the volatility. Using a 3 year moving average provides an even better fit (3rd chart), although the actual (ie current operating) outcomes have tended to be slightly higher over the decade.

The last two sets of industry Enterprise Bargaining data from the DEEWR now use the ANZSIC2006 classification of electricity, gas, water and waste services. Even excluding the impact of the waste services segment, it suggests some moderation in formalised agreements over the second half of 2009 to around 4.3 per cent, with the one year average for calendar 2009 easing to 4.8 per cent (from 5.0 per cent in year ended June 2009) but the three year average slightly higher (than 2008/09) at 4.6 per cent.

Projecting the moving annual average of formalised agreements forward 3 years, or using recent increases as a guide suggests the wage increases will be in the range of 4.5 per cent to 5 per cent, for at least the next year. Even given some lower EBAs lodged over 2009/10, say for example averaging 4 per cent over the next 3 years, the 3 year moving average would be 4.6 per cent in 2009/10, 4.4 per cent for 2010/11 and 4.1 per cent for 2011/12 (see table 4.3, assumption scenario #1.). If went to the extreme low of Access Economics forecast and assumed EBAs lodged were only 3.5 per cent, then the 3 year moving average becomes 4.5 per cent for 2009/10, 4.1 per cent for 2010/11 and 3.6 per cent for 2011/12.

However, we actually expect negotiated agreements to be higher than 4 per cent. We anticipate that the new agreements negotiated by 2011/12 will show an increase on the previous two years, given a strengthening in the economy and higher demand for skilled labour, particularly from the construction and mining sectors. If we use the average of the last seven years, ie 4.5 per cent, for 2010/11, 2011/12 and 2012/13 (as per scenario #2 in table 4.3), the three year moving average is 4.6, 4.4 and 4.5 per cent over these three years.

The point here is that Access Economics wage model is disregarding the reality that EBAs dominate wage setting and that recently lodged EBAs suggest wage increases in the EGW sector in the near term are likely to be at least 0.5 percent higher than the AEM in 2009/10, and in 2010/11. The AEM wage model is not grounded in the real world. AE may claim (as in page 114 of its report) that it "notes developments in DEEWR's Trends in Federal Bargaining reports, and takes account of these in its short term forecasting if they appear likely to have a material impact", but BIS Shrapnel believes it has not taken recent EBAs into account sufficiently, if at all.

The second key point is that the utilities sector has negotiated higher enterprise bargaining outcomes than the national average over the past decade, averaging 0.5% higher than the national average over the past 6 years. Indeed, the national average for collective agreements and overall wages growth are virtually always dragged down by the retail, wholesale, hospitality and consumer services sectors, which collectively account for close to one-quarter of total employees (see tables 4.1 and 4.2). These sectors have comparatively less skilled workers, and usually don't experience the labour — and particularly skilled labour — shortages which have occurred in the utilities, mining and construction sectors.

Another key reason why collective agreements are higher in EGW than the national average is the strength of the two key unions in the sector — the CEPU (Communications, Electrical and Plumbing Union) and ASU (Australian Services Union). The industrial relations reality is that the CEPU is a powerful union with a history of achieving high wage outcomes in the EGW sector, with their powerful position derived from operating within an essential services industry that is not trade exposed. Over the past decade, these unions have achieved outcomes on average 1.5 per cent higher than CPI inflation.

With regard to the estimated 17% of EGW employees on individual arrangements, they have achieved wage increases 0.9 per cent above EBAs over the decade to 2009/10 on average. Given shortages of engineers and other skilled personnel in this segment, they are likely to at least match the wage increases under EBAs going forward, with higher average wage increases more likely (as per the past decade). Accordingly, given the analysis of EBAs above, we believe that Access Economics has seriously under-estimated its projections of utilities wages for the next three years and also for the period to 2015/16.

Table 4.3: Comparison of Access Economics Forecasts and Recent EBAs for Electricity, Gas and Water

	2008/09	2009/10	2010/11	2011/12	2012/13
AE Forecasts (March'10)					
Utilities (Australia) LPI	4.4	4.0	3.9	3.9	3.5
Enterprise Bargaining Agreements (a)					
Current Operating Agreements (b)	4.7	4.6			
Three year moving average of 'formalised' AAWIs (average annualised wage increases):					
1. Assume 4.0% average 'formalised' AAWI from March Qtr 2010 to June Qtr 2013	4.5	4.6	4.4	4.1	4.0
2. Assume 4.0% average 'formailised' AAWI from March Qtr 2010 to June Qtr 2010, and 4.5% AAWI for 2010/11, 2011/12 & 2012/13	4.5	4.6	4.6	4.4	4.5

Source: DEEWR, Access Economics 'Forecast Growth in Labour Costs:March 2010', BIS Shrapnel

(a) data for Electricity, Gas and Water Supply sector from DEEWR 'Trends in Federal Enterprise Bargaining'. Latest data December qtr 2009.

(b) Current operating agreements are AAWIs as at June 2009, with estimate for June 2010 (ie 2009/10) based on actual in December qtr 2009 (4.7%) and 3 year moving average.

The argument here is that the AEM model struggles to accurately model and predict wages in non-market sectors such as the government-related sectors, and can't explain wage movements in the utilities sector.

For non-market and the utilities sectors, an 'institution-based' model (such as BIS Shrapnel uses) is a better predictor.

Chart 4.1: Enterprise Bargaining Agreements — Electricity, Gas & Water, Australia Formalised in Qtr Vs Current Operating at Qtr

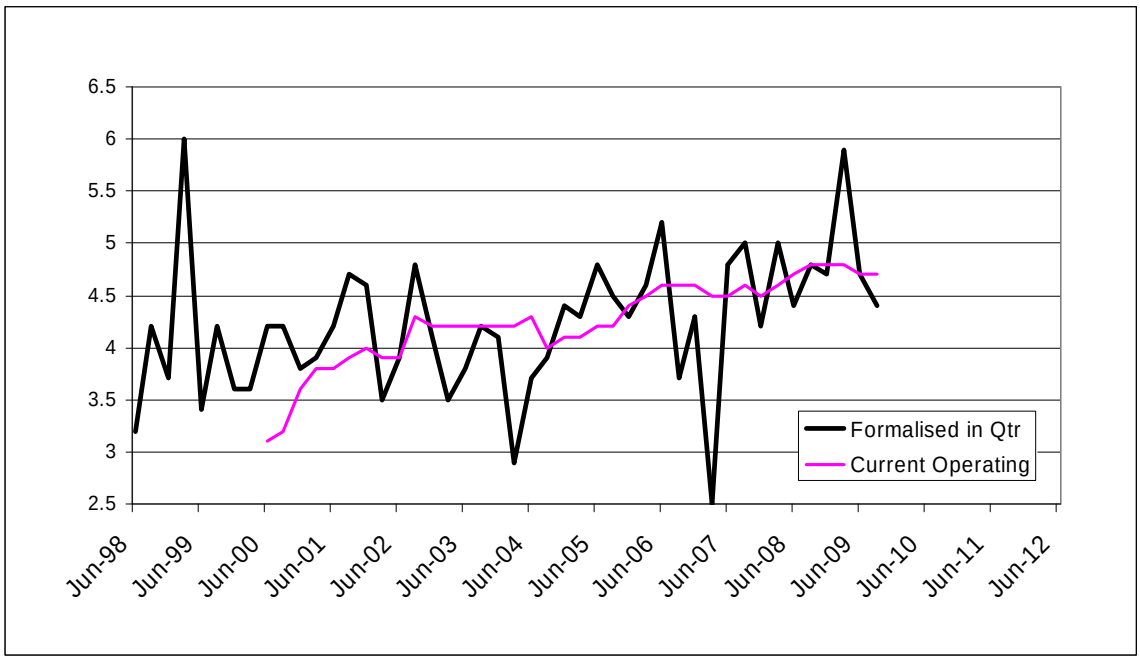


Chart 4.2: Enterprise Bargaining Agreements — Electricity, Gas & Water, Australia Formalised Annual Moving Average Vs Current Operating at Qtr

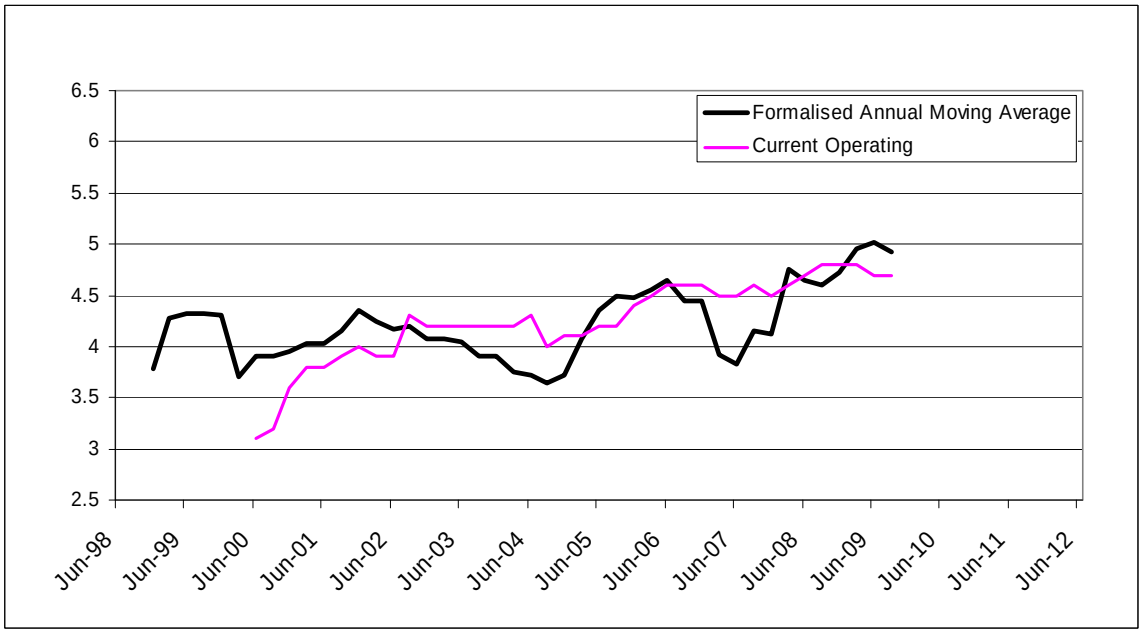
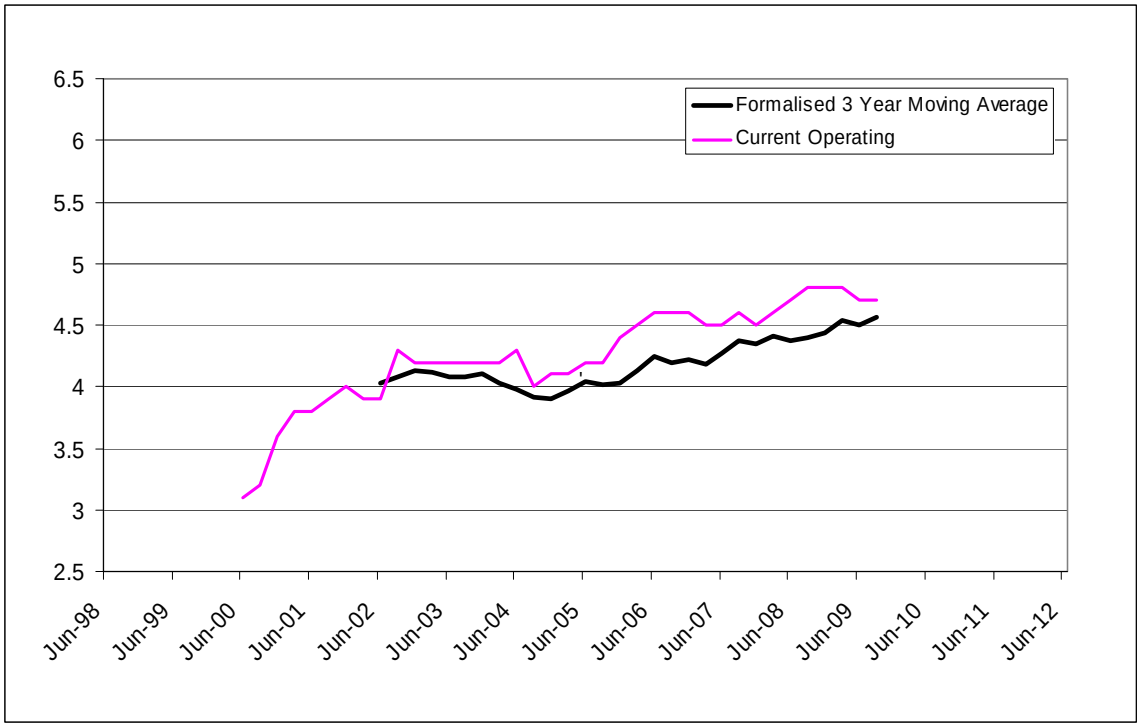


Chart 4.3: Enterprise Bargaining Agreements — Electricity, Gas & Water, Australia
Formalised 3 Year Moving Average Vs Current Operating at Qtr



5. SUMMARY

We have demonstrated that AE wage deviation model is seriously flawed. It fails to incorporate the underlying structural drivers of wage formation in the EGW sector. Moreover, the model's component determinants do a poor job in explaining the variations in the sector wage deviations. As a result, the prescribed model is far from a reasonable approximation to the underlying data generating process.

AE wage deviation model plays an integral part in AE overall sector wage forecasts. Given the limitations of the wage deviation model, we believe AE final EGW wage escalation forecasts are seriously undermined. As a result, the forecasts provided by AE cannot be considered as optimal. In this regard, they should be rejected by the AER.

APPENDIX D: TERMS OF REFERENCE

JOHNSON WINTER & SLATTERY
LAWYERS

Partner: Anthony Groom +61 8 8239 7124
Email: anthony.groom@jws.com.au
Our Ref: A3170
Doc ID: 61254179.1

21 March 2011

Mr Richard Robinson
Associate Director - Economics
BIS Shrapnel Pty Ltd
Level 8
99 Walker Street
NORTH SYDNEY NSW 2060

Dear Mr Robinson

Envestra Limited – South Australian and Queensland Access Arrangement Reviews

We act for Envestra Limited in relation to the AER's review of Envestra's Access Arrangements for South Australia and Queensland.

Envestra Limited has engaged you to prepare an expert report in connection with the AER's review of Envestra's Access Arrangements for South Australia and Queensland.

The purpose of this letter is to confirm your terms of reference and to confirm the matters which Envestra Limited wishes you to address in your report and the requirements the report must comply with to be capable of use in the AER review.

Terms of Reference

We refer you to the Draft Decisions of the AER in respect of the South Australian and Queensland Access Arrangements, specifically:

1. AER Draft Decision entitled "Envestra Ltd Access arrangement proposal for the SA gas network 1 July 2011 – 30 June 2016" and dated February 2011; and

2. AER Draft Decision entitled "Envestra Ltd Access arrangement proposal for the QLD gas network 1 July 2011 – 30 June 2016" and dated February 2011.

We also refer to the analysis undertaken by the AER's consultant, Access Economics, which is referred to in those decisions.

Having regard to any comments made by the AER in those decisions which you consider relevant, please update the forecasts of labour and materials costs set out in your August 2010 Report "Real Cost Escalation Forecasts 2015-2016." In doing so also please comment on any other matters relevant to the forecasting approach taken by the AER and Access Economics.

In providing your opinion, you should have regard to the relevant requirements of rule 74(2) of the National Gas Rules.

Rule 74(2) 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 Envestra in its response to the AER's Draft Decision. 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 Envestra and by the AER.

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

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 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 Envestra.

In particular, your report prepared for Envestra should contain a statement to the effect that the author of the report has read the Code of Conduct and agrees to comply with it.

Your report must also:

1 give details of the expert's qualifications and of the literature or other material used in making the report;

2 state all of the questions or issues that the expert has been asked to address;

3 state all of the factual premises upon which the report proceeds; and

4 otherwise comply with the Code of Conduct.

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 Envestra Limited. You should forward to Envestra Limited any terms you propose govern that contract as well as your fee proposal. Your invoices for the production of the report are to be addressed and sent to Envestra Limited.

Contact with us

We request that you contact us or Envestra Limited by telephone in the first instance to discuss any requests for the provision of data or your preliminary conclusions. All enquiries to Envestra Limited should be made to Craig de Laine or Geoff Barton.

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

Yours faithfully

Johnson Winter & Slattery

Enclosed: 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 ……22/3/2011……..

APPENDIX E: STATEMENT OF COMPLIANCE WITH EXPERT WITNESS GUIDELINES

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

APPENDIX F: CURRICULUM VITAES OF KEY PERSONNEL

Key Personnel No. 1 (Name and Position)

Richard Robinson, Senior Economist & Associate Director – Economics

Qualifications

B.Comm (Hons)

Professional and Business Associations

- Nil

Length of Service at BIS Shrapnel

25 years

Experience

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).

Some examples of recent (similar nature) private client projects that Richard has worked on include:

- *Real Cost Escalation Forecasts for Envestra Ltd.* For this project, Richard, provided an expert opinion on the outlook for a range of labour, materials and contractor cost escalators relevant to operating and capital expenditure of natural gas networks in Queensland and South Australia over the six year period from 2010/11 to 2015/16.

  The labour, materials and contractor escalator forecasts and reports was used by Envestra for internal budgeting and planning purposes and particularly in the preparation of cost estimates for operating and capital expenditure to be included in the regulatory submission to the Australian Energy Regulator (AER) on 1st October 2010.

- *Labour Cost Escalation Forecasts for Powerlink Queensland*. BIS Shrapnel was engaged by Powerlink Queensland (hereinafter referred to as Powerlink) to provide an opinion on the outlook for a range of labour cost escalators at both the Australian and Queensland level. For this project, Richard provided real and nominal labour cost escalators for: internal Labour (comprising Electricity Network and General Labour escalation); external Labour

(mainly consisting of outsourced Contractor escalation rates for both construction and non-construction related activities); and competing sectors ie wage escalation for construction, mining and manufacturing sectors.

The seven year forecasts, covering the period from 2010–11 to 2016–17, will be used by Powerlink in the preparation of cost estimates for operating and capital expenditure both of which will be included in their regulatory submission to the AER in May 2011.

- *Outlook for the Economy, Inflation and Wages* for the Public Service Association and Professional Officers' Association Amalgamated Union of New South Wales ("PSA"). In April 2008, the PSA requested BIS Shrapnel to assist PSA in relation to its application for the making of a new *Crown Employees (Public Sector – Salaries 2008) Award*. For this report, Richard prepared the inflation, wages and GDP forecasts for the Australian Economy.

Key Personnel No. 2 (Name and Position)

Rachael Logie, Senior Economist

Qualifications

B.Sc, B.A, M.A (Hons), M.Sc

Professional and Business Associations

- Member, Australian Business Economists

Length of Service at BIS Shrapnel

9 years

Experience

Rachael works on macroeconomic and industry forecasts. She specialises in forecasts of consumer demand, household income and growth by industry sector.

Rachael is the editor and key author of BIS Shrapnel's monthly short-term Economic Outlook publication as well as the annual Long Term Forecasts publication. She has also worked on industry sector and resources sub-sector analysis and forecasts. Rachael has also been involved with a number of demand-forecasting and economic impact assessment studies such as:

- A demand forecasting model for BP's key products including diesel, jet fuel, lubrication products, bunker oil, gasoline and bitumen. For this recently complete project, Rachael developed an updateable Excel model that allows BP to run sensitivities (or scenario experiments) on the key macroeconomic and growth assumptions.

- Over January-March 2010, Rachael carried a study for MITEZ Inc. which had the objective of quantifying the potential economic benefits arising from the adoption of an AC transmission link from Townsville to Mount Isa (this link was the proponents preferred solution for securing North West Queensland's future power needs).

  The study analysed the potential economic benefits from renewable energy projects which could readily connect into the NEM, as well as the broader regional development gains for towns along the corridor from the higher built-in electricity capacity in terms of output and employment. The study also looked at the benefits to large electricity consumers in the region from investment in renewables and the potential contribution from the North West region to the Commonwealth Government's 20 per cent renewable energy target by 2020.

- In late 2009, Rachael prepared a study to quantify the potential economic benefits arising from the implementation of projects currently proposed in the North West Minerals Province that will potentially rely on the Townsville to Mt Isa rail line to get their product to market and specifically rely on investment in the Eastern Corridor rail link which provides for expanded rail capacity.

  The benefits analysed included the financial gains to the three levels of government, state, federal and local as well as Queensland Rail network, the direct and indirect economic benefits of the upgrade during both the construction and operation phase and any spin off benefits for the local region from the upgrade and the associated economic benefits. The analysis involved quantifying the impact of these projects proceeding in terms of the potential revenue gains for transport providers, the direct and indirect impact on employment and company earnings in the region and also the boost to local, state and federal government tax revenues.

Prior to working for BIS Shrapnel, Rachael worked as a Health Economist at the University of Manchester and a Risk Analyst for PricewaterhouseCoopers in London.

Key Personnel No. 3 (Name and Position)

Dr Kishti Sen, Economist

Qualifications

B.A, M.Ec (Hons), Ph.D

Professional & Business Associations

- Member of New Zealand Association of Economists
- Member of the Economic Society of Australia
- Member of Australian Business Economists
- Member of the Econometric Society

Length of Service at BIS Shrapnel

3 years

Experience

Kishti works across both the Economics and Infrastructure and Mining units. Since joining the company in 2007, 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. Some examples of recent projects that Kishti has worked on include:

- *Revenue Prospects for New South Wales TAB Limited* for Greyhound Racing New South Wales for use in their submission to the *"Cameron Review of Wagering in New South Wales"*. The report provided an overview of and prospects for the Australian and New South Wales economies, household income and expenditure in Australia; and forecasts for TAB Limited's revenue to 2013, 2018 and 2028.

For this project, Kishti estimated NSW TAB's revenue leakage to other betting agencies; most notably the Northern Territory based corporate bookmakers through an empirical implementation of the partial adjustment model.

- *Cost Escalation in the New Zealand Transmission Sector* for Transpower New Zealand Ltd. BIS Shrapnel was engaged by Transpower New Zealand Ltd to provide an opinion on the outlook for a range of labour and other input cost escalators relevant to the New Zealand transmission and electricity distribution sectors over the five years to June 2015. For this report, Kishti developed the Consumer Price Index (CPI) inflation and wage model for New Zealand.

- *Australia and New Zealand Roads Capability Analysis* for the association of Australia and New Zealand Road Transport and Traffic Authorities (AustRoads). The report provided an analysis of the capability of the Australian and New Zealand roads workforce to meet infrastructure development requirements over the decade to 2018/19 and was used by AustRoads to develop their national strategies for skilled workforce capability.

  For this report, Kishti developed the capability model which investigated whether the supply of skilled labour (existing workforce) in the roads sector will be sufficient to cover for the expected demand for skilled labour to be generated by future road construction, maintenance and other road management activity as well as labour lost through workforce attrition.

Prior to joining BIS Shrapnel, Kishti was Senior Economist (Policy & Research) at the Reserve Bank of Fiji.

