Jemena Gas Networks (NSW) – Access Arrangement Information - Appendix 6.4

CEG: Escalation factors affecting expenditure forecasts – A report for Jemena Gas Networks (NSW)

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Escalation factors affecting expenditure forecasts

A report for Jemena Gas Networks

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Executive Summary

1. CEG has been commissioned by Jemena Gas Networks (JGN) to estimate cost escalation factors in order to project forward the costs of JGN's proposed expenditure program for the 2010-11 to 2014-15 regulatory period. JGN has requested that cost escalation factors be developed for:

   - labour paid under enterprise bargaining agreements (EBA);
   - labour paid under individual contracts;
   - aluminium;
   - steel;
   - plastics (nylon-11/polyethylene); and
   - concrete.

2. JGN has also requested that CEG separately estimate the extent to which the planned introduction of an emissions trading scheme (ETS) is likely to affect the escalation factors for aluminium, steel, nylon-11/polyethylene and concrete.

3. The terms of reference for this engagement stipulate that these cost escalation factors should be consistent with the National Gas Rules, and in particular Rule 74(2), which states that any 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.

4. We consider that the estimates presented in this report and the methodologies that we use to derive them are consistent with these requirements.

5. In order to estimate a set of escalation factors to extend forward JGN's costs, it is necessary to form a view about the future movements of wages and commodity prices. The methodology that we have adopted in this report is to source predictions of future prices for these inputs, whether in the form of futures prices or expert forecasts, and to rely on these data to develop escalation factors. Where futures prices are available and are sufficiently liquid, we have used these in preference to forecasts on the basis that these represent the best forecast of prices by informed market participants.

6. Issues of consistency in timing are crucial to the development of escalation factors because their function is to project forward prices or costs from one period to another. Due to the way that spending forecasts are used in regulatory modelling, the escalation factors required to project forward operating and capital expenditure must be made on a different basis. Operating expenditure must be projected forward to the

mid-point of each financial year, using the forecast change in average costs between financial years, or 'financial year' escalators. On the other hand capital expenditure must be projected forward to the end of each financial year, using the change in average costs over each calendar year, or 'calendar year' escalators. Furthermore, since JGN has based its cost estimates for operating expenditure in the 2008-09 financial year and for capital expenditure in the 2008 financial year, it has proved necessary to project these escalators forward from a different base period.

7. In general, the methodology applied in this report to estimate escalation factors is characterised by a high degree of transparency over the use of input data to estimate escalation factors and is broadly consistent with the methodology applied by the Australian Energy Regulator (AER) in its calculation of escalation factors for its Final Determinations for the New South Wales and Tasmanian electricity businesses.

8. CEG's estimates of JGN's escalation factors are set out in Table 1 below.

Table 1: Escalation factors for Jemena Gas Networks, real

Financial year	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**
EBA EGW labour	1.8%	1.3%	2.1%	1.9%	1.6%	1.8%
Contract EGW labour	1.8%	1.4%	2.1%	4.0%	4.4%	4.1%
Aluminium	-7.9%	9.9%	9.0%	7.7%	6.6%	5.9%
Steel	-18.0%	8.4%	6.3%	1.5%	0.9%	0.8%
Polyethylene	0.6%	2.0%	1.1%	0.3%	0.2%	0.2%
Concrete	3.0%	1.5%	3.4%	3.0%	1.8%	0.9%
Calendar year	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
EBA EGW labour	1.6%	2.3%	2.2%	2.0%	1.7%	1.7%
Contract EGW labour	1.9%	1.5%	1.6%	3.1%	4.4%	4.3%
Aluminium	-29.5%	12.5%	9.2%	8.6%	7.0%	6.2%
Steel	-31.6%	9.9%	6.5%	3.8%	1.0%	0.9%
Polyethylene	-7.0%	4.5%	1.5%	0.7%	0.2%	0.2%
Concrete	6.8%	0.7%	2.7%	3.6%	2.3%	1.3%

9. We have separately estimated the effect that the Commonwealth Government's proposed ETS will have on the escalation factors for commodities. This analysis is based on the Australian Bureau of Statistics Input-Output tables, which allow us to track the extent to which an increase in the price of carbon dioxide emissions will have on the price of final outputs over a range of industries. The effect of increasing emissions prices between 2009-10 and 2014-15 on the escalation factors estimated above is shown in Table 2 below.

Table 2: Effect of emissions trading scheme on escalation factors

Financial year	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Aluminium	0.0%	0.0%	0.3%	0.4%	0.1%	0.0%
Steel	0.0%	0.0%	0.7%	1.2%	0.1%	0.1%
Concrete	0.0%	0.0%	0.5%	0.8%	0.1%	0.1%
Polyethylene	0.0%	0.0%	0.3%	0.5%	0.1%	0.1%
Calendar year	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Aluminium	0.0%	0.0%	0.1%	0.4%	0.3%	0.0%
Steel	0.0%	0.0%	0.3%	1.1%	0.7%	0.1%
Concrete	0.0%	0.0%	0.2%	0.7%	0.5%	0.1%
Polyethylene	0.0%	0.0%	0.1%	0.4%	0.3%	0.0%

10. Given the lack of certainty over future emissions prices and the nature of industry relationships in the future, the estimates reported in Table 2 are necessarily approximate. Nonetheless, we believe them to be reasonable and the best estimate possible in the circumstances.

1. Introduction

11. Jemena Gas Networks has engaged CEG to provide advice on the development of annual escalation factors for its operating and capital expenditure programs. The terms of reference for this engagement are set out at Appendix D.

12. Escalation factors, properly derived, can be used to project forward the value of base objects into the future. An example of a base object may be the average wages of a full time employee in the electricity, gas and water sectors over the 2007/08 financial year. Planning of future projects may be conducted on the basis that a certain number of such employees may be required over a period of time during the next regulatory period. Escalation factors for EGW wages can be used to determine the expected cost of the labour input to this project.

13. The methodology for determining escalation factors has become significantly refined over the course of the South Australia, New South Wales and Tasmanian electricity network determinations. Although there are still areas where the businesses are in dispute with the AER, at a high level there is general agreement as to the best approach to calculate escalation factors for:

    - EGW labour;
    - aluminium;
    - steel; and
    - crude oil.

14. In this report, we review the foundations for the methodology that has been applied in the context of the electricity determinations and re-estimate escalation factors based on the most recently available data. Furthermore, we propose methodologies for calculating escalation factors for additional inputs relevant to the gas context, including:

    - concrete; and
    - plastics (nylon-11 or polyethylene).

15. JGN has also asked CEG to estimate the effect that the proposed ETS will have on its escalation factors. We have used forecasts of the price of emissions under a trading scheme, combined with Australia-wide input-output tables published by the Australian Bureau of Statistics, to estimate the effect that the ETS will have on prices in these industries.

16. We have been provided with a copy of the Federal Court guidelines "Guidelines for Expert Witnesses in Proceedings in the Federal Court of Australia" dated 5 May 2008.

We have reviewed those guidelines and our report has been prepared consistently with the form of expert evidence required by those guidelines.

17. This report has been prepared by Dr Tom Hird, a Director of CEG and based in its Melbourne office. Dr Hird has been assisted in the preparation of this report by Daniel Young, an economist in CEG's Sydney office. The qualifications of Dr Hird and Mr Young are set out at Appendix C to this report.

18. In preparing this report, we have made all the inquiries that we believe are desirable and appropriate and no matters of significance that we regard as relevant have, to our knowledge, been withheld.

2. Description of methodology

19. In order to escalate forward JGN's operating and capital expenditure it is necessary to obtain or develop forecasts of either:

    a. the price of goods and services directly purchased by JGN for the purpose of delivering its expenditure programs; or

    b. the price of inputs used in the production of goods and services directly purchased by JGN for the purpose of delivering its expenditure programs.

20. This task would best be achieved by examining forecasts of prices for all inputs purchased by JGN (ie, category a) above). Unfortunately, with the exception of labour costs, such forecasts generally do not exist. For example, while there are forecasts for labour costs in the New South Wales electricity, gas and water sector, there are few if any forecasts of the cost of equipment purchased by JGN (such as pipes, meters and regulators, etc).

21. The lack of such forecasts for most goods and services purchased by JGN reflects the specialised and heterogeneous nature of these goods and services – such that there is insufficient demand for forecasts of these prices and no active trading in 'futures' for these goods and services. For example, there is no formal 'futures market' for plastic pipes.

22. However, for many of these inputs used in the production of equipment/services purchased by JGN there are raw material forecasts and/or futures prices that can inform forecasts for the prices of the inputs themselves. Specifically:

    a. futures prices and forecasts for aluminium and crude oil can be used to inform forecasts for the value of these materials as components of JGN's expenditures;

    b. forecasts of the price of steel, concrete and labour can be used to project forward the value of these components of JGN's expenditures; and

    c. forecasts of general cost movements (eg, consumer price index or producer price index) can be used to derive changes in the cost of other inputs used by JGN or its suppliers that not captured above (eg, energy costs and equipment leases etc).

23. This high-level approach has previously been proposed by CEG in its reports for electricity businesses[1] and has been accepted by the AER in its Final Determinations for ElectraNet, Transend and the New South Wales electricity network businesses.

24. The necessary steps required to develop a forecast for the escalation of an expenditure program are as follows.

- Step 1- break down the expenditure program into different cost categories for which there are cost forecasts (or for which cost forecasts can be derived);
- Step 2 – source/derive the relevant cost forecasts;
- Step 3 – calculate a weighted average escalation factor using weights derived in Step 1 and forecasts from Step 2.

25. In order to complete Step 2 where there are no futures or forecasts available for a particular good or service (eg, gas regulators) it may be necessary to derive a forecast for that good or service from other forecasts. The methodology taken in deriving a forecast for, say, gas meters is similar to the above – the only difference being the starting point is not a breakdown of the costs of the overall capex program but a breakdown of the costs of gas meters. It can be described as follows:

- Step 2A – breakdown the cost of production for that good/service into component inputs parts for which there are forecasts available (eg steel, aluminium and labour);
- Step 2B – source the relevant input cost forecasts;
- Step 2C – calculate a weighted average escalation factor using weights derived in Step 2A and forecasts from Step 2B.

26. The remainder of this section sets out a number of considerations that guide the approach set out above.

2.1. Preference of futures over forecasts

27. Consistent with the approach approved by the AER in its recent New South Wales and Tasmanian electricity Final Determinations, in coming to our estimates of JGN's future escalation factors we have had regard to various predictions of how prices may change in the future. These predictions have been obtained from two general sources: futures market prices and expert forecasts.

[1] See: CEG, *Escalation factors affecting capital expenditure forecasts: a report for ElectraNet*, January 2008; CEG, *Escalation factors affecting expenditure forecasts: a report for NSW electricity businesses*, April 2008; and CEG, *Escalation factors affecting expenditure forecasts: a report for NSW and Tasmanian electricity businesses*, January 2009.

28. In CEG's opinion the most reliable forecast for input prices is provided by prices determined in the futures market – provided that the relevant market is sufficiently liquid. That is, the most reliable predictor of prices on a particular date in the future is the price at which market participants are willing to commit to trading on that day. If there were a better estimate of future prices then investors could expect to profit by buying/selling futures until today's futures price reflected the best estimate of spot prices on the relevant future date.

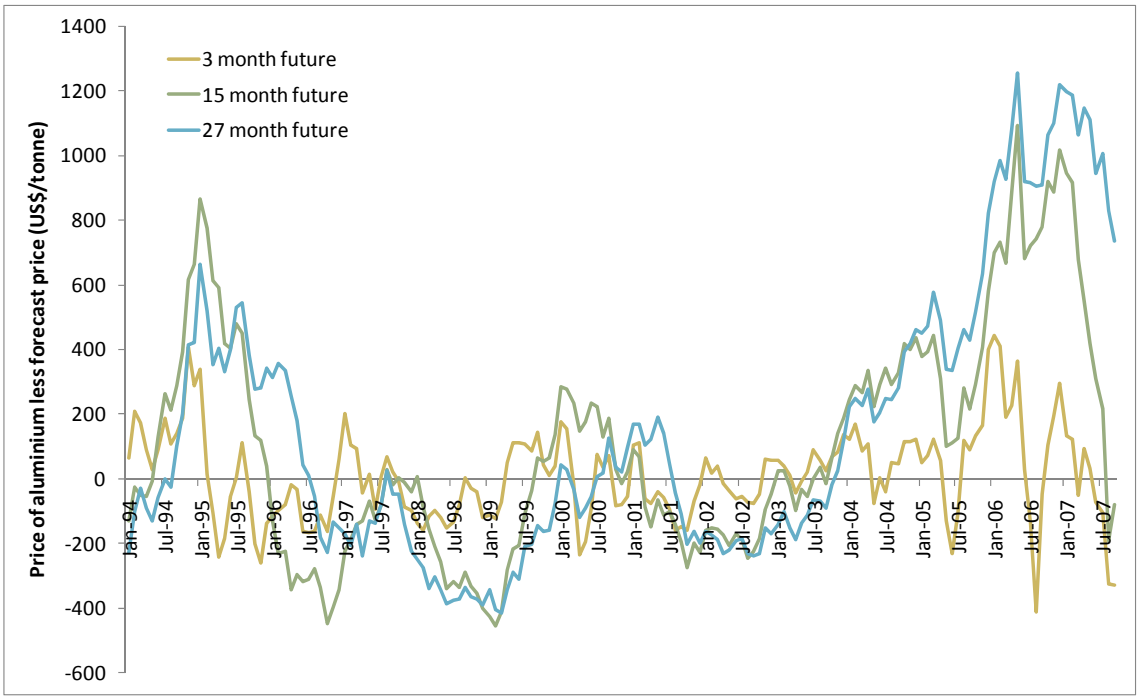
29. Of course, futures prices will be very unlikely to exactly predict future spot prices given that all manner of unexpected events can occur. In fact, futures prices have spectacularly underestimated refined aluminium prices in the last few years (see below graph). However, they nonetheless provide the best estimate of future spot prices. An important reason why futures markets are more reliable than professional forecasters is that in order to participate in a futures market (and help set the price in that market) you must be willing to risk real money.

30. This is a standard proposition in finance theory not just limited to futures markets for base metals and oil. The International Monetary Fund also makes the same point when it states:

> *"While futures prices are not accurate predictors of future spot prices, they nevertheless reflect current beliefs of market participants about forthcoming price developments. Bowman and Husain (2004) find that futures-prices-based models produce more accurate forecasts than the models based on historical data or judgment, especially at long horizons."*[2]

[2] IMF, *World Economic Outlook*, April 2007, p.8

Figure 1: Actual prices less prices predicted by LME futures (nominal, US$/tonne)



31. The graph above shows that, over most of the 1990's, futures prices were a reasonable predictor of aluminium spot prices. However, during the first half of the current decade futures prices have systematically underestimated spot prices (ie, failed to anticipate the increase in spot prices and overestimated the rate at which they would subsequently fall).

2.2. Real versus nominal escalation

32. It is our understanding that the escalation factors that are to be applied to both operating and capital expenditure must escalate the real price of the underlying good or service, not the nominal price. This is because the future costs of JGN are expressed in real terms in the AER's regulatory modelling and are re-inflated in the context of that model. However, it is not always possible to obtain forecasts of future price movements that are expressed in real terms.

33. For wage, construction and concrete costs we have relied on professional forecasters' opinions of the future level of price escalation. Where the forecaster is also an acknowledged macro-economic forecaster we have used its forecasts of inflation to derive an associated real forecast from its nominal forecast. Where the forecaster is a sectoral specific forecaster (rather than a macro-economic forecaster) we have used

our own estimate of expected inflation derived on the basis of the Reserve Bank of Australia's (RBA) forecasts. The derivation of this forecast is very simple, aligns with the method utilised in the AER's spreadsheet modelling for the New South Wales and Tasmanian Final Determinations, and is explained in Box 1 below.

34. For example, in the following section we present real wage cost forecasts from Econtech, BIS Shrapnel and Macromonitor. Econtech and BIS Shrapnel have acknowledged expertise in macro-economic forecasts and we have derived real wage forecasts by deflating their nominal wage forecasts by the forecasts of inflation that it has made on a consistent basis.[3]

35. By contrast, Macromonitor specialises in sectoral analysis of the construction and utility sector – focusing its forecasts on wages and prices in this sector. It does not regard general inflation forecasting (ie, forecasting the prices of all domestically consumed goods and services including the Australian dollar price of imports) as one of its core skills. Consequently, we have deflated Macromonitor's nominal forecasts of wages growth in the utility sector by an inflation forecast based on RBA data.

36. Similarly, where we have relied on futures markets to derive forecasts of particular prices (eg, for aluminium) we have deflated these by a inflation forecast based on RBA data. This is because futures contracts tend to be written in nominal terms and it is not possible to 'see' the inflation expectations of the parties to that contract.

Box 1: Derivation of forecast CPI index based on RBA forecasts

The RBA issues a Statement on Monetary Policy four times a year, the most recent of which is the May 2009 statement. Since February 2007, the RBA has released as part of these statements its forecast of CPI changes over the next two to three years. An example of the most recent forecasts is shown below.

[3] Note however, that for consistency with a regulatory model that re-inflates real forecasts by an estimate of Australia-wide inflation, we consider it necessary that an Australia-wide measure of inflation has been used to deflate a professional forecaster's nominal forecasts. For example, we understand that Econtech reports real forecasts of labour costs in New South Wales and other states that have been deflated using state-specific measures of inflation. Where possible, we have adjusted these real forecasts, using that forecaster's estimate of inflation in that state and over Australia as a whole, to achieve consistency with the regulatory framework.

Table 16: Output and Inflation Forecasts[a]

Percentage change over year to quarter shown

	Dec 2008	June 2009	Dec 2009	June 2010	Dec 2010	June 2011	Dec 2011
GDP	0.3	−1¼	−1	½	2	3¼	3¾
Non-farm GDP	0.0	−1½	−1	½	2	3¼	3¾
CPI	3.7	1½	2¼	2½	2	1½	1½
Underlying inflation	4.3	3¾	3¼	2½	2	1½	1½

(a) Actual data to December 2008. Underlying inflation refers to the average of trimmed mean and weighted median inflation. For the forecast period, technical assumptions include A$ at US$0.75, TWI at 61, cash rate at 3.00 per cent, and WTI crude oil price at US$65 per barrel and Tapis crude oil price at US$67 per barrel.

Sources: ABS; RBA

In combination with the historical Australian Bureau of Statistics (ABS) series for CPI, the RBA forecasts naturally lend themselves to the creation of a forecast index, based on the following steps:

- obtain historical CPI from the ABS, currently available up to and including the March quarter 2009;
- estimate the June and December 2009 forecast index numbers based on the actual index numbers for June and December 2008 and the change in CPI forecast by the RBA;
- estimate subsequent June and December forecast index numbers based on the forecast index numbers for the previous June and Decembers and the change in CPI forecast by the RBA;
- beyond the horizon of the RBA forecasts, estimate June and December forecast index numbers based on the forecast index numbers for the previous June and December, increased by 2.50%; and
- calculate all forecast March and September quarter indices by interpolating between the relevant June and December quarters.

The use of 2.50% as a long-term forecast of inflation is selected as being the mid-point of the RBA's target range of 2-3%. We note that the entirety of this methodology is consistent with the approach utilised in the AER's spreadsheet modelling for the New South Wales and Tasmanian Final Determinations.

2.3. Forecasting foreign exchange movements

37. An important determinant of future equipment prices is the future value of the Australian dollar. This is clearly true of imported equipment but is also true in relation to the purchase of domestically produced equipment that may nonetheless be sold on a world market and in relation to the input costs for domestic suppliers (eg, the cost of aluminium and steel for Australian producers of gas meters and regulators).

38. In the context of JGN's escalation factors, it is normally the case that commodities traded on international markets are priced in terms of United States dollars, and generally futures and forecasts of these commodities are also based in these terms. This means that we must establish a forecast of the value of the Australian dollar, in terms of the United States dollar, over the relevant horizon so that forecasts of commodity prices can be expressed in Australian dollar terms.

39. The fact that there is a recognised link between commodity prices and the value of the Australian dollar is particularly important to this project as it means that cost reductions associated with falling commodity prices can be expected to be at least partially offset by concurrent depreciation in the Australian dollar. This link between the Australian dollar and commodity prices is accepted by both the RBA and in academia. The RBA has recently sought to explain record high Australian dollar values in relation to high levels of commodity prices.

> *"The continued strength in commodity prices, together with higher interest rates in Australia than abroad, helped underpin the Australian dollar's rise to multi-year highs against the US dollar and on a trade-weighted basis in July, before the currency depreciated somewhat following the disturbances in credit markets. It has also contributed to the larger increase in the Australian stock market than in other major markets, as the share prices of resource companies have been particularly strong."*[4]

40. Similarly, the link between the Australian dollar and commodity prices has been confirmed in academic studies such as that by Hatzingkolaou and Polasek (2005) who state that their empirical results:

> *"…strongly supports the widely held view that the floating Australian dollar is a 'commodity currency'."*[5]

[4] RBA, *Statement on Monetary Policy*, August 2007, p.2

[5] Hatzinkolaou, D., and Polasek, *Journal of Applied Economics*, Vol VIII, No. 1, May 2005, pp.81-99.

41. On this basis it is important to use a forecast for the Australian dollar that is consistent with the forecast for commodity prices used. Certainly, it would be inconsistent to adopt an assumption of dramatic falls in commodity prices without also forecasting a similarly dramatic reduction in the value of the Australian dollar.

42. However, it is notoriously difficult to forecast even short term movements in exchange rates, let alone long-term movements. Futures markets for the Australian dollar are relatively thin beyond a few months and these short dated futures are, in any event, driven by differences in risk-free interest rates across countries.[6] It is not possible to use futures markets to forecast out the value of the Australian dollar in 2015.

43. Although a number of organisations provide forecasts of the Australian dollar over a short horizon, the only long term forecasts of the Australian dollar we are aware of are provided by Econtech in its ANSIO reports. For the purpose of this report we adopt the Econtech forecasts to convert United States dollar forecasts for commodity prices to the Australian dollar price of those commodities.

2.4. Timing of escalation factors

44. Issues of timing are critical to determining escalators that can consistently be applied for this purpose. An escalator provides an estimate for the increase in price for an input from one period to another. For consistency it is important that the escalation factors that are applied to the base planning objects must:

    i. be derived in a way that is consistent with the base period in which these costs have been measured;

    ii. be derived in a way that is consistent with their intended use in forecasting future costs in specific periods; and

    iii. avoid overlapping periods or 'gaps' such that escalation is either not properly accounted for or is double counted.

45. It is our understanding that escalation factors are used for two purposes:

    - to inflate the base planning objects for capex to the end of each financial year in the next regulatory period; and
    - to inflate the base planning objects for opex to the mid-point of each financial year in the next regulatory period.

[6] That is, futures reflect the difference in those interest rates such that it is possible for bond holders to 'lock in' the same risk free rate in their home currency by holding foreign bonds. This phenomenon is known as covered interest parity.

46. Furthermore, it is our understanding that JGN's base planning objects for both operating and capital expenditure have been costed as an average over the 2008-09 financial year. Given these considerations, the escalators that take these objects forward must be based in the periods consistent with the costing of the objects that they take forward, as is required by i above.

47. Consistent with the base period for costing and the purpose for escalation, escalation factors that take forward operating expenditure must escalate from average costs over a financial year to average costs over the next financial year – in the sense that inflating opex to the mid-point of a financial year is intended to be representative of the entire financial year. We refer to this type of escalator as a 'financial year' escalation factor.

48. For similar reasons, capex must be taken forward using escalation factors that measure the differences in average costs between calendar years. This is because regulatory modelling typically treats capex as an amount that is added to an asset base at the end of the financial year, and so financial year escalators cannot be used to project these forward. We refer to escalators that project forward objects from average costs over a calendar year into the next calendar year as 'calendar year' escalators.

49. We understand that this methodology and the terminology associated with it has already been accepted by the AER in the context of its Final Determinations for the New South Wales and Tasmanian electricity businesses.

50. Finally, it is important that escalation factors do not either omit or double-count price changes over a particular period of time. Whilst all these criteria may seem trivial, it is our experience that achieving timing consistency is one of the most difficult and contentious issues in the development of escalation factors.

2.5. Quarterly indexation using annual escalators

51. Many of the forecasts that we have regard to in deriving escalation factors, such as those provided by Econtech and Macromonitor, express forecast changes as *change in average prices from one financial year to the next*. These lend themselves naturally to use as financial year escalation factors, as described above.

52. However, sometimes forecasts expressed in this way cannot be so readily used. For example, the methodology used by the AER in its Final Determinations for the New South Wales and Tasmanian electricity businesses assumed that Econtech forecasts for EGW wages would only be applied after the expiry of each firm's enterprise bargaining agreement (EBA). In some cases, this transition was made at the start of the calendar year, which meant that the Econtech forecasts could not straightforwardly be applied to the data in order to project it forward.

53. In the context of these Final Determinations, the AER accepted the views of its consultant, Econtech, that its forecasts could be used to construct a quarterly index that could then be used to estimate forecasts or escalators based on alternative timing assumptions. Econtech proposed a four-part equation,[7] an example of which is:

- Index for September 09 = (2 * Index(07-08) + 7 * Index(08-09) – Index (09-10))/8
- Index for December 09 = (9 * Index(08-09) – Index (09-10))/8
- Index for March 09 = – (Index(07-08) + 9 * Index(08-09))/9
- Index for February 09 = – (Index(07-08) + 7 * Index(08-09) +2 * Index (09-10))/8

54. The main rationale behind the choice of these formulae was that the quarterly index derived by their use was consistent with the annual forecasts from which they were estimated. We note that that this set of formulae is not the only method by which such an index could be constructed, but we regard it as reasonable for its purpose.

55. The AER used these formulae in its Final Determinations in respect of Econtech forecasts for EGW wages, general labour and construction. However, the formulae are not specific to use with Econtech forecasts, and in this report we apply them generally to any forecast expressed in this way, such as Macromonitor's and BIS Shrapnel's forecasts of EGW wage costs. We also employ these formulae, translated by two quarters, to convert forecasts expressed in average calendar year terms into a quarterly index. For example, United States inflation forecasts from the Congressional Budget Office are expressed in these terms.

2.6. Precision and accuracy

56. There is always a high degree of uncertainty associated with predicting the future. Although we consider that we have obtained the best possible estimates of JGN's future costs at the present time, the actual magnitude of these costs at the time that they are incurred may well be considerably higher or lower than we have estimated in this report. This is a reflection of the fact that while futures prices and forecasts today may well be a very precise estimate of current expectations of the future, they are at best an imprecise estimate of future values.[8]

57. This lack of precision of forecasts is recognised in our methodology in at least two ways. Firstly, when we estimate future costs at times between estimates obtained from futures prices or forecasts, these are always calculated using linear interpolation, rather than fitting a more complicated functional form. Secondly, all escalation factors recommended are reported to one decimal place only.

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7 Econtech, *Updated labour cost growth forecasts*, 25 March 2009, pp.23-4

8 See, for example, Figure 1 above.

58. Although the spreadsheet modelling underling the calculation of these escalation factors may, in some cases, predict quarterly or even monthly values of labour or commodity prices in the future, we do not represent that it is possible to generate precise estimates for these values. Rather, this modelling approach is used because futures prices and forecasts often themselves make predictions for a particular quarter in the future, so we must adopt a similar structure to incorporate these predictions.

59. Finally, we note the distinction between precision and accuracy. Although there is considerable imprecision in predicting the future, this is not a reason to estimate escalation factors that are artificially biased upward or downward, even if this bias is relatively small.

60. At Appendix A we describe why a transition between actual EBA EGW wages data and forecasts of future EBA wages must be carefully made to avoid bias in the escalation factors. We consider this to be an issue of accuracy, rather than precision, since it involves making use efficient use of the data available to come to the best forecast escalation factors given the circumstances.

3. Forecasts of component cost inputs

61. The following section sets out the specific considerations that have been made regarding the derivation of escalators for JGN's expenditure programs. These considerations guide the data sources and methodology that have been selected in each case.

3.1. Jemena's EGW labour costs

62. For the purpose of forecasting future labour costs, Jemena has requested that CEG develop separate escalation factors for its EGW labour costs that it pays to staff who are paid:

- under its enterprise bargaining agreement (EBA); and
- under individual contracts.

63. CEG has commissioned forecasts from BIS Shrapnel and Macromonitor for the growth of EBA and individual contract wages in the EGW sector in New South Wales. We are also aware of Econtech forecasts for nominal wage growth across the EGW sector in New South Wales.

64. We consider that, following the AER's approach in its Final Determinations for the New South Wales and Tasmanian electricity businesses, it is reasonable to use actual measures of changes in staff costs where these are available in preference to the much broader measures that are available for the entire EGW sector. We have therefore used actual salary increases paid by Jemena where these are available. Escalation factors beyond this horizon are based on professional forecasts.

65. For EBA EGW wages, we have used the average of the BIS Shrapnel EBA, Macromonitor EBA and Econtech EGW forecasts to extend forward the Jemena data and create an index with which to estimate EBA EGW escalation factors. We have applied the Econtech data on the basis that the large majority of staff within the EGW sector as a whole, for which the Econtech forecast applies, are paid under EBAs.

66. However, we do not use the Econtech EGW forecasts in relation to individual contract EGW wages. Since relatively small proportion of the EGW workforce is paid under these arrangements, it is unlikely that the more general Econtech forecasts will be representative of these salaries. Accordingly we have used only the specific BIS Shrapnel and Macromonitor individual contract EGW forecasts to project forward actual Jemena data in order to derive these escalation factors.

67. Transitioning from modelling wage increases, based on actual data, as occurring once a year to an index based on quarterly changes in wages can result in a biased

estimate of wages escalation. That is, we are transitioning from an index that measures actual wage-setting processes, where Jemena pays its employees wage increases four quarters of increase 'up front', to a stylised framework that assumes it can spread these increases out over a year.[9] Under such a transition, even if the actual wage outcomes and the wages forecasts are perfectly consistent, escalation factors may be underestimated. Appendix A contains a full discussion of the nature of this problem and the solutions that CEG has applied to resolve this bias.

68. Table 3 below shows the financial year and calendar year escalation factors that we calculate using this methodology.

Table 3: Escalation factors for labour components, real

Financial year	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**
EBA EGW labour	1.8%	1.3%	2.1%	1.9%	1.6%	1.8%
Contract EGW labour	1.8%	1.4%	2.1%	4.0%	4.4%	4.1%
Calendar year	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
EBA EGW labour	1.6%	2.3%	2.2%	2.0%	1.7%	1.7%
Contract EGW labour	1.9%	1.5%	1.6%	3.1%	4.4%	4.3%

3.2. Aluminium

69. It is important to be clear when we talk about movements in 'the' price of aluminium that we are really talking about movements in the price of aluminium at a particular stage in its production process – namely refined metal to a particular specification. The prices quoted in this section are prices for aluminium traded on the London Metals Exchange that meet the specifications of that exchange. Specifically, prices are per tonne for 25 tonnes of aluminium with a minimum purity of 99.7%.[10]

70. The prices quoted are not necessarily the prices paid for aluminium by equipment manufacturers. For example, producers of meters purchase fabricated aluminium to be used in their manufacturing processes. This fabricated aluminium has gone through further stages of production than the refined aluminium that is traded on the LME. Its price can be expected to be influenced by refined aluminium prices but these prices cannot be expected to move together in a 'one-for-one' relationship.

71. The absence of a one-for-one relationship between the prices of refined aluminium traded on the LME and the price paid by manufacturers for fabricated metals as inputs

[9] Although Jemena's wage increases appear to have been paid every three quarters, rather than each year, the most recent EBA increase will apply for an entire year from 1 July 2009 to 30 June 2010.

[10] See the London Metals Exchange website for more details of contract specifications.

to their production process does not mean that the use of LME prices to estimate escalation factors is invalid. The correct application of Step 2A, the assignation of component weights to the escalation factors derived from the forecast LME prices, can ensure that these escalation factors are used in a way that is consistent with the underlying objects that they represent.

72. We have obtained LME prices for aluminium averaged over the month of April 2009. The LME's longest dated future for these products is 27 months, allowing us to forecast prices out to and including July 2011 by interpolating between futures prices. However, available futures prices do not extend out to the end of JGN's regulatory period (ie, to the year ended June 2015). In this case we have two choices. We can assume that aluminium prices will remain constant in real terms from July 2011 onwards or we can have regard to professional forecasts.

73. Consensus Economics surveys professional forecasters on a range of economic variables. They regularly perform surveys of forecasters' opinions on future commodity prices, the most recent of which was conducted in April 2009.[11] In relation to aluminium prices there is a wide variety of forecasts. These forecasters provide quarterly forecasts out to September 2011 in nominal United States dollar terms.

74. Consensus Economics also provides a 'long-term' forecast in real United States dollar terms. Unlike with the shorter term forecasts, Consensus does not disclose how many or which institutions contributed to the forecasts nor does it give any information on the range of forecasts. Moreover, it is unclear what the definition of 'long term' is – Consensus Economics only states *"long term 5-10 year forecasts in real (inflation adjusted) 2008 dollar terms"*.[12] For these reasons we must treat these forecasts with some caution.

75. Consistent with the methodology employed previously by the AER, we have assumed that these long-term forecasts apply to a horizon of 7.5 years from the month in which they were made. That is, for forecasts made in April 2009, we assume that the long-term forecasts are for the month of October 2016.

76. Forecasts of the price of aluminium between the end of the LME forecasts in July 2011 and the Consensus Economics forecast in October 2016 can be generated by interpolating between these price points. However, as described above, the escalation factors beyond 2011 must be treated with caution due to their reliance on the Consensus Economics mean forecast.

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[11] Consensus Economics, *Energy & Metals Consensus Forecasts: Minerals Monitor*, 27 April 2009.

[12] Ibid, p.5

77. We use the approach described above to produce a monthly series of aluminium prices, which may then be averaged to estimate financial year escalators out to 2015. These escalators are shown in Table 4 below.

Table 4: Escalation factors for aluminium, real

Financial year	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**
Aluminium	-7.9%	9.9%	9.0%	7.7%	6.6%	5.9%
Calendar year	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Aluminium	-29.5%	12.5%	9.2%	8.6%	7.0%	6.2%

3.3. Steel

78. A component of JGN's costs is associated with the purchase of products using steel. For example, valves and some facility component incorporate significant amounts of steel.

79. Again, it is important to draw a distinction between the steel products used by JGN and the steel 'at the mill gate'. Just as is the case with aluminium, the steel used by JGN has been fabricated and, as such, embodies labour, capital and other inputs (eg, energy).

80. While there is not necessarily a one-for-one relationship, it is still relevant to consider what is expected to happen to 'mill gate' steel prices. The LME has recently developed a futures market for steel billet, with futures trading to a horizon of 15 months. This market is increasing in volume and is gaining some acceptance within the industry as a measure of price. However, we do not consider that these prices are as representative of the overall market for steel as LME prices for aluminium. That is, we consider that this market may not be sufficiently liquid to use LME steel prices in preference to expert forecasts.

81. Consensus Economics also provides forecasts for hot-rolled coil (HRC) for Europe and the United States – Consensus does not publish forecasts for Asian steel prices. These forecasts are in an identical format to those for aluminium, with quarterly short term nominal forecasts and a long term real forecast. It is important to note that HRC is a more processed form of steel than billet, and commands a premium over the prices reported on the LME.

82. We understand that it is likely to be the case that suppliers of equipment to JGN may not necessarily purchase HRC as an input to their manufacturing processes, and that steel pipe is more commonly used as a benchmark in this industry. However, there is significantly better price information available for HRC, in the form of the Consensus forecasts, than there is for steel pipe. We regard the use of HRC price forecasts to

estimate escalation factors as a reasonable alternative to prices for steel pipe on the basis that, over time, the costs of producing these products are likely to move together. Although there may be short-term variance caused by factors specific to the production of steel pipe, we regard it as reasonable to forecast steel prices on this basis and that this is the best available forecasting methodology in the circumstances.

83. The escalation factors derived on the basis of the short term and long term Consensus forecasts are shown in Table 5 below.

Table 5: Escalation factors for steel, real

Financial year	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**
Steel	-18.0%	8.4%	6.3%	1.5%	0.9%	0.8%
Calendar year	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Steel	-31.6%	9.9%	6.5%	3.8%	1.0%	0.9%

3.4. Crude oil

84. JGN has not specifically requested escalation factors for crude oil. However, as we explain at section 3.5 below, we find it useful to estimate these to the extent that they prove of assistance in estimating escalation factors for plastics such as nylon-11 and polyethylene.

85. In order to derive estimates of historical and forecast changes in crude oil prices we have followed largely the same approach used for aluminium. Historical data on crude oil prices have been sourced from the US Department of Energy (DoE).[13] Crude oil futures (NYMEX Crude Oil Light) have been sourced from the Chicago Mercantile Exchange. We have averaged NYMEX prices over the 20 days to 24 April 2009 for use in the estimation of escalation factors.

86. NYMEX futures are available up to December 2017 and, consequently, these can be relied on to develop forecasts of future prices without the use of forecasts from Consensus Economics or other professional forecasters. We have combined forecasts calculated on the basis of linear interpolation between each average futures price with the historical data sourced from DoE. These calculations give rise to the escalators for crude oil shown in Table 6 below.

[13] http://tonto.eia.doe.gov/dnav/pet/pet_pri_spt_s1_d.htm. Consistent with the approach used by the AER, we have used monthly prices for West Texas Intermediate crude.

Table 6: Escalation factors for crude oil, real

Financial year	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Crude oil	2.1%	11.2%	5.6%	1.8%	1.4%	0.7%
Calendar year	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Crude oil	-31.1%	22.8%	8.1%	3.3%	1.2%	1.5%

3.5. Nylon-11 and polyethylene

87. Plastic piping, particularly nylon-11, is an important input into JGN's expenditure programs and we understand that many smaller diameters of pipe purchased by JGN are made using this material. Internationally, there is only limited futures information available for nylon-11, and none for more than one or two months into the future. There is no evidence that these futures markets are liquid or accepted as an international benchmark for the price of nylon-11. We are also unaware of any forecasters tracking the price of nylon-11.

88. In these circumstances, where there is very limited amount of independent and transparent pricing information for the product, we would normally consider that the best proxy for the future price of nylon-11 may be obtained by examining the pricing of JGN's contract with its supplier for evidence of future pricing provisions, perhaps in the form of benchmarking against other products or indices. However, we are informed by JGN that this information is not available for future years.

89. We consider that a next best alternative for deriving escalation factors for nylon-11 is to use a proxy escalation factors developed for a close substitute. We understand that:

- polyethylene is a substitute for the use of nylon-11 for use in gas mains;
- other gas network providers in Australia use polyethylene pipes in preference to nylon-11; and
- JGN itself uses polyethylene for some of its larger diameters of gas pipeline.

90. For these reasons, we are satisfied that it is likely to be reasonable to approximate the future price of nylon-11 with the future price of polyethylene. This does not mean that we expect these prices to be the same, or even similar, at every point in the future – merely that the competitive pressures that determine how the prices of these inputs change are likely to be related over the medium term. As a proxy for the future price of nylon-11 we consider using the price of polyethylene to be superior to the alternative, which is to assume zero real escalation.

91. Like nylon-11, we are unaware of significant futures trading in polyethylene. The LME has established futures prices for thermoplastics, including polyethylene, but these extend only to a horizon of two months, making them unhelpful for the purpose of calculating escalation factors. Whilst we are aware of limited futures trading of polyethylene elsewhere, no market appears to offer the degree of liquidity or long term pricing horizon to be useful.

92. Similarly, we have been unable to locate reliable forecasts of plastics prices from professional forecasters. For example, Consensus Economics does not cover polyethylene in its Minerals Monitor.

93. However, we understand that there is a pricing relationship between crude oil and plastics, to the extent that crude oil is an important component in the manufacture of thermoplastics such as polyethylene. We have obtained a long term monthly pricing history for crude oil and thermoplastic resins from the United States Bureau of Labor Statistics from July 1991 to February 2009[14] and have used this history to obtain econometric estimates of the relationship between these commodities. A discussion of the methodology used is discussed in Appendix B to this report.

94. The relationship estimated in Appendix B has been used to generate an index of future polypropylene prices on the basis of the index of crude oil prices that underlies the crude oil escalation factors discussed at section 3.4. The nature of this relationship, in broad terms, is that approximately 17% of the variation in the price of crude oil is passed over a period of three months to polypropylene. This is unlikely to be an accurate measure at any particular point in time due to other factors, such as specific market conditions, that also affect the price of polyethylene. However, it represents the best representation of the longer term data that we have obtained. In this sense, we regard it as reasonable to forecast average polyethylene prices on this basis, and that this is the best available forecast in the circumstances.

95. Table 7 below shows the escalation factors derived on the basis of this relationship. As we state above, these may also be used as a proxy for escalation factors for nylon-11.

[14] See www.bls.gov. The series we used are 0662 and 056, available from the commodity prices component of the BLS's producer price index.

Table 7: Escalation factors for polyethylene, real

Financial year	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Polyethylene	0.6%	2.0%	1.1%	0.3%	0.2%	0.2%
Calendar year	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Polyethylene	-7.0%	4.5%	1.5%	0.7%	0.2%	0.2%

3.6. Concrete

96. Concrete is used extensively in the installation and maintenance of gas pipelines, primarily through the restoration of road and pavement surfaces following work on pipelines themselves.

97. We have commissioned a forecast for the future prices of concrete from Macromonitor. This forecast has been provided as the year-ending price of concrete, up to and including 2016. Deflating these forecasts using RBA inflation and using linear interpolation between these points, we have created a real index of concrete prices up to June 2016. The escalation factors derived from this forecast are set out in Table 8 below.

Table 8: Escalation factors for concrete, real

Financial year	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Concrete	3.0%	1.5%	3.4%	3.0%	1.8%	0.9%
Calendar year	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Concrete	6.8%	0.7%	2.7%	3.6%	2.3%	1.3%

4. Effect of emissions pricing on escalation factors

98. CEG has estimated the escalation factors above for aluminium, steel, polyethylene and concrete using futures or forecast prices that, to the best of our knowledge, do not include the potential costs relating to an ETS. The Commonwealth Government has proposed an ETS, the broad outline of which is set out in the 2009 Budget. Such a scheme is likely to affect prices of the material inputs to JGN expenditure programs, because these are all commodities or goods that require significant amounts of energy and/or fossil fuels to produce. In this section we estimate the extent to which the escalation factors that we calculate in section 3 above should be increased to capture the likely effect of the ETS.

99. The Commonwealth Government is proposing that the ETS will commence in 2011-12 with an unlimited number of permits made available at the price of $10 per tonne of carbon dioxide emissions.[15] In the following years, a cap will be enforced and the price of emissions will be set by the market under the trading scheme. We have obtained recent estimates of the market price for carbon dioxide emissions from a report commissioned by the electricity market operator, NEMMCO, from Acil Tasman.[16] The emissions prices we assume in this analysis are summarised in Table 9 below.

Table 9: Expected emissions prices, 2009-10 to 2014-15

Financial year	CO_2 emissions price ($/tonne)
2009-10	n.a.
2010-11	n.a.
2011-12	$10
2012-13	$26
2013-14	$28
2014-15	$30

Source: Acil Tasman, Budget 2009

100. The effect that these emissions prices will have on JGN's expenditure on materials will depend upon the extent to which these materials embody carbon dioxide emissions released during their manufacture and transport. In order to estimate this effect, we

[15] See Statement by the Minister for Climate Change, 2009 Commonwealth Budget, 12 May 2009. Available online at: http://budget.australia.gov.au/2009-10/content/ministerial_statements/climate_change/download/ms_climate_change.pdf

[16] Acil Tasman, *Fuel resource, new entry and generation costs in the NEM*, April 2009, p.23

have used the Australian Input-Output tables for 2004-05, issued by the Australian Bureau of Statistics (ABS).[17]

4.1. Input-output tables

101. These input-output tables track the supply and use of products in the Australian economy and show the inter-relationships between industries. As such, they provide a useful indication of the extent to which manufacturers of materials such as those used by JGN use outputs from the fossil fuel industries as inputs into their production processes.

102. For the purposes of this analysis, we have assumed that carbon dioxide emissions enter the economy in the form of coal, crude oil and natural gas that are burnt in order to generate energy and heat to produce other products. This is necessarily an approximation, since we ignore wood or other products that may contribute to carbon emissions. However, we consider that for the materials that are being considered in this report, these alternative sources of emissions are unlikely to be material.

103. The input-output tables break the economy down into 109 industries. This means that there is significant agglomeration of activities. Relevantly for this exercise, the ABS includes mining and exploration industry for coal (1101) and oil and gas (1201) but do not separate these out into the categories above. In our opinion, the industries most relevant to the outputs that we are trying to measure are:

- basic non-ferrous metals and products, 2702, (aluminium);
- iron and steel, 2701, (steel);
- plastics, 2509, (nylon-11 or polyethylene); and
- cement, lime and concrete slurry, 2063, (concrete).

104. None of the industries that we have used is necessarily perfectly suitable for the commodity that we match it to. However, this data limitation cannot be overcome because the input-output tables are not available in finer detail. Whilst this limitation influences the precision of our estimates, in our opinion they remain the best estimates of the impact of emissions prices that are possible in the circumstances.

105. We have used total requirement coefficients from the input-output tables to measure the total direct and indirect inputs requirements for each industry in terms of the outputs of other industries, based on prices prevailing in 2004-05. The results of these for the relevant industries above are summarised in Table 10 below.

[17] ABS, *Australian National Accounts: Input-Output Tables – Electronic Publication, 2004-05 Final*, Catalogue No. 5209.0.55.001.

Table 10: Proportion of fuels outputs as inputs to relevant industries, by value 2004-05

	Plastic products (2509)	Cement, lime and concrete slurry (2603)	Iron and steel (2701)	Basic non-ferrous metals and products (2702)
Coal (1101)	0.3%	0.3%	0.8%	0.2%
Oil and gas (1201)	2.0%	7.4%	2.7%	2.8%

Source: ABS

106. Whilst Table 10 above describes the importance of coal and oil and gas in the production of aluminium, steel, polyethylene and concrete, this information by itself is not enough to estimate the effect of an emissions price on the outputs of these industries. We also require information about the emissions intensity of these fuels per dollar in order to estimate the effect of expected emissions prices.

4.2. Emissions intensity of fuels

107. We have sourced estimates of the carbon intensity of fossil fuels from a research paper at the Commonwealth Parliamentary Library.[18] These carbon intensities are reported at Table 11 below. We note that they are broadly consistent with the carbon intensities of fuel burnt at power stations around Australia, as reported by the Acil Tasman report.

108. We also report at Table 11 below data about the price of fuel. This is required because in order to estimate the effect of emissions prices on the price of fuel, we need to understand the importance of emissions per dollar of fuel. The price data in Table 11 have been obtained from the Acil Tasman report for NEMMCO, the Parliamentary Library Research Paper and ABARE's national energy projections.[19] We have used estimates of wholesale prices, rather than retail prices, on the assumption that this is likely to most representative of the price paid for these fuels by other industries which use them as intermediate inputs, for example the electricity generation industry.[20]

[18] Roarty, M. (2008) *Australia's natural gas: issues and trends*, Research Paper No. 25 2007-08. Available online at: http://www.aph.gov.au/library/Pubs/rp/2007-08/08rp25.htm

[19] ABARE, *Australian energy: national and state projections to 2029-30*, December 2006.

[20] The Acil Tasman report identifies prices paid by electricity generators for black and brown coal. We have used prices that represent charges to third parties, rather than the costs of vertically integrated miner-generators.

Table 11: Emission intensity of fossil fuels

Fuel	Emission intensity (kg CO_2 / GJ energy)	Price ($ / GJ)	Emission intensity ($ / kg of CO_2)
Black coal	93.3	1.50	60.4
Brown coal	90.7	0.60	155.5
Petroleum	68.2	15.00	4.5
Natural gas	50.9	3.50	14.5

Source: Parliamentary Library, Acil Tasman, ABARE

109. As we show at Table 10, the ABS does not report industry outputs in its tables down to the level of black coal or brown coal and it does not distinguish between oil and gas. We have therefore averaged the emissions intensity of these fuels together on the basis of domestic Australian consumption in 2004-05, to be 74.2 $/kg of emissions for coal generally and 5.7 $/kg of emissions for oil and gas combined.[21]

4.3. Effect of emissions prices on escalation factors

110. Based on the emissions prices reported at Table 9, the emissions intensity by fuel at Table 11 and the use of these fuels in producing outputs at Table 10 and the changed prices for the materials since 2004-05, we can estimate the effect that increasing emissions prices will have on final prices for aluminium, steel, polyethylene and concrete over the period from 2009-10 to 2014-15. The extent to which these escalation factors should be increased to cover the expected price for emissions is set out in Table 12 below.

Table 12: Effect of emissions trading scheme on escalation factors

Financial year	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Aluminium	0.0%	0.0%	0.3%	0.4%	0.1%	0.0%
Steel	0.0%	0.0%	0.7%	1.2%	0.1%	0.1%
Concrete	0.0%	0.0%	0.5%	0.8%	0.1%	0.1%
Polyethylene	0.0%	0.0%	0.3%	0.5%	0.1%	0.1%
Calendar year	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Aluminium	0.0%	0.0%	0.1%	0.4%	0.3%	0.0%
Steel	0.0%	0.0%	0.3%	1.1%	0.7%	0.1%
Concrete	0.0%	0.0%	0.2%	0.7%	0.5%	0.1%
Polyethylene	0.0%	0.0%	0.1%	0.4%	0.3%	0.0%

[21] Based on energy consumption by fuel reported by ABARE for 2004-05. See ibid, p.37

111. We acknowledge that many simplifying assumptions have been made in order to estimate these factors. These assumptions were necessary given the complexity required to track the use of emissions in the production of JGN's inputs. Whilst the emissions escalation factors we report above are necessarily imprecise, we consider them to be reasonable and the best estimates possible in the circumstances.

Appendix A. Derivation of escalation factors for EGW labour

112. This section describes in greater detail the derivation of the escalation factors for EBA and non-EBA EGW labour employed by Jemena, as reported at section 3.1 above. Whilst the appendix is self-contained, it can most easily be understood in conjunction with the spreadsheet accompanying this report, whether the calculations described here are set out in full.

A.1. EBA EGW labour costs

113. Jemena has provided CEG with a history of EBA salary increases that are outlined in Table 13 below. It is our understanding that the most recent EBA remains in effect until 30 June 2010.

Table 13: Nominal wage changes for Jemena's EBA staff

Date	Change
1 July 2005	3.0%
1 March 2006	3.0%
1 November 2006	3.0%
1 July 2007	4.0%
1 March 2008	2.5%
2 September 2008	3.0%
1 July 2009	4.0%

114. Since these are nominal increases, it is reasonable to treat these as increases to a nominal index of wages at the dates that they occur and to deflate this nominal index to create a real index that can be used for the purpose of estimating real escalation factors. We have created a quarterly nominal index of Jemena's EBA salaries and deflated this index by the quarterly index of inflation, the derivation of which is described at section 2.2.

115. Beyond the period in which actual EBA salary increases are available, the index of EBA wages can be extended by using professional forecasts.[22] We have access to three sets of forecasts for this purpose:

- the BIS Shrapnel forecasts for New South Wales EGW wages under EBAs;

[22] Although, as per our discussion at section 2.2, this will be a real quarterly index of wages, since we consider it desirable, in general, to utilise Econtech's nominal wage forecasts in conjunction with its forecast for inflation.

- the Macromonitor forecasts for New South Wales EGW wages under EBAs; and
- the Econtech forecast for New South Wales EGW wages generally.

116. The BIS Shrapnel and Macromonitor forecasts appear to more precisely measure the object that JGN intends to escalate in this case. However, we understand that approximately 85% of the EGW sector workforce has its wages set under EBAs. Therefore it is likely to be the case that the Econtech forecasts will be reasonably representative as a forecast of EBA wage increases. We believe on this basis that it is reasonable to give the BIS Shrapnel, Macromonitor and Econtech forecasts equal weight in the construction of the EBA wage escalation factors.

117. BIS Shrapnel, Macromonitor and Econtech all present forecasts of wage increases expressed in terms of change from the average wages in one financial year to another and hence they can be averaged together without adjustments for differences in timing. The timing of these forecasts also lend themselves to the use of the Econtech formulae, described in section 2.5, to derive a quarterly index based on the average annual forecast wage changes. We use this quarterly index, so derived, to extend forward the index based on actual EBA outcomes beyond June 2010.

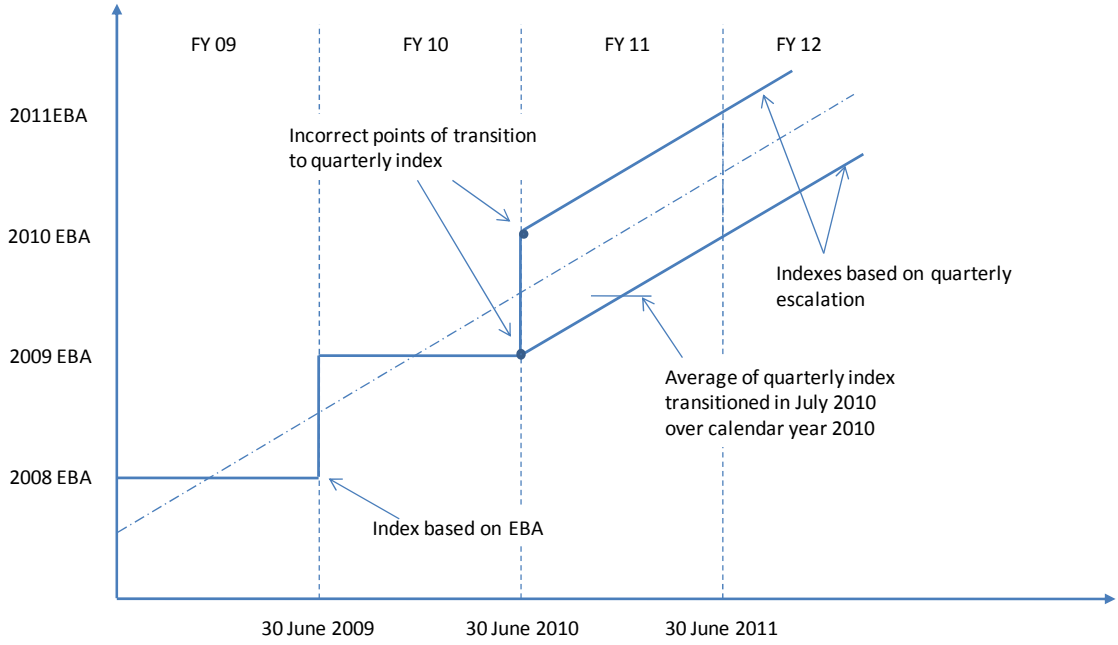
118. However, the timing and nature of this transition to forecasts must be carefully considered since, if implemented at the wrong time or incorrectly, the transition from an index based on wage increases once a year to an index based on quarterly changes in wages can result in a biased estimate of wages escalation. That is, we are transitioning from an index that measures actual wage-setting processes, where Jemena pays its employees wage increases four quarters of increase 'up front' at the start of July, to a stylised framework that assumes it can spread these increases out over a year.[23] Under such a transition, even if the actual EBA outcomes and the wages forecasts are perfectly consistent, escalation factors may be underestimated.

A.1.1. Estimating financial year escalators

119. For example, if the transition from EBA outcomes to forecasts is made at the expiry of Jemena's EBA on 30 June 2010 then the escalation factor for the following financial year will underestimate the correct level of wages escalation, relative to what would have been estimated if the index based on EBA increases were extended. This is demonstrated by the stylised diagram at Figure 2 below.

[23] Although Jemena's wage increases appear to have been paid every three quarters, rather than each year, the most recent EBA increase will apply for an entire year from 1 July 2009 to 30 June 2010.

Figure 2: Illustration of potential for error transitioning to EBA quarterly index, financial year escalators



120. As Figure 2 indicates, transitioning to a quarterly index after 30 June 2010 without applying a step change from that date will underestimate the average level of wages in the 2011 financial year. However, applying a full year of wage increase on 1 July 2010 will cause wages in the subsequent financial year to be too high.

121. The correct method of transition, in order to accurately calculate the 2011 financial year escalator, is to apply as at 1 July 2010 half a year of escalation in a step change. Ideally this would be based on Jemena's EBA at that date, but since an EBA has not been agreed for that period, an equivalent value can be constructed using the forecasts of EBA wages. Under the assumption (implicit in Figure 2 above) that Jemena pays EBA increases half in advance and half in arrears relative to a quarterly industry index, the relevant half year increase to apply at 1 July 2010 is the half of the 2010 calendar year forecast wages increase. This will give the same answer as if there were no transition.

122. The financial year escalation factors that these considerations give rise to are shown in Table 14 below.

Table 14: Escalation factors for EBA EGW labour, financial year, real

Financial year	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
EBA EGW labour	1.8%	1.3%	2.1%	1.9%	1.6%	1.8%

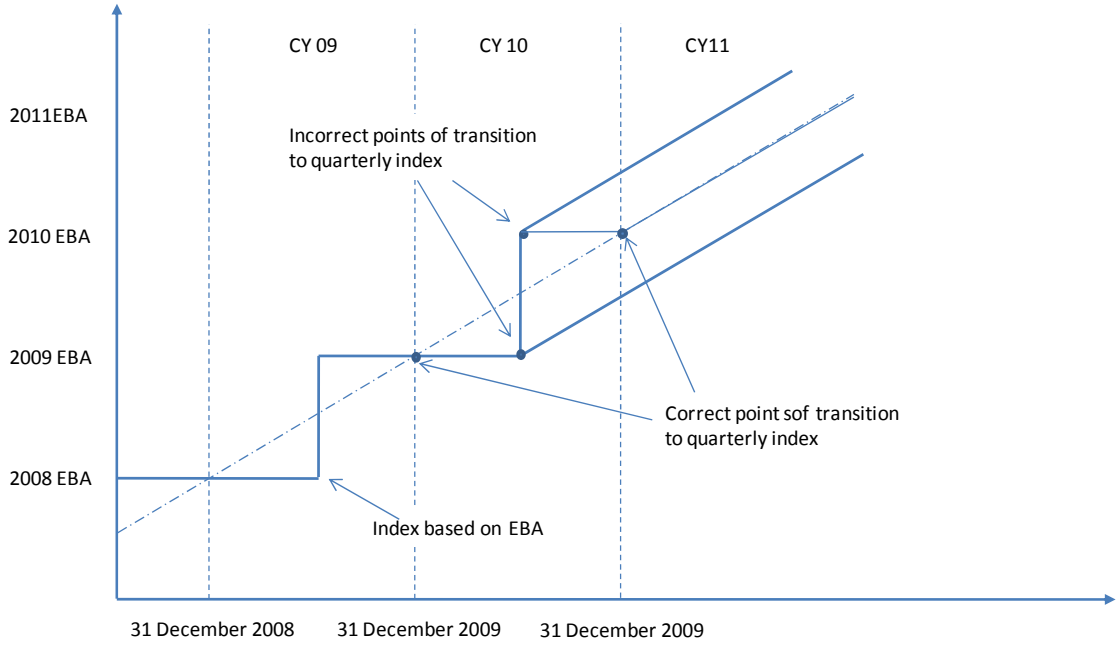
A.1.2. Estimating calendar year escalators

123. Although the methodology described above can be used to estimate financial year escalation factors that are unbiased with respect to a single, consistent underlying view regarding the rate of change of EBA wages, the same methodology does not yield consistent calendar year escalators.

124. For example, in order to accurately measure the escalation of wages to the 2010 calendar year from the 2009 calendar year, it is necessary to assume a full year of wage increases in July 2010 or the equivalent thereof – since this is the timing of increases that we assume Jemena to experience going forward. The solution in respect of financial year escalators is to apply half a year escalation in July 2010 and follow this with two quarters of escalation to the end of the calendar year. However, it is clear that this solution will underestimate the 2010 calendar year EBA wages escalator because it does pays the increases in the September and December quarters 'too late'.

125. As Figure 3 below demonstrates, unbiased calendar year escalators can be derived by transitioning to quarterly forecasts on 1 January. In this context, it makes most sense for this transition to occur on 1 January 2010, since this uses all the actual EBA data available from Jemena which, as we stated earlier, should receive preference over more generalised forecasts due to its greater specificity.

Figure 3: Illustration of potential for error transitioning to EBA quarterly index, calendar year escalators



126. The escalation factors derived from application of the methodology described above are shown in Table 15 below.

Table 15: Escalation factors for EBA EGW labour, calendar year, real

Calendar year	2009	2010	2011	2012	2013	2014
EBA EGW labour	1.6%	2.3%	2.2%	2.0%	1.7%	1.7%

A.2. Individual contract labour costs

127. Jemena has provided CEG with a history of salary increases for non-EBA staff that are outlined in Table 16 below.

Table 16: Nominal wage changes for Jemena's non-EBA staff

Date	Change
1 January 2005	4.5%
1 January 2006	5.5%
1 January 2007	6.5%
1 January 2008	5.0%

128. As with EBA wages changes, these are nominal increases, so we have constructed a nominal wage index using these data that extends to the end of the 2008 calendar year. This series has been deflated using a quarterly index of inflation based on RBA forecasts.

129. Beyond the period in which actual EBA salary increases are available, the index of EBA wages can be extended by using professional forecasts. We have access to three sets of forecasts for this purpose:

- the BIS Shrapnel forecasts for New South Wales EGW wages for non-EBA staff;
- the Macromonitor forecasts for New South Wales EGW wages on individual contracts; and
- the Econtech forecast for New South Wales EGW wages generally.

130. We understand that employees on individual contracts comprise approximately 15% of the workforce in the EGW sector and that these comprise almost all staff that are not paid under EBAs. Since this is a relatively small component of the overall workforce, we consider that the Econtech forecast relating to the entire EGW sector is unlikely to represent a good forecast of wages for these workers, whereas the BIS Shrapnel and Macromonitor forecasts are specific to this group. In order to extend forward the series based on actual wage changes, we have chosen to give equal weight to the BIS Shrapnel and Macromonitor forecasts.

131. The same considerations that applied to EBA EGW wages, regarding timing when transitioning between actual wage outcomes paid annually and a quarterly index of average wage increases, apply here. However, in this case the situation is slightly different, since historically Jemena has paid salary increases to non-EBA staff on 1 January each year, rather than on 1 July as we assume is the case going forward for EBA staff.

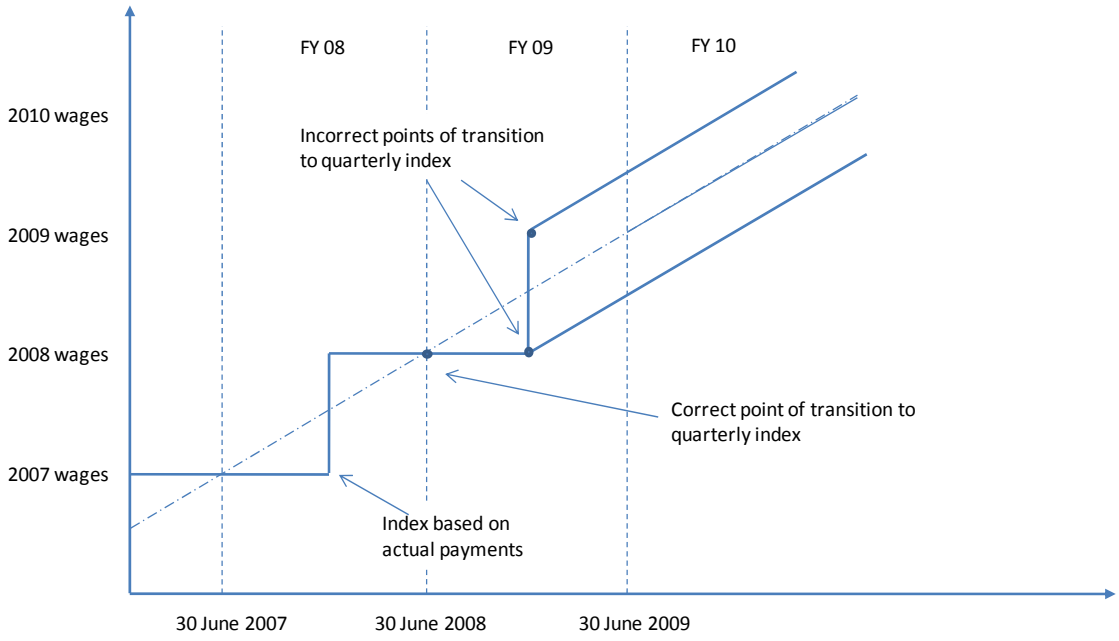
132. Accordingly, the methodologies for deriving unbiased financial year and calendar year escalators are reversed.

A.2.1. Estimating financial year escalators

133. In order to estimate unbiased financial year escalators, the transition from an index based on actual wage outcomes to an index based on forecasts must occur at 1 July 2008, taking into account that the most recent actual wage data is for the 2008 calendar year.

134. This logic can be easily understood in the context of Figure 3 above by relabelling the horizontal axes to shift the dates by two quarters, reflecting the timing of wage increases for Jemena's non-EBA staff. This is shown in Figure 4 below.

Figure 4: Illustration of potential for error transitioning to individual contract quarterly index, financial year escalators



135. The escalation factors that are derived using the correct point of transition, as described in Figure 4 above, are shown in Table 17 below.

Table 17: Escalation factors for contract EGW labour, financial year, real

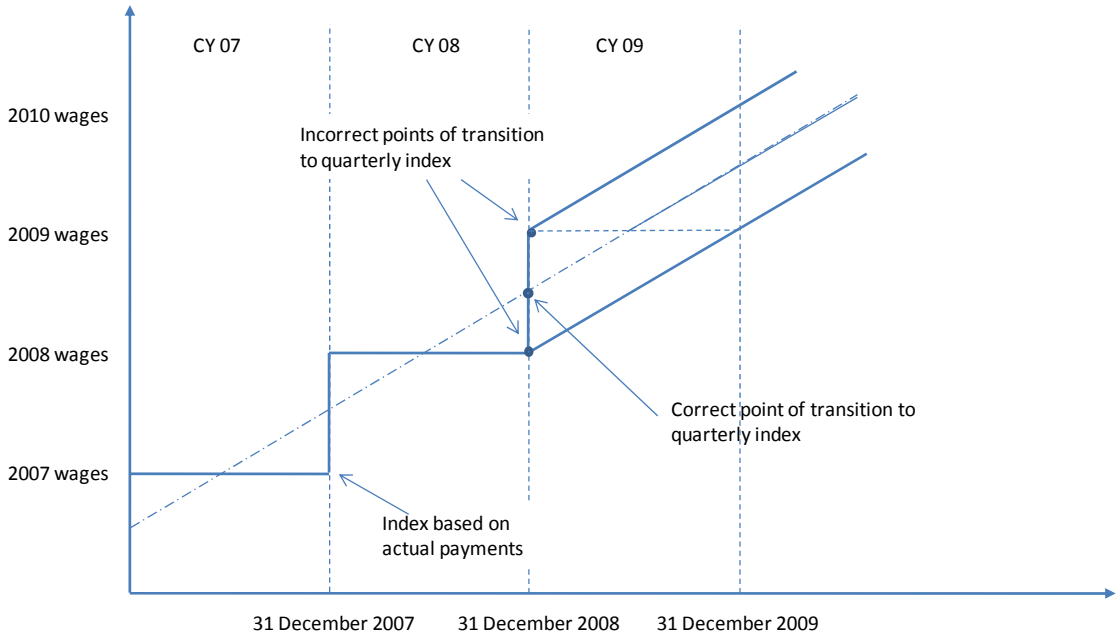
Financial year	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Contract EGW labour	1.8%	1.4%	2.1%	4.0%	4.4%	4.1%

A.2.2. Estimating financial year escalators

136. To estimate calendar year escalators, the actual wage index must be extended to the end of 2008, and half a year of escalation as a 'step increase' is applied at this time.

137. This logic can be easily understood in the context of Figure 2 above by relabelling the horizontal axes to shift the dates by two quarters, reflecting the timing of wage increases for Jemena's non-EBA staff. This is shown in Figure 5 below.

Figure 5: Illustration of potential for error transitioning to individual contract quarterly index, calendar year escalators



138. As is the case for EBA EGW wages, we consider that the appropriate half-year increase to apply at 1 January 2009 is based on the forecast for the year surrounding this point, under the assumption that wage increases are paid half in advance, half in arrears. In this case, we use the half the total escalation over the 2008-09 financial year, as estimated by the Macromonitor forecast. Table 18 below shows the calendar year escalation factors that are estimated using this methodology.

Table 18: Escalation factors for contract EGW labour, calendar year, real

Calendar year	2009	2010	2011	2012	2013	2014
Contract EGW labour	1.9%	1.5%	1.6%	3.1%	4.4%	4.3%

Appendix B. Relationship between crude oil and polyethylene pricing

139. We have obtained an extensive monthly price history of crude oil and polyethylene, as represented in Bureau of Labor Statistics commodity statistics. This dataset extends from July 1991 to February 2009, or 212 observations. These data may be downloaded from the BLS website using produce price index codes 056 (Crude petroleum – domestic production) and 0662 (thermoplastic resins and plastics materials).

140. In order to establish the extent of any historical relationship between movements in the prices of crude oil and polyethylene that can be extended into the future, we investigated a number of hypotheses and selected the regression that provided the best fit based on the BLS data.

141. All of the tests that we undertake assumed a linear relationship between changes in the price of polyethylene (the dependent variable) and changes in the price of crude oil, including lagged changes, as the dependent variable. We did not seek to adopt an alternative functional form and we did not seek to introduce other variables to control for other factors, such as economic growth.

142. Amongst the factors that were investigated were:

- whether or not an intercept term was suggested by the data; and
- whether there was any contemporaneous relationship between changes in crude oil and polyethylene prices and if not, what the lag was in the transmission of changes in the crude oil price to changes in the polyethylene price.

143. *A priori*, we did not expect an intercept to be statistically significant, and this was confirmed by the data in a number of tests.

144. We did not find any significant relationship between contemporaneous changes in the price of crude oil and polyethylene. This is consistent with expectations since, as crude oil is an input to the production of polyethylene, one would expect price changes to follow crude oil, rather than occur simultaneously.

145. Having investigated the statistical significance of including lagged changes to the price of crude oil to explain changes to the price of polyethylene, the results suggest that the best fit is obtained with three months of lagged price changes. That is, using an iterated inclusion of lagged crude oil price changes, the coefficients on the lags are statistically significant up to (but not including) the fourth lag. The full results of the statistical tests that were conducted are included in the spreadsheet that accompanies this report.

146. The relationship between changes in the price of crude oil and polyethylene that provided the best fit is described by the equation below.

$$\Delta PE_t = \alpha_1(\Delta PE_{t-1}) + \alpha_2(\Delta PE_{t-2}) + \alpha_3(\Delta PE_{t-3}) + u_t$$

where *t* indexes a month from 1 to 208, representing October 1991 to February 2009.

147. An abbreviated summary of the results of estimating this equation are set out in Figure 6 below.

Figure 6: Results of regression between prices changes for polyethylene and crude oil

Regression Statistics	
R Square	0.156
Adjusted R Square	0.143
Standard Error	0.025
Observations	208

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Crude oil lag 1 month	0.052	0.018	2.835	0.005
Crude oil lag 2 month	0.064	0.019	3.441	0.001
Crude oil lag 3 month	0.053	0.019	2.812	0.005

148. The interpretation of these results is that movements in the price of crude oil explains approximately 16% of the variation in the price changes of polyethylene, and that this relationship is significant at lags of 1, 2 and 3 months.[24] We have used the coefficients as estimated in the figure above to estimate changes to the price of polyethylene on the basis of past and future changes to the price of crude oil.

[24] Estimating the same equation with a fourth lag returns a coefficient on the fourth lag with an associated p-value of 0.59 – a statistically insignificant result.

Appendix C. Curricula vitae

Tom Hird

Tom Hird is a founding Director of CEG's Australian operations. Tom has a Ph.D. in Economics from Monash University. Tom is also an Honorary Fellow of the Faculty of Economics at Monash University and has 18 years professional experience in the economic analysis of markets and the provision of expert advice in regulatory, business strategy and policy contexts.

Prior to forming CEG Tom was an Associate Director at NERA economic consulting and prior to that was a senior officer in the Australian Commonwealth Treasury.

Tom's clients include private businesses and government agencies, including the World Bank and national regulators. Tom has advised clients on matters pertaining to: valuation, regulatory cost modeling, cost of capital, competition policy issues, merger clearance processes, restraints of trade, vertical and horizontal effects of transactions, access to bottleneck facilities.

Tom's industry experience spans the aviation, electricity and gas transport, electricity generation, finance, ports, rail transport, retailing, industrial packaging, telecommunications and tourism sectors. In terms of geographical coverage, Tom's clients have included businesses and government agencies in Australia, Europe, New Zealand, Macau, Singapore and the Philippines. Selected assignments on valuation and general competition issues include.

2008/09

Advised the following businesses on the development of cost modeling for regulatory reviews in the Australian regulated monopoly energy sector: EnergyAustralia, Integral Energy, TransGrid, ContryEnergy, Transend, Jemena Gas Networks, ETSA, Ergon and Energex.

Advising Optus and the 'G9' group of competitive carriers on the competition and the development of a regulatory framework and model to allow cost recovery for the builder/owner of a new FTTN broadband network. This included drafting of a special access undertaking with Clayton Utz.

2007

Advising Envestra on appropriate value of payments for the use of intangible assets held in Origin Energy. The analysis includes the identification of relevant proxies in other markets.

Advising the Victorian gas distribution businesses on the issues relating to the estimation of the cost of capital for regulated businesses.

2006

Advising the Australian Energy Regulator on the appropriate measurement of cost and valuation of gas pipeline assets associated with the Roma to Brisbane pipeline system.

Advising the ACCC on estimation of the cost of capital and appropriate compensation for hedging costs.

Advising Melbourne water businesses on the potential for reform to the regulatory/competitive framework in that sector.

2005

Advising the ACCC on the competition effects of proposed mergers in the Victorian electricity generation market.

2004

Advising the Australian Competition and Consumer Commission, Australia on the valuation of the Moomba to Sydney pipeline system

Tom Hird | Director | C E G

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| E: tom.hird@ceg-ap.com

Detailed Project Experience

Market Design and Competition Analysis

2008 **Gilbert + Tobin, Australia**
BHPB proposed merger with Rio Tinto
Providing expert statement on the likely impact of a merger in the mining industry (combining mines both domestically and internationally).

2008 **Gilbert + Tobin, Australia**
Confidential merger – Industrial Packaging
Providing expert opinion to Gilbert + Tobin on the competitive implications of a merger involving their client in the industrial packaging sector.

2008 **Vivendi, European Union**
Damages in Mobile Telephony Market
Providing expert critique of a proposed damages claim being brought by Deutsche Telecom against Vivendi in relation to alleged unlawful activity in a Polish mobile telephony joint venture.

2007 **SingTel Optus, Australia**
Mobile Termination
Advising on a range of competition matters relating to mobile termination.

2007 **"G9" Group of Telecommunications Carriers**
Regulatory Undertaking to Build and Operate a FTTN Network in Australia
Advising the G9 on competition analysis associated with the construction and operation of a FTTN network. Developing an regulatory Undertaking under the Australian Trade Practices Act describing the proposed operation of the FTTN. Providing an expert report on the economic benefits associated with the proposed undertaking.

2007 **Gilbert + Tobin, Australia**
Merger Analysis – New Steel Drum Manufacture
Providing expert opinion to Gilbert + Tobin on the competitive implications of a merger involving new steel drum manufacture.

2006 **Melbourne Water Industry, Australia**
Market Design – Bulk Water Sector
Developing reform proposals to facilitate the introduction of tradeable bulk water rights to the Melbourne system – including the specification of operational market rules.

2006 **Australian Competition and Consumer Commission, Australia**
Merger Analysis – Electricity Industry
Providing expert opinion to the Australian Competition and Consumer Commission (ACCC) on the competitive implications of a merger.

2006 **Confidential, Australia**
Section 46 of the TPA - Telecommunications
Providing expert opinion in relation to an action under Section 46 of the Trade Practices Act.

2006 **Australian Competition and Consumer Commission, Australia**
Merger Analysis - Transport Industry
Providing expert opinion to the Australian Competition and Consumer Commission (ACCC) on the competitive implications of proposed merger between Toll and Patrick.

2006 **World Bank, Philippines**
Competition Policy in the Philippines
Providing advice to the World Bank on the development of competition policy in the Philippines including a examination of industry case study relating to the impact of restrictions on competition in the aviation industry.

2005 **Confidential, Australia**
Merger Analysis - Telecommunications Industry
Providing expert opinion to the merging firms on the competitive implications of that merger.

2005 **AirServices Australia (ASA), Australia**
Review of Pricing Conduct
Providing expert opinion to ASA on pricing for its services at Australian Airports. Including an examination of allegations that pricing contravened National Competition Agreements.

2001-05 **TransGrid, Australia**
Market for transmission
Analysis of the design of the National Electricity Market (NEM) and its implications for efficient investment in generation and transmission assets.

2005 **Confidential, Australia**
Competition Assessment of Pricing Strategy
Advising a large corporate on the economic implications of the Trade Practices Act for its pricing conduct.

2005 **Australian Competition and Consumer Commission, Australia**
Competition Assessment of Electricity Generation Merger
Advised the ACCC on the competition concerns (and potential remedies) associated with a specific proposed merger of electricity generation interests.

2004 **Australian Competition and Consumer Commission, Australia**
Competition Impact of Exclusive Rights to Content
Provided a public report to the ACCC on the competition concerns (and potential remedies) associated with the use of exclusive rights to content by incumbent telecommunications infrastructure owners.

2004 **Australian Competition and Consumer Commission, Australia**
Empirical Evidence of Predatory Pricing in Telecommunications
Provided the ACCC with an expert report that developed an imputation test framework and empirical model to test allegations of predatory pricing of broadband services.

2003-04 **Singtel Optus, Australia**
Expert Report on Market Definition and Existence of Market Power in Mobile Termination
Provided Optus with an expert report on the appropriate market definition to use in analysing competition between mobile network operators in providing terminating access.

2003-04 **Singtel Optus, Australia**
Expert Economic Advice on Competition Complaint
Providing Optus advice on a confidential competition complaint relating to the exercise of market power by one of Optus' competitors.

2001-03 **Qantas**
Advice on Competition Law and Predation Allegations
Provided input into NERA's advice in relation to allegations of anticompetitive behaviour under section 46 of the Trade Practice Act.

2002 **National Competition Council (NCC), Australia**
Exploitation of Market Power by a Gas Pipeline
Provided a report to the NCC in which we developed a number of tests for whether current transmission prices were evidence of the exploitation of market power by a gas transmission pipeline. Also provided a separate report that applied these tests. This analysis was used to inform the NCCs decision on whether to recommend the pipeline in question be subject to regulation under the Australian Gas Code.

2002 **Screenrights, Australia**
Advice on methodologies used to estimate the value of retransmitting copyright content contained in local free-to-air broadcast.

Cost of Capital Issues

2008 **Joint Industry Associations, Australia**
Cost of Capital
Advising on the appropriate estimation of the cost of capital associated with capital assets used to provide electricity transport services in the context of a five yearly reveiew performed by the Australian Energy Regulator.

2008 **Telecom New Zealand, Australia**
Cost of Capital
Advising Telecom New Zealand on the appropriate estimation of the cost of capital associated with capital assets used to provide its universal service obligations.

2008 **Queensland Rail, Australia**
Cost of Capital
Advising QR on the appropriate estimation of the cost of capital associated with capital assets used to provide rail transport services

2008 **Transend, Australia**
Cost of Capital
Advising Transend on the appropriate estimation of the cost of capital associated with capital assets used to provide electricity transmission services.

2008 **Energy Australia, TransGrid, Country Energy and Integral Energy, Australia**
Cost of Capital
Advising on the appropriate estimation of the cost of capital associated with capital assets used to provide electricity transmission and distribution services.

2008 **ActewAGL, Australia**
Cost of Capital
An expert report describing the appropriate method for deriving a real risk free rate in the CAPM.

2007 **Electranet, Australia**
Cost of Capital
An expert report describing the appropriate method for deriving a real risk free rate in the CAPM.

2007 **Envestra, SP Ausnet and Alinta, Australia**
Cost of Capital
Three expert reports in response to the Victorian Essential Services Commission's cost of capital decision for Victorian gas distributors. Issues covered included: estimation of the appropriate equity beta, the appropriate form of the CAPM to be used, the use of non-CAPM asset pricing models, the estimation of the risk free rate from Government bond data.

2007 **Energy Networks Association, Australia**
Cost of Capital
Two expert reports with Professor Grundy identifying and quantifying the existence of a bias in the use of Australian Government bond yields as a proxy for the CAPM risk free rate.

2006 **ACTEW Corporation, Australia**
Cost of Capital
Advising on the cost of capital for ACTEW's water and waste water operations.

2006 **AER, Australia**
Cost of Capital
Advising on the cost capital issues in relation to the RBP pipeline access arrangement.

2006 **Integral Energy, Australia**
Cost of Capital
Advising on the cost of capital for Integral's retail operations.

2005 **Energy Networks Association, Australia**
Debt Margin
Advising on the relative merits of CBASpectrum and Bloomberg's methodology for estimating the appropriate debt margin for long dated low rated corporate bonds.

2005 **The Victorian ESC, Australia**
Cost of Capital
Advice on the cost of capital for electricity distribution network assets.

2005 **Prime Infrastructure, Australia**
Weighted Average Cost of Capital
Provided a report for Prime Infrastructure critiquing the QCA's draft cost of capital decision for Queensland electricity distribution.

2004 **The Australian Competition and Consumer Commission, Australia**
Cost of Capital
Provided a report advising on the correct discount rate to use when valuing future expenditure streams on gas pipelines.

2004 **ETSA Utilities, Australia**
Weighted Average Cost of Capital
Provided a report for ETSA examining the use of historical proxy betas.

2004 **ActewAGL, Australia**
Weighted Average Cost of Capital
Provided a report for ActewAGL estimating its weighted average cost of capital for regulated activities (gas distribution).

2004 **TransGrid , Australia**
Debt Margin
Provided a report critiquing CBASpectrum's methodology for estimating the appropriate debt margin for long dated low rated corporate bonds.

2004 **Prime Infrastructure, Australia**
Weighted Average Cost of Capital
Provided a report for Prime Infrastructure the weighted average cost of capital for its regulated activities (coal shipping terminal).

2004 **ActewAGL, Australia**
Debt Margin
Provided a report for ActewAGL advising on the appropriate calculation of debt margins for BBB+ ten year bonds.

2003 **Electricity Transmission Service Providers, Australia**
Expert Report on the Use of Historical Proxy Betas
Critique of the ACCC's statistical interpretation of historical proxy beta in its review of the Statement of Principles for the Regulation of Transmission Revenues.

2003 **Orion, New Zealand**
Cost of Capital
Critique of Associate Professor Lally's advice on the Cost of Capital for New Zealand Electricity Distribution.

2003 **TransGrid, Australia**
Expert Report on TransGrid's WACC
Advising TransGrid on the appropriate weighted average cost of capital (WACC) for its regulated assets

2003 **EnergyAustralia, NSW, Australia**
Advice on Financial Capital Maintenance
Advising EnergyAustralia on issues relating to its appropriate WACC and the modelling of cash flows to ensure the expected present value of future net revenues was equal to the value of the regulated asset base.

2002 **Rail Access Corporation, Australia**
Hurdle Rates of Return
Advising rail access corporation on the appropriate hurdle rates of return that should be applied when assessing competing investments.

2002 **Integral Energy, Australia**
Return on Capital
Advising Integral Energy on what risk adjusted regulatory return on capital is necessary to provide sufficient incentive to invest in new infrastructure assets.

2001 **TransGrid, Australia**
Advice on ACCC's Powerlink WACC decision
A report critically appraising the ACCC's decision regarding Powerlink's weighted average cost of capital (WACC).

2001 **Optus, Australia**
Affidavit on Telstra's PSTN WACC
Providing expert testimony to the Australian Competition Tribunal on Telstra' use of the CAPM model to determine an appropriate rate of return on PSTN assets.

2001 **Australian Competition and Consumer Commission, Australia**
International Comparison of WACC Parameters
Preparation of a report on international and domestic WACC parameters and the potential impact of variations in declared WACCs on incentives to invest in various regulatory jurisdictions.

General Regulatory Analysis

2007/08 **Digicel, PNG and Samoa**
Mobile telecommunications regulation
Advising Digicel on ongoing issues in mobile telecommunication regulation in PNG and Samoa.

2007/08 **Envestra, Australia**
Related party transaction
Expert statement assessing the reasonableness of an alleged related party transaction entered into by Envestra to outsource its operating and maintenance activities to Origin Energy.

2008 **Energy Australia, TransGrid, Country Energy and Integral Energy, Australia**
Cost escalation forecasts
Advising on appropriate forecasts for costs faced by these businesses over the forthcoming regulatory period. Used as an input into their regulatory cost modelling.

2008 **Transend, Australia**
Cost escalation forecasts
Advising on appropriate forecasts for costs faced by these businesses over the forthcoming regulatory period. Used as an input into their regulatory cost modelling.

2008 **Electranet, Australia**
Cost escalation forecasts
Advising on appropriate forecasts for costs faced by these businesses over the forthcoming regulatory period. Used as an input into their regulatory cost modelling.

2007 **Vodafone, Fiji**
Mobile telecommunications regulation
Advising Vodafone Fiji on estimating the cost of mobile termination in Fiji.

2007 **T-Mobile, UK**
Mobile termination cost modelling
Advise T-Mobile on BT's appeal of the UK Commerce Commission's determination on teh cost of mobile termination (specifically in relation to the treatment of 3G spectrum).

2007 **GSME, Europe**
USO reform
Developing and drafting of submission to the European Commission by the GSME on all aspects of universal service obligation reform, including: the appropriate level of obligations; the use of contestable models of provision, alternative funding models, costing of the obligations.

2007 **SingTel Optus, Australia**
FTTN
Advise SingTel Optus on all regulatory and competition issues associated with the construction of a FTTN network. Issues include – costing, form of price controls, capital raising and the cost of capital, drafting of undertakings, expert reports submitted to the regulator (Australian Competition and Consumer Commission).

2007 **Communications Alliance, Australia**
USO reform
Developing and drafting of submission to Government by the Communications Alliance (an industry body covering incumbent and new entrant fixed and mobile carriers) on all aspects of universal service obligation reform, including: the appropriate level of obligations; the use of contestable models of provision, alternative funding models, costing of the obligations.

2006-07 **GDSE, Macau, SAR PRC**
Efficient Electricity Tariff Reform
Advise the Macau regulator (GDSE) on efficient tariff reform for the vertically integrated generation and network provider. This involved estimating the LRMC on maximum demand and translating this into efficient tariff designs given relevant constraints (eg, metering constraints).

2005-06 **Integral Energy, Australia**
Efficient Electricity Tariff Reform
Advise Integral Energy on its LRMC of meeting growing network demand and on how this could be reflected in efficient tariff design (including design of critical peak pricing).

2005 **Telecom New Zealand, New Zealand**
Modelling of New Entrant Costs for TSO
Provide expert reports on the correct methodology for calculating the cost of providing the TSO (universal service obligation) using new entrant costs.

2005 **Telecom New Zealand, New Zealand**
Operating Cost Benchmarks
Advised Telecom on appropriate operating cost benchmarks for telecommunications services

2005 **TransGrid, Australia**
Capital Expenditure Indexation
Advised TransGrid on the development of a price index to reflect movements in the unit costs of inputs into its capital expenditure program.

2005 **TransGrid, Australia**
Forecast of Capital Expenditure
Advised TransGrid on appropriate adjustments to forecast capital expenditure to take account of material increases in demand for investment in future Australian electricity infrastructure.

2005 **TransGrid, Australia**
ACCC's Capital Expenditure Regime
Advised TransGrid on the ACCC's proposed regulatory regime to apply to capital expenditure.

2005 **Actew, Australia**
Financing of New Infrastructure
Advised Actew on options for financing new infrastructure.

2004 **Telecom New Zealand, New Zealand**
Avoided Retail Cost Study
Developing an avoided cost study associated with Telecom's fixed line retail activities.

2004 **TransGrid, Australia**
Fair Sharing of Efficiency Gains
Provided a report to TransGrid advising on whether the ACCC's draft decision was consistent with the National Electricity Code's requirement that there be a 'fair sharing' of efficiency gains.

2004 **Australian Competition and Consumer Commission, Australia**
Asset Valuation Report
Provided an expert report to the ACCC on the calculation of depreciated optimised replacement cost (DORC) in the context of the EAPL's appeal of the ACCC's valuation of its Moomba to Sydney pipeline.

2004 **ESCOSA, Australia**
Incentive Regulation
Provided ESCOSA with a report on the appropriate mechanism to provide ETSA Utilities with an incentive to achieve cost reductions in operating and capital expenditure.

2004 **Perisher Blue Ltd, Australia**
Review of Municipal Services
Assisted PBL with its submission to IPART on the review of municipal services (roads, waste, water and sewerage) at the Perisher Blue Resort.

2004 **TransGrid, Australia**
ACCC Regulatory Review
Assisted TransGrid in drafting its Application to the ACCC for regulated revenues and in its response to the ACCC's draft decision.

2003 **Telecom New Zealand, New Zealand**
Expert Report on Efficient Recovery of CSO Costs
Provided Telecom with a report stepping through all the information necessary to administer CSO costs in a manner consistent with "Ramsey efficient" pricing. The purpose of this was to inform the NZ Commerce Commission of the practical difficulties associated with pursuing such an outcome.

2003 **EnergyAustralia, NSW, Australia**
Advice on Financial Capital Maintenance
Advising EnergyAustralia on issues relating to its appropriate WACC and the modelling of cash flows to ensure the expected present value of future net revenues was equal to the value of the regulated asset base.

2003 **Optus, Australia**
Critique of Telstra's Access Undertaking for PSTN Services
Advising Optus in relation to the reasonableness of Telstra's cost modelling assumptions underlying its access undertaking for PSTN services.

2003 **Optus, Australia**
Indicative Pricing Principles
Advising Optus in relation to appropriate pricing principles the ACCC should adopt when establishing indicative prices for access to PSTN services.

2003 **Optus, Australia**
Estimation and Recovery of Telstra's Access Deficit
Provided a report to the ACCC on behalf of Optus addressing the appropriate measurement of any 'access deficit' that may exist between the cost to Telstra of its access network and the revenues associated with that network. Also examined the most appropriate recovery methodology for any access deficit.

2003 **Rail Infrastructure Corporation, NSW, Australia**
Expert Report on Hurdle Rates of Return
Advising RIC on the appropriate WACC each division should use as a hurdle rate of return when assessing competing capital projects.

2003 **Telecom New Zealand, New Zealand**
Expert at Commerce Commission Hearing
Provided expert testimony to the NZ Commerce Commission on the appropriate calculation of a wholesale discount for regulated services.

2002 **Telecom New Zealand, New Zealand**
'Intelligent' Wholesale Benchmarking Report
Carried out a benchmarking survey and provided a report to the New Zealand Commerce Commission on behalf of Telecom New Zealand. This report adjusted wholesale prices in the United States for differences in cost drivers (in terms of the cost of capital and labour) compared to New Zealand.

2002 **Telecom New Zealand, New Zealand**
Interconnection Pricing
Advised Telecom New Zealand on the potential forms of price control the New Zealand Commerce Commission could adopt in regulating PSTN interconnection prices.

2002 **Telecom New Zealand, New Zealand**
'Intelligent' Interconnection Benchmarking Report
Carried out a benchmarking survey and provided a report to the New Zealand Commerce Commission on behalf of Telecom New Zealand. This report adjusted interconnection prices in Europe, Australia and the United States for differences in cost drivers (in terms of switching and transmission economies of scale, transmission link lengths and the cost of capital and labour) compared to New Zealand.

2002 **SPI PowerNet, Australia**
Design of Efficiency Carryover Mechanism
Advised SPI PowerNet on the appropriate design of an efficiency carryover mechanism intended to share efficiency gains between a regulated business and its customers.

2002 **SPI PowerNet, Australia**
ReOptimisation of Transmission Assets
Advised SPI PowerNet on the appropriate approach to calculating the value of assets previously optimised out of its regulatory asset base and now being "un-optimised" due to greater utilisation levels of those assets.

2002 **SPI PowerNet, Australia**
Strategic Adviser on Revenue Reset Application
Advised SPI PowerNet on a range of high level issues in relation to their regulated revenue reset application, including appropriate drafting and consistency of argument throughout the document. Presented aspects of SPI PowerNet's application to the ACCC and in an ACCC sponsored regulatory public forum.

2002 **Telecom New Zealand, New Zealand**
Review of Interconnection Benchmarking Report
Advised Telecom New Zealand on issues arising out of an Interconnection Benchmarking report commissioned by the Commerce Commission of New Zealand for the purpose of setting interim interconnection charges. This role included the submission of a report to the Commerce Commission and presentation of the findings of that report at a Commerce Commission hearing.

2002 **Australian Pipeline Trust, Australia**
Expert Advice on CPI Indexation
Advised APT in relation to a dispute with customers on the appropriate CPI indexation adjustment of prices for the impact of the GST required under the Trade Practices Act.

2002 **EnergyAustralia, Australia**
Pricing Strategy Under a Price Cap
Advised EnergyAustralia on the commercial implications for pricing strategies under a weighted average price cap.

2001 **IPART, Australia**
Minimum Standards in Regulation of Gas and Electricity Distribution
Advised the NSW regulator on the appropriate role of minimum standards in regulatory regimes and how this could be practically implemented in NSW.

2001-03 **Rail Infrastructure Corporation, New South Wales**
Preparation of access undertaking
Advised on all economic aspects arising in the preparation of an access undertaking for the New South Wales rail network. Issues arising include: pricing principles under a `negotiate and arbitrate' framework, asset valuation, efficient costs, capacity allocation and trading, and cost of capital.

2001 **Australian Competition and Consumer Commission, Australia**
Determination of Local Call Resale Prices
The ACCC's expert regarding the determination of local call resale prices from Telstra's fixed line network. This involved the application, and manipulation, of the Australian incumbent's (Telstra's) regulatory accounting framework to determine appropriate wholesale prices.

2001 **All NSW electricity distribution businesses, Australia**
Form of Price Control
Advice on the economic efficiency implications of various forms of price control that can be applied under the National Electricity Code.

2001 **Wesfarmers, Australia**
Expert Advice on Reasonable Cost Recovery
Advising Wesfarmers in relation to a dispute with customers on reasonable recovery of costs of coal production.

2001 **Integral Energy, Australia**
Pricing Strategy Paper
Advising on appropriate pricing strategy for Integral's electricity distribution business, including advice on an appropriate regulatory engagement strategy.

2001 **TransGrid, SPI PowerNet and GPU GasNet, Australia**
CPI Indexation Adjustment
Advice on the appropriate CPI indexation adjustment for the impact of the GST required under the Trade Practices Act.

2001 **All NSW gas and electricity distribution businesses, Australia**
CPI Indexation Adjustment
Advice on the appropriate CPI indexation adjustment for the impact of the GST required under the Trade Practices Act.

2000 **One.Tel, Australia**
ULL Pricing
Advising OneTel in their arbitration with Telstra on pricing for access to the unbundled local loop.

2000 **Electricity Supply Association of Australia and Australian Gas Association,**
Adjusting the Regulatory Regime for the Impact of Tax Reform
Advised the peak energy bodies on the implications of tax reform on their members under the Trade Practices Act.

2000 **Victorian Department of Treasury and Finance, Australia**
State Business Tax Reform
Advised the Department of Treasury and Finance on State business tax reform including in relation to the relative economic costs associated with payroll, stamp duty and other transaction taxes.

1999 **Independent Pricing and Regulatory Tribunal of NSW**
Various energy regulation issues
Advice on a range of issues in regulation of the NSW energy sector.

1990-99 **Commonwealth Treasury, Australia**
Various economic policy issues
Provided input in the formulation of a number of economic policies. These included: the year 2000 reforms of the Australian indirect and corporate tax regimes; reform of the social

security system and labour market regulation; economic forecasting and monetary policy monitoring; reform to the regulation of the Australian financial system.

Application of Regulatory Test for Network Augmentation

2003 **TransGrid, NSW Australia**
Submission to the ACCC's Review of the Regulatory Test
Advised TransGrid in response to the ACCC's Discussion Paper on the review of the regulatory test. Tom prepared a report which commented both on the ACCC's proposal to amend the regulatory test to improve clarity and to ensure consistency with the provisions in the National Electricity Code, and also on the ACCC's proposed options for incorporating 'competition benefits' in the regulatory test.

2003 **Clayton Utz, TransGrid, NSW, Australia**
Murraylink's Application for Regulated Status
Advised TransGrid and Clayton Utz in responding to Murraylink's Application to the ACCC for regulated status, and, in particular, Murraylink's use of the regulatory test to derive a regulatory asset value.

Advised TransGrid in responding to the ACCC's Preliminary View on Murraylink's Application, and helped draft a further report commenting on aspects of the ACCC's approach.

2001-03 **TransGrid, NSW, Australia**
Application of the regulatory test to network augmentation in the Western Area
Advised TransGrid on the application of the regulatory for intra-regional network augmentation planned for the Western Area of NSW. The application highlighted issues in applying the regulatory test in a situation where an agreed reliability standard is not currently met.

General Policy Analysis

2007 **Menzies Institute, Australia**
Hidden Costs of Stamp Duty
An analysis of the hidden economic costs of state government stamp duty on residential property transactions – including in terms of labour force mobility.

2003 **Betfair, UK**
The Impact of Internet Betting Exchanges on the Racing Industry
Estimated bounds for the price elasticity of demand for wagering in Australia and using these to determine the likely impact of licensing internet betting exchanges to compete with existing TAB wagering operations. Modelled the impact on wagering tax rates required to achieve revenue neutrality under various prices elasticity scenarios.

2002 **Marsh, Australia**
The Impact of Taxation on Levels of Property Insurance
Estimated the number of uninsured households destroyed in the recent NSW bushfires that would otherwise have been insured if the only tax insurance premiums were subject to was GST. The methodology used was based on evidence from studies of the price responsiveness of demand for property insurance in the US and Australian evidence on the proportion of people without home or contents insurance.

Educational Services

2006 **RMIT University, Australia**
Economics Unit for MBA
Developed the course materials for the economics unit in RMIT's MBA course.

Speeches and presentations

2007 **Energy Networks Association, Melbourne**
Setting the cost of capital for Australian energy businesses

2005 **International Telecommunications Society regional Conference, Perth**
Stepping over the Competitive Line

2005 **ACCC Regulatory Conference, Gold Coast**
Exclusive Rights to Content and Competition in Telecommunications

2004 **Office of the Water Regulator, Perth**
Cost Benchmarking – Practical Pitfalls

2004 **ACCC Conference of Regulatory Principles for Electricity Transmission, Melbourne**
Drawing a Line in the Sand on Cost of Capital Issues

2004 **Macquarie Bank, Terrigal**
Internal presentation on regulatory risk across jurisdictions and industries

2003 **ACCC Regulatory Conference, Gold Coast**
Anticompetitive Pricing in Telecommunications

2003 **ACCC Conference on SPI PowerNet Regulatory Decision**
Operation of the efficiency carryover

2002 **International Telecommunications Society regional Conference, Perth**
TSLRIC Regulation and Leverage of Market Power

Daniel Young

Daniel Young is an Economist with CEG, based in its Sydney office. Daniel has a Masters degree in Economics and a Bachelors degree in Operations Research from Auckland University. He has worked as a professional economist for 5 years. Prior to joining CEG, Daniel was an Analyst at NERA Economic Consulting.

Daniel has extensive experience across a wide range of matters relating to economic regulation, antitrust issues and commercial damages in Australia and overseas. He has worked for clients in the electricity, gas, mining, telecommunication, and finance sectors.

Daniel has particular expertise in relation to the implementation of economic principles in computer modelling and has created models for electricity pricing, demand response and competition in electricity generation that have been applied in Australia and overseas.

Recent selected assignments include:

2008/09

Assisting in the preparation of reports for Australian electricity and gas network businesses estimating the rate of inflation for regulatory purposes and calculating and forecasting materials escalators.

Econometric testing using Australian data of the specification of the Sharpe CAPM equation for the ENA in relation to the AER's cost of capital review.

Providing advice to a European firm regarding the implications on competition in the UK electricity generation market of a number of proposed corporate transactions; and

2007

Estimating the likely response in the demand for electricity to the increased proliferation of time of day and critical peak tariffs as part of the MCE's cost/benefit analysis of the introduction of smart meters.

Analysing the results of the 2006 household survey of electricity, gas and water consumption in the Sydney region and preparing a report summarising these on behalf of IPART.

2006

Advising the electricity regulator in Macau about efficient tariff reform using modelling of the short run and long run marginal cost of supply in Macau.

Assisting in determining the market gas price on behalf of Santos in arbitration for two major gas supply contracts.

Conducting modelling of the hypothetical cost of entry using alternative technologies to determine Telecom NZ's service obligation.

2005

Developing a modelling framework for the ACCC to understand the increased incentives of merged generators in the NEM to engage in strategic withholding of capacity.

Estimating the long run marginal cost of Integral Energy's distribution network and applying this to improve the efficiency of tariffs.

Daniel Young | Economist | C E G

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Detailed Project Experience

Market Design and Competition Analysis

2008 **Confidential, European Union**
BHPB proposed merger with Rio Tinto
Constructing spreadsheet models of the price effects of a major proposed merger in the European pharmaceutical industry.

2008 **Gilbert + Tobin, Australia**
BHPB proposed merger with Rio Tinto
Assisted in the preparation of an expert statement on the likely impact of a merger in the mining industry (combining mines both domestically and internationally).

2008 **Gilbert + Tobin, Australia**
Confidential merger
Assisted in the preparation of an expert report on the competitive implications of a merger in the industrial packaging sector.

2008 **Vivendi, European Union**
Damages in mobile telephony market
Analysis of the appropriate cost of capital to be used proposed damages claim being brought by Deutsche Telecom against Vivendi in relation to alleged unlawful activity in a Polish mobile telephony joint venture.

2008 **Confidential, United Kingdom**
Estimation of price effect of proposed mergers
Assisted a European firm examining the implications for competition in the United Kingdom electricity generation market of a number of proposed transactions.

2007 **Meerkin & Apel, Australia**
Damages in waste disposal
Prepared an expert report and response examining the reasonableness of assumptions underlying the estimation of damages in a commercial arbitration.

2007 **Freehills, Australia**
Shareholder class action damanges
Prepared estimates of the potential damages faced by Telstra under a class action lawsuit from shareholders .

2006 **Channel Seven, Australia**
Special access undertaking for pay TV
Provided drafting and analytical assistance for an expert report examining the effect of Foxtel's proposed special access undertaking on competition in the market for subscription television services.

2006 **Australian Competition and Consumer Commission, Australia**
Merger analysis
Provided modelling underlying the provision of expert opinion to the Australian Competition and Consumer Commission (ACCC) on the competitive implications of a merger.

2006 **Hong Kong Government, Hong Kong**
Analysis of competitiveness of the auto-fuel industry
Contributed to an analysis of the extent of competition in the auto-fuel retail sector in Hong Kong by estimating the margins of local firms and developing international comparisons as benchmarks.

2005 **Australian Competition and Consumer Commission, Australia**
Merger analysis
Advised the ACCC on the competition concerns (and potential remedies) associated with a specific proposed merger of electricity generation interests.

2005 **Austrac, Australia**
Predatory pricing
Assisted in the preparation of advice to Austrac in relation to alleged breaches of section 46 of the Trade Practices Act.

Cost of Capital Issues

2008 **Joint Industry Associations, Australia**
Cost of Capital
Advising on the appropriate estimation of the cost of capital associated with capital assets used to provide electricity transport services in the context of a five yearly reveiew performed by the Australian Energy Regulator.

2008 **Energy Australia, TransGrid, Country Energy and Integral Energy, Australia**
Cost of Capital
Advising on the appropriate estimation of the cost of capital associated with capital assets used to provide electricity transmission and distribution services.

2008 **ActewAGL, Australia**
Cost of Capital
An expert report describing the appropriate method for deriving a real risk free rate in the CAPM.

2007 **Electranet, Australia**
Cost of Capital
An expert report describing the appropriate method for deriving a real risk free rate in the CAPM.

Cost Modelling and General Regulatory Analysis

2008-09 **Energy Australia, TransGrid, Country Energy and Integral Energy, Australia**
Cost escalation forecasts
Advising on appropriate forecasts for costs faced by these businesses over the forthcoming regulatory period. Used as an input into their regulatory cost modelling.

2008 **Transend, Australia**
Cost escalation forecasts
Advising on appropriate forecasts for costs faced by these businesses over the forthcoming regulatory period. Used as an input into their regulatory cost modelling.

2008 **Confidential, Australia**
Telecommunications cost modelling
Developing a cost model for an Australian telecommunications company.

2008 **Electranet, Australia**
Cost escalation forecasts
Advising on appropriate forecasts for costs faced by these businesses over the forthcoming regulatory period. Used as an input into their regulatory cost modelling.

2007 **Multinet, Australia**
Outsourcing contracts
Assisted in the preparation of an expert report on the prudency of Multinet's outsourcing contracts in the context of the National Gas Code.

2007 **Ministerial Council on Energy, Australia**
Demand response from smart meters
Estimating the likely response in the demand for electricity to the increased proliferation of time of day and critical peak tariffs as part of the MCE's cost/benefit analysis of the introduction of smart meters.

2006-07 **GDSE, Macau, SAR PRC**
Efficient electricity tariff reform
Advising the electricity regulator in Macau about efficient tariff reform using modeling of the short run and long run marginal cost of supply in Macau.

2006-07 **Santos, Australia**
Gas contract arbitration
Assisted in determining the market gas price on behalf of Santos in arbitration for a major gas supply contract.

2005-06 **Integral Energy, Australia**
Efficient electricity tariff reform
Advise Integral Energy on its LRMC of meeting growing network demand and on how this could be reflected in efficient tariff design (including design of critical peak pricing).

2005-06 **Telecom New Zealand, New Zealand**
Modelling of new entrant costs for TSO
Assisted in the preparation of expert reports on the correct methodology for calculating the cost of providing the TSO (universal service obligation) using new entrant costs.

General Policy Analysis

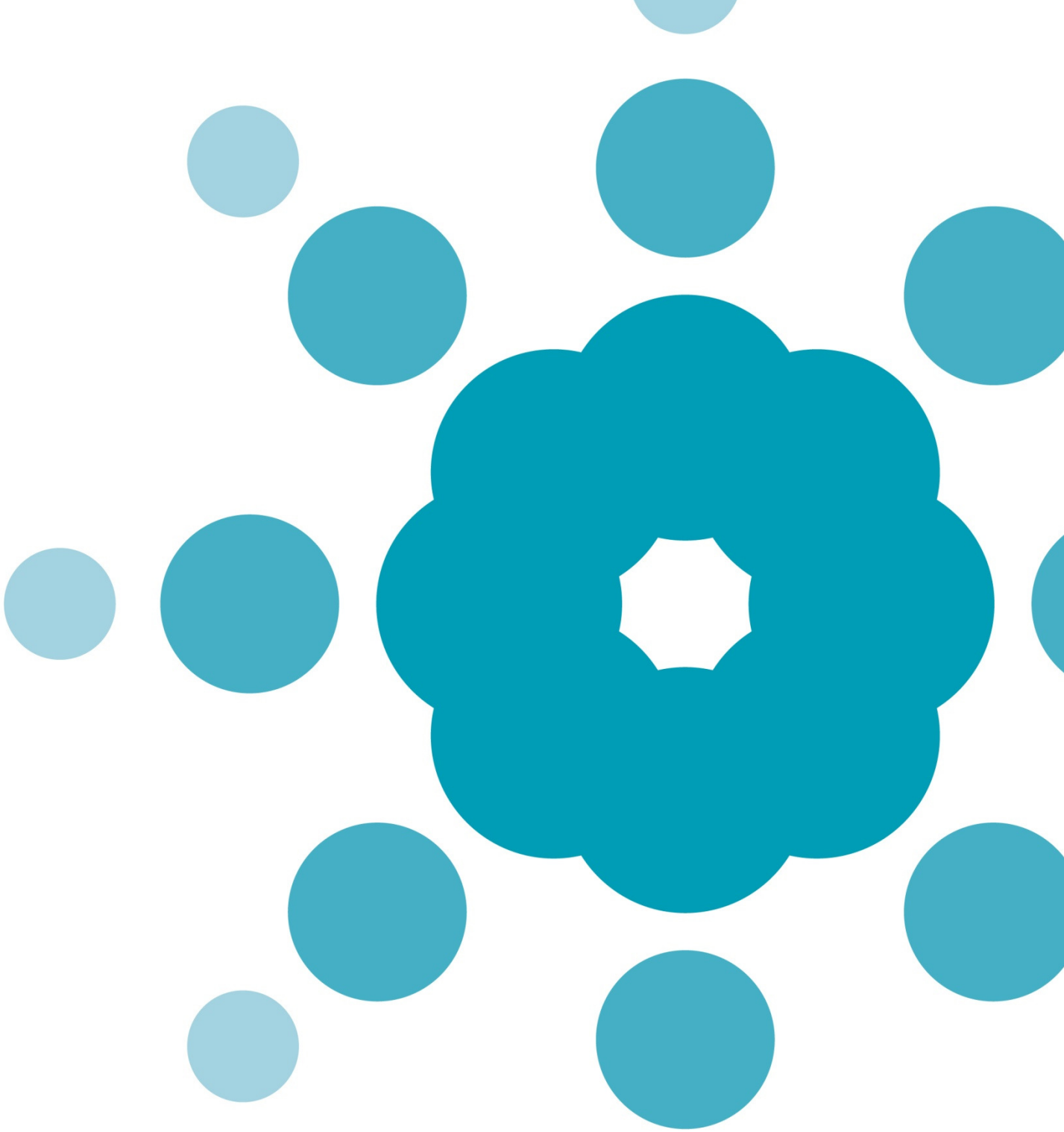
2007 **IPART, Australia**
Statistical modelling of energy and water consumption
Analysing the results of the 2006 household survey of electricity, gas and water consumption in the Sydney region and preparing a report summarising these on behalf of IPART.

2007 **Australian Rail Association, Australia**
Efficient pricing for road and rail
Assisted in the preparation of reports for the ARA on the efficiency of methods for charging for use of road and rail networks. Prepared a critique of an econometric analysis on the benefits of changing the charging methodology.

2004 **Auckland University, New Zealand**
Analysis of healthcare outcomes
Conducted statistical modelling of the relationships between socioeconomic variables and healthcare outcomes using census data.

Appendix D. Terms of reference

Confidential terms of reference removed



Forecasts of Cost Indicators – Electricity, Gas & Water Sector

New South Wales

Report prepared for CEG March 2009

macromonitor

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1. Introduction

The objective of this report is to provide well researched forecasts of cost increases which are expected to be experienced by gas networks in New South Wales.

Specific measures of costs in the gas sector in New South Wales are generally not available. Therefore the information provided in this report is based on data for the overall *electricity, gas & water* sector. Where state specific data is not available, we have used national level data. We have sourced all of the data in this report from the Australian Bureau of Statistics (ABS).

The types of costs we cover in this report are:

- Total Wage costs,
- Estimated wage costs by method of wage setting (awards, enterprise agreements and individual contracts)
- Productivity adjusted wage costs, and
- Readymixed concrete costs.

We aim to provide the historical data which we believe to be the best available indicators of these costs. We also provide annual forecasts of these data series out to 2014/15, along with a clear explanation of the forecasts.

All of the forecasts in this report are in nominal terms. These reflect wage and other cost pressures in the Electricity, Gas & Water and Construction sectors which Macromonitor specialises in analysing. In order to derive forecasts of real changes in costs one must adopt a forecast of CPI inflation. This will require one to take a view of changes in all prices for consumer goods across all sectors (including exchange rates and the price of imports of finished goods). Macromonitor does not hold itself out to be an expert in developing such forecasts.

2. Wages Costs – Electricity, Gas and Water Sector

This chapter covers the outlook for nominal wage costs. While our focus in this report is on the gas sector, wages data are only available at the industry division level. Hence we will be covering the outlook for wages in the *electricity, gas and water* industry sector.

The main data series which we use to measure wage costs in this report is *Average Weekly Full time, Ordinary Time Earnings* (also labelled AWOTE), which is sourced from the Australian Bureau of Statistics publication, *Average Weekly Earnings, Australia*, catalogue number 6302.0.

This measure includes the income earned by full time workers, for one week's earnings attributable to award, standard or agreed hours of work. Excluded are overtime payments, retrospective pay, pay in advance, leave loadings, severance, termination and redundancy payments, and other payments.

AWOTE is not affected by compositional changes between full and part time work or changes in the average amount of paid overtime worked, but it is affected by other compositional changes in the labour force – specifically, changes in the proportion of workers in lower as opposed to higher paid jobs.

Another important measure of wage rates is the *Labour Price Index*. This measure is constructed by taking a 'basket' of standard occupations/positions in each industry and measuring the normal hourly rate of each and weighting them together in a standard way. This measure excludes the effects of all types of compositional change, including changes in the amount or type of work being undertaken in a given period.

The labour price index is a good measure of the underlying rate of wage inflation in an industry. However, it is important to note that it does not capture various labour market effects, for example the promotion of workers to higher paid positions in order to retain them in a tight labour market.

Average Weekly Earnings is a good measure of the actual average wage rates that are being paid in the industry. The Labour Price Index is not available at the state level. Both measures have their place, but for the purposes of this report, we generally use Average Weekly Ordinary Time Earnings (AWOTE) as the primary measure of labour costs.

The long term rate of growth in AWOTE measure in the electricity, gas and water sector (looking over the last decade) has been stronger than the labour price index measure, suggesting relatively more growth in the higher paid portion of the workforce.

The reverse is true however if we only look at the last five years (see Table 1). Here, the labour price index has grown more strongly. Most of the difference occurred during the year to June 2006, when the labour price index increased by 6.9% (June quarter 2006 over June quarter 2005) while average weekly earnings increased by just 2.1%.

Table 1

Wage Cost indicators - Electricity, Gas and Water Sector

Annual Percentage Changes

	June 2005	June 2006	June 2007	June 2008	June 2009 *estimated* [1]
AWOTE					
- Electricity, Gas & Water	2.6	2.1	3.6	3.4	6.3
- All Industries	6.0	3.3	5.1	4.0	4.9
- Difference (Electricity, Gas & Water LESS All Industries)	*-3.3*	*-1.2*	*-1.4*	*-0.6*	*1.4*
Labour Price Index					
- Electricity, Gas & Water	3.8	6.9	4.2	3.1	5.7
- All Industries	4.1	4.2	4.0	4.2	4.4
- Difference (Electricity, Gas & Water LESS All Industries)	*-0.2*	*2.7*	*0.2*	*-1.1*	*1.3*
New Enterprise Agreements					
- Electricity, Gas & Water	4.8	5.5	4.8	4.4	4.0
- All Industries	4.0	4.4	4.3	4.0	3.6
- Difference (Electricity, Gas & Water LESS All Industries)	*0.8*	*1.1*	*0.5*	*0.4*	*0.4*

Source: ABS, DEEWR & Macromonitor

[1] Based on data for the first half of the year

The data in Table 1 above indicate that significant inflationary pressures are present in the electricity, gas & water sector at the present time. Each of the indicators of wages growth are higher, on our estimates, in 2008/09 than the average of all industries. Both the Labour Price Index and New Enterprise Agreement increases also suggest higher rate of increase within the sector for earlier years also.

The latest two periods of available quarterly data, which cover the September and December quarters of 2008, showed a marked acceleration in wages growth. The quarterly increase in September 2008 (from the June quarter 2008 to the September quarter 2008) was 3.2% (which equates to an annual rate of growth of 12.8%). The quarterly increase in December 2008 was 2.9% (which equates to an annual rate of growth of 11.7%). Looking at the Wage Price Index, the latest quarterly data also show an acceleration of growth. The quarterly increase in September 2008 was 1.4% and the quarterly increase in December was 1.9%.

An important cause of upward pressure on wages in the electricity, gas and water sector is the strength of growth in demand for labour, within the sector itself, and also in other areas of the economy which might compete for the same types of workers (particularly construction and mining).

Chart 1
Employment by Sector

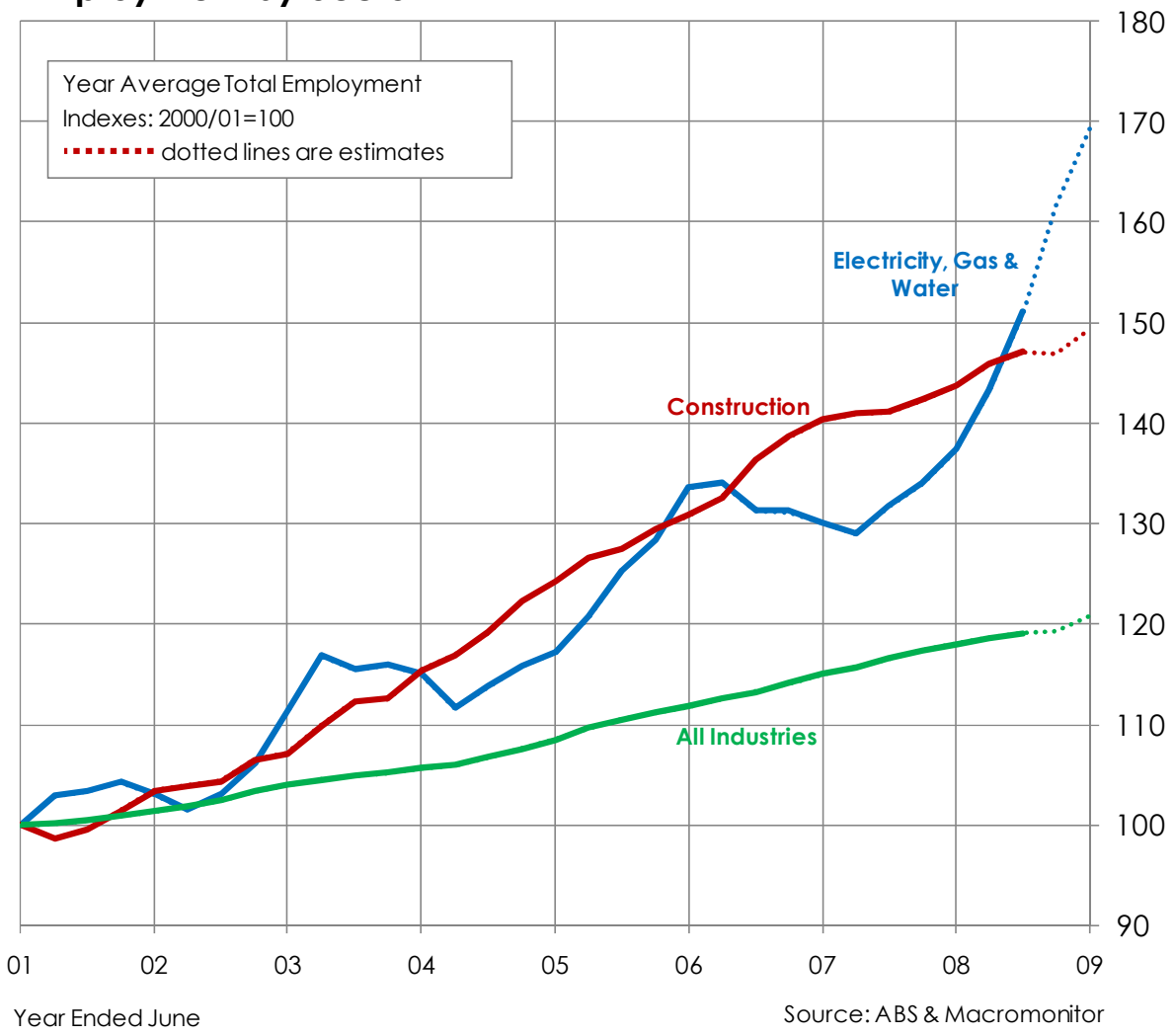


Chart 1 above shows indexes of employment. The data are presented as indexes so that they are comparable.

Over the last 12 months, employment in the electricity, gas & water sector has increased by 30%, compared to growth of less than 1% in the overall economy.

Wage pressures in the electricity gas and water sector are likely to be exacerbated by the strength of demand for people in the sector, but this is likely to be offset to some extent by a weakening labour market in other parts of the economy, such as the mining and construction sectors.

We should also note that problems of skilled labour shortages persist in some areas of the electricity gas and water sectors, as noted in recent information from the Commonwealth Department of Education, Employment and Workplace Relations (various reports, including 'Overview of Demand for Skills trades', January 2009, and the latest 'List of Skills Shortages').

Table 2

Wage Cost Indicators
Electricity, Gas and Water Sector

Annual Averages

Year Ended June	Wage Price Index - Ordinary Time Hourly Earnings		Average Weekly Ordinary Time Earnings			
	AUST		AUST		NSW	
	Index: 03/04=100	Ann. % Ch	$	Ann. % Ch	$	Ann. % Ch
1990	-	-	559.2		547.0	
1991	-	-	585.2	4.7	575.9	5.3
1992	-	-	620.5	6.0	622.3	8.1
1993	-	-	638.3	2.9	630.8	1.4
1994	-	-	657.9	3.1	657.1	4.2
1995	-	-	679.3	3.2	672.8	2.4
1996	-	-	725.0	6.7	739.5	9.9
1997	-	-	773.6	6.7	787.3	6.5
1998	79.2	-	831.8	7.5	851.1	8.1
1999	81.7	3.1	867.1	4.2	883.1	3.8
2000	84.8	3.9	922.8	6.4	938.3	6.2
2001	88.1	3.9	982.3	6.4	995.3	6.1
2002	91.9	4.3	1055.3	7.4	1095.3	10.0
2003	95.8	4.3	1085.1	2.8	1099.8	0.4
2004	100.0	4.4	1155.7	6.5	1196.8	8.8
2005	104.3	4.3	1194.5	3.4	1197.5	0.1
2006	110.1	5.5	1214.1	1.6	1224.4	2.2
2007	115.6	5.0	1262.4	4.0	1289.8	5.3
2008	120.3	4.0	1304.2	3.3	1336.5	3.6
2009	126.0	4.8	1384.3	6.1	1405.5	5.2
2010	131.3	4.2	1439.4	4.0	1461.7	4.0
2011	136.6	4.0	1491.2	3.6	1511.4	3.4
2012	142.5	4.3	1555.3	4.3	1571.8	4.0
2013	148.9	4.5	1633.1	5.0	1650.4	5.0
2014	156.3	5.0	1722.9	5.5	1744.5	5.7
2015	164.2	5.0	1817.7	5.5	1843.9	5.7
Average Annual Growth Rates						
1998-2003			5.5		5.3	
2003-2008	4.7		3.7		4.0	
Forecasts 2008-2015	4.0		4.2		4.1	

Source: ABS & Macromonitor

The second half of calendar 2008 witnessed some dramatic and unforeseen events on world financial markets, which are having, and will continue to have, a large impact on the world economy. There is likely to be an impact, in one way or another, on most economic variables, including wages and other costs.

The first year of our forecasts, 2008/09, is likely to be composed of two quite different parts. The first part of the year (covering the September and December quarters) has been characterized by quite strong increases in both construction costs and electricity, gas and water sector wage costs. The second part of the year is likely to be characterized by an easing of cost inflation.

For the full year 2008/09, we are forecasting growth in average weekly ordinary time earnings, in the Australian electricity, gas & water sector, of 6.1%. Our forecast for the wage price index is 4.8%.

Table 2 on the previous page contains our forecasts of wages growth.

Over the next two years, we expect the rate of wages growth to slow, both in the overall economy and in the electricity, gas & water sector. The extent of the slow-down in the overall economy is likely to have a significant impact on wages growth, with a smaller increase in the minimum wage likely and annual wage increases in both individual contracts and newly formulated enterprise agreements likely to be lower as a result of the weakened economy, reduced company profitability and the softer jobs market.

In the electricity, gas and water sector, while the demand for people looks likely to remain strong, we still expect there to be some flow-on benefit to costs as a result of the weaker wage environment. The demand for labour from competing industries, most notably mining and the building and construction sectors, is expected to fall significantly, after many years of strong rises.

This weakness in demand for the pool of available labour should mean that the same kind of wage increases previously required to attract and keep good people will now ease. There could also be compositional changes, with less of a need now to move more people into higher paying positions in order to attract or retain them.

Overall, we expect a modest easing in wages growth in the electricity, gas and water sector over the next two years. In terms of the wage price index, we expect a fall in growth from 4.8% in 2008/09 back to a low point of 4% growth in 2009/10. The more cyclical average weekly ordinary time earnings measure is likely to fall a bit further, reaching a low point, on our forecasts, of 3.6% in 2010/11.

Wages growth is unlikely to stay at this level for long and should rebound in 2011/12, climbing back to 4.3% on our forecasts (in both the wage price index and average weekly earnings measures). Thereafter, we expect another period of solid growth in the economy, as well as in the construction, mining and utilities sectors, and a return to a period of stronger employment growth and renewed wage inflationary pressure.

Australia's problem of labour shortages has no easy solution and will persist for many years. As stronger growth returns, on our forecasts, wages growth is expected to return to reasonably high levels. We expect average weekly ordinary time earnings to rise to 5.5% in each of 2013/14 and 2014/15.

Growth in electricity, gas and water wages in New South Wales has been very similar to the national average over the past decade. In 2007/08, growth in average weekly earnings was marginally higher in New South Wales and in 2008/09 it was a little lower. Over the long term (the last decade), growth in average weekly earnings in New South Wales and in Australia overall tend to average out to an almost identical rate.

We expect growth in the state's wages to remain similar to total Australia over the next six to seven years, marginally weaker over the next few years and then marginally stronger in the longer term.

3. Wage Costs by Method of Pay Setting

This section examines the different rates of change in wage costs across segments of the labour market defined by method of pay setting. The segments of the workforce thus defined are:

- Award wage earners
- Workers subject to enterprise bargaining agreements (EBAs)
- Workers on individual contracts

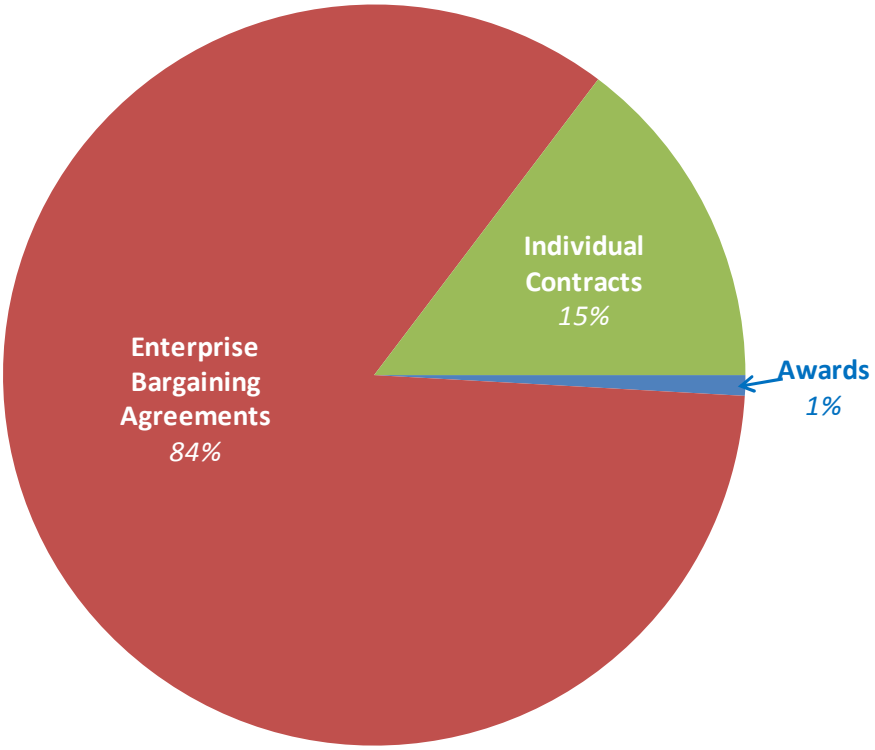
We firstly examined historical movements in each of these components and made historical estimates .We then forecast the rate of wage increases in each component of the workforce separately.

The wage increases in the three segments of the workforce (both historical and forecast) were weighted together according to the estimated proportion of the workforce represented by each group. This estimated composition of the workforce is shown in Chart 2 below. By weighting the wage increases together using these proportions, we arrived at the total wage increase which is shown in Table 2 in the previous section.

Chart 2

Estimated Composition of the Workforce

Electricity, Gas & Water Sector, Australia



Source: *Employee Earning & Hours, Australia, 2006*, ABS, Cat. No. 6306.0

It is worth once again noting here the difference between the wage price index measure of wages and the average weekly earnings measure of wages.

The wage price index measures a standard basket of positions and occupations, weighted together in a standard way. It does not allow for any actual changes in the composition of the workforce. If we estimate a breakdown of the wage price index into the component parts, by wage setting method, then the wage increases for the individual components should also not include any compositional changes.

For example, the wage increases in the enterprise bargaining part of the workforce should be more or less a straight average of all wage increases included in enterprise agreements, without any allowance for compositional changes amongst the different occupations or positions over time. For this reason, the breakdown of the wage price index is perhaps more easily understood than the breakdown of the average weekly earnings, which can include various types of compositional changes within each component of the workforce.

In our analysis we have provided a breakdown of the wage price index at the total Australia level (there is no wage price index available at the state level) and also a breakdown of average weekly earnings at the New South Wales level.

Data and other information on wage increases in the various segments of the workforce are sourced from:

- *Employee Earnings and Hours, Australia*, Australian Bureau of Statistics, Catalogue Number 6306.0
- *Trends in Federal Enterprise Bargaining*, Department of Education, Employment and Workplace Relations
- *Melbourne Institute Wages Report*, Melbourne Institute of Applied Economic and Social Research

The breakdown of wages growth by segment was also the result of estimation by Macromonitor, based on being able to best explain the movements in the overall wages data.

It is clear from Chart 2 on the previous page, that wage increases in the enterprise bargaining segment of the workforce are going to be the most important in determining the overall rate of wages growth in this sector. We will therefore give some attention now to those wage figures.

Table 3 and Chart 3 on the following page show data on average annualised wage increases contained in Federal enterprise agreements in the electricity, gas and water sector.

These data show that the overall average wage increase included in newly formulated enterprise agreements has remained high in recent quarters. The average wage increase in agreements in September 2008 and December 2008 (the last two available quarters) remained at close to 5%, compared with an average of 4% for all industries.

The wage increase included in new agreements can be quite volatile however, as shown in Chart 3, as a result of the particular agreements which happen to be formulated in a given quarter, and the market conditions which exist at the time. For example, the annualised wage increases in agreements formulated during 2006/07, averaged 3.8%, compared with 4.7% in the previous year.

Table 3

Federal Wage Agreements

Agreements Processed in the Quarter - Recent Quarters

Average Annualised Wage Increase per Employee - %

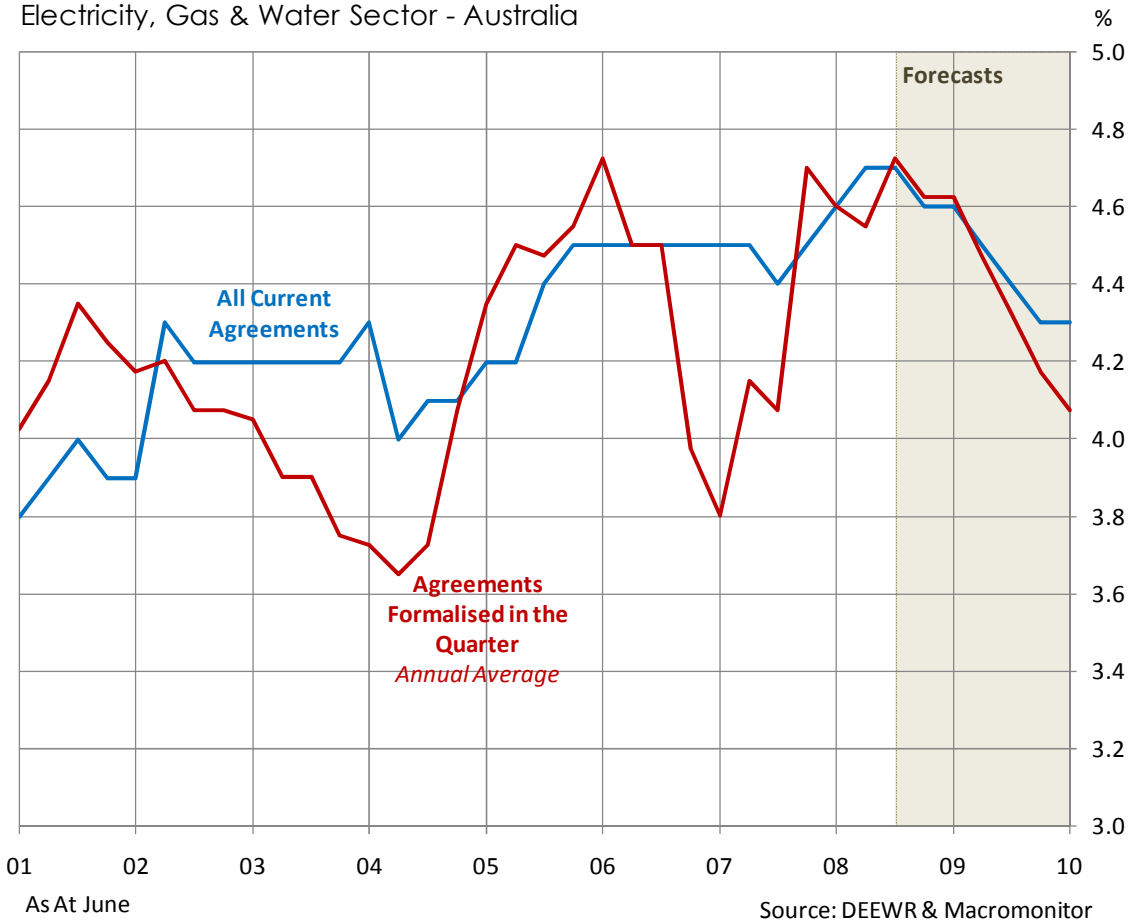
	All Industries	Electricity Gas & Water	Construction
June Qtr 2007	4.3	4.8	4.3
Sept Qtr 2007	3.9	5.0	4.4
Dec Qtr 2007	3.8	4.0	4.8
March Qtr 2008	3.7	5.0	4.5
June Qtr 2008	4.0	4.4	4.6
Sept Qtr 2008	4.1	4.8	4.7
Dec Qtr 2008	4.3	4.7	5.6
Average last 4 quarters	4.0	4.7	4.9

Source: Workplace Agreements Database, DEEWR

Chart 3

Annual Average Wage Increases in Enterprise Agreements

Electricity, Gas & Water Sector - Australia



Source: DEEWR & Macromonitor

The wage increases that occur in the enterprise bargaining segment of the workforce are dependent on the average increase included in all agreements currently in force. This is shown in Chart 3 as the line labelled *All Current Agreements*. This will fluctuate over time as some kind of weighted average of the increases in past new agreements.

We anticipate that the next 1 to 2 years will see agreements being formalised in an environment much less conducive to high rates of wage increases. Labour market weakness should reduce the pressure on employers to pay larger increases and the diminishing profitability of some private sector businesses in this sector might also encourage wage moderation.

We are therefore projecting a modest reduction in the average rate of wage increases in new enterprise agreements, back to around 4% per year by mid-2010.

Table 4 on the following page presents our historical estimates and forecasts of wage increases in each workforce category. The Enterprise Agreements category shows wage increases in all current agreements as at June of each year.

We are forecasting a low point in enterprise agreement increases of 4.1% in 2010/11, followed by a gradual rise once again, back to 4.6% (which is the current rate of increase) by 2013/14.

Table 4 provides a breakdown of the total Australia level wage price index into each workforce segment. The reason why we have chosen the wage price index to breakdown into the workforce segments is because the wage price index is a weighted average of the wage increases in each position and occupation across the sector, with no allowance for any compositional change between different workforce segments or within each workforce segment. It is therefore possible to express the wage price index as a simple weighted average of wage increase in each segment, as we have done in Table 4.

We do not have wage price index data for New South Wales however, and so Table 5 presents a breakdown of average weekly ordinary time earnings into the workforce segments. Because of the complexities of compositional changes which have occurred over time however, we have not been able to present estimates of this breakdown historically. We have simply presented our forecasts for the seven years starting in 2008/09.

The assumed average increase in enterprise agreement wage increases is forecast to fall a little lower in New South Wales, reaching a low point of 3.6% in 2010/11. This is partly because we expect wage pressures to be slightly weaker in New South Wales than in some other states, but also because of an allowance for compositional changes which have an effect on the average weekly earnings measure of wage increases.

In the very tight labour market of recent years, the difficulty of attracting and keeping good staff meant that higher wages needed to be offered and paid. This involved, in part, a compositional change towards the higher paid segments of the workforce, which would have increased the contribution of enterprise agreement increases to average weekly earnings. In the weaker labour market expected over the next couple of years, this is likely to be reversed to some extent, which will mean a slight dampening effect on the contribution of enterprise agreement increases. This is contributing to the marginally weaker wages growth in New South Wales average weekly earnings over the next couple of years. The effect will likely be reversed once again later in our forecast period.

Table 4

Contributions to Wage Price Index Increases by Method of Wage Setting
Electricity, Gas and Water Sector - Total Australia

Annual Averages

Year Ended June	Award Wages[1]			Enterprise Agreements[1]			Individual Contracts[1]			Total	
	Index: 99/00=100	Ann. % Ch	%of Workforce	Index: 99/00=100	Ann. % Ch	%of Workforce	Index: 99/00=100	Ann. % Ch	%of Workforce	Index: 99/00=100	Ann. % Ch
2000	100.0		1.4	100.0		76.5	100.0		22.1	100.0	
2001	100.5	0.5	1.3	103.8	3.8	77.3	104.6	4.6	21.5	103.9	3.9
2002	101.0	0.5	1.1	107.8	3.9	78.1	110.8	5.9	20.9	108.4	4.3
2003	103.0	2.0	1.4	112.4	4.2	79.0	116.3	5.0	19.6	113.0	4.3
2004	106.0	2.9	1.7	117.2	4.3	79.9	122.4	5.2	18.4	118.0	4.4
2005	108.1	2.0	1.3	122.1	4.2	82.2	128.5	5.0	16.6	123.0	4.3
2006	109.4	1.2	0.9	127.6	4.5	84.4	141.3	10.0	14.7	129.5	5.3
2007	112.3	2.7	0.9	133.4	4.5	84.4	152.3	7.8	14.7	136.0	5.0
2008	116.4	3.7	0.9	139.5	4.6	84.4	158.4	4.0	14.7	142.1	4.5
Forecasts											
2009	118.6	1.9	0.9	145.9	4.6	84.4	167.9	6.0	14.7	148.9	4.8
2010	120.3	1.4	0.9	152.2	4.3	84.4	174.7	4.0	14.7	155.2	4.2
2011	122.1	1.5	0.9	158.4	4.1	84.4	181.7	4.0	14.7	161.5	4.0
2012	124.6	2.0	0.9	165.2	4.3	84.4	189.8	4.5	14.7	168.4	4.3
2013	127.3	2.2	0.9	172.4	4.4	84.4	199.3	5.0	14.7	176.0	4.5
2014	130.6	2.6	0.9	180.4	4.6	84.4	213.3	7.0	14.7	184.8	5.0
2015	134.1	2.7	0.9	188.7	4.6	84.4	228.2	7.0	14.7	194.0	5.0
Average Annual Growth Rates											
2003-2008	2.5			4.4			6.4			4.7	
Forecasts 2008-2015	2.0			4.4			5.4			4.5	

Source: ABS & Macromonitor

[1] Contributions from each wage fixing method segment are Macromonitor estimates

Table 5

Contributions to Average Weekly Earnings Increases by Method of Wage Setting
Electricity, Gas and Water Sector - New South Wales

Annual Averages

Year Ended June	Award Wages[1]			Enterprise Agreements[1]			Individual Contracts[1]			Total	
	Index: 99/00=100	Ann. % Ch	%of Workforce	Index: 99/00=100	Ann. % Ch	%of Workforce	Index: 99/00=100	Ann. % Ch	%of Workforce	Index: 99/00=100	Ann. % Ch
Forecasts											
2009	118.6	1.9	0.9	146.2	4.8	84.4	169.7	7.1	14.7	149.4	5.2
2010	120.3	1.4	0.9	152.2	4.1	84.4	175.6	3.5	14.7	155.4	4.0
2011	122.1	1.5	0.9	157.6	3.6	84.4	180.7	2.9	14.7	160.7	3.4
2012	124.6	2.0	0.9	164.1	4.1	84.4	187.7	3.9	14.7	167.2	4.0
2013	127.3	2.2	0.9	171.6	4.6	84.4	200.8	7.0	14.7	175.5	5.0
2014	130.9	2.8	0.9	180.6	5.2	84.4	216.9	8.0	14.7	185.5	5.7
2015	134.4	2.7	0.9	190.0	5.2	84.4	234.2	8.0	14.7	196.0	5.7
Average Annual Growth Rates											
Forecasts 2008-2015	2.1			4.5			5.7			4.7	

Source: ABS & Macromonitor

[1] Contributions from each wage fixing method segment are Macromonitor estimates

Award wages growth has been consistently lower, on our estimates, than the other segments of the workforce and should remain so. But this is such a small component of the electricity, gas and water sector that it has virtually no effect on the overall wage outcome.

The individual contract segment of the workforce is more significant in size, and here, the wage increases tend to fluctuate more. Wage increases are generally negotiated year by year and will be affected by labour market conditions, economic conditions and profitability of the business at the time of re-negotiation. These wages are generally not tied to any award or agreement benchmarks and so can increase at highly fluctuating rates.

We anticipate that the rate of increase in wages of persons on individual contracts will slow over the coming two to three years, as a result of a worsening economy and a much weaker jobs market. Belt tightening is likely to be encouraged in private and public sector businesses alike and management and higher level staff on individual contracts will likely experience smaller increases than during the boom times.

At the total Australia level (in wage price index terms) we expect the rate of wage increase in the individual contract segment to slow to 4% per year in 2009/10 and 2010/11, before accelerating once again, peaking at 7% in 2013/14 and 2014/15.

At the New South Wales level (in average weekly earnings terms), we are forecasting the rate of increase in wages in the individual contracts segment to fall to a low of 2.9% in 2010/11, again with composition changes towards lower paid positions partly responsible for a lower rate of growth in the average weekly earnings measure of wages. Growth in this wages component is expected to accelerate once again as the economy recovers, reaching a peak of 8% in 2013/14 and 2014/15.

4. Productivity Adjusted Wage Costs

The actual labour cost involved with undertaking a given amount of activity is not purely determined by the rate of wages per hour, but also by the number of hours of work required. In examining changes in an organisation's labour costs over time, a more meaningful measure than nominal wages is labour cost per unit of output, or per unit of activity. The change in this measure over time reflects both changes in wages and changes in labour productivity.

Our view is that it has become increasingly important in recent times for organisations to allow for productivity changes in making cost projections. Up until very recently, Australia has experienced a long period of uninterrupted economic expansion and employment growth, which has been associated with a long-run decline in unemployment. The availability of additional labour for the expansion of economic activity has declined to a point where chronic labour shortages have emerged in many areas (particularly for skilled labour).

In this environment it has been difficult to find and keep high quality staff. In an environment of skills shortages, new people entering the workforce tend to be less efficient and productive than existing employees and less experienced people tend to be elevated to positions of greater responsibility than they would be normally. This environment is likely to be characterised by both strong increases in wages and declining labour productivity.

Consequently, it has been important to consider the potential impact of productivity declines on labour costs.

As we enter a period of weaker economic growth, the entire labour market environment is in the process of changing. Employment growth is weakening and the unemployment rate has begun to rise. Yet it is important to note the ongoing strength of employment demand in the electricity, gas and water sector, which is in contrast to falling employment demand in many other sectors.

In the electricity, gas and water sector, the primary problem with measuring labour productivity is describing and measuring output. Productivity is defined as volume of output per unit of labour. Units of labour are reasonably easy to define and measure – either number of people employed or the total hours worked can be used.

The volume of output is more difficult to define and measure.

The measure of output typically used by the Australian Bureau of Statistics in measuring productivity in industry sectors is *value added in constant prices*. Another measure which is sometimes used is *gross output in constant prices*. Gross output is the total value of all products produced by all firms operating in an industry, while value added is the total value of products produced in an industry minus the value of intermediate inputs used during the production process.

One problem with applying these measures of output to the electricity, gas and water sector is that changes in them can, at least in the short run, have little to do with the amount of labour

used or labour productivity. Value added and gross output is largely determined by the amount of electricity, gas or water delivered (although it also includes the amount of construction work done for own use). In the short turn, some of the change in the volume of throughput can be attributed, not to changes in labour input or labour productivity, but rather to the utilisation of spare capacity (or the amount of capital inputs).

We would expect that increases in the throughput of electricity or gas, up to the maximum annual capacity, would not need to be accompanied by a commensurate increase in employment. An increase in output resulting from greater capacity utilisation (or improved economies of scale) will show up (incorrectly) as increased labour productivity if measured by value added per person. In the long run, persistent high capacity utilisation will require expansion to capacity which, in turn, is likely to require increased hours of labour. Thus, in the long run, variations in the utilisation of existing capacity will play a less important role in explaining measured variations in productivity.

With these caveats in mind, we still must make use of the labour productivity measure from the ABS which is the most relevant to the gas sector in New South Wales. That measure is the index of value added per hours worked in the electricity, gas and water sector at the total Australia level. This index is not available at the state level (the reason being that constant price industry value added is not available by state).

Table 6 and Chart 4 on the following pages show the Australian Bureau of Statistics (ABS) data on gross product per hours worked in the electricity, gas and water sector, along with Macromonitor's forecasts. Looking at the ABS data, the sustained decline in productivity since the late 1990s, illustrated in the chart, represents the combined result of three possible effects:

- Changes attributable to increased throughput (electricity, gas or water delivered), or improving economies of scale (we would expect this to be a positive influence on measured productivity)
- Compositional changes in the nature of work undertaken – that is, relative increases in more labour intensive types of activities, possibly including construction and maintenance activities
- Declining productivity of labour

In Macromonitor's view much of the decline in productivity, as measured by the ABS data, is likely to be attributable to declining productivity of labour. The first influence listed above would be expected to be positive, meaning that the second two influences, taken together must have had an overall negative influence which more than offset this. We feel that it is likely that both factors have had a negative impact on labour productivity thus measured.

A declining level of labour productivity is a natural consequence of the very tight labour market which has existed through most of this period. It has been difficult to obtain and keep good staff, less qualified or capable staff have been given more responsibility and a large proportion of the workforce has been able to demand reasonably good pay increases, with or without productivity offsets.

It may also be the end result of many years of efficiency improvements in the utilities sectors (through the 1980s and 1990s) which exhausted all of the 'easy' or obvious productivity improvements, with any further improvements in work practices or manning levels now much harder to achieve.

Table 6

Productivity Estimates

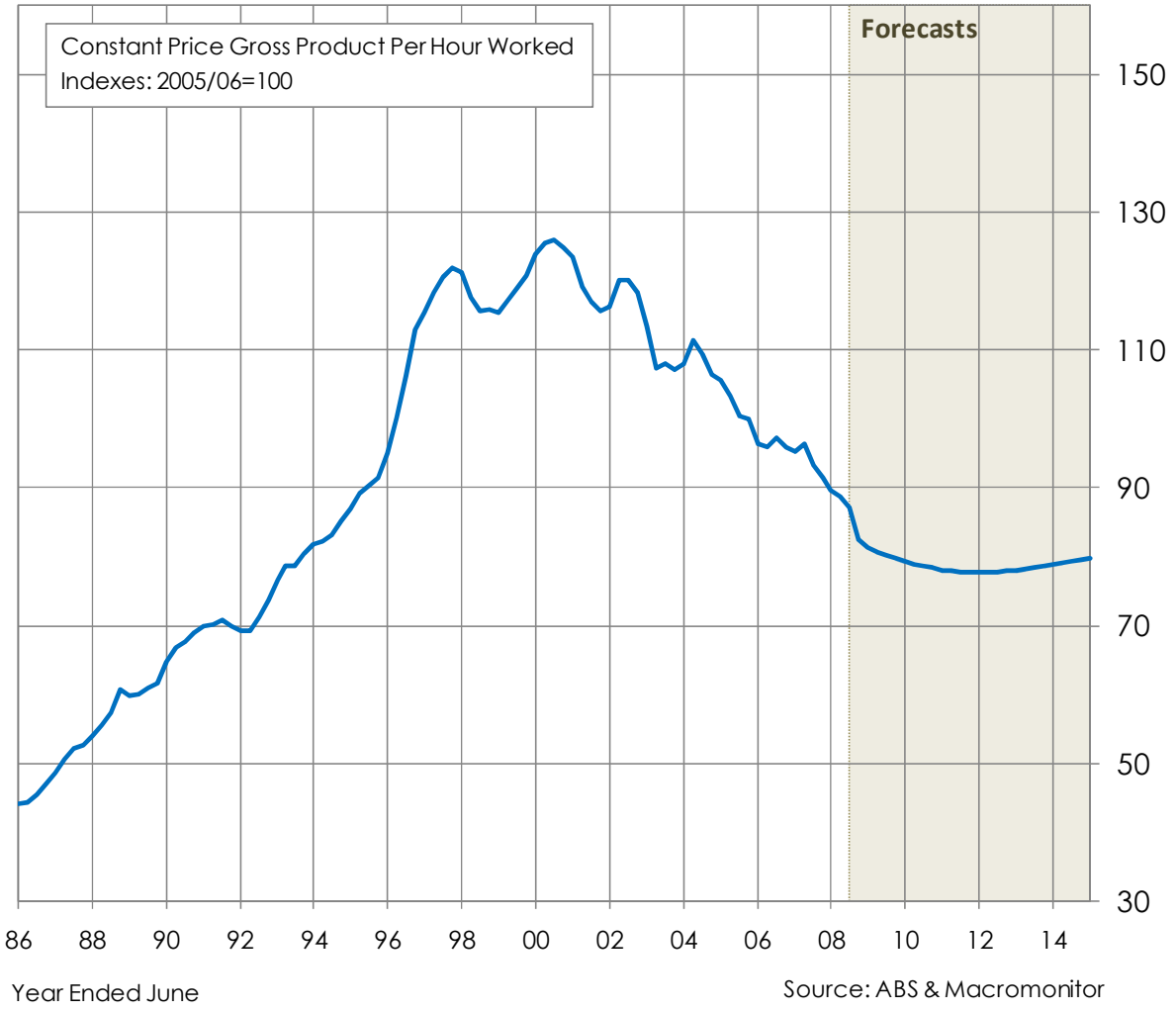
Annual Averages

Year Ended June	Electricity, Gas and Water Sector - Productivity - Real Gross Product per Hour Worked		
	AUST		NSW[1]
	05/06=100	Ann. % Ch	Ann. % Ch
1993	79.5	11.1	-
1994	84.7	6.5	-
1995	90.0	6.3	-
1996	98.5	9.5	-
1997	119.6	21.3	-
1998	125.8	5.2	-
1999	119.5	-5.0	-
2000	128.5	7.5	-
2001	127.8	-0.5	-
2002	120.6	-5.6	-
2003	117.5	-2.6	-
2004	112.1	-4.5	-
2005	109.5	-2.3	-
2006	100.0	-8.7	-
2007	98.6	-1.4	-1.0
2008	92.9	-5.8	-5.3
Forecasts			
2009	84.4	-9.2	-9.0
2010	82.3	-2.5	-2.5
2011	81.0	-1.5	-1.5
2012	80.6	-0.5	-0.5
2013	81.0	0.5	0.5
2014	81.8	1.0	1.0
2015	82.9	1.3	1.3
Average Annual Growth Rates			
1998-2003	-1.4		-
2003-2008	-4.6		-
Forecasts			
2008-2015	-1.4		-1.5

Source: ABS & Macromonitor

[1.] Historical productivity data for New South Wales are not available. Estimates for 2006/07 and forecast percentage changes are based on the national level producitivity changes, partial historical estimates for each state and Macromonitor analysis.

Chart 4
Labour Productivity - Electricity, Gas & Water Sector - Australia



In our forecasts, our intention is to capture changes in actual labour productivity, rather than changes in measured productivity related to increasing capacity utilisation (economies of scale) or compositional changes.

We expect the decline in utilities sector labour productivity to persist for another three years, at diminishing rates of decline. The continued very strong demand for people in the utilities sectors and the need to resource still increasing capital expenditure programs is expected to maintain the declining trend in the overall productivity of the workforce, despite a weaker jobs market in the economy overall.

We expect the productivity declines to flatten-out and then turn positive once again from around 2012/13.

The long term trend in most industries is for positive labour productivity increases, as a result of improving technology and work methods. Ultimately, labour productivity in the electricity, gas and water sector will turn positive once again. On our forecasts, this will happen once the current expansion phase in the sector – involving large additions to, and upgrades of, capacity, strongly rising construction activity and big rises in employment – comes to an end. This should be around 2012/13, and will result in a reduced demand for additional labour and a return to a

more normal mode of operation with labour productivity more normalised. The major phase of investment in new equipment, buildings and infrastructure now taking place should also provide some long run benefits to the productivity of labour.

Table 6 on page 17 shows our forecasts of productivity, at the national level and for New South Wales. These forecasts are based on historical data measuring gross value added per hour worked (derived from Australian Bureau of Statistics data).

In our forecasts, our intention is to capture changes in actual labour productivity, rather than changes in measured productivity related to increasing capacity utilisation (economies of scale) or compositional changes.

The measure of labour costs which incorporates these productivity effects is called *unit labour costs,* or simply *productivity adjusted wages growth*. Our forecasts of unit labour costs (average weekly ordinary time earnings adjusted for our productivity forecasts) are presented, at the total Australia level, in Table 7.

For the full year 2008/09, productivity is expected to drop by 9.2%. Taken together, the strong rate of nominal wages growth in 2008/09 and the large productivity decline, they suggest a large rise in productivity adjusted wage costs. We are now forecasting an increase of 16.9%.

We expect unit labour cost increases to slow over the next two years (as nominal wages growth slows) and then remain relatively stable over the five years to 2014/15. The pick-up in nominal wages growth from 2011/12 to 2014/15 is expected to be offset by a return to positive productivity growth and then a marginal rise in that rate of productivity growth.

Labour productivity data at the state level is not available from the ABS. It is also not possible to construct comparable labour productivity data at the state level, because industry sector constant price value added data is not available for individual states.

Our forecasts of productivity for New South Wales are very similar to the national level forecast. Table 8 provides our forecasts of average weekly ordinary time earnings, labour productivity growth and productivity adjusted wages (unit labour costs) in New South Wales.

Table 7

Electricity, Gas & Water Labour Costs - Australia

Annual Averages

Year Ended June	Nominal Wages Measures				Productivity Effects			
	Average Weekly Ordinary Time Earnings		Wage Price Index - Ordinary Time Hourly Rate		Productivity - Real Gross Product per Hour Worked		Unit Labour Costs - $ Wages per $ Real Gross Product	
	$	Ann. % Ch	03/04=100	Ann. % Ch	05/06=100	Ann. % Ch	$	Ann. % Ch
1990	559.2		-		67.1		0.18	
1991	585.2	4.7	-	-	72.4	7.9	0.18	-3.0
1992	620.5	6.0	-	-	71.6	-1.2	0.19	7.3
1993	638.3	2.9	-	-	79.5	11.1	0.18	-7.4
1994	657.9	3.1	-	-	84.7	6.5	0.17	-3.2
1995	679.3	3.2	-	-	90.0	6.3	0.17	-2.8
1996	725.0	6.7	-	-	98.5	9.5	0.16	-2.5
1997	773.6	6.7	-	-	119.6	21.3	0.14	-12.1
1998	831.8	7.5	79.2	-	125.8	5.2	0.15	2.2
1999	867.1	4.2	81.7	3.1	119.5	-5.0	0.16	9.7
2000	922.8	6.4	84.8	3.9	128.5	7.5	0.16	-1.0
2001	982.3	6.4	88.1	3.9	127.8	-0.5	0.17	7.0
2002	1055.3	7.4	91.9	4.3	120.6	-5.6	0.19	13.9
2003	1085.1	2.8	95.8	4.3	117.5	-2.6	0.20	5.6
2004	1155.7	6.5	100.0	4.4	112.1	-4.5	0.23	11.6
2005	1194.5	3.4	104.3	4.3	109.5	-2.3	0.24	5.8
2006	1214.1	1.6	110.1	5.5	100.0	-8.7	0.27	11.3
2007	1262.4	4.0	115.6	5.0	98.6	-1.4	0.28	5.4
2008	1304.2	3.3	120.3	4.0	92.9	-5.8	0.31	9.7
Forecasts								
2009	1384.3	6.1	126.0	4.8	84.4	-9.2	0.36	16.9
2010	1439.4	4.0	131.3	4.2	82.3	-2.5	0.39	6.6
2011	1491.2	3.6	136.6	4.0	81.0	-1.5	0.41	5.2
2012	1555.3	4.3	142.5	4.3	80.6	-0.5	0.42	4.8
2013	1633.1	5.0	148.9	4.5	81.0	0.5	0.44	4.5
2014	1722.9	5.5	156.3	5.0	81.8	1.0	0.46	4.5
2015	1817.7	5.5	164.2	5.0	82.9	1.3	0.48	4.2
Average Annual Growth Rates								
1998-2003	5.5		-		-1.4		6.9	
2003-2008	3.7		4.7		-4.6		8.7	
Forecasts								
2008-2015	4.2		4.0		-1.4		5.7	

Source: ABS & Macromonitor

Table 8
New South Wales
Electricity, Gas & Water Labour Costs
Annual Averages

Year Ended June	Average Weekly Ordinary Time Earnings		Productivity - Real Gross Product per Hour Worked	Unit Labour Costs - $ Wages per $ Real Gross Product
	$	Ann. % Ch	Ann. % Ch	Ann. % Ch
Forecasts				
2009	1405.5	5.2	-9.0	15.6
2010	1461.7	4.0	-2.5	6.7
2011	1511.4	3.4	-1.5	5.0
2012	1571.8	4.0	-0.5	4.5
2013	1650.4	5.0	0.5	4.5
2014	1744.5	5.7	1.0	4.7
2015	1843.9	5.7	1.3	4.4
Average Annual Growth Rates				
Forecasts 2008-2015	4.1		-1.5	6.5

Source: ABS & Macromonitor

[1.] Historical productivity and Unit Labour Costs data for New South Wales are not available. Forecast percentage changes are based on partial historical estimates and Macromonitor analysis.

5. Readymixed Concrete Costs

There are three primary data series measuring the cost of readymixed (or premixed) concrete. These three data series are:

- ***Price Indexes of Materials Used in House Building – Readymixed Concrete***, from the ABS publication, *Producer Prices Indexes, Australia*, catalogue Number 6427.0
- ***Price Indexes of Articles Produced by Manufacturing Industries – Concrete Slurry Manufacturing***, from the ABS publication, *Producer Prices Indexes, Australia*, catalogue Number 6427.0
- ***Price Indexes of Materials Used in Building other than House Building – Readymixed Concrete***, from the ABS publication, *Producer Prices Indexes, Australia*, catalogue Number 6427.0 – discontinued n June 2004, but projected forward using the other two measures

Chart 5 below presents each of these series on the same chart, illustrating the similarity between movements in each of the three series.

Chart 5
Price Indexes of Readymixed Concrete

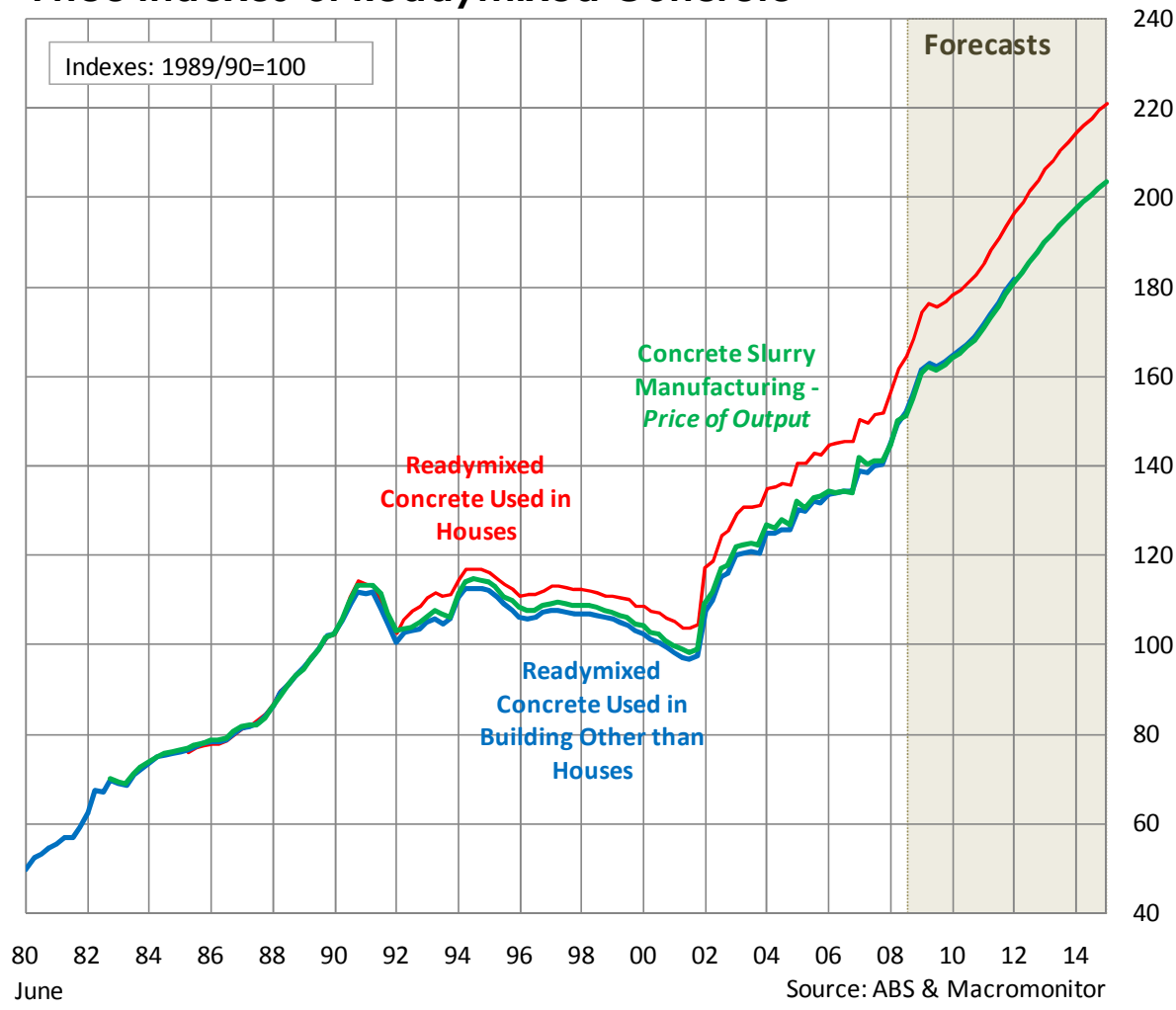
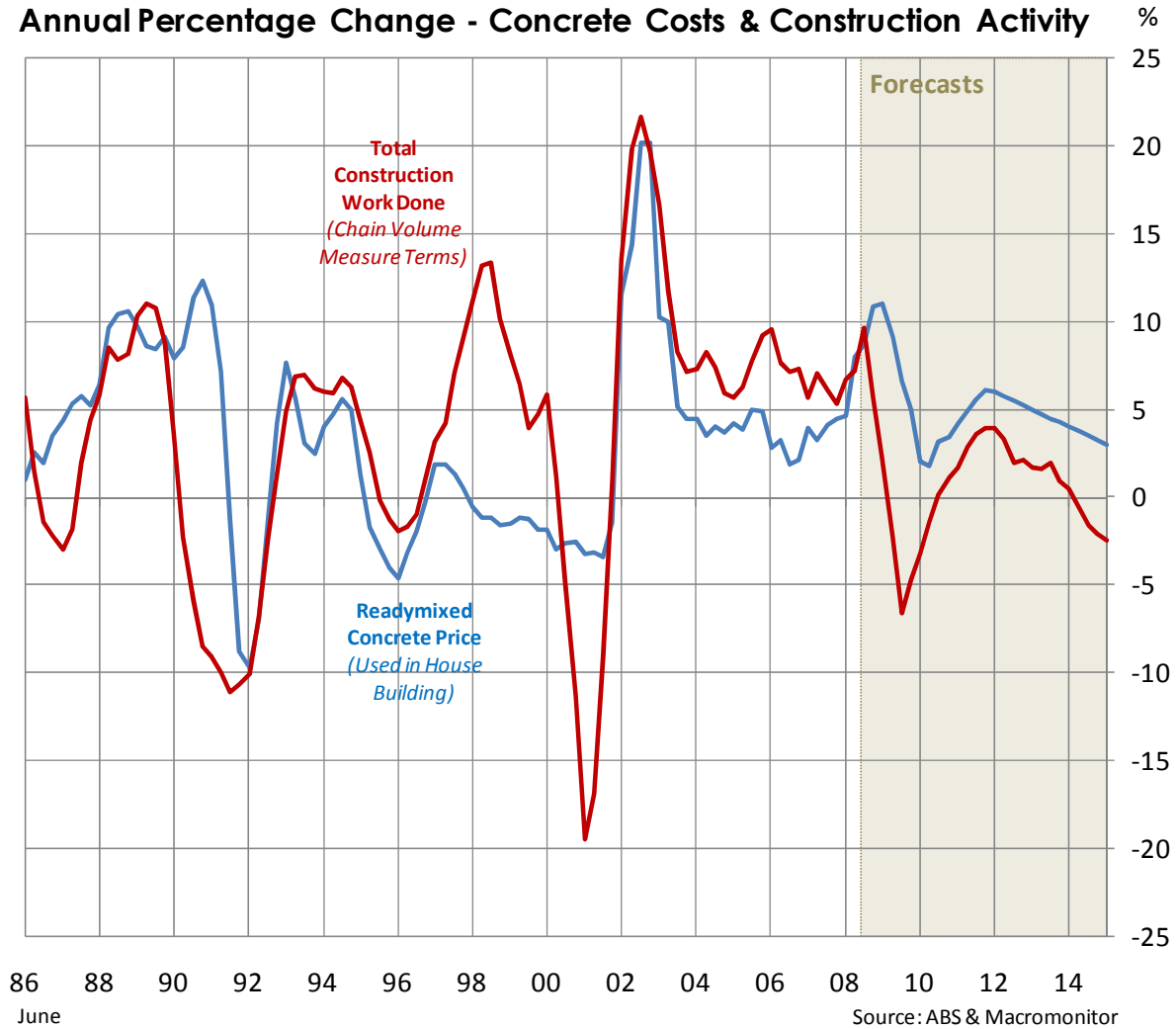


Table 9 on the following page contains historical data and our forecasts of readymixed concrete costs. This table contains data from the series: *Price Indexes of Materials Used in House Building – Readymixed Concrete*, but any of the three series could be used, because their movements are so similar over time.

The determinants of concrete prices are a combination of trends in cost inputs (prices of cement, other raw materials, fuel and labour) and trends in the demand for concrete. Demand for concrete, in turn, is driven by cycles in the construction activity. Chart 6 below illustrates the relationship which often exists between changes in the volume of construction activity and changes in the price of concrete.

Chart 6
Annual Percentage Change - Concrete Costs & Construction Activity



Source: ABS & Macromonitor

In the short term, concrete prices are still experiencing an increase, despite a precipitous fall in building and construction activity. The global financial crisis, and associated lack of financing availability in Australia, has triggered a sharp downturn in many parts of the building and construction sector. But concrete prices are still rising as a lagged response to the construction boom and the rises in input costs which resulted.

Table 9

Readymixed Concrete Price Index

Index: 1999/2000=100 - Excluding GST

	Index As At June	Annual % Change
1988	78.9	6.4
1989	86.6	9.7
1990	93.5	7.9
1991	103.7	11.0
1992	93.7	-9.7
1993	100.8	7.6
1994	104.8	4.0
1995	106.1	1.2
1996	101.3	-4.6
1997	103.2	1.9
1998	102.6	-0.5
1999	101.1	-1.5
2000	99.2	-1.8
2001	96.0	-3.2
2002	107.1	11.5
2003	118.1	10.2
2004	123.3	4.4
2005	128.5	4.2
2006	132.1	2.8
2007	137.3	3.9
2008	143.6	4.6
Forecast		
2009	159.4	11.0
2010	162.6	2.0
2011	169.4	4.2
2012	179.6	6.0
2013	188.5	5.0
2014	196.1	4.0
2015	202.0	3.0
Average Annual Growth Rates		
1998-2003	2.8	
2003-2008	4.0	
Forecasts		
2008-2015	5.0	

Source: ABS & Macromonitor

The major concrete suppliers announced two sets of price increases since the middle of last year – one price increase effective from around the August to November 2008 period, and the other effective from April. We estimate that the first of these increases was of a magnitude of around 8% on average while the second was around 5% to 6%. That amounts to a total increase through the 2008/09 financial year of around 13% to 14%.

This full increase is unlikely to flow through to national average concrete prices however, as a result of three factors:

- Not all suppliers will have increased prices by these amounts,
- There are lags in the transmission of prices as a result of term supply contracts, and
- The construction downturn will put pressure on suppliers to moderate price increases.

We are forecasting the annual rate of increase in concrete prices will hit a maximum of around 11% around June 2009.

Thereafter, we expect the combination of falling input costs (particularly fuel costs) and a much weaker construction sector to drive down the rate of concrete price growth. We are forecasting growth in readymixed concrete prices of 2% in 2009/10 as the worst of the construction downturn hits.

Beyond 2009/10, we expect a return to higher rates of growth in prices, reflecting a tentative upturn in construction sector activity, led by house building. We are forecasting average annual growth in concrete prices of 4.4% over the five years from 2010/11 to 2014/15 inclusive.

Wages Outlook for the Electricity, Gas and Water Sector in New South Wales

Prepared by BIS Shrapnel for Jemena Gas Networks
Final Report

MAY 2009

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.

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EBA - Enterprise Bargaining Agreement

Non-EBA – Non Enterprise Bargaining Agreement

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1. SUMMARY

- BIS Shrapnel was engaged by Jemena Gas Networks to provide an expert opinion regarding the outlook for wage costs (EBA and non-EBA) relevant to the electricity, gas and water sector over a period that extends to 2014/15.

- Table 1 presents a summary of the forecasts of the wage cost escalators for the New South Wales utilities sector, with annual (year average) movements in Enterprise Bargaining Agreements (EBA's), Non-Enterprise Bargaining Agreements (non-EBA's) and average weekly ordinary time earnings expressed in both nominal and real terms, the latter adjusted for the headline CPI inflation rate.

- In real terms, EBA wages growth for the New South Wales utilities sector is forecast to average 1.7 per cent per annum over the seven years to 2014/15, while real non-EBA wages is forecast to average 2.6 per cent per annum. The key elements of our forecasts are set out below.

- BIS Shrapnel forecasts that New South Wales will be one of the better performing state economies over the 2009/10 to 2012/13 period. While the resource rich states like Queensland and Western Australia will suffer from the current downturn in minerals investment, New South Wales will come out of the downturn stronger, driven by dwellings construction, overall better growth in construction activity, the low A$ and other factors. This is likely to end up putting pressure on wages growth in the NSW construction and utilities sector over the forecast period.

- Although we expect the current setback to employment to lead to some easing in the tightness of the skilled labour market over the next year, the predicted recovery in economic growth from next year will lead to a recovery in skilled labour demand in NSW and a tightening in the market over the 2010/11 to 2014/15 period. These skilled labour shortages are expected to be even more pronounced over the next 7 years given the large capital works and maintenance programs planned in the NSW and other states' utilities sectors. The strength in demand for skilled labour will add to wage pressures on the New South Wales utilities sector — it will need to offer competitive wages to retain its existing workforce and attract new recruits.

- Overall, NSW utilities wages growth expressed in average weekly ordinary time earnings is forecast to average 5.0 per cent per annum and keep pace with national utilities wages growth of 5.1 per cent per annum over the next seven years to 2014/15.

Table 1: Summary of Forecast Wage Cost Escalators
(percent change, year average, year ended June)

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	7 yr Avg (a)	5 yr Avg (b)
Nominal Price Changes									
EBA Wages - EGW in NSW	4.7	4.6	4.4	4.5	4.7	4.7	4.6	4.6	4.6
Non-EBA Wages - EGW in NSW (c)	5.4	5.0	4.5	5.0	6.5	6.5	5.5	5.5	5.6
Bonuses and Compositional Effects (d)	0.6	0.4	0.0	0.1	0.2	0.3	0.1	0.3	0.2
Total NSW EGW AWOTE (e)	5.4	5.0	4.4	4.7	5.2	5.2	4.8	5.0	4.9
Consumer Price Index (headline) (f)	3.2	2.8	2.7	3.0	3.2	3.0	2.7	2.9	2.9
Real Price Changes									
EBA Wages	1.5	1.8	1.7	1.5	1.5	1.7	2.0	1.7	1.7
Non-EBA Wages (c)	2.2	2.2	1.8	2.0	3.3	3.5	2.9	2.6	2.7

(a) Average Annual Growth Rate for 2008/09 to 2014/15 inclusive
(b) Average Annual Growth Rate for 2010/11 to 2014/15 inclusive
Source: BIS Shrapnel, ABS Data
(c) On a LPI (Labour Price Index) basis (Labour Price Index for New South Wales Electricity, Gas and Water estimated from Australia LPI)
(d) The difference between AWOTE and LPI (Labour Price Index for New South Wales Electricity, Gas and Water estimated)
(e) AWOTE is Average Weekly Ordinary Time Earnings for Full-time Adult Persons, excluding overtime for the Electricity, Gas and Water
(f) Weighted Average of 8 Capital Cities

- In the first half of 2008, economic conditions were favourable and inflation was rising above 4 per cent in annual terms and peaked at 5 per cent in September 2008. These conditions saw average outcomes of EBA's increase through 2008, with the year average of the 'formalised' agreements rising to 4.7 per cent by the December quarter. Given the average duration of enterprise agreements in the utilities sector is close to 3 years, these outcomes in 2008 will push up the overall EBA average over 2009/10 and 2010/11.
- Economic conditions have weakened considerably and inflation moderated substantially in the first half of 2009 (annual headline price inflation has fallen to 2.5 per cent in March 2009 from 3.7 per cent through the year to December 2008). The onset of weaker conditions has moderated union demands, with anecdotal evidence suggesting outcomes and negotiations are seeing agreements now being 'formalised' at between 4 and 4.5 per cent.
- Despite the downturn in the economy, EBA wages are expected to remain elevated and be a lot less cyclical in the utilities sector over the forecast period due to the relative strength in demand for skilled labour and because of the strength of unions in what is an essential service sector.
- Because reliability is essential in the utilities sector, utilities' workforces need to have a 'buffer' of 'extra' 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. 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 the electricity, gas and water sector.
- An expected upturn in New South Wales construction activity from 2011/12 will see a significant strengthening in the demand for skilled labour. In addition, New South Wales utilities will also be increasing their workforces for their own capital expenditure requirements. This will add pressure to EBA wages and push up EBA wages growth from 2011/12 right through to 2014/15.
- Skilled labour shortages and an ageing of the workforce remain significant drivers of non-EBA wages growth in the utilities sector. Although the current downturn will lead to an easing in overall skilled labour shortages for some professions relevant to the utilities sector, there is still expected to be shortages of engineers and engineering managers – key professionals in the utilities sector.
- Once economic conditions improve and demand for labour recovers, we expect higher wages growth in non-EBA's, 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 will eventually pick up strongly towards the end of the forecast period.

2. MACROECONOMIC OVERVIEW — AUSTRALIA AND NEW SOUTH WALES

The Australian economy faces a sharp downturn through this calendar year and next, before a period of stabilisation through 2011 leading to solid growth in 2012 and 2013.

The initial weakening in the economy in early 2008 was due to precautionary savings by households, leading to lower consumer spending. As the year progressed, the global financial crisis increasingly made its mark on the Australian economy. A repatriation of funds contributed to the collapse in the share market and the $A. The credit squeeze has come out of the need to finance the current account deficit, and the severe recession in much of the developed world has signalled the end of the minerals investment boom.

Worse is to come. Businesses profitability has already weakened dramatically and spending is being wound back, with investment to fall and unemployment to rise over the next two years as a result. How bad it will be depends on the extent of offsetting factors, in particular government investment and a recovery in dwelling construction. The low $A will help to cushion the downturn, later boosting the tradeables sectors in the economy.

The New South Wales economy has under-performed the national average over the last five years and has also been dragged down by the reverberations of the credit squeeze. We expect its impact to be severe but transitory, with the New South Wales economy forecast to strengthen early next decade. An easing of drought conditions, lower interest rates, a recovery in dwellings investment and a lower $A boosting the tradeable and services sectors are likely to see New South Wales catch up to the national average growth rate over the next four to five years.

New South Wales economic activity will weaken in the current setback to national growth. Indeed, State Final Demand already fell by 0.3 per cent in the December 2008 quarter. In addition, the global financial crisis and local credit squeeze have impacted heavily on the state's important finance, property and business services sectors. Over the short term, the economy will be hit by the demand shock gripping the national economy. Consumers have essentially stopped spending on discretionary items and have shifted towards cheaper goods in an endeavour to cut costs further.

Table 2.1: Australia and NSW – Key Economic Indicators
Constant 2006/07 Prices, Financial Years

						Forecasts						
Year Ended June	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Australia GDP	4.0	2.8	3.0	3.3	3.6	0.6	0.8	3.3	3.9	4.2	2.7	3.6
NSW GSP	2.0	1.6	2.0	1.8	2.8	0.1	0.7	3.5	4.2	4.2	2.6	3.2
CPI Australia (Headline)	2.4	2.4	3.2	2.9	3.4	3.2	2.8	2.7	3.0	3.2	3.0	2.7
CPI Australia (Underlying) (a)	2.3	2.1	2.3	2.6	3.4	3.7	2.9	2.6	2.6	3.2	3.1	2.7
Australia (All Industries) Wage Measures (b)	4.8	4.5	4.7	3.7	5.0	5.2	4.7	4.0	4.3	4.8	5.0	4.7

(a) Baseline CPI excludes GST effects, mortgage interest charges, fuel and fruit and vegetables Source: BIS Shrapnel, ABS Data
(b) Average weekly ordinary time earnings per person. Data is year ended May.

After growing strongly in 2007/08, New South Wales business investment is forecast to decelerate in 2008/09—sustained as current projects are completed—but will fall sharply in 2009/10. However, the easing drought conditions throughout New South Wales will provide a significant rebound for farm exports and farm incomes, which will boost some regional economies (particularly across the northern and western regions). The recovery in the export sector will be aided by gold and coal exports, the latter following the recent completion of the Port Waratah expansion. In addition, the tradeables sectors i.e. agriculture, manufacturing, tourism and education services will benefit from the current low $A, although weak overseas demand will offset these potential benefits in the short term.

Employment is expected to fall in 2008/09 due to relatively slower growth in business investment in the current financial year. This, together with weak consumer sentiment and an uncertain economic environment is likely to subdue growth in household consumption expenditure.

The New South Wales economy is expected to strengthen over the medium term. A range of positive factors—such as easing drought conditions, lower interest rates, a recovery in dwellings investment and a lower $A boosting the tradeables sector—are likely to push state economic growth close to the national average over the three years to 2011/12. Essentially the reversal of the current negatives that have weighed on economic activity in New South Wales is expected to underpin a strong period of economic growth for the state.

Dwellings construction is expected to be the key driver of domestic demand growth over 2009/10, 2010/11 and 2011/12. Dwelling construction in New South Wales has now fallen to a level where not enough is being built to satisfy underlying demand for dwellings. This has resulted in a significant deficiency of residential stock, which, in turn, is leading to strong increases in rents in the state. Although there are emerging signs that the cyclical property slump is bottoming out, we believe that the knock-on effects of the current financial crisis will prevent a strong recovery gaining traction in the current financial year. Tight bank credit criteria have acted to shelve high rise residential projects this financial year.

The easing of drought conditions will continue to provide a significant rebound for the agriculture and export sector generally over 2009/10. Meanwhile, business investment is expected to decline sharply over the same period. Partially offsetting this weakness will be increased government spending flowing from the federal government's fiscal packages. The New South Wales state government is also expected to bring forward capital works into 2009/10 and 2010/11.

The boom in housing construction and stable (or lower) interest rates through 2009/10 and 2010/11 is expected to encourage another round of business investment from 2011/12, led by factories, subdivisions and telecommunications construction and an upturn in plant and equipment. Office construction will be slower to pick up, held back by cautious financiers. The lower $A over these three years will also boost the tradeables sectors and encourage investment. The end result will be stronger employment growth over 2010/11 and 2011/12, leading to strong household consumption spending in these years. A solid pick-up in education investment (driven by the federal government's fiscal package), coupled with the investment in health due to an ageing population, will support non-residential activity over this period.

The state's Gross State Product is expected to slow substantially to record only 0.1 per cent growth in the current financial year. However, going forward, we expect the New South Wales economy to recover during 2009/10 and thereafter record strong growth rates through to 2012/13. Beyond 2012/13, an easing in inflationary pressures is expected to drive a decline in interest rates around 2014, which will precipitate a broad based recovery in investment and household consumption. A synchronised boom in investment—with dwelling, domestic businesses, mining related and possibly public investment all expanding at roughly the same time—is highly probable.

We believe that New South Wales economic growth over the next seven years will outperform other states and territories, with dwelling investment a key driver. New South Wales will also benefit from the sharp depreciation of the $A which will support the competitiveness of domestic tradeables industries i.e. agriculture, manufacturing and tradeables service sectors.

3. WAGES AND INFLATION OUTLOOK — AUSTRALIA

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.

3.1 A note on different wage measures

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 Earnings — average weekly total gross before tax earnings per employee. The measure includes both earnings from standard hours and from overtime, bonuses, etc. It is derived by dividing weekly total earnings by an estimate of the number of employees.
- 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.

Table 3.1: Wages and Prices – Australia
Year Average Growth

Year Ended June	Average Weekly Ordinary Time Earnings[1]		Labour Price Index	Official/ Headline Inflation CPI		BIS Shrapnel Baseline CPI (2)
	$/week	%CH	2003/04=100	89/90=100	%CH	%CH
1989	487.3	7.2		92.6	7.3	5.7
1990	521.0	6.9		100.0	8.0	4.8
1991	555.4	6.6		105.3	5.3	5.4
1992	580.8	4.6		107.3	1.9	4.6
1993	591.0	1.8		108.4	1.0	3.4
1994	609.1	3.1		110.4	1.8	3.1
1995	633.9	4.1		113.9	3.2	2.1
1996	662.5	4.5		118.7	4.2	3.3
1997	687.8	3.8		120.3	1.3	3.2
1998	715.6	4.0		120.3	0.0	3.2
1999	741.4	3.6	3.2	121.8	1.3	1.5
2000	765.6	3.3	2.9	124.7	2.4	1.9
2001	805.3	5.2	3.5	132.2	6.0	2.6
2002	849.1	5.4	3.4	136.0	2.9	3.5
2003	892.0	5.0	3.5	140.2	3.1	2.9
2004	934.6	4.8	3.6	143.5	2.4	2.3
2005	976.8	4.5	3.8	147.0	2.4	2.1
2006	1 022.6	4.7	4.1	151.7	3.2	2.3
2007	1 060.1	3.7	4.0	156.1	2.9	2.6
2008	1 112.6	5.0	4.2	161.4	3.4	3.4
Forecasts						
2009	1 170.5	5.2	4.1	166.6	3.2	3.7
2010	1 226.0	4.7	3.3	171.2	2.8	2.9
2011	1 275.5	4.0	3.1	175.9	2.7	2.6
2012	1 330.6	4.3	3.4	181.1	3.0	2.6
2013	1 394.2	4.8	3.9	186.9	3.2	3.2
2014	1 464.2	5.0	4.1	192.5	3.0	3.1
2015	1 532.7	4.7	4.0	197.6	2.7	2.7
Long Term Averages						
1990-2000	3.9			2.2		3.2
2000-2008	4.8		3.7	3.3		2.7
2003-2008	4.5		3.8	2.9		2.5
2008-2015	4.7		3.7	2.9		2.9
2010-2015	4.6		3.7	2.9		2.8

e : estimate Source: BIS Shrapnel, ABS Data

(1) Earnings per person. Data is year ended May.

(2) Baseline CPI excludes GST effects, mortgage interest charges, fuel and fruit and vegetables

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.

3.2 Wage setting methods by workforce segment and implications for forecasting

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 Table 3.2):

- Those dependent on awards rely on pay increases given in the annual National Wage case by the Fair Pay Commission (formerly by 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, 19.0% 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 41% of all employees, but 84.4% of electricity, gas and water employees' wage increases are determined by this method.
- The remaining 40% 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%.

Wage movements by segment are shown in Table 3.3. Note in Table 3.3, wage increases under 'individual arrangements' are calculated by deduction. Data from either ACIRRT (Australian Centre for Industrial Relations Research and Training) or 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.

Table 3.2: Methods of Setting Pay, Industry, May 2006
Proportion of Employees (%)

Industry	Award only	Collective agreement	Individual arrangement	All methods of setting pay
Mining	2.4	29.8	67.8	100.0
Manufacturing	10.6	37.7	51.7	100.0
Electricity, gas and water supply	0.9	84.4	14.7	100.0
Construction	12.0	27.7	60.3	100.0
Wholesale trade	12.8	9.5	77.7	100.0
Retail trade	28.7	34.8	36.5	100.0
Accommodation, cafes and restaurants	57.2	8.8	34.0	100.0
Transport and storage	12.4	40.4	47.1	100.0
Communication services	0.9	61.3	37.8	100.0
Finance and insurance	5.1	42.6	52.3	100.0
Property and business services	23.2	15.5	61.3	100.0
Government administration and defence	0.6	91.8	7.6	100.0
Education	11.9	81.5	6.7	100.0
Health and community services	25.4	58.4	16.2	100.0
Cultural and recreational services	19.2	40.7	40.1	100.0
Personal and other services	23.4	46.4	30.1	100.0
All industries	**19.0**	**41.2**	**39.9**	**100.0**

Source: Australian Bureau of Statistics, Employees Earnings and Hours, cat. N^{o} 6306, Table 15

Table 3.3: Wages Growth by Workforce Segmented by Pay Setting Method
All Industries

	Year Average Percent Change															
										Forecast						
Year Ended June	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Proportion of Workforce by Pay setting Method																
Awards Only	23.2%	21.9%	20.5%	20.3%	20.0%	19.5%	19.0%	19.0%	19.0%	19.0%	19.0%	19.0%	19.0%	19.0%	19.0%	19.0%
Collective Agreements	36.8%	37.5%	38.2%	39.6%	40.9%	41.0%	41.1%	41.1%	41.1%	41.1%	41.1%	41.1%	41.1%	41.1%	41.1%	41.1%
Individual Arrangements	40.0%	40.7%	41.3%	40.2%	39.1%	39.5%	39.9%	39.9%	39.9%	39.9%	39.9%	39.9%	39.9%	39.9%	39.9%	39.9%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
AWOTE																
Awards Only	1.6	1.9	1.6	2.1	1.9	2.0	1.7	0.9	1.6	1.7	1.3	1.5	1.7	2.0	2.0	1.9
Collective Agreements	3.5	3.7	3.8	3.8	3.9	4.0	4.1	4.0	3.9	4.1	3.9	3.7	3.8	4.0	4.1	4.0
Individual Arrangements (a)	4.0	8.3	8.8	7.7	7.2	6.3	6.7	4.7	7.7	8.0	7.2	5.6	6.1	7.0	7.4	6.7
AWOTE (Persons)(b)	**3.3**	**5.2**	**5.4**	**5.0**	**4.8**	**4.5**	**4.7**	**3.7**	**5.0**	**5.2**	**4.7**	**4.0**	**4.3**	**4.8**	**5.0**	**4.7**
Labour Price Index																
Awards Only	1.6	1.9	1.6	2.1	1.9	2.0	1.7	0.9	1.6	1.7	1.3	1.5	1.7	2.0	2.0	1.9
Collective Agreements	3.5	3.7	3.8	3.8	3.9	4.0	4.1	4.0	3.9	4.1	3.9	3.7	3.8	4.0	4.1	4.0
Individual Arrangements (a)	3.2	4.1	3.8	3.8	4.2	4.4	5.2	5.4	5.7	5.2	3.6	3.2	3.8	4.8	5.2	5.0
Labour Price Index (Ord. Time)	**2.9**	**3.5**	**3.3**	**3.5**	**3.6**	**3.8**	**4.1**	**4.0**	**4.2**	**4.1**	**3.3**	**3.1**	**3.4**	**3.9**	**4.1**	**4.0**
Compositional Effects + Bonuses,etc	0.3	1.7	2.1	1.6	1.2	0.8	0.6	-0.3	0.8	1.1	1.4	1.0	0.9	0.9	0.9	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

For example, the $17 per week increase granted in mid-2005 was equal to a 1.7 per cent increase in all industries AWOTE in 2005/06. Using the proportions of the workforce under each pay setting method (and with total AWOTE measured at 4.7 per cent) then the individual arrangements is calculated (as a residual) at 6.7 per cent in 2005/06. The same methodology was used to calculate individual arrangements using the labour price index.

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

This predominantly decentralised system of wage determination has evolved over the past 15 years (from a much more centralised system in the 1970s and 1980s), particularly since the Federal Industrial Relations and Workplace Relations Act in 1996. Over time, the operation of the new Act also produced a lengthening in the average duration of wage contracts — enterprise agreements now run for an average of over two years, although many include 'escalation' clauses that provide higher wages if inflation runs higher than expected. The longer duration of wage contracts means wage pressures are now slower to respond to changing economic conditions. Businesses also have more flexibility when it comes to meeting changes in demand, and are more readily able to change the number of hours worked rather than employment levels or wages in response to a slowdown in activity.

However, the shift to a decentralised system of wage determination has not altered the fundamental supply and demand drivers of wages. The new system has reduced the threat of a 'union-driven' rise in wages growth but it does not preclude a 'market-driven' rise, i.e. one driven by strong demand and supply shortages. Indeed, a more market-oriented system may make wages more prone to strong rises, especially when skilled labour is in short supply.

A market-driven acceleration in wages would be driven primarily by the section of the workforce who are on individual contracts or other salary arrangements, particularly as this segment has higher proportions of more highly skilled workers. Conversely, wages growth in this segment will be quicker to react to a dramatic weakening in the labour market because of the more flexible, less institutionalised, wage setting faced by businesses.

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 $21.66 increase granted by the Commission in its decision in mid-2008 (effective October 2008) amounted to a 4.15% increase for those on the Federal Minimum Wage (equal to around 1.9% of AWOTE of $1,126/week). This reflected the marked acceleration in the CPI in the first half of 2008 (to 4.2% in the March quarter and to 4.5% in the June quarter). It also reflected the strong economic conditions apparent around mid-2008 (the unemployment rate was just over 4%). However, given the dramatic weakening in the economic outlook since September 2008 and the decline in CPI inflation (with further falls forecast), we expect the next decision this year will only grant $13.50 — equal to a 2.5% rise for those on the Minimum Wage.

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

We believe that BIS Shrapnel's model of wage determination is superior to methodology utilising purely econometric regression techniques to forecast wages, particularly at the industry sector level. Our opinion is based on a number of factors:

- the evolution of the wage determination system from the 1980s and particularly during the 1990s 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.

- we believe that an econometric equation would struggle to properly model the present complexity of the wage determination processes.

- 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 has had a less-than-happy experienced with large, multi-equation macroeconomic models. Because many regression equations include lagged dependent variables, econometric-based models tend to miss turning points in the cycle, and often produced results we knew 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.

Productivity assumptions are a key exogenous (independent) variable used in most econometric wage models. However, there are problems with accurately measuring and forecasting productivity, this particularly applies to the sectors where it is difficult to measure output — as most measures of productivity measure output divided by employment (or hours worked). The Property and Business Services sector and 'non-market' sectors such as Government Administration and Defence and Education are sectors where the statistician has difficulty determining output. We would also argue that 'productivity' is also 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 a 'buffer' of 'extra' 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.

3.3 Wage forecasts – Australia

3.3.1 Wage pressures to ease through 2009 and 2010 as employment stalls, and then falls

Wages growth picked up through 2007/08, but remained surprisingly contained given the tight labour market conditions and the shortage of skilled workers. Wage inflation, as measured by the 'All Industries' (Australian) LPI (labour price index), rose 4.2% through the year, up from 4.0% in 2006/07. Growth measured by All Industries AWOTE (average weekly ordinary time earnings) jumped to 5.0%, up from 3.7% in 2006/07, as shown in Table 3.1.

We believe wages growth in LPI terms peaked in the December quarter, 2008 at 4.3%, while the AWOTE increase was 5.5% (December quarter 2008 compared to December quarter 2007). The December quarter result (which is the latest actual available) was boosted by the latest Fair Pay Commission ruling which took effect in October 2008. The $22 weekly increase in the minimum wage represented a 4.15% pay increase for workers on the federal minimum wage. This was double the previous year's result. However, most workers on awards do not receive the minimum wage and the actual wage rise for affected workers was considerably less than 4.15%.

The strong AWOTE growth in 2007/08 and through calendar 2008 came off a weak base. The combination of the delay in the 2006 National Wage case decision and significant compositional effects — with an increase in the proportion of lower paid workers in total employment — dragged down AWOTE growth through 2006/07.

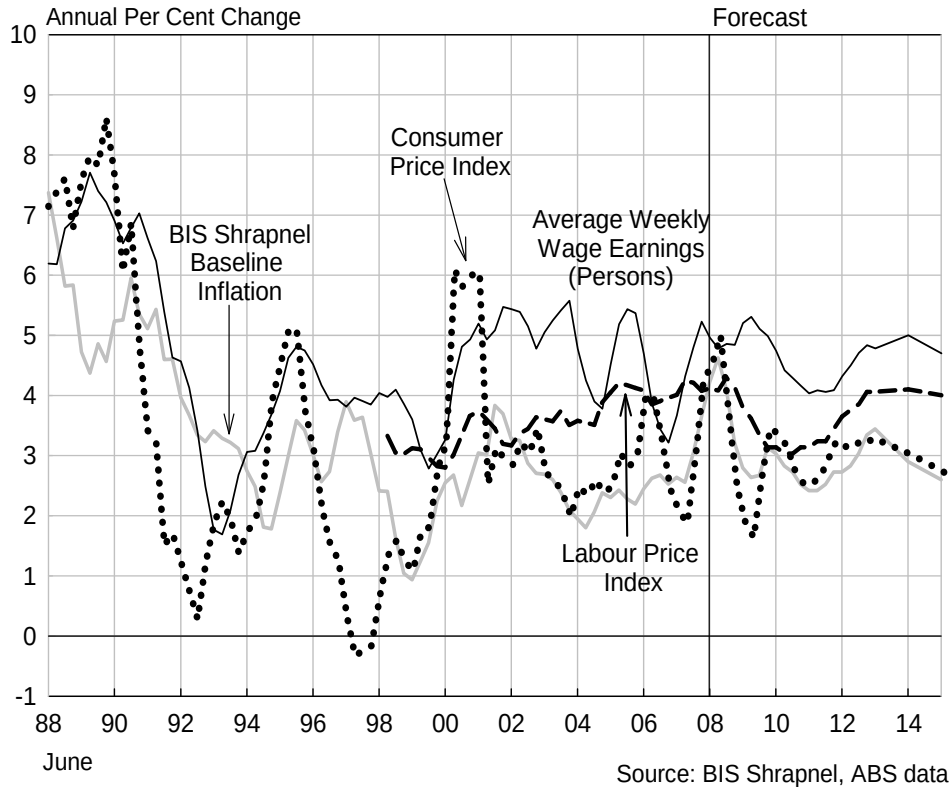
As a result of the slowdown in domestic demand through 2008/09, profits have come under significant pressure and employment growth slowed sharply. However, the easing in labour markets will be slow to affect wages because of the staggered nature of wage setting decisions. Tight labour conditions and the high CPI through most of 2008 (the headline rate peaked at 5.0% in the September quarter, 2008) also pushed up wage demands and agreements through 2008 and most of these agreements will run from one to three years.

Although headline CPI inflation is expected to fall back toward 2 per cent by the June quarter, 2009 — largely due to the sharp fall in oil and local petrol prices over the past 6 months — the headline rate is expected to move back over 3 per cent by early 2010, as the effect of the large one-off fall in petrol prices drops out. Both headline and underlying CPI inflation are then forecast to ease through 2011 back toward 2.5%. The depreciation in the A$ will offset some of the benefits of global disinflationary forces. Domestic capacity constraints in the rental housing and energy sectors are set to persist and the impact of the credit squeeze on banking costs, which soared through 2007/08, is expected to unwind only gradually. The outlook for CPI inflation is covered in Section 3.4.

Meanwhile, employment is forecast to decline over calendar 2009 and into 2010, with only very weak (or negligible) growth expected over calendar 2010. The unemployment rate is forecast to climb above 7% by late 2009), and peak at over 7.5% by mid to late 2010. Because contracts are fixed for a set period, a year in the case of awards and some individual arrangements and multiple years for collective agreements, it will take time for the decline in employment growth and weakening inflationary environment to be reflected in wages growth.

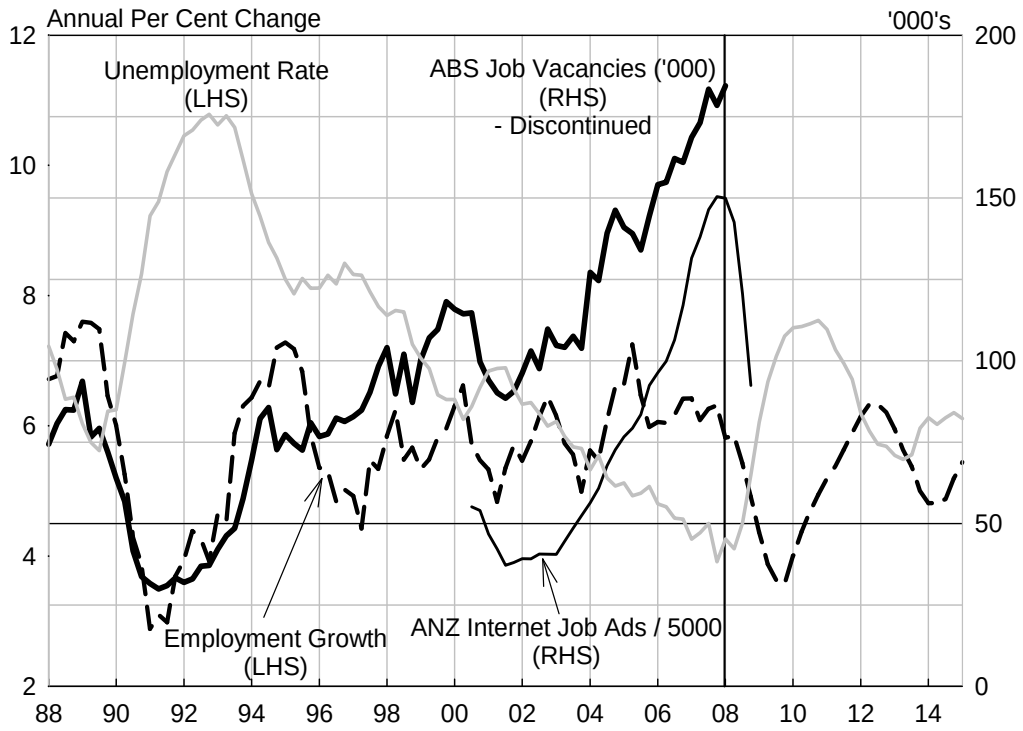
Nevertheless, wages growth is forecast to ease from a forecast 4.1% for the LPI in 2008/09 to 3.3% in 2009/10 and 3.1% in 2010/11, led by the sharp slowing in wages growth in the individual arrangements segment. We also expect the Fair Pay Commission to give a relatively low increase in the National Wage Case for award-dependent workers, effective in October 2009. AWOTE wages growth is expected to be slower to ease initially, slowing from a forecast 5.2% in 2008/09 to 4.7% in 2009/10, with compositional effects holding up average wages. We expect the largest proportion of job losses to occur among the lower skilled (and lower paid) sections of the workforce, which will 'artificially' boost the level of average wages.

Chart 3.1: Australia – Wages and Prices



Source: BIS Shrapnel, ABS data

Chart 3.2: Employment and Unemployment



Source: BIS Shrapnel, ABS data

3.3.2 Medium to longer term outlook – wages growth contained but pressures persist

Low interest rates, a housing construction recovery, and government stimulus packages, followed by stronger household consumer spending and a turnaround in business investment will drive a recovery in employment growth, which will gather pace over 2010/11 and particularly 2011/12. This is projected to push the unemployment rate down back under 6 per cent again by the second half of 2012, and toward 5 per cent by mid 2013. With the labour market again showing signs of tightness and skilled labour shortages re-emerging, we expect wage pressures to be re-ignited, with both AWOTE and the LPI rising to around 5 per cent and 4 per cent respectively during 2012/13 (see Table 3.1). Wages growth is expected to remain at these relatively high levels over 2013/14 and 2014/15, despite the RBA and government acting to constrain economic growth and inflationary pressures. Indeed, by the middle of next 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 2023 (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.

3.4 Outlook for price inflation

Domestic capacity constraints and global supply shocks stoke inflation through 2007/08

Headline CPI hit 5 per cent in the September quarter 2008. The average of the Reserve Bank's measures of core (or underlying) inflation ran at 4.7 per cent through the September quarter 2008 and averaged 3.8 per cent over 2007/08, well clear of the RBA's target of 2 to 3 per cent.

A renewed spike in food and oil prices underpinned the run up in headline inflation, although their potential impact was dampened by a significant appreciation in the A$ through the year — the currency averaged US$0.90 in 2007/08, up from US$0.79 in 2006/07.

The global credit squeeze was the single largest contributor to the run up in core CPI inflation through 2007/08, as the banking and insurance sector pushed up fees and charges to cover higher funding costs — the global credit squeeze also saw the banking sector increase interest rates over and above moves made by the RBA through the year, however interest payments are not included in the CPI.

Also contributing to the rise in baseline and core inflation in 2007/08 were "second round" effects emanating from the substantial rise in oil prices between 2004/05 and 2007/08 — which have added indirectly to food, freight, chemicals, plastics and packaging costs.

Domestic capacity constraints in housing, water and energy have had a less conspicuous impact on inflation than the petrol and food shocks, but housing-related components constitute around 20 per cent of the total CPI and pressures have intensified as the rental housing market has progressively tightened.

Excluding the financial & insurance services and the housing-related components of the CPI (rents, utilities, construction costs), non-tradeables inflation still stepped up through the year. Sharply higher costs for petrol and finance contributed to a rise in business costs and, given the strong demand environment prevailing in 2007, these costs are likely to have been passed on. However, wages are the largest component of business expenses and the rise in non-tradeables inflation also suggests that mounting wage bills were feeding into prices.

Marked slowdown in domestic and world demand to see pressures ease over 2009

The moderation in demand through 2008 and subdued outlook for 2009 will see these demand inflationary pressures recede. Employment demand is expected to stall over 2009, the 2008 spike in oil prices has already unwound, the freeze in short term money markets appears to be thawing and commodity prices have fallen significantly from their peaks. Headline CPI inflation has already fallen back to 2.5 per cent through the year to March 2009.

However, much of the current inflationary problem is intransigent in nature and consequently underlying inflation is expected to persist above the RBA's preferred target range of 2 to 3 per cent through 2009. Moreover, while the sharp drop in commodity prices will ease imported prices pressures, the economy has lost its main ally in dampening tradeables inflation, namely an appreciating A$, which will negate much of the benefit of global disinflationary forces, not withstanding some scope for retailer discounting given a previously strong run of profit growth and a weakening demand environment.

The headline CPI annual (through-the-year) rate has declined from a peak of 5.0 per cent in the September quarter 2008 to 2.5 per cent in March quarter 2009. Meanwhile, the RBA's measure of underlying inflation has declined at a much slower rate — from a peak of 4.7 per cent in the September quarter 2008 to 4.2 per cent in March quarter 2009. The sharp drop in the annual headline rate is largely due to dramatic declines over the December 2008 and March 2009 quarters in fuel prices, financial services (i.e. deposit and loan facilities) and airfares (which pushed down the 'holiday travel and accommodation' category). Interestingly, these three elements were key factors which pushed the headline rate above the underlying rate last year.

The bottom line is that these relatively significant categories of CPI inflation are unlikely to be ongoing. Indeed, they are likely to reverse over coming quarters. International oil prices have already increased — from around US$40 per barrel in February 2009 to close to US$50 per barrel (on average) in March and April 2009. Oil prices are expected to hold between US$45 per barrel to US$55 per barrel over the next year. The rise in oil prices is also likely to prevent another bout of heavy airfare discounting. The bottom line is that once these large one-off declines 'drop-out' of the measures, the annual rate of headline CPI inflation will rise back over 3 per cent in the March quarter 2010 — back to around the underlying rate at that time.

Weaker A$ to offset much of the benefit of global disinflationary forces

The Australian dollar lost over 32 per cent of its value between the July 2008 peak (where the A$ averaged US$0.96) and February 2009 (A$ averaged US$0.65). The currency is expected to remain weak through 2009 on account of faltering world demand for commodities and the expectation that the RBA will cut official interest rates further during 2009. Although countries overseas have also significantly cut rates already, they now have little scope to cut rates further, so further RBA cuts will result in a narrowing interest rate differential vis-à-vis overseas and this will reduce demand for the A$.

Base metal, spot iron ore and coal prices have fallen sharply from their peaks as a result of an unwinding in speculative demand and a significant slowdown in world industrial production. A falling terms of trade will tend to put further downward pressure on the A$. Furthermore, the

recent improvement (in March and April 2009) in some commodity prices and the Australian dollar (when it pushed back over US$0.70) are unlikely to be sustained. We believe the overall fundamentals of these commodities and the Australian dollar are weaker than suggested recently, and the dollar will fall. Although markets are likely to experience considerable volatility, we expect the A$ to average US$0.67 through 2009.

However, while the fall in the A$ has removed the currency's ability to offset or dampen imported price pressures, the sharp fall in commodity prices, particularly for oil, and the significant slowdown in world industrial production will have disinflationary benefits which, on balance, we expect will partly counterbalance the impact of a weaker currency on tradeables inflation.

Food prices are likely to be the main limiting factor to a significant easing in tradeables inflation. Food prices are affected by climatic conditions which affect supply (droughts etc) and to a lesser degree petrol prices. Prices are also partly responsive to world prices for grains, meat and diary products, in particular, and also other traded foodstuff. Therefore prices are also affected by movements in exchange rates.

Adverse weather patterns, rising world incomes (and demand for a western diet), increasing urbanisation and demand for biofuels all contributed to the emergence of a significant demand-supply imbalance which led to a surge in food prices through 2007/08. Speculative demand also played a role in the price hikes and the global deleveraging process has seen rural commodity prices fall sharply from their highs, particularly wheat prices, through the second half of 2008. A return to more average growing patterns will further ease price pressures but a major supply response, particularly for dairy and meat, will take time to come through which will limit the extent of the downward bias to food inflation.

Moderation in labour and consumer demand will take pressure off wages growth and non-tradeables inflation

Non-tradeables CPI inflation (which accounts for approximately 58 per cent of the total CPI) is driven by domestic cost pressures, and tends to track unit labour costs over the medium term — which is basically wages growth less productivity growth. Other influences on non-tradeables inflation include market fundamentals in individual markets and government policies and subsidies.

After stabilising at around 4 per cent over the three years to 2006/07, underlying wage inflation — as measured by the Labour Price Index (LPI) — nudged up through 2007/08. Non-farm productivity growth was negligible over 2004/05 and 2005/06, but recovered through 2006/07 and 2007/08.

Consumer spending has been knocked both by the impact of rising interest rates on disposable incomes and a reduction in spending power as a result of the sharp rises in food and petrol prices. But, given the strength of incomes, there also appears to have been a significant element of precautionary saving by householders driven by concerns over job security.

But low productivity growth and 'sticky' wages will keep unit cost pressures elevated

The unemployment rate is expected to be around 7 per cent by the end of 2009 and to peak between 7 and 8 per cent. Wage pressures will be slow to adjust down, because collective bargaining agreements run for multiple years, the increase in the minimum wage which came into force in October 2008 and that the fact that there will be considerable resistance to a return to weak outcomes for collectivised wage bargaining, given previous erosion of real wages for these workers and only a gradual moderation in the CPI inflation. Nevertheless, as detailed in Section 3.3, wages growth will ease back over 2009/10 and 2010/11.

Although much of the investment over recent years has been for both capacity enhancing and labour-saving investment, the full benefits of this potentially productivity boosting investment will not come fully to fruition for another 2 to 3 years, mainly because the economy will run at less than full capacity. Although there will be job losses, businesses (and the public sector) will tend to hoard labour — much of which was difficult and expensive to procure over recent years. This means there will be little growth in productivity and therefore unit labour costs will see little improvement until GDP picks up in 2010/11.

Persistent high rental increases will also prevent a sharp easing in non-tradeables inflation over the next two-to-three years. Although dwelling construction will pick-up over 2009/10, 2010/11 and 2011/12, very low residential vacancy rates and a chronic undersupply (i.e. serious deficiency) of dwelling stock means further high rental increases.

The end result is that we expect baseline inflation (excluding fuel and fruit and vegetables) to moderate gradually back towards the RBA upper target bound of 3.0 per cent during 2009/10, with domestic supply constraints in housing and energy and a weaker A$ offsetting weakening demand inflationary pressures and the benefits from sharply lower commodity prices and global disinflationary forces.

Stronger growth to re-emerge from 2010/11, led by housing and exports

With the decline in the Australian dollar projected to bottom out during 2009/10, wages pressures easing and consumer demand subdued, both baseline and headline CPI inflation are expected to ease over 2009/10 and 2010/11. We expect an upswing in dwelling activity through 2009/10, triggered by lower interest rates and considerable pent up demand for housing, which will help stimulate broader economic activity. The low A$ will also encourage strong export volumes as world growth starts to recover.

But the economy is expected to emerge from the current downturn with considerable excess capacity given the extent of the slowdown in demand and the sustained strong period of investment growth prior to the setback. An upturn in non-dwelling construction is not anticipated before 2012/13, but the strength in dwelling construction and exports is expected to stimulate renewed employment and machinery and investment from 2010/11.

As demand starts to recover there would be a period of absorption of underutilised labour before employment growth recovers. Employment growth is expected to recover through 2010/11 and regain momentum from 2011/12.

Rising A$ to help dampen tradeables inflation over 2010/11 and 2011/12

A return to stronger employment growth and consumer demand will see core CPI move higher through 2012, with rising wages pressures also adding to non-tradeable inflation. Meanwhile, the expected rise in oil prices will push up local petrol prices, particularly over 2011/12, and this will push up the headline CPI rate during 2011/12.

A rising A$ over 2010/11, 2011/12 and into 2012/13 — due to both rising commodity prices (as world growth regains momentum and excess supply is absorbed) and higher local interest rates — will help dampen tradeables inflation and offset the pick up in non-tradeables prices. An easing in domestic capacity constraints, in the rental housing and energy sectors, will also help keep a lid on inflationary pressures.

But higher inflation over 2012/13 to 2014/15

Inflationary pressures are projected to increase over 2012/13 due to a combination of strong consumer demand, falling unemployment, higher wages growth, higher overseas inflation and a stabilisation of the exchange rate (thus not providing a dampening effect). The headline and baseline inflation rate are both forecast to average 3.2 per cent.

The increase in inflationary pressures is expected to result in the RBA raising rates in order to slow demand and foster an easing in inflationary pressures, which we assume will be successful. CPI inflation is projected to ease over 2013/14 and fall back to 2.7 per cent in 2014/15.

Over the seven year period from 2008/09 to 2014/15, the increase in the headline consumer price index is forecast to average 2.9 per cent per annum. Baseline CPI inflation (i.e. excluding automotive fuel and fruit and vegetable prices) is also forecast to average 2.9 per cent per annum over the same period. Over the regulatory period from 2010/11 to 2014/15, the official (headline) CPI inflation rate is forecast to average 2.9 per cent per annum.

Unprecedented times means plenty of risks to growth and inflation outlook

This forecast is based on BIS Shrapnel's 'most likely' scenario of economic conditions over the 2008/09 to 2014/15 period. A higher growth scenario would have only a marginally higher average of CPI inflation. This is because CPI inflation over 3.0 per cent — which showed signs of being sustained — would draw a substantial monetary policy response from the Reserve Bank of Australia i.e. interest rates would be raised significantly. The RBA's charter is to keep CPI inflation within a 2 to 3 per cent band, on average, over the cycle. As such, the RBA would raise interest rates and keep them high until domestic demand and employment growth weakened enough to drive annual CPI inflation down to 2 to 3 per cent. A lower growth scenario (compared to the 'most likely') would see CPI inflation average around 2.5 per cent per annum over the period, or possibly lower.

However, tight labour markets are set to become a chronic problem for inflation by the middle of next decade. While-ever the unemployment rate is below 5 or 6 per cent there will be the potential for a demand-driven rise in wages growth and inflation. The Australian economy has entered a new mode of operation. The large pool of unemployed that was a feature of the 1990s has gone. Skilled labour shortages are set to re-emerge as a problem over the medium-to-long term, once the current downturn passes.

Chart 4.1: Employment Growth and Job Vacancies
Electricity, Gas and Water and Selected Industries

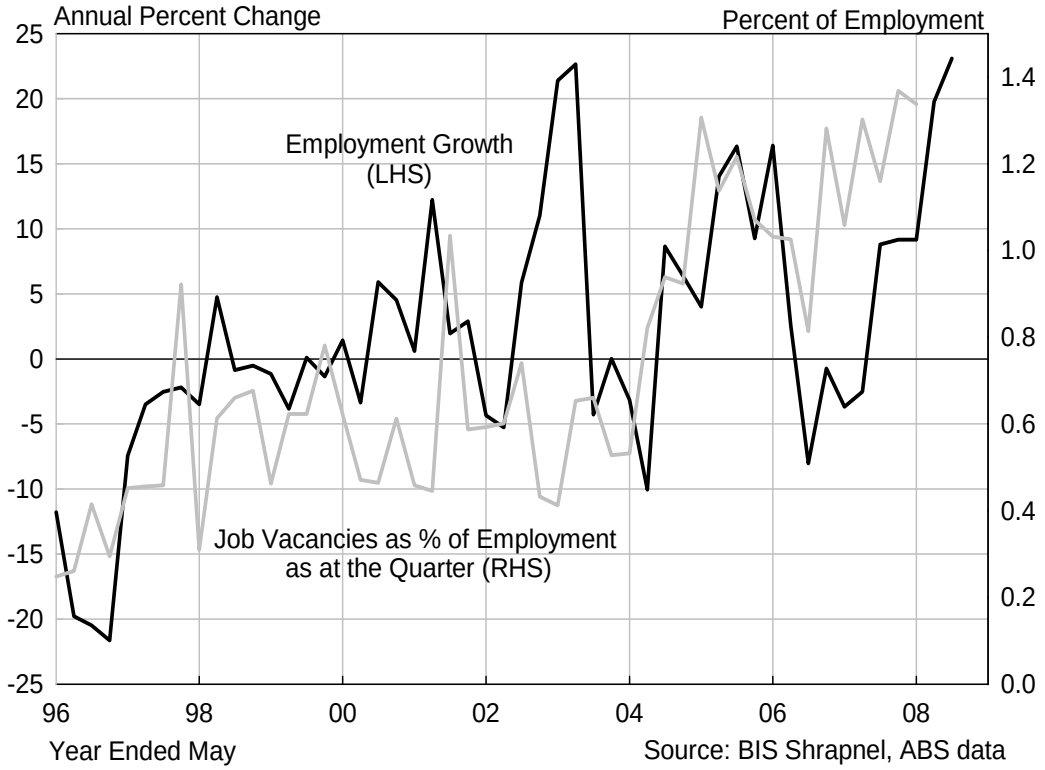
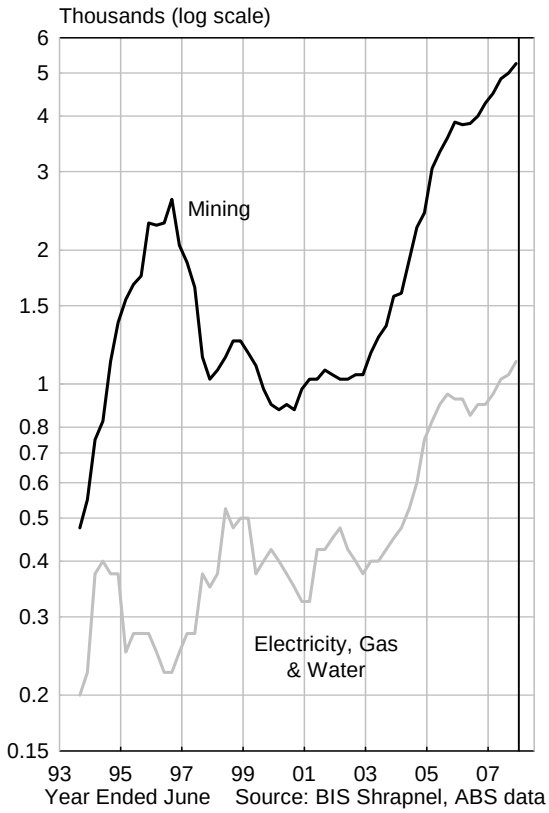
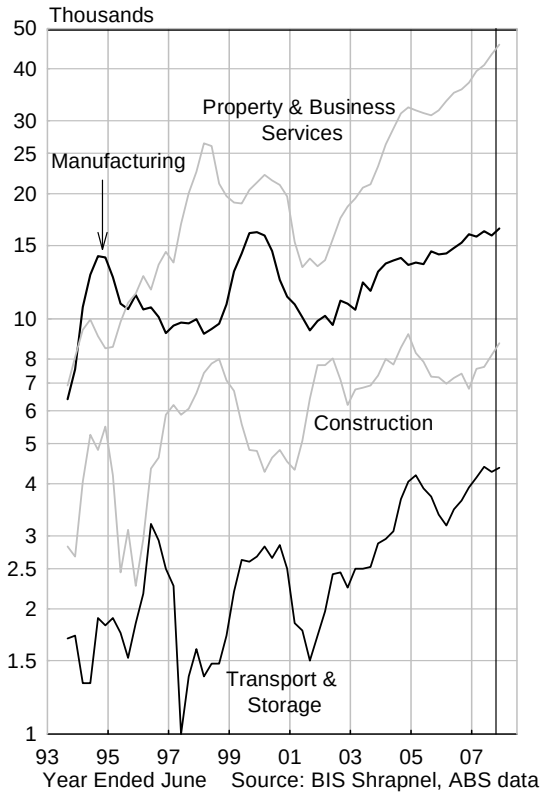


Chart 4.2: Job Vacancies – Selected Industries
Moving Annual Averages





4. WAGE OUTLOOK FOR THE ELECTRICITY, GAS & WATER SECTOR

4.1 Stronger demand for skilled labour will keep wage rises higher in the utilities sector than the All Industries average

Skills shortages were evident in the electricity, gas and water sector over 2004/05 to 2007/08 as demonstrated by the sharp increase (to historically high levels) in job vacancies during this period (see Charts 4.1 and 4.2). Chart 4.1 shows a good correlation between job vacancies (as a percent of employment in the sector) and employment growth in the utilities sector over the 12 years to 2008, although the decline in employment in 2006/07 could have been an indication of increased difficulty in finding the 'right' people for vacant jobs.

Despite the easing in overall labour demand since mid-2008, shortages of skilled labour, in particular, are still being reported for a number of professions throughout Australia. The latest 'Skills in Demand' lists released in March 2009 by the Department of 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 New South Wales, relevant shortages are being reported for:

- electrical engineers and electrical engineering associates
- civil and mechanical engineers, and civil engineering associates
- engineering managers
- electrical powerline tradespersons
- electricians
- metal machinists
- fitters and welders

Other surveys also confirm that skills shortages still persist 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 2008 report that the overall level of skills shortage is high and that "the labour market easing is far from uniform, with extreme shortages persisting in a few professions" (page 2, Clarius Skills Index, December quarter 2008). It reported that the Clarius Skills Index for Building and Engineering professions rose slightly in December quarter (compared to the September quarter 2008), while three occupations relevant to the utilities sector among the top ten occupations with the highest level of skills shortages, these being:

- building and engineering professionals
- construction tradespersons
- building and engineering associate professionals.

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 in 2007/08, but accelerated over the second half of calendar 2008, with the average LPI growth for 2008/09 estimated to be 4.8 per cent.

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

Selected Industry	Collective Agreements Average Annualised Wage Increase[1] 2001	2002	2003	2004	2005	2006	2007	2008	Average 2001-2008
Electricity, gas and water supply	3.8	3.9	4.2	4.3	4.2	4.3	4.5	4.6	4.2
Mining	3.4	3.4	3.2	3.3	3.6	3.8	4.0	4.1	3.6
Manufacturing	3.9	4.1	4.1	4.1	4.1	4.1	4.1	4.0	4.1
Construction	4.7	4.7	4.1	4.3	4.4	4.9	4.8	4.4	4.5
Retail trade	3.2	3.2	3.2	3.2	3.4	3.5	3.4	3.4	3.3
Accommodation, cafes and restaurants	3.5	2.8	2.8	2.8	3.2	3.3	3.4	3.3	3.1
Property and business services	3.9	3.6	3.8	4.1	4.1	3.8	3.8	3.7	3.9
Government administration and defence	3.6	3.9	4.5	4.4	4.3	4.0	4.0	4.0	4.1
ALL INDUSTRIES	3.7	3.8	3.8	3.9	4.0	4.1	4.0	3.9	3.9

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

Table 4.2: Electricity, Gas & Water Supply – Australia

	Year Average Percent Change															
										Forecast						
Year Ended June	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Proportion of Workforce by Pay setting Method																
Awards Only	1.4%	1.3%	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%
Collective Agreements	76.5%	77.3%	78.1%	79.0%	79.9%	82.2%	84.4%	84.4%	84.4%	84.4%	84.4%	84.4%	84.4%	84.4%	84.4%	84.4%
Individual Arrangements	22.1%	21.5%	20.9%	19.7%	18.4%	16.6%	14.7%	14.7%	14.7%	14.7%	14.7%	14.7%	14.7%	14.7%	14.7%	14.7%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
AWOTE																
Awards Only	1.4	1.6	1.3	1.7	1.5	1.6	1.4	0.7	1.3	1.4	1.0	1.2	1.4	1.7	1.6	1.5
Collective Agreements	3.1	3.8	3.9	4.2	4.3	4.2	4.5	4.5	4.6	4.7	4.6	4.4	4.5	4.7	4.7	4.6
Individual Arrangements (a) (c)	18.0	16.0	21.0	-2.6	16.5	-0.5	-14.7	1.6	-3.8	14.8	7.0	5.5	6.0	7.5	8.0	6.5
AWOTE (Persons)(b)	**6.4**	**6.4**	**7.4**	**2.8**	**6.5**	**3.4**	**1.6**	**4.0**	**3.3**	**6.2**	**4.9**	**4.5**	**4.7**	**5.1**	**5.2**	**4.9**
Labour Price Index																
Awards Only	1.4	1.6	1.3	1.7	1.5	1.6	1.4	0.7	1.3	1.4	1.0	1.2	1.4	1.7	1.6	1.5
Collective Agreements	3.1	3.8	3.9	4.2	4.3	4.2	4.5	4.5	4.6	4.7	4.6	4.4	4.5	4.7	4.7	4.6
Individual Arrangements (a) (c)	6.2	4.2	5.6	5.0	4.5	5.5	11.2	7.8	1.2	5.4	5.0	4.5	5.0	6.5	6.5	5.5
Labour Price Index (Ord. Time)	**3.8**	**3.9**	**4.2**	**4.3**	**4.3**	**4.4**	**5.5**	**5.0**	**4.1**	**4.8**	**4.6**	**4.4**	**4.5**	**4.9**	**4.9**	**4.7**
Compositional Effects + Bonuses,etc	2.6	2.5	3.2	-1.5	2.2	-1.0	-3.8	-0.9	-0.7	1.4	0.3	0.1	0.1	0.1	0.2	0.1

(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

(c) 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

On the other hand, the growth in average weekly earnings in the electricity, gas and water sector has actually slowed in comparison, particularly over 2005/06, due to composition effects of strong employment growth in the sector. Total employment in the electricity, gas and water sector increased 14.0 per cent in 2005/06, followed by a 2.6 per cent decline in 2006/07 and a 5.6 per cent increase in 2007/08 (see Table 4.7). Given the low AWOTE (average weekly ordinary time earnings) growth of 1.6 per cent in 2005/06, 4.0 per cent in 2006/07 and 3.3 per cent in 2007/08, it is likely the biggest growth in employment has been in the lower paid segments in the industry sector, which has pushed down the average wage for the whole sector over 2005/06 to 2007/08. Nevertheless, given the high underlying rate indicated by the LPI, we expect higher AWOTE figures over the next two-to-three years.

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 (see Chart 4.2) over recent years has 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.

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) and has averaged 0.7 per cent higher over the decade to 2008 (see Table 4.3). While growth in average weekly ordinary time earnings of the electricity, gas and water sector has displayed considerably more volatility (mainly related to compositional effects) over the past two decades, AWOTE growth in the sector has usually been higher than the national average, except for the past five years (see Tables 4.3 and 4.4).

We expect wages growth in the electricity, gas and water sector to push above the national average within the next two years, 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 3 to 4 years at least. Electricity utilities across Australia are embarking on major network refurbishment, extension and augmentation programs. Added to this is our expectation that a number of peak, intermediate and base load power stations will be built over the next decade, while local reticulation construction will continue to be driven by new housing and industrial and commercial demand.

Table 4.3: 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
1989	487.3	7.2	513.4	6.4				
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	633.9	4.1	679.3	3.2				
1996	662.5	4.5	725.0	6.7				
1997	687.8	3.8	773.6	6.7				
1998	715.6	4.0	831.8	7.5	82.2		79.2	
1999	741.4	3.6	867.1	4.2	84.8	3.2	81.7	3.2
2000	765.6	3.3	922.8	6.4	87.3	2.9	84.8	3.8
2001	805.3	5.2	982.3	6.4	90.3	3.5	88.2	3.9
2002	849.1	5.4	1,055.3	7.4	93.3	3.4	91.9	4.2
2003	892.0	5.0	1,085.1	2.8	96.5	3.5	95.8	4.3
2004	934.6	4.8	1,155.7	6.5	100.0	3.6	100.0	4.3
2005	976.8	4.5	1,194.5	3.4	103.8	3.8	104.3	4.4
2006	1 022.6	4.7	1,214.1	1.6	108.0	4.1	110.0	5.5
2007	1 060.1	3.7	1,262.4	4.0	112.3	4.0	115.5	5.0
2008	1 112.6	5.0	1,304.2	3.3	117.0	4.2	120.2	4.1
Forecasts								
2009	1 170.5	5.2	1,384.5	6.2	121.7	4.1	125.9	4.8
2010	1 226.0	4.7	1,453.8	5.0	125.7	3.3	131.7	4.6
2011	1 275.5	4.0	1,519.7	4.5	129.6	3.1	137.5	4.4
2012	1 330.6	4.3	1,591.0	4.7	134.0	3.4	143.8	4.5
2013	1 394.2	4.8	1,671.9	5.1	139.3	3.9	150.9	4.9
2014	1 464.2	5.0	1,758.1	5.2	145.1	4.1	158.3	4.9
2015	1 532.7	4.7	1,843.4	4.9	150.9	4.0	165.8	4.7
Long Term Averages								
1990-2000	3.9		5.1					
2000-2008	4.8		4.4		3.7		4.5	
2003-2008	4.5		3.7		3.9		4.6	
2008-2015	4.7		5.1		3.7		4.7	
2010-2015	4.6		4.9		3.7		4.7	

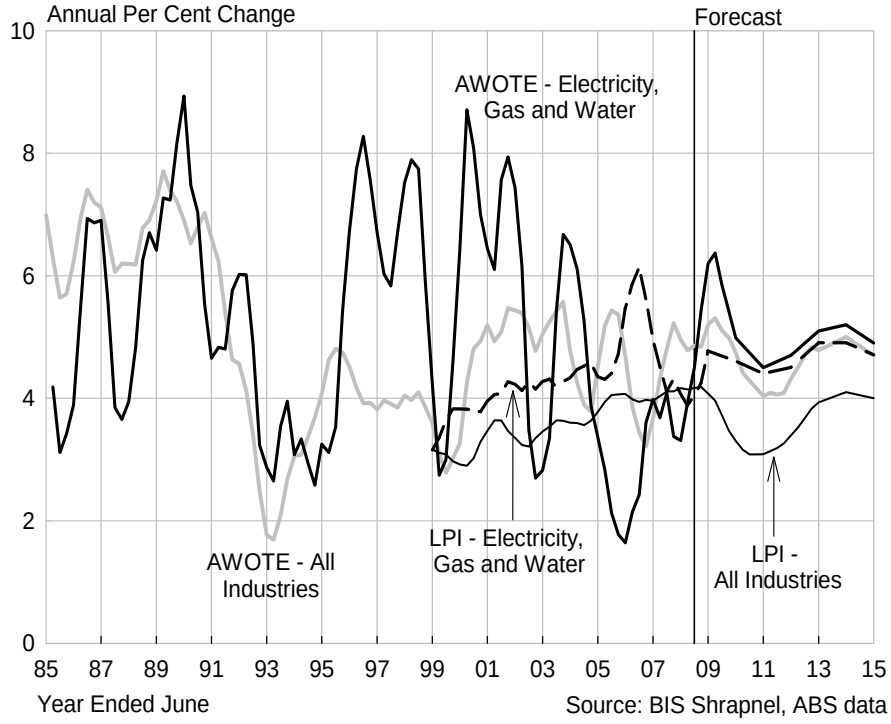
e : estimate

Source: BIS Shrapnel, ABS

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

(2) Ordinary time hours excluding bonuses.

Chart 4.3: AWOTE & LPI
Total Australia (All Industries) and Electricity, Gas and Water
Moving Annual Averages



Over recent years, the electricity, gas and water sector also had to compete against mining, construction and, to a lesser degree, manufacturing, all of which experienced strong demand for skilled labour with similar desired skills (i.e. engineers, engineering trades, gas-fitters, electricians, etc). Vacancies rose to historically high levels in all these sectors (see Chart 4.2). However, the looming downturn in mining investment and overall construction, plus further weaknesses in the manufacturing sector is expected to see demand for labour in these three sectors ease over 2008/09 and 2009/10, before construction and manufacturing employment stabilise in 2010/11. BIS Shrapnel forecasts employment growth to strengthen in these two sectors over 2011/12 to 2014/15, particularly as first housing construction and then non-dwelling building and engineering construction recovers, with the lower A$ also aiding growth in the manufacturing sector. Mining sector employment is forecast to increase and strengthen from 2012 as the recovery in the world economy (from 2010) eventually produces a recovery in commodity prices, which leads to the next upswing in mining investment. The continued urbanisation and industrialisation process in China and (later) India, will also help drive renewed resources investment by early-to-mid next decade.

Meanwhile, 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 (see Table 4.7). 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. This suggest that wages growth in the mining, construction and manufacturing sectors will ease faster than wages growth in the electricity, gas and water sector.

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 electricity, gas and water.

Table 4.4: AWOTE Persons by State - Electricity, Gas and Water Supply (Year Average Growth)

Year Ended May	NSW Year Avg $	NSW A%Ch	VIC Year Avg $	VIC A%Ch	QLD Year Avg $	QLD A%Ch	SA Year Avg $	SA A%Ch	WA Year Avg $	WA A%Ch	TAS Year Avg $	TAS A%Ch	NT Year Avg $	NT A%Ch	ACT Year Avg $	ACT A%Ch	AUSTRALIA Year Avg $	AUSTRALIA A%Ch
1985	423.1		420.5		429.0		393.1		404.1		400.2		455.5		394.2		417.9	
1986	437.4	3.4	438.4	4.3	448.6	4.6	407.4	3.7	426.5	5.5	419.9	4.9	484.4	6.4	433.9	10.1	434.1	3.9
1987	470.6	7.6	468.1	6.8	479.9	7.0	433.4	6.4	441.5	3.5	438.5	4.4	513.1	5.9	434.0	0.0	464.1	6.9
1988	484.3	2.9	492.3	5.2	491.1	2.3	460.2	6.2	460.6	4.3	461.7	5.3	507.2	-1.1	440.2	1.4	482.4	3.9
1989	517.5	6.8	516.0	4.8	536.6	9.2	483.6	5.1	500.4	8.6	495.1	7.2	513.1	1.2	498.5	13.3	513.4	6.4
1990	547.0	5.7	597.5	15.8	551.7	2.8	517.1	6.9	546.9	9.3	506.0	2.2	613.1	19.5	549.3	10.2	559.2	8.9
1991	575.9	5.3	623.1	4.3	565.3	2.5	558.1	7.9	565.3	3.4	550.8	8.9	614.6	0.2	558.2	1.6	585.2	4.7
1992	622.3	8.1	657.8	5.6	584.8	3.4	577.9	3.5	598.9	6.0	565.5	2.7	641.1	4.3	604.6	8.3	620.5	6.0
1993	630.8	1.4	698.3	6.2	597.6	2.2	584.5	1.1	613.0	2.3	604.8	6.9	664.1	3.6	599.3	-0.9	638.3	2.9
1994	657.1	4.2	711.2	1.9	619.0	3.6	616.5	5.5	624.3	1.9	661.4	9.4	666.5	0.4	612.2	2.1	657.9	3.1
1995	672.8	2.4	722.7	1.6	651.3	5.2	644.0	4.5	673.2	7.8	695.2	5.1	699.8	5.0	636.8	4.0	679.3	3.2
1996	739.5	9.9	751.1	3.9	694.1	6.6	654.1	1.6	725.6	7.8	714.1	2.7	701.2	0.2	711.8	11.8	725.0	6.7
1997	787.3	6.5	803.5	7.0	746.4	7.5	720.6	10.2	777.5	7.2	724.1	1.4	731.4	4.3	758.2	6.5	773.6	6.7
1998	851.1	8.1	873.7	8.7	777.9	4.2	793.1	10.1	836.5	7.6	790.3	9.1	771.5	5.5	812.3	7.1	831.8	7.5
1999	883.1	3.8	892.0	2.1	820.0	5.4	816.9	3.0	880.7	5.3	889.5	12.5	803.9	4.2	884.0	8.8	867.1	4.2
2000	938.3	6.2	975.5	9.4	883.0	7.7	862.7	5.6	932.8	5.9	880.3	-1.0	1054.0	31.1	931.4	5.4	922.8	6.4
2001	995.3	6.1	1048.1	7.4	925.8	4.8	905.5	5.0	992.7	6.4	979.2	11.2	968.4	-8.1	989.6	6.2	982.3	6.4
2002	1095.3	10.0	1112.9	6.2	978.3	5.7	956.1	5.6	1065.3	7.3	1042.0	6.4	1004.1	3.7	1048.7	6.0	1055.3	7.4
2003	1099.8	0.4	1150.4	3.4	1018.0	4.1	1030.2	7.7	1121.5	5.3	1074.9	3.2	997.9	-0.6	1081.8	3.2	1085.1	2.8
2004	1196.8	8.8	1140.2	-0.9	1151.4	13.1	1071.5	4.0	1163.6	3.8	1137.4	5.8	1003.5	0.6	1174.2	8.5	1155.7	6.5
2005	1197.5	0.1	1180.2	3.5	1268.1	10.1	1070.3	-0.1	1194.4	2.6	1182.4	4.0	1069.7	6.6	1221.1	4.0	1194.5	3.4
2006	1224.4	2.2	1200.2	1.7	1218.3	-3.9	1090.9	1.9	1300.9	8.9	1263.6	6.9	1175.3	9.9	1157.1	-5.2	1214.1	1.6
2007	1289.8	5.3	1238.5	3.2	1226.9	0.7	1160.2	6.3	1389.4	6.8	1285.8	1.8	1286.4	9.5	1244.9	7.6	1262.4	4.0
2008	1336.5	3.6	1245.5	0.6	1259.8	2.7	1211.2	4.4	1478.5	6.4	1290.1	0.3	1339.8	4.1	1374.5	10.4	1304.2	3.3
Forecast																		
2009	1409.0	5.4															1384.5	6.2
2010	1479.7	5.0															1453.8	5.0
2011	1545.3	4.4															1519.7	4.5
2012	1617.8	4.7															1591.0	4.7
2013	1701.2	5.2															1671.9	5.1
2014	1790.2	5.2															1758.1	5.2
2015	1875.8	4.8															1843.4	4.9
Compound Annual Average Growth Rates																		
1985-2008	5.1		4.8		4.8		5.0		5.8		5.2		4.8		5.6		5.1	
1990-2000	5.5		5.0		4.8		5.3		5.5		5.7		5.6		5.4		5.1	
2000-2008	4.5		3.1		4.5		4.3		5.9		4.9		3.0		5.0		4.4	
2003-2008	4.0		1.6		4.4		3.3		5.7		3.7		6.1		4.9		3.7	
2008-2015	5.0																5.1	
2010-2015	4.9																4.9	

e: estimate

Source: BIS Shrapnel, ABS Data

4.2 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 5.1 per cent per annum (0.4 per cent higher than the national AWOTE average of 4.7 per cent per annum) over the next seven years from 2008/09 to 2014/15. Meanwhile, we anticipate growth in the labour price index (LPI) for the Australian electricity, gas, water sector will average 4.7 per cent per annum (1.0 per cent higher than national LPI growth of 3.7 per cent per annum) over the seven years to 2014/15. The faster wages growth expected in the electricity, gas and water sector over the next seven years is in line with historical movements over the past 15 years (see Table 4.3).

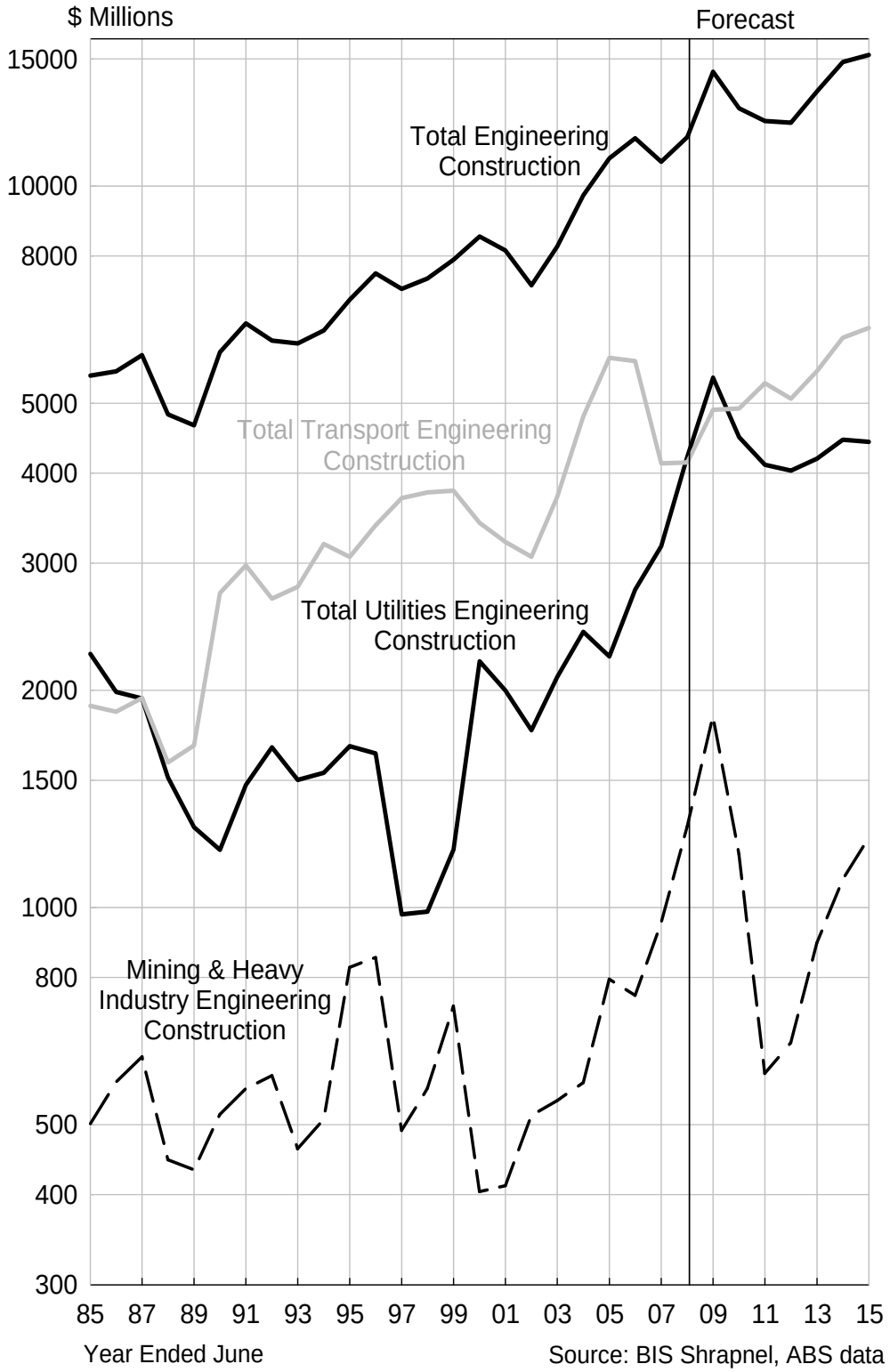
The electricity, gas and water sector is a largely capital intensive industry whose employees have higher skill, productivity and commensurately higher wage levels than most other sectors. With many of the particular skills relevant to the electricity, gas and water sector expected to remain in relatively 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. 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.

The key elements of the utilities wage forecast is set out in Table 4.2. Table 4.2 shows that collective bargaining dominates the pay setting arrangements in the utilities sector, while the relative absence of workers relying on low-increase awards (currently set by Fair Pay Commission) means the overall average for total utilities wages will invariably be higher than the all industries average. Table 4.1 shows that the utilities sector has consistently had higher wage increase under collective agreements than the all industries average. Over the past 5 years, the outcomes from collective agreements have been 0.4 per cent higher, on average, than the all industries average. We expect this trend to continue over the next seven years, with the all industries average to also continue to be dragged down by the retail and hospitality industries.

The analysis in Table 4.2 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 Section 3.1 – some incentives and compositional effects emanating from the collective agreements may be ending up in the individual arrangements segment calculated in the LPI in Table 4.2. Nevertheless, we expect outcomes under both collective agreements and individual arrangements to be higher over the next seven years, compared to the last five years. There are basically three reasons for the higher outcomes:

- skilled labour shortages and competition for scarce labour, particularly from the mining and construction sectors, will push up wage demands under both collective bargaining and by those 15% of employees under individual arrangements.
- the upskilling (and associated higher wages) of the large influx of apprentices and other skilled workers hired over the last two or three years (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 4.2).

Chart 4.4: Total Engineering Construction – New South Wales
Constant 2006/07 Prices



- fewer negative compositional effects, given slower employment growth (compared to recent years) and a fairly stable employment profile predicted over the seven years to 2014/15, as shown in table 4.7. This implies no large influxes or exits of low-paid workers.
- We have included year-to-year movements for AWOTE in the electricity, gas and water sector over the seven years to 2014/15, which are presented in table 4.3 and chart 4.3. 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.

4.3 Outlook for utilities wages growth in New South Wales

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, but lower employment growth in the New South Wales utilities sector over the last two years may have been due to the failed privatisation of the utilities sector by the New South Wales Government. Employment declined 5.2 per cent in 2006/07 and stalled (+0.1 per cent) in 2007/08, despite the large capital works program undertaken by the New South Wales utilities sector over the last two years (see Chart 4.4). Since plans to privatise the utilities sector have been shelved, employment growth in the utilities sector has rebounded strongly, estimated to have risen 28.1 per cent in 2008/09 (see Table 4.8). Further growth in New South Wales utilities employment is expected to be in line with the national average over the forecast period.

Table 4.4 shows the history of wage movements in the electricity, gas and water sector by state from 1985 to 2008 for Average Weekly Ordinary Time Earnings (AWOTE) for full-time adult persons. Table 4.4 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 2008, except for Western Australia, which averaged 5.9 per cent. It is likely that the wide year-to-year divergences between states are due to compositional effects. Unfortunately, Labour Price Index data for the electricity, gas and water sector is not available by state (only available for total Australia and Victoria), so we do not have a historical data series which quarantines most of the compositional effects.

Growth in utilities AWOTE in NSW over the 5 years to 2007/08 inclusive averaged 4.0 per cent per annum, compared to the national average of 3.7 per cent per annum. The higher wages growth in NSW over the past five years was probably due to weaker employment growth in the state (compared to the national average (see Tables 4.5 and 4.6), which suggests that NSW had less compositional effects from lower paid workers, which dragged down overall average earnings in other states' utilities. Note that the opposite appears to be occurring in 2008/09 (based on data from the September and December 2008 quarters) — with the faster growth in NSW employment having more negative compositional effects than the national average.

Over the next seven years, we have assumed that the historical uniformity of wages growth in the utilities sector across the states will continue, given that we expect AWOTE growth in Western Australia to 'come back to the pack' as the resource investment boom eases later this decade. The mining boom has been a key factor driving higher growth in wages in that state over recent years.

BIS Shrapnel forecasts that New South Wales will be one of the better performing state economies over the 2009/10 to 2012/13 period, as discussed in Section 2. Overall employment growth is forecast to be higher in NSW compared to the national average over the six years to 2014/15 — after lagging the national average over the six years to 2008/09 (inclusive) by almost 1.0 per cent per annum. With NSW employment forecast to be faster over the outlook period, the demand for labour — including skilled labour — will be stronger, and this will lead to higher overall wages growth for NSW compared to the national average. This will also add to pressure on the New South Wales utilities sector — it will need to offer competitive wages to retain its existing workforce and attract new recruits.

Overall, New South Wales electricity, gas and water AWOTE is forecast to average 5.0 per cent per annum over the next seven years compared to the Australian electricity, gas and water AWOTE of 5.1 per cent per annum, as Table 4.4 shows. The similar growth profile for New South Wales compared to Australia is not surprising, given NSW dominates both output and employment in the sector, presently accounting for around 28% of national utilities employment and output.

The key reasons that underpin our forecasts of similar wages growth in NSW and Australian utilities sector over the next seven years include:

a) Stronger growth in demand for relevant skilled labour in New South Wales over the six years to 2014/15

Growth in employment — and therefore demand for skilled labour — in the key industry sectors of mining, construction and utilities (combined) in New South Wales is forecast to outstrip the Australian equivalent over the 2009/10 to 2014/15 period, after the current setback. 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 comparable or higher increases.

As previously mentioned, while the resource rich states like Queensland and Western Australia will suffer from the downturn in minerals investment, New South Wales will come out of the downturn stronger, driven by dwellings construction, overall better growth in construction activity (see point b) following), the low A$ and other factors. Even in the mining sector, NSW will perform relatively better, due to the stronger outlook for the state's dominant minerals — gold, copper and thermal coal. While there will be job losses in the NSW mining sector over the next 2 to 3 years, we expect a recovery from 2012 in line with the next upturn in investment. Also adding to the demand for skilled labour (i.e. in competition with the utilities sector) will be an improvement in the state's manufacturing sector from 2010/11, boosted by the local construction sector and the lower A$.

Skills shortages have been evident in the electricity, gas and water sector for the past three years, which was demonstrated in the sharp increase in job vacancies during this period. The latest 'skills in demand' lists released by the Department for Employment and Workplace Relations show that NSW is experiencing skills shortages in the engineering and building trades. Shortages in the electrical trades are also apparent. Although we expect the current weakening in employment to lead to some easing in the tightness of the skilled labour market over the next year, the predicted recovery from next year will lead to a recovery in skilled labour demand in NSW and a tightening in the market over the 2010/11 to 2014/15 period.

b) Continued high levels of utilities-related and overall construction

The rolling minerals investment boom, which has supported growth since 2002 is now over. We expect a significant downturn in minerals investment later this decade. The major impact will be on the Queensland, Northern Territory and Western Australian economies, while, New South Wales, which largely missed the minerals investment boom, will be relatively less affected. Therefore, while we expect the resource rich states (mainly Queensland and Western Australia) to drag down the Australian construction sector over the forecast period, New South Wales construction will hold up and be stronger. This is likely to end up putting pressure on wages growth in the NSW construction and utilities sector over the forecast period.

Engineering construction

Chart 4.4 shows utilities engineering construction in New South Wales has lifted to record levels. Although New South Wales utilities engineering construction is expected to fall back next year, it will remain at record levels – indeed, much higher than the 2000–2007 period. BIS Shrapnel forecasts both New South Wales and Australia utilities engineering construction to peak in 2008/09, before weakening over the three years to 2011/12, and then recovering over the remainder of the forecast period.

From 2012/13, activity is expected to resume an upward trend, with all three components of electricity, water and gas infrastructure contributing. We see the current economic issues merely providing a short term deviation away from this long run growth trend (see Chart 4.4). It is expected that solid levels of utilities capital expenditure will resume once credit conditions ease.

Charts 4.5 and 4.6 compare engineering construction work done for Australia and New South Wales in utilities construction (which includes electricity generation, transmission and supply, water storage and supply, sewerage and drainage and pipelines construction) and total engineering construction.

Chart 4.5 (total utilities engineering construction) shows that New South Wales utilities engineering construction has out-performed national growth since 2002/03. The stronger demand for utilities construction related labour may have also contributed to the stronger utilities wage growth (AWOTE) in New South Wales over that five year period compared to Australia utilities AWOTE, although we suspect compositional effects were probably more significant. Meanwhile, New South Wales total engineering construction (Chart 4.6) is forecast to record similar growth rates to that of Australia over the seven years to 2014/15.

The fundamentals that prompted the previous growth in engineering construction activity remain largely unaddressed. Aging infrastructure, capacity constraints, previous underinvestment, continued population growth and the urban sprawl of Sydney (encompassing areas previously considered to be out of the Sydney metropolitan area, such as the Central Coast, Newcastle, the Illawarra and the Blue Mountains), but also in regional cities (especially along the North Coast) will be an ongoing driver of activity in many sectors as overall activity strengthens considerably from 2012/13.

Dwelling construction & non-dwelling building

The protracted downturn in the housing market and dwelling construction from 2004 to 2007 was a key negative factor contributing to the below average performance of the NSW economy. Over the medium term, this negative is expected to be reversed, with housing construction leading the upturn in the state economy.

Dwellings construction is expected to be a key driver of total construction over the four years 2012/13. There is a substantial undersupply of dwellings in Sydney and NSW generally. Dwelling commencements are still well below the required level of building, so this stock deficiency will worsen over the next year. Significant pent-up demand and rapidly rising rents as well as the stabilisation of credit conditions and lower interest rates toward the middle of this year, are expected to drive the upturn from late 2009.

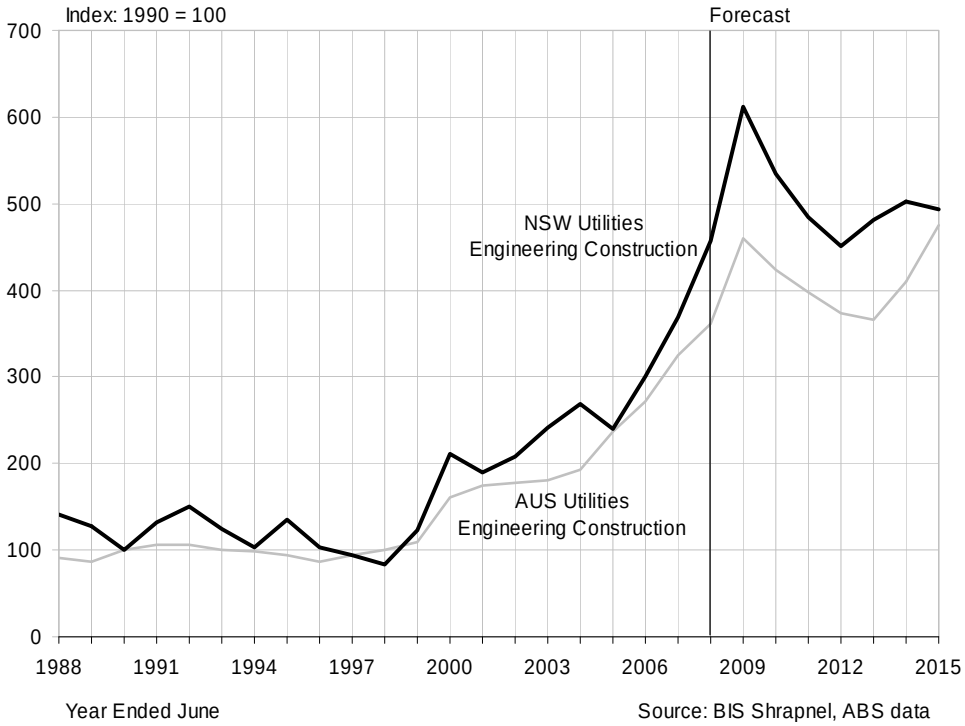
The boom in housing construction and stable (or lower) interest rates through 2009/10 and 2010/11 is expected to encourage another round of business investment from 2011/12, led by offices, factories, subdivisions and telecommunications construction and an upturn in plant and equipment. The lower A$ over these two years will also boost the tradeables sectors and encourage investment in these sectors. A solid pick up in educational investment (driven by the Federal Government's fiscal package), coupled with the investment in health due to an ageing population, will also support non-residential activity over this period.

c) Interstate relativities

While growth in average weekly ordinary time earnings of the electricity, gas and water sector between New South Wales and Australia has displayed year-to-year variations (mainly related to compositional effects) over the 23-year period since 1984/85, AWOTE growth in the sector has still averaged the same (5.1 per cent) as the national average.

Average wages in the New South Wales utilities sector were higher than the Australian equivalent over the last five years, mostly due to compositional effects (see Table 4.4). Given NSW dominates both output and employment in the sector, and with growth in utilities output and employment expected to be similar to the Australian average (see Tables 4.5 and 4.6), we also expect average wages growth to remain in line with the national average over the forecast period.

Chart 4.5: Utilities Engineering Construction
Australia vs New South Wales



4.3.1 The outlook for utilities Enterprise Bargaining Agreements

Firstly, it is important to note that there is no wage data on Enterprise Bargaining Agreements (or EBA's) for the New South Wales utilities sector. Given New South Wales dominates utilities employment in Australia, we have assumed the ratio of collective agreements negotiated in the New South Wales utilities sector is the same as Australia and that movements in collective agreements in New South Wales have been similar to the national average (see table 4.2 and table 4.5). The latest data (May 2006) shows that 84.4% of utilities employees' wage increases are determined by collective agreements negotiated under enterprise bargaining (see table 3.2 and table 4.2) at the national level. Enterprise Bargaining Agreements dominate the pay setting arrangements in the utilities sector, while the relative absence of workers relying on low-increase awards (set by Fair Pay Commission) means the overall average for total utilities wages will invariably be higher than the all industries average.

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') over recent quarters.

In the first half of 2008, economic conditions were favourable and inflation was rising above 4 per cent in annual terms and peaked at 5 per cent in September 2008. These conditions saw unions in the utilities sector push for agreements in the 4.5 per cent to 5.5 per cent range. Data from the Department of Employment and Workplace Relations December 2008 *Trends in Federal Enterprise Bargaining* shows that average outcomes of agreements increased through 2008, with the year average of the 'formalised' agreements rising to 4.7 per cent by the December quarter. Given that the average for current operating agreements in the December quarter was also 4.7 per cent, our EBA forecast for 2008/09 is 4.7 per cent (see table 4.6).

Furthermore, given the average duration of enterprise agreements in the utilities sector is close to 3 years, these outcomes in 2008 will influence the overall EBA average over 2009/10 and 2010/11 i.e it will tend to push up the overall average.

In contrast to 2008, economic conditions weakened considerably and inflation moderated substantially in the first half of 2009 (annual headline price inflation has fallen to 2.5 per cent in March 2009 from 3.7 per cent through the year to December 2008). The onset of weaker conditions has moderated union demands, with anecdotal evidence suggesting outcomes and negotiations are seeing agreements now being 'formalised' at between 4 and 4.5 per cent. As the high wage outcomes negotiated in 2008 start to have less effect, we expect the average EBA wage growth to ease to 4.4 per cent in 2010/11 and 4.5 per cent in 2011/12. However, despite the downturn in the economy, wages are expected to remain elevated in the utilities sector due to the relative strength in demand for skilled labour (see part a) in section 4.3 above), and because of the strength of unions in what is an essential service sector.

The New South Wales economy is expected to strengthen from 2011/12, following the current setback to growth. An expected upturn in construction activity from 2011/12 will see a significant strengthening in the demand for skilled labour. In addition, New South Wales utilities will also be increasing their workforces for their own capital expenditure requirements. This will add pressure to EBA wages and push up EBA wages growth from 2011/12 right through to 2014/15.

Table 4.5: Wage Forecasts – Electricity, Gas & Water Supply – New South Wales

	Year Average Percent Change															
										Forecast						
Year Ended June	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Proportion of Workforce by Pay setting Method (a)																
Awards Only	1.4%	1.3%	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%
Collective Agreements	76.5%	77.3%	78.1%	79.0%	79.9%	82.2%	84.4%	84.4%	84.4%	84.4%	84.4%	84.4%	84.4%	84.4%	84.4%	84.4%
Individual Arrangements	22.1%	21.5%	20.9%	19.7%	18.4%	16.6%	14.7%	14.7%	14.7%	14.7%	14.7%	14.7%	14.7%	14.7%	14.7%	14.7%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
AWOTE																
Awards Only	1.4	1.6	1.3	1.7	1.5	1.6	1.4	0.7	1.3	1.4	1.0	1.2	1.4	1.7	1.6	1.5
Collective Agreements (b)	3.1	3.8	3.9	4.2	4.3	4.2	4.5	4.5	4.6	4.7	4.6	4.4	4.5	4.7	4.7	4.6
Individual Arrangements (c) (d)	17.2	14.5	33.0	-15.0	29.0	-20.5	-11.0	10.5	-2.0	9.5	7.8	4.8	6.0	8.0	8.5	6.0
AWOTE (Persons)(e)	**6.2**	**6.1**	**10.0**	**0.4**	**8.8**	**0.1**	**2.2**	**5.3**	**3.6**	**5.4**	**5.0**	**4.4**	**4.7**	**5.2**	**5.2**	**4.8**
Labour Price Index (f)																
Awards Only	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*
Collective Agreements	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*
Individual Arrangements (c) (d)	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*
Labour Price Index (Ord. Time)	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*
Compositional Effects + Bonuses,etc	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*	*n.a*

(a) Assume workforce proportions are the same as Australia Source: BIS Shrapnel, ABS, DEWR
(b) Historical movements in Collective Agreements in NSW assumed to be the same as Australia
(c) Calculated as a residual - affected by compositional effects and the payments of bonuses, incentive payments, etc
(d) 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
(e) Full-time Adult Persons, excluding overtime
(f) Labour Price Index for New South Wales Electricity, Gas and Water not available

Table 4.6: EBA vs Non-EBA – New South Wales

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	7 yr Avg (a)	5 yr Avg (b)
Nominal Price Changes									
EBA Wages - EGW	4.7	4.6	4.4	4.5	4.7	4.7	4.6	4.6	4.6
Non-EBA Wages - EGW (c)	5.4	5.0	4.5	5.0	6.5	6.5	5.5	5.5	5.6
Bonuses and Compositional Effects (d)	0.6	0.4	0.0	0.1	0.2	0.3	0.1	0.3	0.2
Total NSW EGW AWOTE (e)	5.4	5.0	4.4	4.7	5.2	5.2	4.8	5.0	4.9

(a) Average Annual Growth Rate for 2008/09 to 2014/15 inclusive Source: BIS Shrapnel, ABS Data
(b) Average Annual Growth Rate for 2010/11 to 2014/15 inclusive
(c) On a LPI basis (Labour Price Index for New South Wales Electricity, Gas and Water estimated from Australia LPI)
(d) The difference between AWOTE and LPI (Labour Price Index for New South Wales Electricity, Gas and Water estimated)

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). Although we expect union demands to ease in line with lower inflation and slower growth in wages in other sectors, on balance, we expect that EBA wages growth will average 4.6 per cent per annum over the forecast period (as in table 4.6).

Overall, we expect EBA wages growth to be a lot less cyclical over the forecast period. 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 the electricity, gas and water sector.

4.3.2 The outlook for utilities Non-Enterprise Bargaining Agreements (individual arrangements)

In the utilities sector, 14.7% of all employees have their pay set by individual arrangements at the national level, such as individual contracts or other salary arrangements (including incentive-based schemes).

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.

Skilled labour shortages remain a significant driver of wages growth in the utilities sector. A supply/demand imbalance for skilled labour will push up wage demands for those under individual arrangements. The latest 'skills in demand' lists released by the Department of Employment and Workplace Relations show that all states are experiencing skills shortages in the engineering and building trades, while shortages in the electrical trades are also widespread.

Although the current downturn will lead to an easing in overall skilled labour shortages for some professions relevant to the utilities sector, there is still expected to be shortages of engineers and engineering managers – key professionals in the utilities sector. These shortages are expected to be even more pronounced over the next 7 years given the large capital works and maintenance programs planned in the NSW and other states' utilities sectors.

Once economic conditions improve and demand for labour recovers, we expect higher wages growth in this 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 will eventually start to accelerate from 2011/12. We expect non-EBA wages growth to pick up strongly and average 6.5 per cent over the two years to 2013/14 and remain high at 5.5 per cent in 2014/15.

Discussions we have had with industry players suggest that going forward non-EBA wages are expected to average between 5 and 6 per cent per annum over the forecast period. Overall, we expect non-EBA wages growth to average 5.6 per cent per annum over the five years to 2014/15.

Another factor which will act to push up non-EBA wages later in the period will be the ageing of the workforce. This will particularly affect the 'professionals' on non-EBA's, who tend to be older and more experienced.

Chart 4.6: Total Engineering Construction – Australia v New South Wales
Constant 2006/07 Prices

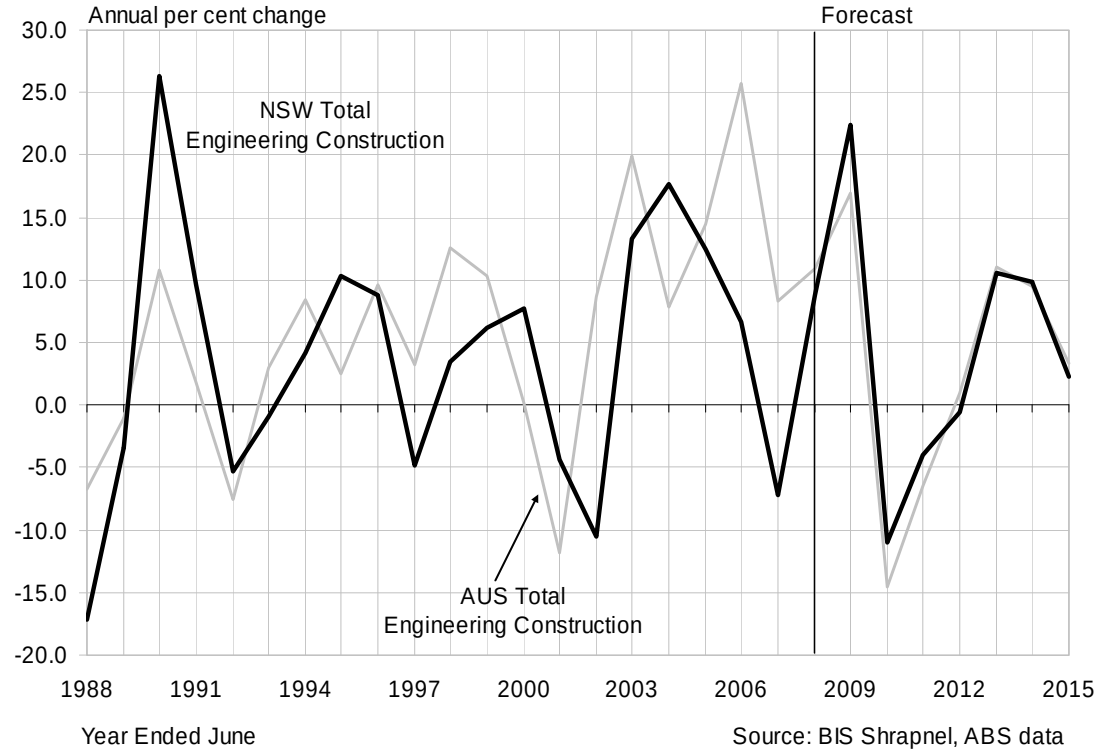


Chart 4.7: Electricity, Gas & Water Wages
Australia vs New South Wales

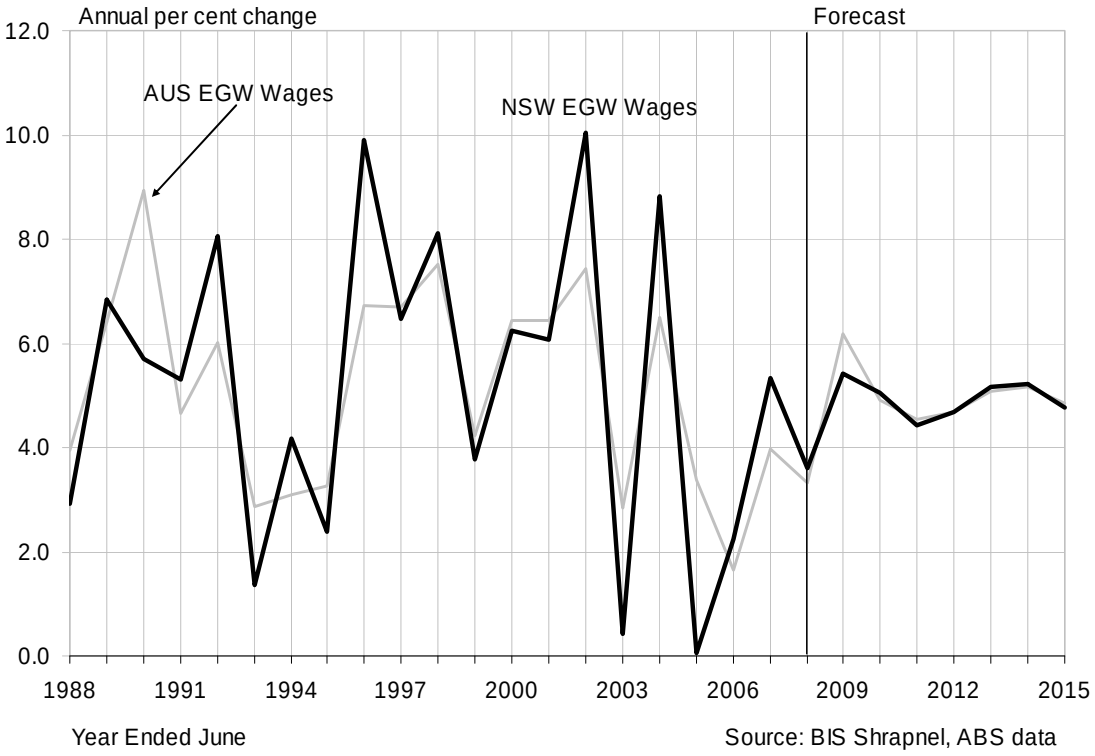


Table 4.7: Electricity, Gas and Water – Australia
Output and Employment

Year Ended June	Gross Value Added $m(06/07$'s)	A%Ch	Employment '000	A%Ch
1986	15 063	3.8	144.1	5.6
1987	15 402	2.3	133.0	-7.7
1988	16 156	4.9	124.2	-6.6
1989	16 882	4.5	119.3	-4.0
1990	17 698	4.8	108.7	-8.9
1991	17 982	1.6	103.4	-4.9
1992	18 137	0.9	106.2	2.8
1993	18 453	1.7	97.6	-8.1
1994	19 036	3.2	92.2	-5.5
1995	19 521	2.5	86.8	-5.9
1996	19 781	1.3	80.6	-7.1
1997	19 718	-0.3	66.5	-17.6
1998	20 415	3.5	64.5	-3.0
1999	20 751	1.6	64.9	0.6
2000	21 155	1.9	64.2	-1.0
2001	21 481	1.5	65.4	1.8
2002	21 318	-0.8	67.3	2.9
2003	21 510	0.9	72.5	7.8
2004	21 656	0.7	75.3	3.9
2005	21 827	0.8	76.7	1.9
2006	22 117	1.3	87.4	14.0
2007	21 854	-1.2	85.1	-2.6
2008	21 843	-0.1	89.9	5.6
Forecasts				
2009	22 540	3.0	110.9	23.4
2010	22 720	-0.1	113.8	2.6
2011	23 040	1.4	114.4	0.5
2012	23 160	0.5	115.1	0.6
2013	23 300	0.9	116.2	1.0
2014	23 390	0.4	118.0	1.5
2015	23 580	1.0	121.5	3.0
Long Term Averages				
1990-2000	1.8		-5.1	
2000-2008	0.4		4.3	
2003-2008	0.3		4.4	
2008-2015	1.1		4.4	
2010-2015	0.5		1.2	

e : estimate Source: BIS Shrapnel, ABS data

Table 4.8: Electricity, Gas and Water Sector – New South Wales Output and Employment

Year Ended June	Gross Value Added $m(06/07$'s)	A%Ch	Employment '000	A%Ch
1986	4919	0.2	55.7	
1987	4717	-4.1	49.3	-11.6
1988	4904	4.0	48.1	-2.4
1989	5518	12.5	41.8	-13.1
1990	5395	-2.2	40.4	-3.2
1991	5511	2.2	38.2	-5.5
1992	5586	1.4	40.4	5.7
1993	5716	2.3	38.1	-5.6
1994	5810	1.6	36.3	-4.9
1995	5944	2.3	34.2	-5.7
1996	6005	1.0	29.3	-14.4
1997	6142	2.3	22.9	-22.0
1998	6005	-2.2	23.3	1.9
1999	6188	3.0	22.7	-2.6
2000	6361	2.8	22.3	-1.5
2001	6664	4.8	22.1	-1.0
2002	6345	-4.8	22.0	-0.6
2003	6258	-1.4	26.9	22.2
2004	6203	-0.9	26.8	-0.3
2005	6135	-1.1	22.8	-14.7
2006	6256	2.0	25.3	10.6
2007	6034	-3.5	24.0	-5.2
2008	6050	0.3	24.0	0.1
Forecasts				
2009	6201	2.5	30.7	28.1
2010	6176	-0.4	31.4	2.1
2011	6275	1.6	31.6	0.8
2012	6325	0.8	31.9	1.0
2013	6401	1.2	32.3	1.2
2014	6459	0.9	32.6	1.0
2015	6511	0.8	33.3	1.9
Long Term Averages				
1990-2000	1.7		-5.8	
2000-2008	-0.6		0.9	
2003-2008	-0.7		-2.2	
2008-2015	1.1		4.8	
2010-2015	0.7		1.0	

e : estimate Source: BIS Shrapnel, ABS data