



# ElectraNet Transmission Network Revised Revenue Proposal

Appendix D KPMG, *Labour Cost Escalators*,  
January 2013





# Labour Cost Escalators

Final report to ElectraNet  
January 2013

GOVERNMENT ADVISORY SERVICES

# Contents

<b>1.</b>	<b>Introduction</b>	<b>2</b>
1.1	Purpose of this report	2
1.2	Compliance with Federal Court's Practice Note CM7	2
1.2.1	The Expert	2
1.2.2	Expert's acknowledgement	2
1.2.3	Training and experience	3
1.2.4	The questions the Expert was asked to address	3
1.2.5	Source materials referenced by this report	3
1.2.6	Factual findings and assumptions	3
1.2.7	Expert's opinion and reasoning	4
1.2.8	Closing	5
<b>2.</b>	<b>Availability and estimation of LPI data</b>	<b>6</b>
<b>3.</b>	<b>Assumptions for LPI forecasts</b>	<b>8</b>
3.1	Forecasting LPI	8
3.2	Synthetic wage sums for groups of states	9
3.3	Wage sum shares	10
3.4	LPI for EGWWS and CON	12
3.5	LPI for EGW	12
<b>4.</b>	<b>South Australia electricity, gas, water and waste water services LPI forecasts</b>	<b>13</b>
4.1	Approach	13
4.1.1	Estimating historical EGWWS LPI	13
4.1.2	Forecasting EGWWS LPI	13
4.1.3	Deriving EGWWS LPI for South Australia	14
4.2	Background for EGWWS LPI forecasts	14
4.3	Findings	16
<b>5.</b>	<b>South Australia electricity, gas, and water services LPI forecasts</b>	<b>19</b>
5.1	Approach	19
5.2	Background for EGW LPI projections	19
5.3	Findings	20

© 2013 KPMG, an Australian partnership and a member firm of the KPMG network of independent member firms affiliated with KPMG International Cooperative ("KPMG International"), a Swiss entity.

All rights reserved.

KPMG and the KPMG logo are registered trademarks of KPMG International.  
Liability limited by a scheme approved under Professional Standards Legislation

6.	The appropriate index to apply to the circumstances of ElectraNet	22
7.	South Australia construction LPI forecasts	23
7.1	Approach	23
7.1.1	Estimating historical CON LPI	23
7.1.2	Forecasting CON LPI	23
7.1.3	Deriving CON LPI for South Australia	24
7.2	Background for CON LPI forecasts	25
7.3	Findings	28
8.	Expert's statement	30
	Appendix A: References	31
	Appendix B: Ashley Winston's curriculum vitae and relevant experience	32
	Appendix C: Terms of reference	34

# 1. Introduction

In November 2012, the Australian Energy Regulator (AER) published its draft decision on ElectraNet Pty Limited's (ElectraNet's) transmission determination for the period 2013-14 to 2017-18<sup>1</sup>. (the draft decision). In making its draft decision the AER has applied forecasts of labour cost escalators prepared by AER's consultant, Deloitte Access Economics (DAE).

## 1.1 Purpose of this report

This report has the sole purpose of providing independently derived forecasts in accordance with the terms of reference set out in Appendix A to this report and may assist the AER and any appellate body, consider ElectraNet's regulatory proposal of its revenue requirements for electricity transmission services in South Australia for the regulatory period beginning 1 July 2013. This report has been written to comply with the Federal Court's Practice Note CM7 Expert witnesses in proceedings in the Federal Court of Australia (Federal Court of Australia, 2011).

## 1.2 Compliance with Federal Court's Practice Note CM7

### 1.2.1 The Expert

The author of this report is:

Dr. Ashley Winston

KPMG

20 Brindabella Circuit

Canberra ACT 2609

### 1.2.2 Expert's acknowledgement

Dr Winston has read, understood and prepared this report in compliance with the Federal Court's Practice Note CM7 Expert Witnesses in proceedings of the Federal Court of Australia (1 August 2011).

---

<sup>1</sup> Australian Energy Regulator, Draft Decision, ElectraNet, Transmission Determination, 2013-14 to 2017-18, November 2012.

### **1.2.3 Training and experience**

Dr. Winston's qualifications and relevant experience are set out in Appendix B.

### **1.2.4 The questions the Expert was asked to address**

Terms of reference dated 5 December 2012 (see Appendix C) required the Expert to provide:

- 1) A realistic expectation of ElectraNet's reasonable forecast internal labour costs in the form of a Labour Price Index (LPI) forecast for the South Australian electricity, gas and water sector (EGW) and South Australian electricity, gas, water and waste water services sector (EGWWS) for the period 2012-13 to 2017-18;
- 2) Advice on the appropriate index to apply to most accurately represent the circumstances of ElectraNet for the period 2012-13 to 2017-18;
- 3) A realistic expectation of ElectraNet's reasonable forecast external labour costs in the form of a construction sector wage forecast for South Australia for the period 2012-13 to 2017-18; and
- 4) Detailed explanations and supporting evidence used to develop the cost escalation forecasts.

### **1.2.5 Source materials referenced by this report**

These are listed in Appendix A.

### **1.2.6 Factual findings and assumptions**

The forecasts set out in this report are based on factual findings and assumptions set out as follows.

- Section 2 outlines the findings and assumptions for LPI data;
- Section 3 details the assumptions made for developing the LPI forecasts;
- Section 4 sets out findings and assumptions for LPI forecasts for South Australian electricity, gas, water and waste water services;
- Section 5 sets out findings and assumptions for LPI forecasts for South Australian electricity, gas, and water services;
- Section 6 provides advice on the appropriate index to apply to most accurately represent the circumstances of ElectraNet; and
- Section 7 describes findings and assumptions for LPI forecasts for South Australian construction.

### 1.2.7 Expert's opinion and reasoning

The Expert's opinions are presented in the following tables. Each of the expert's opinions is wholly or substantially based on the expert's specialised knowledge. These opinions are also based on the application of robust, well-proven economic modelling approaches, consistent with KPMG's macroeconomic model.

In this section, each question is set out separately and below each question is our opinion on the question. Further descriptions are set out in sections 4.3, 5.3 and 7.3 of this report.

- 1) *A realistic expectation of ElectraNet's reasonable forecast of internal labour costs in the form of a Labour Price Index (LPI) forecast for the South Australian electricity, gas and water sector (EGW) and South Australian electricity, gas, water and waste water services sector (EGWWS) for the period 2012-13 to 2017-18.*

**Table 1: LPI forecasts for EGWWS and EGW in South Australia (nominal)**

	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Electricity, gas, water and waste services	4.7%	2.6%	3.9%	4.3%	4.6%	4.6%
Electricity, gas and water services	5.1%	4.8%	4.3%	4.6%	4.9%	4.9%

Source: KPMG modelling

A key driver of the projections for LPI for both electricity, gas, water and waste water services and electricity, gas and water services in South Australia is the gross value added by the electricity, gas, water and waste water services across Australia. Expanding activity in the sector across Australia is bidding up the cost of labour in the sector. The activity in electricity, gas, water and waste water services in Australia has slowed down from previous high levels, but is expected to stabilise around trend growth within the forecast horizon.

The labour price escalator for EGWWS in South Australia is also supported by higher productivity; employment growth is slower than output growth for the industry.

The labour cost escalator for electricity, gas and water services only—that is without waste water services—is projected to grow faster than the wider group as this sub-industry's output is growing at a relatively faster rate than its employment is projected to grow. In other words, productivity in electricity, gas and water services is projected to increase by more than in the wider electricity, gas, water and waste water services industry.

Further detail on the reasons for these findings is provided in sections 4.3 and 5.3.

- 2) *Advice on the appropriate index to apply to most accurately represent the circumstances of ElectraNet for the period 2012-13 to 2017-18.*

The definition of EGWWS is electricity, gas, water and waste water services while EGW only comprises electricity, gas and water services. The difference between the two sets of cost escalators is that waste water services are included in EGWWS but not in EGW.

ElectraNet is an electricity transmission business and as such does not operate in waste water services and we therefore find that EGW is a more appropriate index than EGWWS to apply to the circumstances of ElectraNet.

- 3) *A realistic expectation of ElectraNet's reasonable forecast of external labour costs in the form of a construction sector wage forecast for South Australia for the period 2012-13 to 2017-18.*

**Table 2: LPI forecasts for construction in South Australia (nominal)**

	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Construction	5.0%	4.9%	6.2%	5.5%	5.0%	5.0%

Source: KPMG modelling

Drivers for the projections of LPI in construction in South Australia are gross state products, compensation of employees and the consumer price index. Expanding gross state products are driving general labour demand higher, putting upward pressures on labour costs. Compensation of employees in construction is closely linked to LPI and continued firm growth in compensation of employees in construction drives LPI higher.

Higher consumer prices drive the LPI for construction in South Australia higher. The effect is lagged so that higher CPI has a positive impact on LPI in later quarters. This effect likely represents the bargaining power of construction employees; when consumer prices rise, employees are able to achieve higher wages and LPI rises.

Further detail on the reasons for these findings is provided in section 7.3.

## 1.2.8 Closing

The statement required by paragraph 2.3 of the Federal Court's Practice Note CM7 is set out in section 8 of the report.

## 2. Availability and estimation of LPI data

The three relevant series to forecast are:

- LPI in South Australia for electricity, gas, water and waste water services;
- LPI in South Australia for electricity, gas and water services; and
- LPI in South Australia for construction.

Historical data are not available for any of these three series from the Australian Bureau of Statistics (ABS) or another source. The first task is to estimate the three LPI series historically.

The availability of LPI data from ABS is illustrated in Table 3.

**Table 3: Availability of historical LPI data**

	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	Australia
Mining			✓		✓				✓
Manufacturing	✓	✓	✓	✓	✓	✓			✓
Electricity, gas, water and waste services	✓	✓							✓
Construction	✓	✓	✓		✓				✓
Wholesale trade	✓	✓	✓						✓
Retail trade	✓	✓	✓	✓	✓				✓
Accommodation and food services	✓	✓	✓		✓				✓
Transport, postal and warehousing	✓	✓	✓						✓
Information media and telecommunications	✓	✓							✓
Financial and insurance services	✓	✓	✓						✓
Rental, hiring and real estate services									✓
Professional, scientific and technical services	✓	✓	✓		✓				✓
Administrative and support services	✓	✓	✓	✓	✓				✓
Public administration and safety	✓	✓	✓	✓	✓	✓		✓	✓
Education and training	✓	✓	✓	✓	✓			✓	✓
Health care and social assistance	✓	✓	✓	✓	✓	✓			✓
Arts and recreation services			✓						✓
Other services									✓
All industries	✓	✓	✓	✓	✓	✓	✓	✓	✓

✓ indicates that data are available in the September quarter 2012

□ indicates the specific series required for this forecasting job

Sources: KPMG illustration based on ABS data

The row and column totals for industries and states are the publicly available in ABS Cat. No. 6345, Table 2 for states and Table 5 for industries. Other data have been purchased from the ABS. The two boxes in the table indicate which data need to be estimated to enable forecasting of the relevant three LPI for South Australia. In fact, the box for electricity, gas, water and waste water services in South Australia has to be split further into electricity, gas and water and the rest of electricity, gas, water and waste water services.

An LPI for electricity, gas, water and waste water services (EGWWS) is only available for New South Wales, Victoria and total Australia. For construction (CON), LPI is only available for New South Wales, Victoria, Queensland, Western Australia and total Australia.

Not all states have an ABS-published LPI - South Australia is a state that does not have a published LPI. To get closer to an LPI for EGWWS and CON in South Australia, an LPI for the states without LPI data is constructed. A numerical approximation is used to calculate the LPI for this group. The basic idea is that the Australian index for an industry is a weighted sum of the indices for each state:

$$LPI_t^{Aus,i} = \frac{\sum_{s=NSW,VIC,...,ACT} LPI_t^{s,i} * LBE_t^{s,i}}{\sum_{s=NSW,VIC,...,ACT} LBE_t^{s,i}} \quad (1)$$

where  $i$  is the industry;  $i$  = mining, electricity & gas & water & waste water services, construction, manufacturing, etc.  $s$  is the states;  $s$  = NSW, VIC, QLD, SA, WA, TAS, NT, ACT.  $LPI$  is the labour price index and  $LBE$  is total employment.

Equation (1) is a numerical approximation, but it performs well when applied on historical data and summing across states. Calculating the Australian LPI by summing the employment-weighted LPIs for states gave a result only 0.04 per cent lower than the officially reported national LPI. This result was reached when using the LPI data from ABS Catalogue 6345 table 2b and employment data for employed total from ABS Catalogue 6291 table 5. The close relationship between the actual Australian LPI and that calculated by the formula in (1) allows us to calculate an LPI for the group of states which does not have formal ABS LPI data.

## 3. Assumptions for LPI forecasts

The LPI forecasts for EGWWS and CON industries in South Australia are reached through four steps. First, the LPI for the group of states which include South Australia is forecast. Second, a synthetic wage sum<sup>2</sup> is created for EGWWS and CON in the group of states by using the LPI and employment. Third, South Australia's share of the wage sum in the group is estimated, allowing the calculation of the synthetic wage sum of EGWWS and CON in South Australia. Fourth, the LPI for EGWWS and CON is calculated from the synthetic wage sum and the number of employees.

LPI for electricity, gas and water services (EGW) is calculated from the synthetic wage sum for EGWWS in South Australia in step 3. This wage sum is split further down to only EGW and via estimates of employment in EGW, the LPI for EGW in South Australia is reached.

In the following each of these steps are outlined in detail.

### 3.1 Forecasting LPI

LPI for the groups of states are forecast since these data are derived from LPI data only. Once LPI is split into South Australian LPI, data from other surveys are used. Other surveys may introduce other error sources and could potentially change the stochastic properties of the series. LPI for the group of states are forecast to best maintain the original stochastic properties from the LPI surveys which aids in making the regressions more robust.

Historical data for LPI by state and industry are available from the September quarter 2008 and applying the method outlined in section 2 gives series for LPI in the two groups of states with 17 observations. The standard procedure to derive an econometric model based on historical relationships is to start with a general specification which includes all potential explanatory variables and their lags. Insignificant variables are subsequently removed from the regression and the final, specific, regression has the significant variables.

This procedure is difficult to apply to the LPI data as the many variables in the general regressions take up too many degrees of freedom for the regression to be estimated. The solution applied here to this problem is to investigate each explanatory variable with lags in turn and from there construct a shortlist of potential variables which could be significant. These variables were then included in a second-stage general regression which was then reduced to a specific regression. The explanatory variables considered in the general regressions are:

- The gross value added (GVA) for the industry;
- The gross state product (GSP) for the state;
- Employment in the industry;
- CPI (national); and

---

<sup>2</sup> Wage sum is defined as the total sum of wages; average wage multiplied by the number of employees. The synthetic wage sum referred to here is the wage sum using LPI as the average wage.

- Compensation of employees in the industry.

These variables are included as potential explanatory variables from economic theory and from which variables are available from KPMG's macroeconomic model.

If an industry is expanding, upward wage pressures emerge if labour is not readily available and the LPI will edge higher. The expected sign on industry GVA is positive as competition for labour pushes earnings higher.

Likewise, if a state is growing, demand for labour is generally high and any industry must increase wages to compete for workers. The expected sign on GSP in the regression for LPI is positive.

Employment in an industry should generally attract a positive coefficient in the LPI regression; if employment is growing, the industry will generally have to increase wages to attract the desired number of employees.

The national consumer price index is included to capture general upward price pressures in the economy. When prices are rising, employees demand higher wages. Also, the economy is generally performing well when prices are rising, making growing CPI a proxy for economic strength. CPI should attract a positive estimated coefficient in the model.

Compensation of employees is closely related to labour prices as they are essentially measuring the same thing. Compensation of employees reflects the payment to labour on the production side of the economy, and there should be a positive relationship between compensation of employees and the labour price index.

## 3.2 Synthetic wage sums for groups of states

In the steps above, the historical and forecast LPI for the two groups of states have been estimated. LPI for EGWWS in Queensland, South Australia, Western Australia, Tasmania, Northern Territory and the ACT has been estimated. Also, LPI for CON in South Australia, Tasmania, Northern Territory and the ACT has been estimated. The historical series have been derived as described in section 2, and the forecasts have been derived as described in section 3.1. The forecasts have been derived using the estimated coefficients from the regressions together with macroeconomic forecast series.

The splitting of LPI for the groups of states to South Australia makes use of wage sums. The wage sums are the wages times by employees.

Synthetic wage sums (*sws*) can be constructed for the two groups using LPI and employment:

$$sws_i^{other,i} = LPI_i^{other,i} * \sum_{s \in other} LBE_i^{s,i} \quad (2)$$

Where the 'other' group is Queensland, South Australia, Western Australia, Tasmania, Northern Territory and the ACT for  $i=EGWWS$ . The 'other' group is South Australia, Tasmania, Northern Territory and the ACT for  $i=CON$ . Historical quarterly  $LBE_i^{s,EGWWS}$  is available from ABS and forecast  $LBE_i^{s,EGWWS}$  is available from KPMG's macroeconomic model.

### 3.3 Wage sum shares

The synthetic wage sums for the groups of states is split into a South Australian synthetic wage sum by using South Australia's wage sum's weight in the group. South Australia's share of the total wage sum can be obtained historically from data on employment and average weekly earnings. While this is essentially an average wage measure, it is as close as we can get to a measure for how labour costs vary by state for industries.

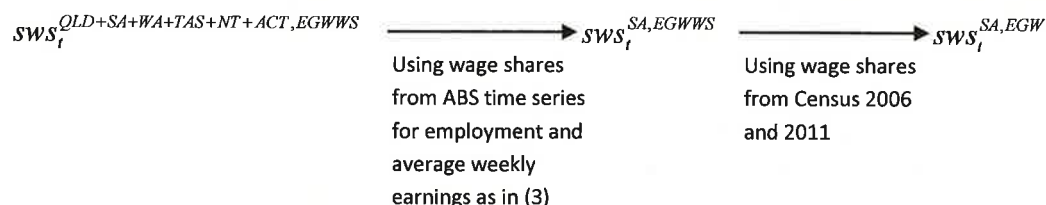
The wage sum shares are calculated as outlined in equation (3):

$$wss_t^{SA,i} = \frac{AWE_t^{SA,i} * LBE_t^{SA,i}}{\sum_{s \in other} AWE_t^{s,i} * LBE_t^{s,i}} \quad (3)$$

Where  $i$  = EGWWS, CON, and the 'other' group is Queensland, South Australia, Western Australia, Tasmania, Northern Territory and the ACT for  $i$ =EGWWS. The 'other' group is South Australia, Tasmania, Northern Territory and the ACT for  $i$ =CON. Historical data on employment, LBE, by state and industry is total employed according to ABS Catalogue 6291 table 5.  $AWE_t^{s,i}$  is average weekly total earnings; historical data are available from ABS Catalogue 6302 for industry  $i$  in state  $s$  at time  $t$ . Future wage sum shares for EGWSS and CON are forecasted using the historical trend.

The synthetic wage sum for South Australia EGWWS needs to be further split into EGW. EGWWS is a 1-digit industry in the Australian and New Zealand Standard Industry Classification (ANZSIC) which comprises the 2-digit industries "Electricity Supply", "Gas Supply", "Water Supply, Sewage and Drainage Services", and "Waste Collection, Treatment and Disposal Services". EGW comprises the 2-digit industries "Electricity Supply", "Gas Supply", "Water Supply, Sewage and Drainage Services" (ABS, Catalogue no. 1292.0). There are no time series for wages on 2-digit level available, but the wage sum can be calculated using Census data. This is illustrated in Figure 1.

**Figure 1: Splitting the synthetic wage sum for EGWWS for 'other' states**



To split EGWWS for South Australia further to EGW the Census surveys from 2006 and 2011 are used which hold information about how many employees there were in South Australia in EGW and EGWWS and which income bracket they belong to. This is again essentially an average wage measure, but it is a good proxy for as close as we can get to a measure for how labour costs vary for 2-digit industries.

In Census (2006 and 2011) the following data is available:

- Employment by state and by 2-digit industries; and

- Employed persons by income bracket by state and 2-digit industries<sup>3</sup>.

From this data, we can calculate weights of EGW in SA out of EGWWS in SA. The weights are calculated from the wage sums which are the number of employees multiplied by their income.

---

<sup>3</sup> The average income is calculated using the mid-point of each income interval. Only full-time employees' income is included and full-time employees with negative income are not included. For the top income bracket which earns \$2,000 or more each week, the 'mid-point' is \$6,000 which is the average of \$2,000 and \$10,000.

**Table 4: Wage sums for EGW**

Weekly wage sum (\$)			
	2006	2011	average
EGW, SA	7,392,875	15,206,885	11,299,880
Waste, SA	1,155,604	2,192,020	1,673,812
Total	8,548,479	17,398,905	12,973,692
EGW's weight	0.865	0.874	0.869

Source: KPMG calculations using data from Census 2006 and 2011

The average wage sum is used to amend the measurement errors from just having two data points. EGW's average weight is 0.869 out of the total which means that EGW constitute 86.9 per cent of the total wage sum in EGWWS.

### 3.4 LPI for EGWWS and CON

The final step to calculate LPI for EGWWS and CON is to apply the wage sum shares estimated in section 3.3 to the wage sums estimated in section 3.2 and deflating with historical and forecast employment. The general equation for LPI is:

$$LPI_t^{SA,i} = \frac{SWS_t^{other,i} * WSS_t^{SA,i}}{LBE_t^{SA,i}} \quad (4)$$

### 3.5 LPI for EGW

There are additional calculations required to reach the LPI for EGW in South Australia. The equation for this 2-digit industry LPI is described in equation (5)

$$LPI_t^{SA,ew} = \frac{SWS_t^{other,EGWWS} * WSS_t^{SA,EGWWS} * r^{EGW}}{LBE_t^{SA,EGW}} \quad (5)$$

Where  $r^{EGW}$  is the wage sum share of EGW in EGWWS in South Australia as described in Table 4.

## 4. South Australia electricity, gas, water and waste water services LPI forecasts

This section addresses the terms of reference (1). This section describes the modelling approach to generate LPI forecasts for EGWWS LPI in South Australia and present the findings. It relies heavily on the assumptions and methodology outlined in section 3.

### 4.1 Approach

This section describes the different modelling steps involved in producing the projections for LPI for EGWWS in South Australia. Historical data is first estimated and next projected in an econometric model. The projection of LPI for EGWWS in a group of states (which includes South Australia) is then split down to represent South Australian EGWWS LPI only.

#### 4.1.1 Estimating historical EGWWS LPI

The first task in projecting the LPI for EGWWS in South Australia is to construct the historical LPI series using equation (1).

LPI for EGWWS is only available for New South Wales, Victoria and total Australia. To get closer to an LPI for EGWWS in South Australia, an LPI for the states without an LPI is constructed. The states and territories in this group are Queensland, South Australia, Western Australia, Tasmania, Northern Territory and the ACT.

For the electricity, gas, water and waste water services industry, equation (1) turns into:

$$LPI_t^{other,EGWWS} = \frac{LPI_t^{Aus,EGWWS} * LBE_t^{Aus,EGWWS} - \sum_{s=NSW,VIC} LPI_t^{s,EGWWS} * LBE_t^{s,EGWWS}}{\sum_{s=QLD,SA,WA,TAS,NT,ACT} LBE_t^{s,EGWWS}}$$

Where notation is as previously;  $LPI_t^{s,EGWWS}$  is the labour price index for EGWWS in state  $s$ , and  $LBE_t^{s,EGWWS}$  is total employment in EGWWS in state  $s$ .  $t$  denotes time.

#### 4.1.2 Forecasting EGWWS LPI

The method applied to derive the forecasting equation was to go from a general specification and sequentially remove insignificant variables to reach a specific regression. The specific regression for LPI for EGWWS in Queensland, South Australia, Western Australia, Tasmania, Northern Territory and the ACT is:

$$d \ln(LPI_t^{other,EGWWS}) = 0.02 + 0.47 * d \ln(GVA_t^{EGWWS}) - 0.01 * seas1 - 0.01 * seas2 - 0.01 * seas3 + \varepsilon_t$$

$\frac{7.03}{2.76}$ 
 $\frac{2.44}{3.35}$ 
 $\frac{2.51}{2.51}$

$$R^2=64.4$$

The explanatory variables are listed below.

- $GVA_t^{EGWWS}$  is the gross value added (GVA) by EGWWS in Australia; data from ABS catalogue 5206.
- $seasi$  are seasonal dummy variables for quarter  $i$ .  $i = 1, 2, 3$ . Seasonal dummy variables are binary variables which capture that LPI is seasonal.
- $\varepsilon_t$  is the error term.

The regression explains 64.4 per cent of variation in the dependent variable and all explanatory variables are statistically significant at least at the 5 per cent level. The regression hence explains data relatively well and forecasts should be robust.

#### 4.1.3 Deriving EGWWS LPI for South Australia

Combining equations (2), (3) and (4) gives the expression for LPI for EGWWS in South Australia:

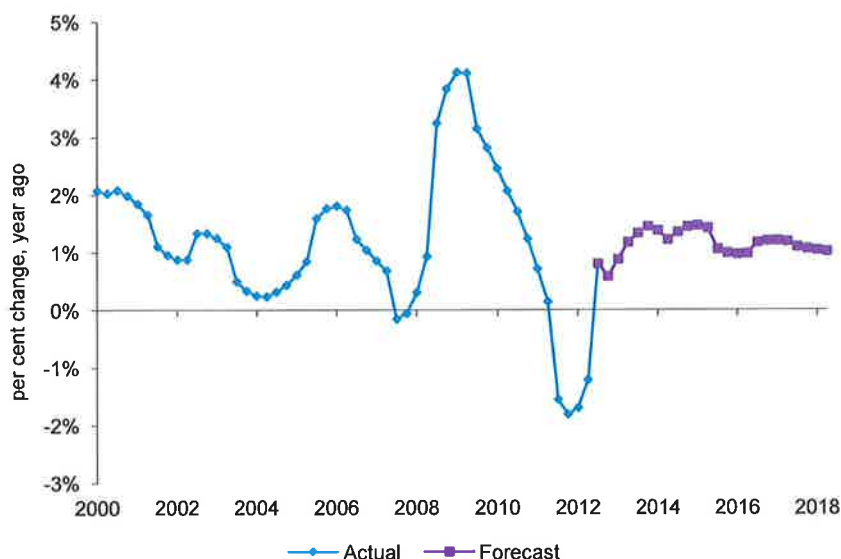
$$LPI_t^{SA,EGWWS} = \frac{LPI_t^{other,EGWWS} * \sum_{s \in other} LBE_t^{s,EGWWS} * \left[ \frac{AWE_t^{SA,EGWWS} * LBE_t^{SA,EGWWS}}{\sum_{s \in other} AWE_t^{s,EGWWS} * LBE_t^{s,EGWWS}} \right]}{LBE_t^{SA,EGWWS}}$$

South Australian employment in EGWWS has been extremely volatile and a 5-quarter centered moving average has been applied to smooth the employment series and the wage share series.

## 4.2 Background for EGWWS LPI forecasts

The key driver of the LPI forecasts derived from the regression presented in section 4.1.2 is the gross value added by EGWWS nationally. The forecasts from KPMG's macroeconomic model are presented in Chart 1.

**Chart 1: Historical and forecast real GVA for Australian EGWWS**



Source: ABS catalogue no 5206, KPMG's macroeconomic model

GVA in Australian EGWWS has highly volatile and the last 'cycle' of activity peaked in 2009 on the back of high investments encouraged by deregulation and a move into renewable energy. Activity slipped off its peak and the industry contracted in three quarters in 2011 and 2012. The industry is nevertheless on a path to recovery and our projected growth is in line with the historical average. The firm outlook is supported by a recent pickup in national investments in electricity generation, transmission and distribution.<sup>4</sup>

The projected growth in EGWWS GVA is creating upward wage pressures in the industry since employment is not expanding as rapid as output. Output per worker is projected to grow faster in EGWWS than in other industries of the economy, driving wages higher.

South Australia's wage share out of the group's wage share, calculated by equation (3) has been declining steadily since data series began in 1984.<sup>5</sup> The forecast wage share is a continuation of this linear trend. South Australia's wage share has been declining as other states, most noticeably Queensland and Western Australia, have experienced higher growth in both employment and wages.

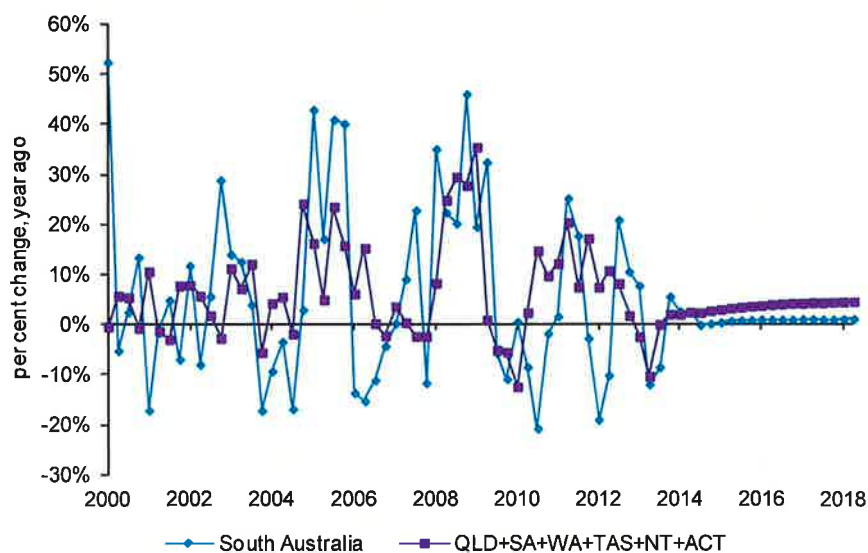
South Australian EGWWS employment is volatile as illustrated in Chart 2. The employment trend reflects the high industry activity in 2008 followed by some softer years sparked by the economic slowdown after 2008. South Australian EGWWS employment has expanded at double-digit pace in

<sup>4</sup> ABS Catalogue 8760, Engineering Construction Activity, Australia, released 3 October 2012.

<sup>5</sup> Data for employment are from ABS Catalogue no. 6291, Labour Force, Australia, Detailed, Quarterly. Data for average weekly earnings are from ABS, Average Weekly Earnings, data made available on request.

recent quarters but is projected to stabilise at a lower growth rate as the sector has absorbed recent investments.

**Chart 2: Historical and forecast employment in EGWWS**

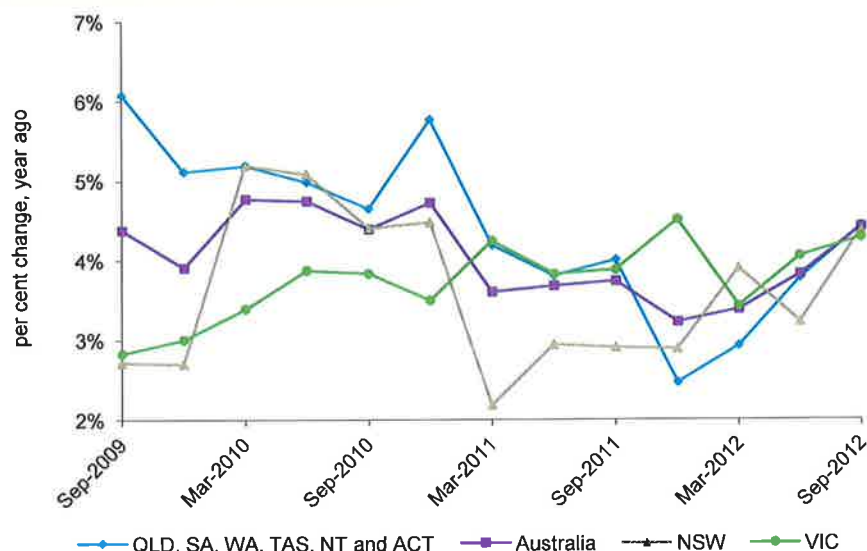


Source: ABS catalogue 6291 and KPMG's macro model

### 4.3 Findings

The estimated historical LPI for the group of Queensland, South Australia, Western Australia, Tasmania, Northern Territory and the ACT is illustrated in Chart 3.

**Chart 3: Historical LPI for EGWWS**



Source: ABS release 6345 and specially requested ABS data, KPMG calculations

Chart 3 shows how the LPI for the group including SA is calculated from the available historical data. The group's LPI represents the variation in the national index which is not assigned to NSW or VIC. Historical EGWWS LPI has been accelerating in recent quarters; for Australia and the group which includes South Australia since the December quarter 2012.

The projected labour cost escalators are outlined in Table 5 which reproduces the first line of Table 1.

**Table 5: Projected nominal LPI for South Australian EGWWS**

	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Electricity, gas, water and waste services	4.7%	2.6%	3.9%	4.3%	4.6%	4.6%

Source: KPMG modelling

LPI for South Australian EGWWS is projected to grow at 4.7 per cent in 2012-13 which is a slight acceleration from the latest historical data point for Australia (4.4 per cent in third quarter of 2012). The pick-up in LPI growth is mainly created by the projected acceleration in industry GVA.

The wage cost escalator is projected to slow in 2013-14 as employment growth in South Australian EGWWS slows less relatively the group of South Australia, Queensland, Western Australia, Tasmania, Northern Territory and the ACT. Remember, the LPI is calculated based on five-quarter centered moving employment averages, and it is the high growth in South Australian EGWWS employment in the first quarter of 2013 which pulls up employment growth for 2013-14.

From 2014-15, LPI for EGWWS in South Australia is accelerating, driven by activity in the sector growing at a faster pace than employment. In other words, productivity is rising and the wage sum is expanding faster than the number of employees in the industry.

The projected labour cost escalators in Table 5 are realistic as they are within the bound of historical, observed LPI for EGWWS. Australian LPI for the industry grew, on an annual basis, in excess of 4.7 per cent for the majority of 2010. Also, the estimated series for EGWWS LPI in Queensland, South Australia, Western Australia, Tasmania, Northern Territory and the ACT grew in excess of 4.6 per cent from the third quarter of 2009 throughout 2010.

## 5. South Australia electricity, gas, and water services LPI forecasts

This section addresses the terms of reference (1). This section describes the modelling approach to generate LPI forecasts for EGWWS LPI in South Australia and present the findings. It relies heavily on section 3 and 4.

### 5.1 Approach

The derivation of LPI for EGW only in South Australia relies on the results from section 4. Combining the expression for EGWWS LPI in (4) and the expression for EGW LPI in (5) gives the following expressions which shows that EGW LPI is essentially EGWWS LPI adjusted for employment growth.

$$LPI_t^{SA,EGW} = \frac{LPI_t^{SA,EGWWS} * LBE_t^{SA,EGWWS} * r^{EGW}}{LBE_t^{SA,EGW}}$$

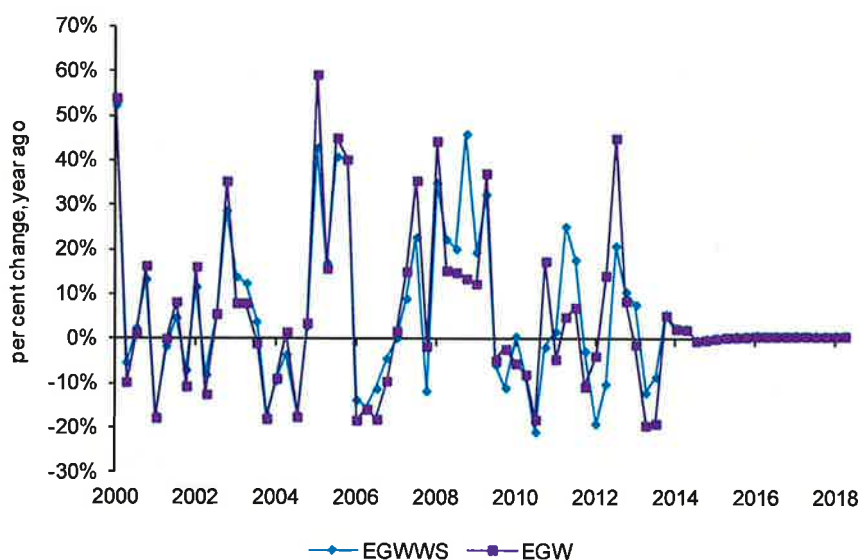
Where  $r^{EGW}$  is the relative weight of EGW to EGWWS according to Census as calculated in Table 4. Employment in EGW is even smaller than in EGWWS and the series' high volatility makes it necessary to smooth it by applying a nine-quarter centered moving average.

### 5.2 Background for EGW LPI projections

To explain the variations in the LPI for EGW compared to EGWWS, it is most useful to look at how employment forecasts vary between the two groups of industries. As outlined in previous section, the key difference between LPI for the two groups is different employment growth.

The industries in EGW form the largest part of EGWWS. In 2011-12, 83 per cent of employment in EGWWS was EGW. EGW's large weight in EGWWS is obvious from Chart 4.

**Chart 4: Employment in EGW and EGWWS**



Sources: ABS catalogue no. 6291 and KPMG's macroeconomic model

Employment in EGWWS and its sub-industry EGW move closely together in history and is generally forecast to continue to do so in the future. Projected employment growth in EGW is lower in the nearest forecasting quarters as relative higher investments by EGW industries push labour demand lower.

## 5.3 Findings

The results for EGW are very similar to those for EGWWS. Table 6 reproduces the second row of results in Table 1.

Table 6: Projected nominal LPI for South Australian EGW

	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Electricity, gas and water services	5.1%	4.8%	4.3%	4.6%	4.9%	4.9%

Source: KPMG modelling

The difference between the LPI projections for EGWWS and EGW come from the industry groups' wage sums expanding at the same pace—mainly driven by GVA in EGWWS—while employment in EGW is slower. EGW industries hence need fewer workers to produce the same amount, and workers' productivity is growing relative to that of EGWWS industries.

The projected labour cost escalators in Table 6 are realistic as they fall within the historical growth rates of the estimated LPI for EGWWS in Queensland, South Australia, Western Australia, Tasmania, Northern Territory and the ACT; growth was above 6 per cent in the first quarter of 2009 and above 5.1 per cent for the following two quarters.

## 6. The appropriate index to apply to the circumstances of ElectraNet

This section addresses the terms of reference (2).

The LPI for EGW and EGWWS have been derived in the sections above. The definition of EGWWS is electricity, gas, water and waste water services while EGW only comprises electricity, gas and water services. The difference between the two sets of cost escalators is that waste water services are included in EGWWS but not in EGW.

ElectraNet is an electricity transmission business and as such does not operate in waste water services and we therefore find that EGW is a more appropriate index than EGWWS to apply to the circumstances of ElectraNet.

## 7. South Australia construction LPI forecasts

This section addresses the terms of reference (3). This section describes the modelling approach to generate LPI forecasts for CON LPI in South Australia and present the findings. It relies heavily on section 3.

### 7.1 Approach

This section describes the different modelling steps involved in producing the projections for LPI for CON in South Australia. Historical data are first estimated and next projected in an econometric model. The projection of LPI for CON in a group of states which includes South Australia is then split down to represent South Australian CON LPI only.

#### 7.1.1 Estimating historical CON LPI

The first task in projecting the LPI for CON in South Australia is to construct the historical LPI series using equation (1).

LPI for CON is only available for New South Wales, Victoria, Queensland, Western Australia and total Australia. To get closer to an LPI for CON in South Australia, an LPI for the states without an LPI is constructed. The states and territories in this group are South Australia, Tasmania, Northern Territory and the ACT.

For the electricity, gas, water and waste water services industry, equation (1) turns into:

$$LPI_t^{other,CON} = \frac{LPI_t^{Aus,CON} * LBE_t^{Aus,CON} - \sum_{s=NSW,VIC,QLD,WA} LPI_t^{s,CON} * LBE_t^{s,CON}}{\sum_{s=SA,TAS,NT,ACT} LBE_t^{s,CON}}$$

Where notation is as previously;  $LPI_t^{s,CON}$  is the labour price index for CON in state  $s$ , and  $LBE_t^{s,CON}$  is total employment in CON in state  $s$ .  $t$  denotes time.

#### 7.1.2 Forecasting CON LPI

The method applied to derive the forecasting equation was to go from a general specification and sequentially remove insignificant variables to reach a specific regression. The variables included in

the general regression are listed in section 3.1. The specific regression for LPI for CON in South Australia, Tasmania, Northern Territory and the ACT is:

$$d \ln(LPI_t^{other, CON}) = -0.01 + 0.22 * d \ln(COE_{t-2}^{other}) + 2.69 * d \ln(GSP_{t-1}^{other}) \\ + 0.97 * d \ln(CPI_{t-1}) + 1.36 * d \ln(CPI_{t-4}) \\ - 0.01 * seas1 - 0.02 * seas2 - 0.02 * seas2 + \varepsilon_t$$

$\begin{matrix} 1.97 & 3.40 & 2.35 & 2.61 & 3.61 & 3.07 & 3.90 & 4.511 \end{matrix}$

$$R^2 = 79.5$$

The explanatory variables are:

- $COE_t^{other}$  is the compensation of employees in current price in South Australia, Tasmania, Northern Territory and the ACT. Data are from ABS catalogue 5220, "Australian National Accounts: State Accounts";
- $GSP_t^{other}$  is the real gross state product for South Australia, Tasmania, Northern Territory and the ACT. Data are from ABS catalogue 5220;
- $CPI_t$  is the consumer price index, ABS catalogue 6401; and
- $seasi$  are seasonal dummies for quarter  $i$ .  $i = 1, 2, 3$ ,

and  $\varepsilon_t$  is the error term.

The regression explains 79.5 per cent of variation in the dependent variable and all explanatory variables are statistically significant at least at the 5 per cent level. The regression hence explains data relatively well and forecasts should be robust.

The explanatory variables all have the expected sign; higher compensation of employees, gross state product and consumer prices all drive LPI higher.

### 7.1.3 Deriving CON LPI for South Australia

Combining equations (2), (3) and (4) gives the expression for LPI for CON in South Australia:

$$LPI_t^{SA, CON} = \frac{LPI_t^{other, CON} * \sum_{s \in other} LBE_t^{s, CON} * \left[ \frac{AWE_t^{SA, CON} * LBE_t^{SA, CON}}{\sum_{s \in other} AWE_t^{s, CON} * LBE_t^{s, CON}} \right]}{LBE_t^{SA, CON}}$$

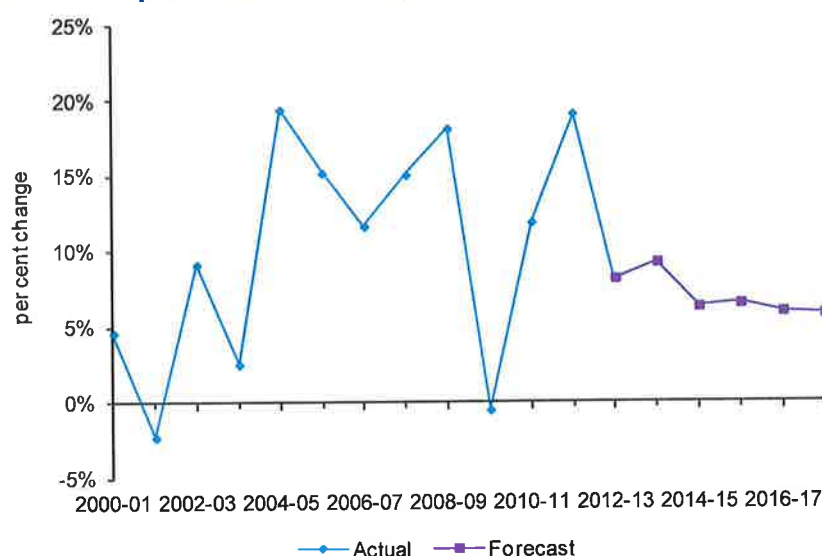
## 7.2 Background for CON LPI forecasts

The key drivers of the LPI forecasts according to the regression presented in section 7.1.3, are compensation of employees, GSP and CPI. The forecasts from KPMG's macroeconomic model are presented next.

Chart 5 shows historical and projected compensation of employees in CON in the group consisting of South Australia, Tasmania, Northern Territory and the ACT. The sum of compensation of employees for these states is applied because the dependent variable, LPI is for this group of states.

Compensation of employees has expanded rapidly in CON except from during the global financial crisis. Our forecast is for continued strength in the CON sector and as an outcome of this, compensation of employees is rising.

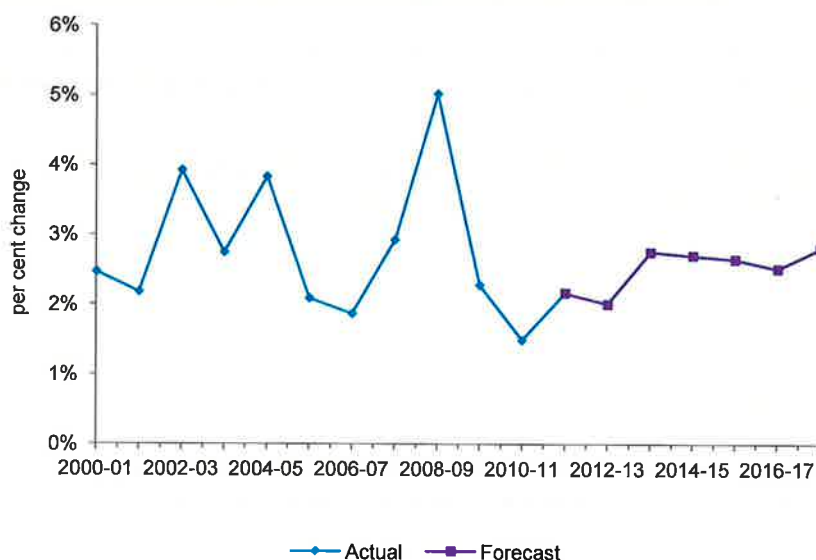
**Chart 5: Compensation of CON employees, nominal, SA+TAS+NT+ACT**



Source: ABS catalogue no 5220, KPMG's macroeconomic model

Historical and forecast real GSP for the group of states is shown in Chart 6. South Australia's GSP is dominating the group's as its weight is around 55 per cent of the group. GSP has historically been growing around 2 per cent each year, and a slight acceleration is projected. This projecting happens on the back of the expanding economies in Northern Territory and South Australia. Both economies are resource rich and the growth outlook is on the upside of the national outlook.

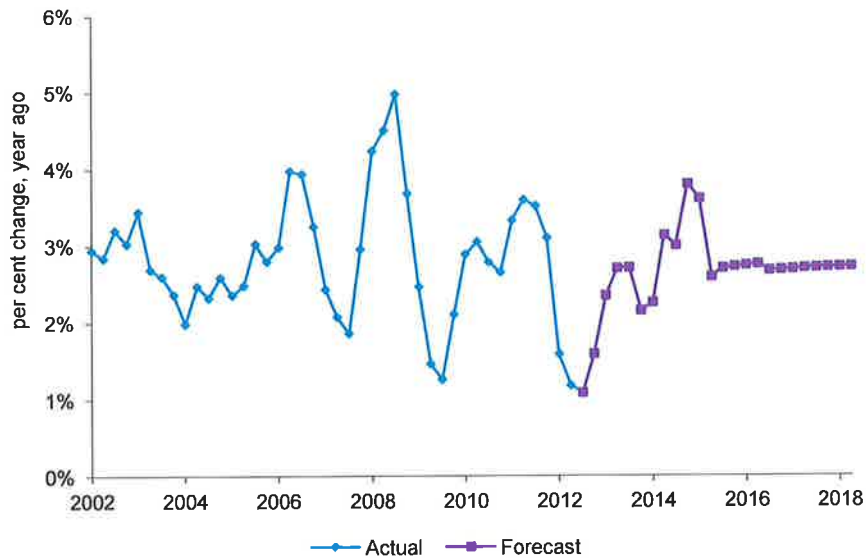
**Chart 6: Historical and forecast real GSP for SA+TAS+NT+ACT**



Source: ABS catalogue no 5220, KPMG's macroeconomic model

Chart 7 shows historical and forecast CPI. After very low inflation earlier in 2012, price pressures are projected to pick up. A solid Australian economy is supporting upward price pressures and the potential of a moderately weaker exchange rate is adding imported inflation to the upward pressures on domestic prices. RBA's inflation target between 2 and 3 per cent is generally met, but fast growth—in particular in mining states Queensland and Western Australia—is likely to push inflation higher than the upper limit of the inflation target.

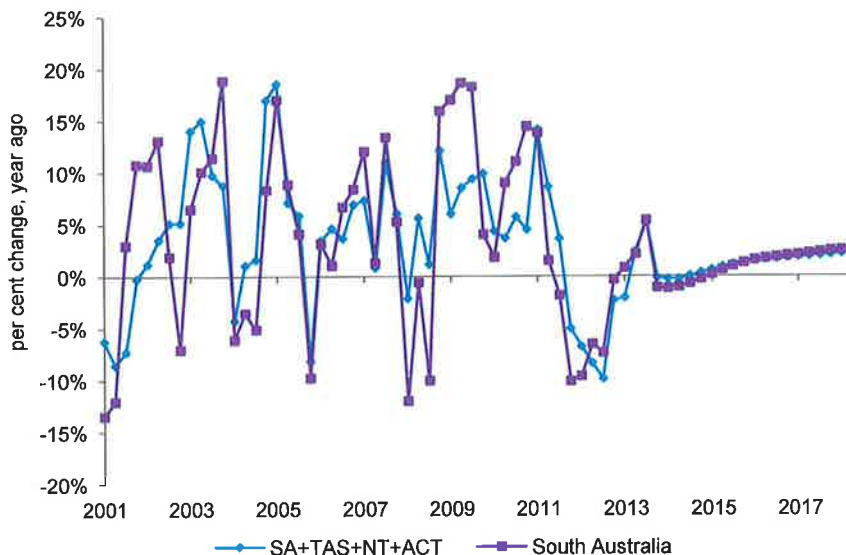
**Chart 7: Historical and forecast CPI**



Source: ABS catalogue no 6401, KPMG's macroeconomic model

Chart 8 confirms that South Australia carries a large weight in the group as South Australia's CON employment growth is highly correlated with the rest of the group's. The outlook for construction employment is cautiously optimistic. Employment has been contracting for four quarters but is projected to start improving thanks to a firmer economy, easier access to finance and lower interest rates.

**Chart 8: Historical and forecast employment in CON**

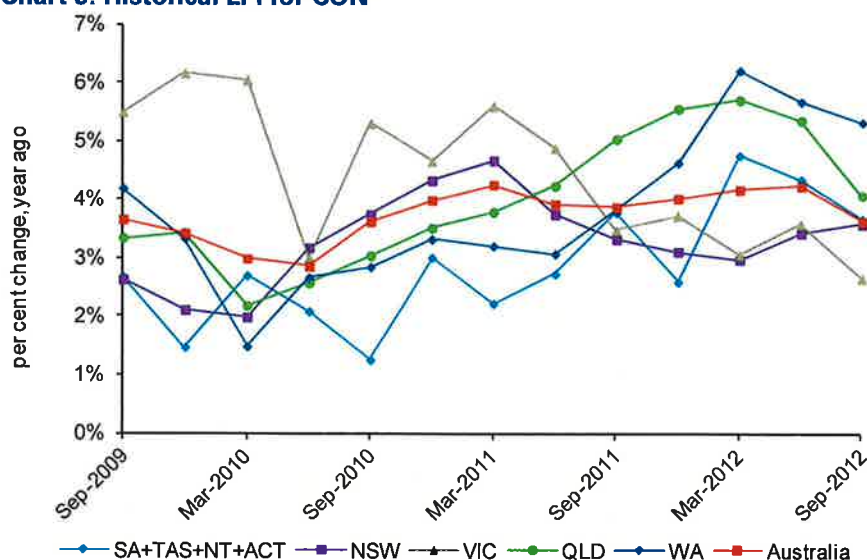


Source: ABS catalogue 6291 and KPMG's macro model

## 7.3 Findings

The estimated historical LPI for the group of South Australia, Tasmania, Northern Territory and the ACT is illustrated in Chart 9.

**Chart 9: Historical LPI for CON**



Source: ABS release 6345 and specially requested ABS data, KPMG calculations

Chart 9 shows how the LPI for the group including SA is calculated from the available historical data. The group's LPI represents the variation in the national index which is not assigned to NSW, VIC, QLD or WA. Historical CON LPI has an accelerating trend for the group which includes South Australia, but growth is still slower than in QLD and WA where many large mining construction projects are carried out at the moment.

The projected labour cost escalators are outlined in Table 7. The definition of EGWWS is electricity, gas, water and waste water services while EGW only comprises electricity, gas and water services. The difference between the two sets of cost escalators is that waste water services are included in EGWWS but not in EGW.

ElectraNet is an electricity transmission business and as such does not operate in waste water services and we therefore find that EGW is a more appropriate index than EGWWS to apply to the circumstances of ElectraNet.

- 4) *A realistic expectation of ElectraNet's reasonable forecast of external labour costs in the form of a construction sector wage forecast for South Australia for the period 2012-13 to 2017-18.*

Table 2.

**Table 7: Projected LPI for South Australian CON**

	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Construction	5.0%	4.9%	6.2%	5.5%	5.0%	5.0%

Source: KPMG modelling

The key driver of South Australian CON LPI is compensation of employees which is closely connected to industry output. Firm performance in the construction sector is pushing demand for construction labour higher and the industry's LPI rises.

The expansion in GSP is another significant driver of LPI; when general activity in the economy expands, so does the cost of construction employees. This represents the effect of construction competing with other industries for labour. This finding also reflects that construction is an important industry in the economy. When construction performs well, often so does the overall economy.

The final economic driver—the rest are seasonal dummies—is the consumer price index. Higher consumer prices drive the LPI for construction in South Australia higher. The effect is lagged so higher CPI has a positive impact on LPI in later quarters. This effect likely represents the bargaining power of construction employees; when consumer prices rise, employees are able to achieve higher wages and LPI rises.

## 8. Expert's statement

I have read the Federal Court's Practice Note CM 7 Expert Witnesses in proceedings in the Federal Court of Australia (1 August 2011) and prepared this report in a form consistent with Practice Note CM 7.

I have prepared this report for the purpose set out in section 1.1 of this report and it is not to be used for any other purpose without my prior written consent. Accordingly, KPMG accepts no responsibility in any way whatsoever for the use of this report for any purpose other than that for which it has been prepared.

I have made all inquiries that I believe are desirable and appropriate and no matters of significance which I regard as relevant have, to my knowledge, been withheld from the material set out in this report.

Nothing in this report should be taken to imply that I have verified any information supplied to me, or have in any way carried out an audit of any information supplied to me other than as expressly stated in this report.

My opinion is based solely on the information set out in this report. If I amend any conclusion on further information, I will amend the report.



*Ashley Winston*

## Appendix A: References

ABS, Catalogue no. 1292.0, *Australian and New Zealand Standard Industrial Classification 2006*, February 2006

ABS Catalogue 5206.0, *Australian National Accounts: National Income, Expenditure and Product*

ABS catalogue 5220.0, *Australian National Accounts: State Accounts*

ABS Catalogue 6291.0.55.003, *Labour Force, Australia, Detailed, Quarterly*

ABS Catalogue 6302.0, *Average Weekly Earnings, Australia*

ABS Catalogue 6345.0, *Labour Price Index, Australia*

ABS Catalogue 6401.0, *Consumer Price Index, Australia*

ABS Catalogue 8760.0, *Engineering Construction Activity, Australia*

AER, 2012, Australian Energy Regulator, *Draft Decision, ElectraNet, Transmission Determination, 2013-14 to 2017-18*, November 2012

Census 2006

Census 2011

ElectraNet, 2012a, ElectraNet homepage,  
<http://www.electranet.com.au/corporate/governance/ownership/>, accessed 14 December 2012

ElectraNet, 2012b, [ElectraNet homepage, <http://www.electranet.com.au/corporate/governance/>, accessed 14 December 2012]

Federal Court of Australia, 2011, *Federal Court of Australia, Practice Note CM 7, Expert witnesses in proceedings in the Federal Court of Australia, 1 August 2011*, <http://www.fedcourt.gov.au/law-and-practice/practice-documents/practice-notes/cm7>, accessed 14 December 2012.

## Appendix B: Ashley Winston's curriculum vitae and relevant experience



**Dr Ashley Winston**  
**Director**

KPMG  
20 Brindabella Circuit  
Brindabella Business Park  
Canberra Airport ACT 2609

Tel +61 02 6248 1163  
Fax +61 02 6248 1122  
Mob +61 407 380 455  
[awinston@kpmg.com.au](mailto:awinston@kpmg.com.au)

### Function and Specialisation

CGE Modelling

### Certifications & Professional Memberships

- Ph.D in Economics, Monash University
- Master of Economics (with Honours), Monash University
- Bachelor of Economics (with Honours), Monash University

### Profile/Overview

Ashley leads KPMG's specialist economic modelling and analysis team. For the last 15 years Ashley was a Senior Research Fellow at the Centre of Policy Studies at Monash University, providing policy advice and analysis to various levels of government and private sector clients in Australia, North America, Asia, Africa, South America and Western and Eastern Europe.

Ashley has extensive research conducting model-based analysis of a wide range of policy issues. For the last 8 years Ashley was based in Washington DC, working with several federal agencies of the US government, US inter-agency policy teams and the Senate and House committees of the US Congress including Senate Finance and House Ways and Means. Ashley also has ongoing research relationships with several overseas economic research centres such as the Centre for Global Trade Analysis.

Ashley's expertise includes: CGE modelling (theory and applied); trade and international macroeconomics; energy and environmental policy; investment and capital accumulation, and interactions with corporate finance and taxation; and economic policy analysis/advice. Ashley has developed a global reputation as a leading expert on CGE modelling, and his advice is widely sought from all over the world.

### Selected Experience

Ashley's experience includes:

- A utility company: Cost escalators. Ashley recently led our engagement with a utility company to provide

escalators for labour costs, construction costs and electricity prices. Ashley oversaw the modeling of the three types of cost escalators.

- **Federal Government Agency: Regional Economic Impact and Assessment of Manufacturing Facilities** – KPMG was engaged to assess the possible expansion of two strategic manufacturing facilities. Ashley played a key role in the development of the modelling methodology for each phase of the project and ensured the timely delivery of high quality outputs.
- **A Singaporean government agency: Supply and Delivery of Economic Impact Assessment Models** – KPMG has been engaged by the Government of Singapore to develop a CGE model for policy analysis. Ashley is leading the complete development of this and ensuring the model is to international best practice.
- **An inter-state environmental planning agency: Critique of economy wide modelling** – Ashley provided the high level of expertise required to critically and comprehensively evaluate the modelling done to date. Ashley's insights resulted in key recommendations being adopted by the client.
- **A State Government Department: Modelling Manufacturing Industry Scenarios** – KPMG Econtech provided advice to the Department on the future of the State's manufacturing industry. Ashley provided expert advice on the baseline trajectory, as well as the impacts of various economic events and policies, such as: exchange rate, carbon tax and productivity improvements.
- **Policy advisor to a Gulf country in the Middle East on the implementation of a new taxation system.** Ashley is also assisting this country in building an enhanced in-house economics capacity, both in terms of analytical, planning and policy functions.
- **CGE analyst and policy advisor as part of a US federal inter-agency team to report on proposed US cap-and-trade policy for carbon emissions ("Waxman-Markey" bill).**
- **Advisor to the Economic Research Service of a US Department on US bio-energy policy, including managing several policy research projects.** This resulted in several public policy papers, quoted at press conferences.

## Appendix C: Terms of reference

The scope of work as described by ElectraNet in their letter to KPMG in November is:

### *Scope of Work*

*The independent expert will provide a report addressing the following issues:*

- 1) A realistic expectation of ElectraNet's reasonable forecast internal labour costs in the form of a Labour Price Index (LPI) forecast for the South Australian electricity, gas and water sector (EGW) and South Australian electricity, gas, water and waste water services sector (EGWWS) for the period 2012-13 to 2017-18;*
- 2) Advice on the appropriate index to apply to most accurately represent the circumstances of ElectraNet for the period 2012-13 to 2017-18;*
- 3) A realistic expectation of ElectraNet's reasonable forecast external labour costs in the form of a construction sector wage forecast for South Australia for the period 2012-13 to 2017-18;*
- 4) Detailed explanations and supporting evidence used to develop the cost escalation forecasts; and*
- 5) A critical assessment of the methodology applied in deriving preparing the labour cost escalation assumptions adopted for the purposes of the Draft Decision to be published by the AER by 30 November 2012.*

Points 1) to 4) are addressed in this report. Point 5) is addressed in a separate report.