TransGrid

TransGrid Revised Revenue Proposal
2018/19 – 2022/23

Appendix A

BIS Oxford Economics:

Wage forecasts to 2023

Expected Wage Changes in the EGWWS Sector to 2022/23

> Australia and New South Wales

> October • 2017

> TransGrid

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BIS OXFORD ECONOMICS

BIS Oxford Economics

Effective March 1 2017, UK-headquartered **Oxford Economics** acquired a controlling stake in **BIS Shrapnel.** The latter had been in continuous operation since July 1, 1964 as a completely independent Australian owned firm providing industry research, analysis and forecasting services. The new organisation is now known as **BIS Oxford Economics**.

Oxford Economics was founded in 1981 as a commercial venture with Oxford University's business college to provide economic forecasting and modelling to UK companies and financial institutions. Since then, the company has become one of the world's foremost independent global advisory firms, providing reports, forecasts and analytical tools on 200 countries, 100 industrial sectors and over 3,000 cities. The company's best-of-class global economic and industry models and analytical tools provide an unparalleled ability to forecast external market trends and assess their economic, social and business impact.

Headquartered in Oxford, England, with regional centres in London, New York, and Singapore, Oxford Economics has offices across the globe in Belfast, Chicago, Dubai, Miami, Milan, Paris, Philadelphia, San Francisco, and Washington DC. Oxford Economics employs over 300 full-time people, including more than 200 professional economists, industry experts and business editors—one of the largest teams of macroeconomists and thought leadership specialists. The company's global team is highly skilled in a full range of research techniques and thought leadership capabilities, from econometric modelling, scenario framing, and economic impact analysis to market surveys, case studies, expert panels, and web analytics. Underpinning the in-house expertise is a contributor network of over 500 economists, analysts and journalists around the world.

Oxford Economics is a key adviser to corporate, financial and government decision-makers and thought leaders. The company's worldwide client base now comprises over 1000 international organisations, including leading multinational companies and financial institutions; key government bodies and trade associations; and top universities, consultancies, and think tanks.

20 October 2017

The modelling and results presented here are based on information provided by third parties, upon which BIS Oxford Economics has relied in producing its report and forecasts in good faith. Any subsequent revision or update of those data will affect the assessments and projections shown.

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EXECUTIVE SUMMARY

In October 2016, BIS Oxford Economics was engaged by TransGrid to provide wage forecasts relevant to electricity transmission networks in New South Wales. Forecasts of wages were used by TransGrid to develop the real price changes over its upcoming regulatory period, which, in turn, was used by the business to construct its operating and capital expenditure forecasts. Both capex and opex forecasts were included in TransGrid's initial revenue proposal to the AER in January 2017.

Although TransGrid's next revenue proposal covered the five-year period from 2018/19 to 2022/23 (inclusive), BIS Oxford Economics was asked to provide eight year forecasts covering financial years 2016/17 to 2022/23 to allow for escalation over the full outlook period. Forecasts of both nominal and real wages growth were provided.

On 21 September 2017, BIS Oxford Economics was again engaged by TransGrid to update the wage forecasts included in TransGrid's initial revenue proposal. In addition, BIS Oxford Economics was asked to provide an expert opinion on expected wage changes in the New South Wales Electricity, Gas, Water and Waste Services (EGWWS or the Utilities sector) as measured by the public and private WPI (wage price index). TransGrid had asked that we provide numerical forecasts of wages for the New South Wales utilities sector taking into account the macroeconomic conditions that are likely to prevail over the next six years including the likely investment profile and expected employment growth within the sector.

+3.7%

Expected wage increases for employees in the utilities industry

BIS Oxford Economics expects wages for the Australian Electricity, Gas, Water and Waste Services (EGWWS or 'Utilities) sector — as measured by the public and private WPI for the utilities sector — to average 3.7% per annum over the five years to 2022/23, 0.5% higher than the national 'All Industries' average of 3.2% p.a. over the same five-year period.

Utilities wages are forecast to increase by more than the national average because of the following factors:

- 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.
- strong union presence in the utilities sector will ensure outcomes for collective agreements, which covers nearly 61% of the workforce, remain above the wage increases for the national 'all industry' average.
- increases in individual agreements (or non-EBA wages) are expected to strengthen from current weakness as broadly based economic recovery takes a foothold from early next decade.
- demand for (tight) skilled labour as investment in the sector picks up from late this decade will also be a key driver of wages going forward.
- 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 EGWWS sector is not impacted in the same way due to its obligation to provide essential services and thus retain skilled labour.

New South Wales is Australia's largest state economy. As a result, wage increases in New South Wales tends to track the Australian wage cycle fairly closely. That said, state wage increases can differ from the Australian average if the state's utilities sector is undertaking a larger volume of work (relative to the national average). In addition, state industry wages can grow faster than the national average if it faces stronger competition from related industries such as the construction section which employ similarly skilled labour.

BIS Oxford Economics is forecasting wages in the NSW utilities sector to dip below the national average over 2017/18 before converging to and then surpassing the national average early next decade as utilities investment picks up in the state. Overall, we expect wage increases in the NSW EGWWS sector to average 3.8% p.a. over the five years to 2022/23 (i.e. 0.1% above the national average).

Fig. 1. Wage Forecasts for Australia and New South Wales

(Per cent change, year average, year ended June)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Average (g)
NOMINAL LABOUR PRICE CHANGES	Actuals						Forecasts	Next Regulatory Period					
New South Wales Wages													
(1) All Industries:													
- Average Weekly Earnings (a)	2.9	4.8	2.4	2.1	3.9	1.3	2.6	2.9	3.0	3.7	4.3	4.0	3.6
- Average Weekly Ordinary Time Earnings (b)	3.1	4.3	2.6	4.3	2.3	0.6	2.8	3.5	3.1	3.7	4.3	4.3	3.8
- Wage Price Index (c)	3.6	3.1	2.5	2.3	2.1	2.1	2.5	2.6	2.5	3.2	3.5	3.6	3.1
(2) Electricity, Gas, Water and Waste Services Wages:													
Wage Price Index (c)	**3.2**	**3.7**	**3.0**	**3.0**	**1.3**	**1.3**	**2.5**	**3.2**	**3.4**	**3.9**	**4.2**	**4.2**	3.8
Australian Wages (d)													
(1) All Industries:													
- Average Weekly Earnings	4.1	4.3	2.7	1.3	1.7	1.6	2.6	2.8	3.0	3.8	4.5	4.1	3.6
- Average Weekly Ordinary Time Earnings	4.3	4.6	3.0	2.4	1.9	2.0	2.6	3.4	3.3	3.9	4.5	4.4	3.9
- Wage Price Index	3.6	3.3	2.6	2.4	2.1	2.0	2.3	2.6	2.6	3.3	3.7	3.8	3.2
(3) Electricity, Gas, Water and Waste Services Wages:													
Wage Price Index	3.5	4.2	3.2	2.8	2.4	2.2	2.6	3.2	3.3	3.8	4.1	4.2	3.7
Consumer Price Index (headline) (e)	2.3	2.3	2.7	1.7	1.4	1.7	2.4	2.4	2.4	2.4	2.4	2.4	2.4
REAL LABOUR PRICE CHANGES (f)	Actuals						Forecasts	Next Regulatory Period					
New South Wales Wages													
(1) All Industries													
Average Weekly Earnings	0.6	2.5	-0.3	0.4	2.5	-0.4	0.2	0.5	0.6	1.3	1.8	1.6	1.2
Average Weekly Ordinary Time Earnings	0.8	2.0	-0.1	2.6	1.0	-1.1	0.3	1.0	0.7	1.3	1.9	1.9	1.4
Wage Price Index	1.3	0.8	-0.2	0.6	0.7	0.4	0.0	0.1	0.1	0.7	1.1	1.1	0.6
(2) Electricity, Gas, Water and Waste Services Wages													
Wage Price Index	**0.9**	**1.4**	**0.3**	**1.3**	**0.0**	**-0.4**	**0.1**	**0.8**	**1.0**	**1.4**	**1.8**	**1.8**	**1.4**
Australian Wages													
(1) All Industries													
Average Weekly Earnings	1.8	2.0	0.0	-0.4	0.3	-0.1	0.2	0.3	0.5	1.4	2.0	1.7	1.2
Average Weekly Ordinary Time Earnings	2.0	2.3	0.3	0.7	0.5	0.3	0.2	1.0	0.9	1.4	2.1	2.0	1.5
Wage Price Index	1.3	1.0	-0.1	0.7	0.7	0.2	-0.1	0.1	0.2	0.8	1.3	1.3	0.8
(3) Electricity, Gas, Water and Waste Services Wages													
Wage Price Index	1.2	1.9	0.4	1.1	1.0	0.5	0.2	0.8	0.9	1.3	1.7	1.8	1.3

Source: BIS Oxford Economics, Department of Employment, RBA, ABS Data

(a) Average Weekly Earnings (AWE) for all employees. It is derived by dividing weekly total earnings (i.e. sum of gross or pre-tax earnings in the form of wages, salaries and bonuses as well as overtime earnings) by the number of employees. While changes in AWE reflects changes in the price of labour, it is materially affected by compositional effects such as changes in hours worked, upskilling of workers, changes in occupation and generally shifts in the quality and quantity of work performed. Hence, it cannot be interpreted as a series purely reflecting changes in the price of labour due to changing labour market conditions. That said, availability of a long historical series allows for the calculation of how employee earnings or labour costs have changed over time.

(b) Average Weekly Ordinary Time Earnings for full-time adult persons. This series is also affected by compositional effects but to a lesser extent than the AWE series as AWOTE excludes all part-time employees, juniors, trainees and apprentices along with all overtime earnings of full-time adult employees. Adult employees means employees paid at the adult rate.

(c) Wage price index for public and private, all industries. This series is published as either ordinary time hourly rates pay or total (i.e. including overtime) hourly rates of pay excluding bonuses. However, at the state industry level, data is only published for total hourly rates of pay excluding bonuses. Hence, at the Australia level we present the total hously rates of pay excluding bonuses to make it compatible with the state industry wage measure. Note that both the ordinary time and total time annual growth rates are very similar over time and rarely are they different to each other. On seldom ocassions when growth rates differ, the difference is usually only 0.1%. Note also that the WPI series is unaffected by compositional shifts in earnings and hence is a pure labour price measure. That is, the WPI reflects changes in the demand and supply of labour or generally changes in the labour market conditions. As bonuses are excluded, this series of the WPI does not reflect compensation for productivity improvements.

(d) Australian wages provided for comparison.

(e) Inflation forecasts are calculated as a geometric mean of the 'official' inflation forecasts over the next 10 years. This methodology has been adopted by the AER in their recent revenue decisions.

(f) Real price changes are calculated by deducting the inflation rate from nominal price changes.

(g) Expected average wage change for TransGrid's next revenue determination period i.e. from 2018/19 to 2022/23 inclusive.

1. INTRODUCTION

Project background, motivation and research agenda

In October 2016, BIS Oxford Economics was engaged by TransGrid to provide wage forecasts relevant to electricity transmission networks in New South Wales. Forecasts of wages were used by TransGrid to develop the real price changes over its upcoming regulatory period, which, in turn, was used by the business to construct its operating and capital expenditure forecasts. Both capex and opex forecasts were included in TransGrid's initial revenue proposal to the AER in January 2017.

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On 21 September 2017, I (Kishti Sen, Senior Economist at BIS Oxford Economics) was asked by TransGrid to update the wage forecasts included in TransGrid's initial revenue proposal. In addition, I was asked to provide an expert opinion on expected wage changes in the New South Wales Electricity, Gas, Water and Waste Services (EGWWS or the Utilities sector) as measured by the public and private WPI (wage price index). TransGrid had asked that I provide numerical forecasts of wages for the New South Wales utilities sector taking into account the macroeconomic conditions that are likely to prevail over the next six years including the likely investment profile and expected employment growth within the sector.

In keeping with my instructions, I confirm that I have undertaken this engagement having regard to the Guidelines for Expert Witnesses in Proceedings in the Federal Court of Australia and the requisite statement to this effect is included in Appendix B. I have been assisted in the preparation of this report by Richard Robinson, Associate Director Economics at BIS Oxford Economics, Husam El-Tarifi (Economist) and Stella McMullen (Research Analyst) at BIS Oxford Economics. Curriculum vitas of all relevant personnel are attached in Appendix C. Notwithstanding the assistance from the other two economists, the opinions in this report are my own and I take full responsibility for them.

The Australian Bureau of Statistics is the primary data source for the consumer price index, wages, employment, real gross value added and investment (including engineering construction) data, and for a range of other economic variables shown in Fig.2 and Fig. 3. The most recent wages data is for the June 2017 quarter and the latest industry employment data is for the month of August 2017. The June 2016 quarter was the latest available data for real gross value added (at the Australian level only), investment and indeed most of the economic variables in Fig. 2. The detailed engineering construction data (by state and by category) have data up to June 2017 quarter. The latest data for Gross State Product and real gross value added for state industry sectors was 2015/16. Other inflation and interest rate data were sourced from the Reserve Bank of Australia while data and information concerning enterprise agreements were obtained from the Department of Employment.

Structure of the report

Forecasts of the economic variables in this report were mostly sourced from BIS Oxford Economics reports, including *Economic Outlook*, *Long Term Forecasts: 2017 – 2032*, *Engineering Construction: 2016/17 to 2031/32* and *Long Term Building Work Done Forecasts*, along with other unpublished forecasts and from BIS Oxford Economics internal research and modelling.

The previous Summary section presents an overview of the outlook for wages in the EGWWS sector including numerical forecasts which are presented in a summary table.

Section 2 provides a macroeconomic outlook for Australia and New South Wales. This section also has forecasts of key economic variables plus a discussion of the drivers and logic underpinning the forecasts. Section 2 essentially provides a context for our Australian wage forecasts including wage forecasts at the state level by industry.

Section 3 discusses BIS Oxford Economics' model of wage determinations and provides forecasts of national ('all industries') wages and CPI inflation.

Section 4 has wage forecasts for the Electricity, Gas, Water and Waste Services (EGWWS) sector at the Australia level and for New South Wales as measured by the WPI (wage price index).

Appendices, which includes CVs of project key personnel.

2. MACROECONOMIC OVERVIEW: AUSTRALIA AND NEW SOUTH WALES

2.1 AUSTRALIAN ECONOMIC OVERVIEW AND OUTLOOK

Offsetting investment cycles and slow structural change are keeping the economy soft

This is not a steady state economy. Hence the patchy quarterly growth figures which are symptomatic of our soft economy. It'll be like this through the end of the decade before non-mining business investment builds momentum sufficiently to drive stronger growth.

The structural change being underwritten by the lower dollar is just beginning. Rebuilding growth and investment in the dollar-exposed industries, and the subsequent broadening through the non-mining economy, will take time.

This is a reversal of the structural change during the mining boom when the rise in the Australian dollar (to well above parity with the US dollar) drove activity towards industries and regions servicing high levels of mining investment at the expense of non-mining dollar-exposed industries, incidentally making room for the mining boom.

Structural change is slow

Structural change is in any case a slow process. The driving force will be the improved competitiveness associated with a lower dollar.

The dollar is barely low enough to underwrite structural change in some sectors. It would be faster and broader if the dollar were lower. The lower the dollar, the faster the change.

Our behavioural modelling suggests a dollar in a range around $0.75US on current commodity prices and interest rate differentials. That leaves the dollar a little too high for our liking, crimping growth in dollar-exposed industries. Our estimate is a broad competitiveness range of $0.60-$0.72 US.

Even so, we've seen significant recoveries in dollar-exposed industries, particularly tourism and education services. And this is just the beginning. But they're only now starting the investment phase, let alone initiating a broadening of growth through the rest of the economy. Other dollar-exposed industries will benefit, including agriculture, finance and business services, mining and even manufacturing, particularly secondary processing of food. But with the A$ above US75 cents (or US80 cents recently), it is still too high, hampering competitiveness and growth.

There is progress, but it's slow.

Offsetting investment cycles means investment is flat

Events have moved on, but the basic cyclical drivers in the Australian economy remain intact. To put the current state of play into perspective, we need to recognise that this is not a steady-state economy. The last 15 years have been an unusual period with major structural changes and cyclical shifts, punctuated by the global financial crisis. Just as we are nearing the end of the negative impact of the fall in mining investment, and as infrastructure expenditure and non-dwelling building are picking up pace, the residential boom is coming to an end with construction now starting to fall. Even after eight years, we still haven't recovered from the shock of the GFC. Non-mining business investment has

started to pick up, but it remains patchy. It will need a switch in business psychology to investing for growth before it picks up momentum.

- The mining boom provided a significant boost to growth, initially through the strength of mining investment with a large flow on to the rest of the economy, and later, as capacity came on stream, through the strength of mining production and exports. The end of the mining` investment boom came as supply caught up to demand, reversing the investment driver and initiating the current fall in mining investment. The associated fall in the dollar is again underwriting structural change, this time a reversal of the change during the mining boom.
- We are now almost through the fall in mining investment. Equipment investment has stabilised. And we are 85% through a forecast fall of 76% from the peak in mining-related construction. (That excludes aluminium smelters and heavy industry, but includes private harbours, rail and pipelines). It still leaves a negative shock over the next two years as mining construction falls by another 31% from current (lower) levels.
- Public infrastructure investment is two years into a four-year recovery followed by a plateau in spending.
- Non-residential building will be picking up over the next few years, albeit moderately, both in the public and private sectors.
- However, after a strong boom, residential building is on the threshold of a substantial decline. Intervention by APRA and the banks have taken the head off the boom - otherwise it would have gone stronger and longer with a more severe downturn to follow. That has helped to contain the damage of oversupply. Accordingly, we expect a soft landing for the housing market. Nevertheless, we expect the number of commencements to fall by a third and work done on new dwellings to fall by 22% over the next three years, with the consequent impact on growth more than offsetting the improvement in infrastructure and non-residential building.
- The GFC provided a significant shock to the economy, switching business logic away from growth and towards cutting costs and containing non-essential expenditure, with consequent impacts on business investment.
- Non-mining business investment has started to pick up. But it's patchy, with premature surges of investment in bulky goods retail, offices and capital city hotels followed by corrections. Non-mining growth and profits remain weak, impeding the recovery in non-mining business investment. We need an improvement in demand, profits and tighter capacity utilisation to drive a switch in business psychology and for non-mining business investment to pick up momentum sufficiently to be a primary driver of growth.

Minimal risk of recession

The net effect is that construction will still be falling beyond the end of the fall in mining investment. And falling residential building will keep the economy contained for several years yet.

The negative shock to GDP growth from falling mining investment has been offset by:

- Strongly increasing mining production and exports. Fortunately for Australia, much of the mining investment boom increased capacity in high-quality low-cost reserves with demand continuing to increase as capacity came on stream, albeit at lower prices, putting a floor under growth and boosting the balance of payments. Unfortunately, mining production has little flow-on to the rest of the economy, leaving many industries and regions weaker than the aggregate GDP figures suggest. Growth in mining production remains strong, continuing to underpin GDP through this weak period.
- While subdued, private consumption expenditure has continued to underpin growth. Weak wage inflation and household income have constrained expenditure growth. But households are spending more of what they earn (reducing the savings ratio) to maintain expenditure.

The upshot is that the soft growth we've seen in the aftermath of the mining boom will continue for several years yet. Accordingly,

- The labour market is a lot weaker than the unemployment figures suggest with underemployment at historical highs. That's why wages growth remains so weak, constraining household disposable income and hence expenditure and retail sales growth.
- We expect a soft landing for residential property. But the forecast fall in housing construction over the next three years will impact on the economy.
- Inflation remains contained and won't be a problem until next decade.

Overseas, conditions are improving. The US economy remains solid. Europe is recovering after its rolling recessions. The Chinese economy continues to grow, albeit with structural change. We won't have another global financial crisis while ever we remember the last one.

The sea change in the direction of interest rates has been effectively confirmed. The long phase of falling and then low rates post-GFC has given way to a phase of rising rates, with implications for the economy and investment markets.

- The US Fed has come through the first two hesitant cash rate rises with two more rate rises confirming the phase of rising rates.
- That will underpin bond rate rises in the US, flowing on to Australia.
- But the buffer between Australian and US cash rates means that the RBA can set cash rates on domestic policy considerations.

We expect RBA cash rates to stay at current levels until 2020, particularly since housing rates have already risen as banks have (thoughtfully) expanded their margins on housing loans.

Economic recovery will be a long slow process.

Our forecast is that GDP growth will remain below 3% for another three years, until non-mining business investment gains sufficient momentum to become a primary driver of growth. Indeed, the expected synchronisation of investment cycles in the early 2020s will see growth lift to 3.4% in 2021/22.

Structural change and cyclical shifts mean significant industry and regional differences in the performance of different parts of the economy.

Fig. 2. Australia – Key Economic Indicators, Financial Years

Year Ended June						Forecasts					
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Private Investment											
– Dwellings	-1.2	4.8	7.8	10.5	1.6	-1.3	-8.3	-4.5	2.6	5.6	1.2
– New Non-Dwelling Construction (+)	10.0	0.0	-12.3	-15.5	-12.4	-4.8	-0.7	0.0	4.2	7.4	3.8
– New Non-Dwelling Building (+)	6.7	3.3	5.1	0.1	-5.9	8.7	7.5	0.5	2.9	6.7	1.1
– New Engineering Construction (+)	11.5	-1.3	-19.5	-24.1	-17.2	-15.8	-9.3	-0.5	5.8	8.3	7.1
Total New Private Investment (+)	**4.0**	**-0.8**	**-2.1**	**-4.6**	**-2.1**	**-0.5**	**-1.9**	**3.2**	**8.0**	**7.8**	**1.4**
New Public Investment (+)	**-3.5**	**-4.0**	**-7.4**	**5.5**	**8.7**	**7.7**	**2.7**	**0.1**	**-0.1**	**2.5**	**2.8**
Gross National Expenditure (GNE)	**1.5**	**1.0**	**1.3**	**1.4**	**2.1**	**2.1**	**1.5**	**2.9**	**3.9**	**4.2**	**2.5**
GDP	**2.6**	**2.6**	**2.4**	**2.7**	**1.9**	**2.5**	**2.3**	**2.9**	**2.9**	**3.4**	**2.9**
Inflation and Wages											
CPI (Yr Avg)- RBA forecasts (*)	2.3	2.7	1.7	1.4	1.7	2.4	2.4	2.4	2.4	2.4	2.4
Wage Price Index (Jun on Jun)(**)	2.9	2.6	2.3	2.1	1.9	2.5	2.6	2.7	3.5	3.7	3.8
Wage Price Index (Yr Avg)(**)	3.3	2.6	2.4	2.1	2.0	2.3	2.6	2.6	3.3	3.7	3.8
Average Weekly Earnings (Yr Avg)(^)	4.6	3.0	2.4	1.9	2.0	2.6	3.4	3.3	3.9	4.5	4.4
Employment											
– Employment Growth (Yr Avg)	1.2	0.5	1.2	2.2	1.4	2.3	0.9	1.1	1.8	2.2	1.4
– Employment Growth (May on May) (%)	0.8	0.5	1.9	1.7	2.0	1.5	0.8	1.3	2.1	2.0	1.0
– Unemployment Rate (May) (%)	5.6	5.9	5.9	5.6	5.4	5.9	6.0	5.8	5.2	4.8	5.1
Labour Productivity Growth											
– Total	1.3	2.1	1.2	0.5	0.6	0.2	1.4	1.8	1.0	1.2	1.6
– Non-farm	1.4	2.1	1.3	0.7	0.2	1.1	1.3	1.6	1.1	1.3	1.6

Source: BIS Oxford Economics, ABS and RBA

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

*Geometric mean of the annual average 'official' forecasts for the next 10 years.

** Based on Ordinary Time Hourly Rates of Pay Excluding Bonuses.

^ Average Weekly Ordinary Time Earnings for Full-Time Adult Persons.

In the medium to longer term, we expect a resumption of reasonably strong population growth to underwrite a higher growth rate in the Australian economy.

Over the next 20 years, implementation of technical advances associated with integration of advances in computing, communications and robotics will cause considerable disruption, improving productivity but providing challenges to the redeployment of displaced workers.

But in the near term, for businesses operating in this overall slow growth context, there are opportunities, but also risks. There is no choice but to carefully navigate our way through a cyclical and structurally changing environment.

2.2 NEW SOUTH WALES: CURRENT STATE OF PLAY AND OUTLOOK

After lagging the national economy over much of the past two decades, New South Wales' economic growth is now running ahead of the national average. The state is benefitting from improved competitiveness – due to a significantly lower A$ – which is boosting domestic trade exposed industries via increased exports and import substitution. This, in turn, has supported increased business investment, strong employment growth and household consumption expenditure. Combined with record home building and strong growth in government expenditure in the state, these have seen New South Wales skip past the national average in terms of economic performance.

Australia's largest state economy has a number of positive economic drivers

Gross State Product (GSP) growth was 2.6% in 2014/15, 0.2 percentage points higher than Australian Gross Domestic Product (GDP) growth. GSP growth accelerated to 3.5% in 2015/16, 0.8% above Australian GDP growth. Meanwhile, State Final Demand (SFD) has been growing strongly, increasing 3.4% and 4.4% in 2014/15 and 2015/16 respectively, around 2-3% higher than Australian Domestic Demand growth in both years. This outperformance continued into 2016/17, with SFD increasing 3.3% compared to 1.9% for Australian domestic demand.

Much of the state's recent economic growth is attributable to the increase in private residential investment (driven by a chronic undersupply of housing and low interest rates), business and public investment. Even though forecast dwelling completions are now pushing well above the underlying demand (number of houses required given household formation rates), the market remains in a state of undersupply which underpinned further strength in residential investment in 2016/17. New public investment increased 14% in 2015/16, following five years of weakness. Public investment in NSW is ramping up at a faster and more sustained rate than in other states, underwritten by proceeds from asset sales and helped by rising tax revenues driven by residential stamp duties and stronger economic and employment growth.

The privatisation of 49% of the state's electricity network will provide a further boost to long-term funding.

The main negative has been the dramatic decline in private new engineering construction, which has fallen 45% over the three years to 2015/16 inclusive, due largely to the decline in mining and heavy industry construction, with coal-related engineering construction down by 78% since the 2011/12 peak. Steep falls in roads and subdivisions, harbours, water and electricity-related construction also detracted from activity. However, private new engineering construction has rebounded significantly over the past year (jumping 24% in 2016/17) and is on track for further growth. Conversely, private new non-dwelling building has declined over 2016/17, but we expect this to reverse over the next two years.

NSW has the best short to medium term prospects of all states

The biggest surprise over the past year has been the lack of employment growth – February 2017 employment was only 0.1% higher than February 2016 levels. We had expected slower employment growth in 2016/17 following the unsustainably high 3.7% increase in 2015/16, but this slower growth is well below prior expectations. However, job creation has picked up over the months to August 2017.

We believe that the current momentum in the New South Wales economy will only continue to build over the next two years, with the following factors lining up to drive further strong growth:

- Major government infrastructure projects are now under way and will ramp up further over the next two to three years.
- The 30% decline in the Australian dollar (against the US$) over the three years to 2015/16 is boosting the states tradeables sectors, both in terms of increased exports and import substitution.
- The strength in private non-dwelling building, equipment investment, and software and research and development spending (which form the majority of 'intellectual property products' investment) suggest non-mining business investment has started to recover in the state – a lot earlier than in other states.
- The project pipeline for private non-residential building and private engineering construction indicates further growth in these construction segments over the next three years, although the non-dwelling building segment suffered a temporary decline over 2016/17.
- Population growth has picked up and is predicted to hold at just below the national average over the next two to three years.
- Employment growth is forecast to pick up from here and exceed the national average for the next year.
- The strength of the labour market, increases in population and buoyant property prices have driven – and will continue to drive – solid growth in household consumption expenditure.

After weak growth in 2016/17 (averaging 0.9% growth from the average level in 2015/16) employment growth is forecast to rebound to 2.6% in 2017/18, before easing over the subsequent two years. However, only a small rise in the state's unemployment rate is predicted with the state rate continuing to remain well below the national unemployment rate. In August, the NSW unemployment rate was 5.0% compared with 5.6% for Australia.

The continuing strong growth in private investment and recovery in public investment will boost the states' key finance and property and business services sectors, which collectively account for over 26% of New South Wales GSP and almost 19% of total state employment. These sectors will also derive additional benefits from the revival in non-mining business demand and profits, and ultimately the increased investment. The state's construction sector – which accounts for just under 9% of employment (but only 5% of GSP) – will also grow over the next 2 years, and boost other sectors, such as manufacturing, wholesaling, transport and a range of service industries. NSW services industries will benefit from the broader base of growth across the state and nation, including solid consumer demand.

The significant depreciation of the Australian dollar is driving the nation's structural shift away from mining and mining-related investment and towards a broader base of economic growth. New South Wales' diversified economy is in a good position to reap the benefits of the weaker dollar as improved competitiveness drives growth in the state's key trade-exposed industries, including agriculture, manufacturing, education, and tourism.

SFD growth remained high at 3.3% in 2016/17, and SFD growth is expected to be higher in 2017/18, at 3.6%. As such SFD growth is forecast to remain well above the national growth in Australian Domestic Demand of around 1.5 – 2.2% over the next two years. Meanwhile, GSP growth is estimated to have eased to 2.1% in 2016/17 as net exports (both international and interstate)

made a large negative contribution to output. However, a pickup in international exports and interstate net exports is expected to realise a smaller negative 'contribution' to overall growth, with GSP growth predicted to increase 2.9% in 2017/18 before both SFD and GSP growth is forecast to ease over 2018/19 and 2019/20, due to declines in residential construction activity. Stronger growth will return in the early 2020s as a synchronised upturn in residential and business and then public investment drives SFD, employment and household spending growth.

Fig. 3. New South Wales – Key Economic Indicators, Financial Years

Year Ended June	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
New South Wales													
Total Construction Activity(*)	5.9	-1.8	9.2	-4.0	0.7	9.6	7.3	7.2	0.4	-3.1	0.2	3.7	-1.5
State Final Demand	3.1	1.6	1.7	2.5	3.4	4.4	3.3	3.6	2.2	2.6	3.5	3.7	1.9
Gross State Product (GSP)(**)	**2.6**	**1.8**	**1.9**	**2.4**	**2.6**	**3.5**	**2.1**	**2.9**	**2.5**	**2.7**	**2.8**	**3.2**	**2.6**
Employment Growth (Year Average)	2.5	0.7	1.7	0.5	1.3	3.7	0.9	2.6	1.4	1.0	1.5	1.8	0.9
Australia													
Total Construction Activity(*)	6.9	14.5	5.8	1.1	-6.3	-4.9	-4.3	-1.7	-3.7	-3.6	1.5	5.1	3.2
Australian Domestic Demand(**)	3.7	5.1	1.7	1.3	1.1	1.4	1.9	2.2	1.5	2.7	3.9	4.2	2.6
Gross Domestic Product (GDP)	2.4	3.6	2.6	2.6	2.4	2.7	1.9	2.5	2.3	2.9	2.9	3.4	2.9
Employment Growth (Year Average)(**	2.4	1.2	1.2	0.5	1.2	2.2	1.4	2.3	0.9	1.1	1.8	2.2	1.4

Source: BIS Oxford Economics and ABS

* Total construction work done in constant 2014/15 prices as per the ABS Building Activity and Engineering Construction Activity in Australia surveys. Total construction is the sum of new dwelling building (includes alterations and additions activity greater than $10,000), new non-dwelling building and new engineering construction.

** 2017 values are estimates

3. INFLATION AND WAGE FORECASTS

3.1 CPI INFLATION: CURRENT CONDITIONS AND FORECASTS

Inflation contained despite large depreciation of the Australian dollar

Consumer price inflation has been subdued for three years, despite a substantial depreciation of the Australian dollar between 2013 and 2016. Indeed, fears of deflation plastered the headlines in March 2016, as underlying inflation fell below the Reserve Bank's 2 – 3% target band for the first time since 2012. These fears were unfounded, but underlying inflation has remained below 2% since then.

Tradeables inflation has been especially weak, at just 0.4% in June 2017 and an average 0.6% over the past year. Tradeables inflation excluding the volatile categories of fuel and fruit and vegetables saw deflation of -0.1% in the June quarter. Stagnant world prices for manufactured goods, reduced transport costs, margin compression by exporters, and potential hedging by importers have combined to limit price rises for imported consumer goods. Furthermore, a slight appreciation in the Australian dollar over the past year has contributed to lower import prices, and high levels of retail and supermarket competition have reduced price growth. As a result, baseline tradeables inflation has been especially weak.

Non-tradeables inflation has shown some strength, although dismal wages growth has contained unit labour costs. Additionally, we have seen more of a pick-up in headline inflation due to increases in petrol prices since June 2016.

We do not expect inflation to approach the top of the RBA's 2-3% band for the rest of this decade. We expect the Australian dollar will depreciate over the next two years, from US 77 cents in June 2017 to US 72 cents in June 2019, as commodity prices retreat over 2017/18, the interest rate differential between the US and Australia narrows, and weaker Australian economic growth over 2018/19 weighs on the A$. This will help stimulate inflation, as it pushes the prices of imported goods higher with a flow-on impact on final consumer prices. The headline rate will also rise at a faster pace, as oil prices come out of their troughs, pushing petrol prices higher. In addition, planned increases in tobacco excise will keep the headline rate elevated over the short to medium term.

The AUD will pick up from the end of FY 2019 as a strengthening in commodity prices is coupled with strong Australian economic growth and rising local interest rates, acting as an inflation buster by making prices of imported goods cheaper. Longer-term, we believe inflation containment will re-emerge as a policy challenge.

Deflation in freight costs has more than offset rises in import prices, but the tide is turning

Freight costs have generally subtracted from inflation over the past two years due to lower petrol prices resulting from sharp falls in oil prices. In the June 2014 quarter, Brent Oil was US$110 per barrel. In less than two years, Brent Oil collapsed to hit a low of US$35 per barrel in March 2016. This huge decline drove significant falls in petrol prices across the globe and weakened the Australian CPI.

We believe higher prices of imported consumer durables, including clothing, footwear and furniture, were largely offset by reduced freight costs of transporting these goods from ports to warehouses and to retail stores.

Accordingly, retailers were able to keep their margins despite growing price competition. Lower freight costs also helped keep a lid on increases in prices of domestically produced goods.

However, in the past year we have seen a turnaround in oil prices. In June 2016, Brent Oil prices rebounded – increasing by 33.3%. Following a slight withdrawal in September, prices rose 9.3% in the December quarter and a further 7.9% in the March quarter to reach US$54 per barrel. The rise in oil prices in the December and March quarters led to increases in automotive fuel prices of 6.7% and 5.7% respectively, contributing 0.2 percentage points to the headline CPI in each quarter, however prices fell 2.5% in the June quarter. The increase in oil prices has also fed through to shipping and freight costs. This manifested itself in final retail prices, adding to broad based inflationary pressures. However, oil prices fell back again in the June quarter and we are expecting further declines in September, before oil and fuel prices return to growth.

Food inflation surprisingly low

The supermarket price war continues to hold back food inflation, even though adverse weather conditions have driven up some fresh fruit and vegetable prices

Adverse weather conditions in major growing areas have resulted in shortages of certain fruits and vegetables, and consequently higher prices. Vegetable prices rose 13.1% through the year to March, and fruit prices have risen 12.2% over the same period.

Despite the destruction of crops caused by Cyclone Debbie in March, fruit and vegetable prices fell 1.7% in the June quarter due to lower prices for seasonal fruits and the ongoing supermarket price war holding back price growth. High levels of competition in the retail sector are also holding back inflation. We may see further weakness in fruit and vegetable prices as some of the produce prices pushed up by Cyclone Debbie reverse in the next two quarters.

Meanwhile, non-tradeables inflation is stronger, despite weak wages growth

Non-tradeables inflation reached a strong 2.7% in the June 2017 quarter, despite weak demand and wages growth. The rises have largely come from one-off factors and key service sectors, including education, the recent increase in excise tax for cigarettes and tobacco, housing, and seasonal items such as pharmaceutical products. The March 2017 quarter showed the wage price index slowing to 1.9% growth through-the-year – the lowest level on record – while Average Weekly Ordinary Time Earnings increased by 2.2% in the December 2016 quarter.

3.1.1 CPI inflation forecasts

Headline CPI expected to rise at a faster pace as oil prices rebound …

We are forecasting the Brent Oil price in $US to fall for the next quarter, before continuing its slow and steady recovery. This will contribute to a measured climb in automotive fuel prices, and subsequently headline inflation. We may also see some flow on effects on underlying inflation.

… significant increases in utility prices will boost headline inflation…

We expect a significant increase in utilities prices will boost headline inflation in the September quarter, and potentially beyond as the jump in wholesale energy prices is passed on to consumers.

… and hefty increases in tobacco excise will keep headline rate inflation elevated

Also putting upward pressure on the headline rate will be further planned increases in tobacco excise over the next three years. Tobacco excise are legislated to increase by 12.5% each year on September 1 2017 through to September 1 2020. This combined with the bi-annual indexation of the tobacco excise to average weekly ordinary time earnings, and aligning the tax treatment of roll your own tobacco and cigarettes, will add significantly to the headline CPI.

However, softness in the economy will offset pressures on headline inflation …

Offsetting these inflationary pressures will be soft growth in output, wages, employment and household incomes over the next two years, and contained inflationary expectations.

… Overall, inflation will stay within the Reserve Bank's target band for the next decade

We are expecting inflation to stay within the Reserve Bank's target band for the next decade. Overall, soft growth in output, wages, employment, and household incomes will continue to contain underlying inflation, despite a weakening Australian dollar over the next 24 months. It is our view that inflation will gradually increase to 2.9% in June 2022 as economic growth increases, employment and wage growth strengthen, and inflationary pressures begin to build. Falling oil prices over the next quarter will slightly weaken headline inflation. However, we are forecasting a rebound beginning in the December 2017 quarter. This will result in a measured bounce back in fuel prices. Additionally, headline inflation will be boosted by further hikes in tobacco taxes and some pass through of higher import prices from the depreciation of the A$. Accordingly, we are expecting headline CPI to rise to reach 2.9% in 2022.

Inflation containment will re-emerge as a policy challenge in the long run

Headline CPI inflation is forecast to average 2.6% per annum over the decade to 2032. This is slightly higher than the mid-point of the Reserve Bank's 2 to 3% target range.

In the future, declining population growth and an ageing population may result in a reduction of the labour supply. This means we may see both temporary skilled and general labour shortages emerge, as demand for labour continues to rise, and a transitory increase in wage inflationary pressures. However, in the long-term, the labour market will adjust back to equilibrium – as higher wages attract additional workers (from home and abroad) into the labour market. Hence, although demographic changes may lead to periods of cost-push inflation in the future, these periods will be transient and the labour market will adjust in the long run, especially as the progressive nature of the changes allows time for adaptation.

Have low inflation expectations become entrenched?

Inflation expectations influence realised inflation. Inflation rates in advanced economies have been low and under many central bank's targets since the GFC. This has caused declines in inflation expectations. Such an extended period of low inflation could result in low inflation expectations becoming entrenched, as people expect that future inflation will remain low. Furthermore, as central banks have consistently met their inflation targets, they have

increased their credibility to meet such targets and lowered long-term inflation expectations. Low and anchored inflation expectations may have changed the shape in the Phillips curve, resulting in a substantial decline in its slope. There have even been cries that the Phillips curve, which demonstrates the inverse relationship between inflation and unemployment, is “broken”. If central banks have successfully anchored inflation expectations lower, this may mean inflation remains contained in the future. However, prolonged deviations of inflation from the target may eventually de-anchor expectations. It is our view that inflation expectations are more anchored to 2.5% than they were 5-10 years ago. Hence, when inflation containment re-emerges as a policy challenge in the future, the monetary response needed to steer the economy back to equilibrium will be a lot smaller than what it once was

3.2 OFFICIAL CPI INFLATION FORECASTS

The Australian Energy Regulator in its recent revenue decisions has used the geometric mean of long-term ‘official’ forecasts of CPI inflation to deflate nominal wages. We have adopted the same methodology in this report. Hence to deflate our nominal wage forecasts, we have deducted the geometric mean of official forecasts from our nominal wage forecasts. Official forecasts comprise the Reserve Bank forecasts for the next two years and an assumption of annual inflation of 2.5% (the mid-point of the Reserve Bank’s 2 to 3 per cent target range) for the next eight years.

3.3 WAGES OUTLOOK

Wages growth now at its slowest pace in two decades – and will remain soft

The key determinants of nominal wages growth are consumer price inflation, productivity, the relative tightness of the labour market (i.e. the demand for labour compared to the supply of labour), and compositional changes in the labour market following the end of the mining investment boom. Price inflation, in turn, is influenced by unit labour costs – referred to as `wage-push inflation’ or more broadly `cost-push inflation’. Other factors which influence price inflation include the exchange rate, the stage of the business cycle and the level of competition in markets generally.

Wage growth in Australia remains very weak, due to spare capacity in the labour market and lower inflation outcomes and expectations. In March 2017, wages growth through-the-year slackened to 1.9% - its lowest recorded level. However, this suggests that we are at the bottom of the current wage cycle, with wage increases for employees stabilising in the past three quarters. In 2016/17, year average growth for the WPI is expected to have fallen to 2.0%, while Average Weekly Ordinary Time Earnings is lifted from 1.9% in 2015/16 to 2.3% in 2016/17.

Trends in wage growth by pay-setting method have diverged in recent years. Aggregate wage growth has slowed significantly since December 2012 due to a collapse in wage increases awarded to the 47% of non-managerial full-time workers who are on individual agreements (contracts) with their employers. In contrast, workers subject to collective agreements have maintained wage rises above 3% pa. However, with union membership at an all-time low, the proportion of the full-time non-managerial workforce on collective agreements has fallen from 42% in 2010 to 37% in 2016. Workers on individual agreements, whose wage rises respond more to prevailing labour market

conditions, have been at the mercy of slackness in labour market and the end of the mining investment boom.

Low wages growth is both a product of and key cause of low underlying inflation. Low wages are keeping business costs down and thus muting upward price pressures, while a significant section of pay deals are being set in line with CPI inflation – especially for employees on awards.

Spare capacity in the labour market is a fundamental contributor to low wage growth.

The unemployment rate and underemployment rate are key indicators of the amount of slack in the labour market. The unemployment rate has been trending down in recent quarters, but it remains above the NAIRU, (the Non-Accelerating Inflationary Rate of Unemployment or the `natural rate of unemployment') of around 5%, and therefore represents spare capacity in the labour market. Compounding this, Australia's underemployment rate[1] is now at historic highs – averaging 8.7% over the past year. The high underutilisation rate – the sum of unemployment and underemployment – reflects considerable slack in the labour market, which limits the bargaining power of workers and reduces pressure on wages. Spare capacity is likely to continue due to weak demand and investment, as well as the continued casualisation of the workforce.

Spare capacity in the labour market is most apparent in the mining industry. During the mining investment boom, wages in mining and mining-related industries soared, with mining wages reaching peaks of 6.7% annual growth in 2008 and 5.2% in 2012. Since moving to the less labour intensive production phase, workers have faced pay cuts, employment has dropped, and workers have been forced to move into lower paying jobs outside of the mining industry, which has also lead to a skills mismatch between workers and jobs. This transition has caused a sharp reduction in wage growth in these industries, with growth in mining wages slowing to 0.6% through-the-year to March 2017 and the construction, professional services, and transport sectors also seeing steep reductions.

We expect that wage growth has levelled off, and we will now rise out of its trough

Additionally, the compositional shifts within the labour market following the end of the mining investment boom have weighed on total wage growth in Australia. Workers have been pushed out of mining – an industry with comparatively high wages – and into lower paid industries; this structural change in employment away from mining has weighed on total wage growth.

The latest data suggests that we are at the bottom of the current wage cycle, with wage increases for employees stabilising over the past three quarters. We are forecasting wage growth will be largely stable over the next 18 months and then begin to accelerate, in line with improvements in the labour market. WPI inflation is expected to rise 2.5% through the year to June 2018. We expect wage growth will level off over 2018/19 in response to weakening in economic growth, lower CPI and a rising unemployment rate.

Stronger growth in wages is anticipated in 2019/20 as economic growth strengthens and the unemployment rate falls – with the unemployment rate

[1] Underemployment comprise all employed persons who are willing and available to work additional hours, and were not fully employed (worked less than 35 hours) in the reference week.

forecast to fall below 5% by the end of 2021. Indeed, we are expecting improvements in employment, profits and investment from early next decade as non-mining business investment and other positive forces drive economic growth. Reduced slack in the labour market, meaning workers can bargain for better pay rises, combined with rising price inflation next decade will push up wages growth over between 2019/20 and 2021/22. Wages growth (in year average terms) is expected to rise further and peak at 3.7% for WPI (4.5% for AWOTE) in 2021/22 – which would be the strongest result in WPI terms in nearly a decade. This is still lower than the 4.1% annual growth average for WPI over 2005/06 to 2008/09, when the unemployment rate was between 4.2% and 5.0% and employment growth was strong.

In the long run, wage growth is determined by productivity growth and inflation.

We expect that WPI growth will level off at its long run level of around 3.6% from 2022, driven by stable non-farm productivity growth of around 1.3% and inflation of around 2.6%.

Over the next decade and beyond, slowing growth in the labour supply may result in the emergence of both transient skilled and general labour shortages that temporarily drive up wages. However, these shortages will be transitory and the labour market will adjust in response to this shortage, through increased net overseas migration or a rise in the participation rate e.g. through delayed retirement.

Over the long term, there are three other key forces worth mentioning. Firstly, a greater global supply of workers and increased cross-national labour market connectedness may erode the bargaining power of workers in developed countries, contributing to lower wages. De-unionisation will also continue to decrease the bargaining power of workers, contributing to temporary periods of lower wage growth. Thirdly, there is a risk that further automation of the workforce may reduce employment and lead to wage losses. Negative effects are expected to be unevenly distributed, with blue-collar workers seeing the worst effects. However, some jobs will benefit from increased automation, so it is difficult to predict at an aggregate level what the impact will be. A literature review suggests that one more robot per thousand workers reduces wages by 0.25 – 0.5%, based on industrial robot usage between 1990 and 2007 on US local labour markets.

BIS Oxford Economics Wage Growth Model

BIS Oxford Economics' model of wage determination is based on the analysis of expected future wage movements in the three main methods of setting pay, as each discrete pay setting method has its own influences and drivers (see Fig. 8). The main pay setting categories and their key determinants are:

- Employees under awards have their pay determined by Fair Work Australia in the annual National Wage case. When determining pay increases, Fair Work Australia aim to maintain the standard of living of those employed on awards by providing a safety net of fair minimum wages. Hence, they focus on the overall performance of the domestic economy, taking into account productivity, business competitiveness, inflation and employment growth. This means that increases in the Federal Minimum Wage are usually based on recent CPI growth along with Fair Work Australia's view on short term future conditions for the Australian economy. From 1 July 2016, the minimum wage has increased by 2.4% following a 2.5% rise on 1 July 2015. This brings the Australian minimum wage to $672.70 per week. At the all industries level, 16% of all non-managerial full-time employees (data excludes those in agriculture, forestry and fishing) have their pay rises determined by this method.
- For employees under collective agreements (representing 37% of all employees), their pay is determined through enterprise bargaining, and wage increases are influenced through a combination of recent CPI, inflationary expectations, profitability levels of relevant enterprises, business conditions, and the short term economic outlook. Workers unions can also play a significant part in negotiations, especially unions with a good position in industrial relations through strong membership. With the average duration of these agreements currently two to three years, BIS Oxford Economics use the most recent agreements formalised in recent quarters as a basis for our near term forecasts. Beyond that, collective agreements are based on our expectations of economic conditions.
- The remaining 47% of employees have their pay set by individual arrangements, whether it be individual contracts or some other form of salary agreement, which may include incentive based schemes. Similar to the minimum wage and collective agreements, inflation and inflationary expectations have a strong influence on agreements, as well as the strength of the labour market. Individual arrangements are skewed towards more skilled workers, so the balance between demand and supply in skilled labour can be a large influence.

Fig. 4. Wages and Prices: Australia, year-average growth

Year Ended June	Average Weekly Ordinary Time Earnings[1]		Wage Price Index (All Industries)		Official Headline CPI [2]	
	$/week	%CH	Index	%CH	Index	%CH
2000	765.4		71.7		69.4	
2001	804.2	5.1	74.2	3.5	73.6	6.0
2002	847.4	5.4	76.7	3.3	75.7	2.9
2003	890.0	5.0	79.3	3.5	78.0	3.0
2004	931.6	4.7	82.2	3.6	79.9	2.4
2005	972.9	4.4	85.3	3.7	81.8	2.4
2006	1 017.5	4.6	88.7	4.1	84.4	3.2
2007	1 054.1	3.6	92.2	3.9	86.9	3.0
2008	1 106.1	4.9	96.1	4.1	89.8	3.4
2009	1 166.5	5.5	100.0	4.1	92.6	3.1
2010	1 231.3	5.6	103.1	3.1	94.8	2.3
2011	1 282.5	4.2	107.0	3.8	97.7	3.1
2012	1 338.1	4.3	110.9	3.6	100.0	2.3
2013	1 400.3	4.6	114.6	3.3	102.3	2.3
2014	1 442.2	3.0	117.6	2.6	105.0	2.7
2015	1 477.3	2.4	120.4	2.4	106.8	1.7
2016	1 505.0	1.9	123.0	2.1	108.3	1.4
2017	1 535.8	2.0	125.4	2.0	110.1	1.7
Forecasts						
2018	1 576.3	2.6	128.3	2.3	112.3	2.4
2019	1 630.3	3.4	131.6	2.6	114.8	2.4
2020	1 683.8	3.3	135.0	2.6	117.7	2.4
2021	1 749.1	3.9	139.4	3.3	120.6	2.4
2022	1 828.5	4.5	144.6	3.7	123.7	2.4
2023	1 909.6	4.4	150.0	3.8	126.7	2.4
Compound Annual Growth Rates [3]						
1990-2000	3.9				2.1	
2000-2010	4.9		3.7		3.2	
2010-2017	3.2		2.8		2.2	
2017-2023	3.7		3.0		2.4	
2018-2023	3.9		3.2		2.4	

Source: BIS Oxford Economics, ABS

(1) Average Weekly Ordinary Time Earnings for full-time adult persons. Data is year ended May (available only mid month of quarter).
(2) Geometric mean of average annual 'official' CPI inflation forecasts.
(3) CAGR (Compound Annual Growth Rates) for 2018-2023 is CAGR for 2018/19 to 2022/23 inclusive (ie for TransGrid's upcoming revenue determination period).

Fig. 5. Methods of Setting Pay, Industry May 2016

Proportion of Full Time Adult Employees (%)

Industry (ANZSIC 2006)	Award Only	Collective Agreements	Individual Arrangements	All Methods of Pay Setting
Mining	0.6%	40.7%	58.6%	100.0%
Manufacturing	10.9%	29.9%	59.2%	100.0%
Electricity, Gas, Water & Waste Services	**5.7%**	**60.6%**	**33.6%**	**100.0%**
Construction	10.7%	26.7%	62.6%	100.0%
Wholesale trade	10.5%	12.6%	76.9%	100.0%
Retail trade	16.6%	20.7%	62.7%	100.0%
Accommodation and Food Services	31.7%	23.0%	45.3%	100.0%
Transport, Postal and Warehousing	3.9%	55.9%	40.2%	100.0%
Information Media and Telecommunications	3.6%	29.0%	67.4%	100.0%
Finance and Insurance Services	1.5%	39.9%	58.7%	100.0%
Rental, Hiring and Real Estate Services	13.1%	10.4%	76.5%	100.0%
Professional, Scientific ans Technical Services	2.2%	11.5%	86.3%	100.0%
Administrative and Support Services	15.9%	30.1%	54.1%	100.0%
Public Administration and Safety	1.2%	92.5%	6.3%	100.0%
Education and Training	2.9%	88.9%	8.1%	100.0%
Health Care and Social Assistance	12.3%	66.6%	21.1%	100.0%
Arts and Recreation Services	10.4%	40.1%	49.4%	100.0%
Other Services	15.7%	11.0%	73.3%	100.0%
All Industries 2010 Survey	**15.9%**	**41.9%**	**50.0%**	**100.0%**

Source: ABS

Fig. 6. Australia: Wages and Prices

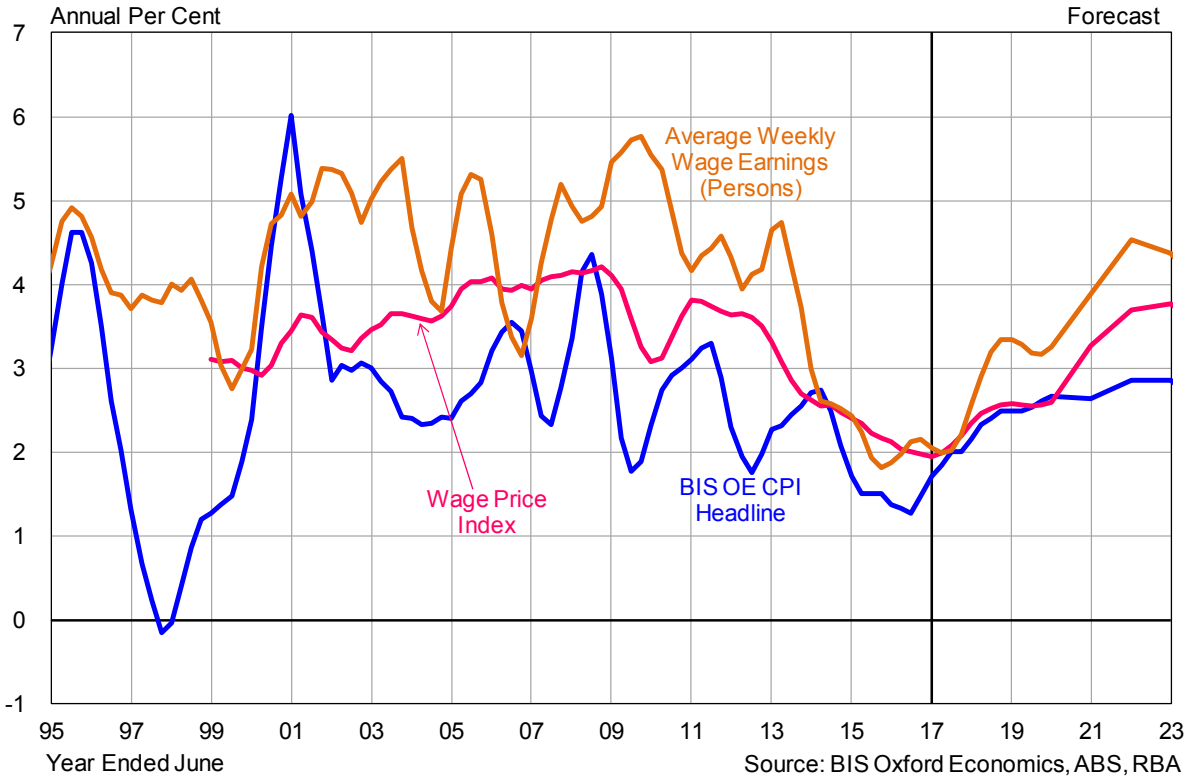


Fig. 7. Employment and Unemployment

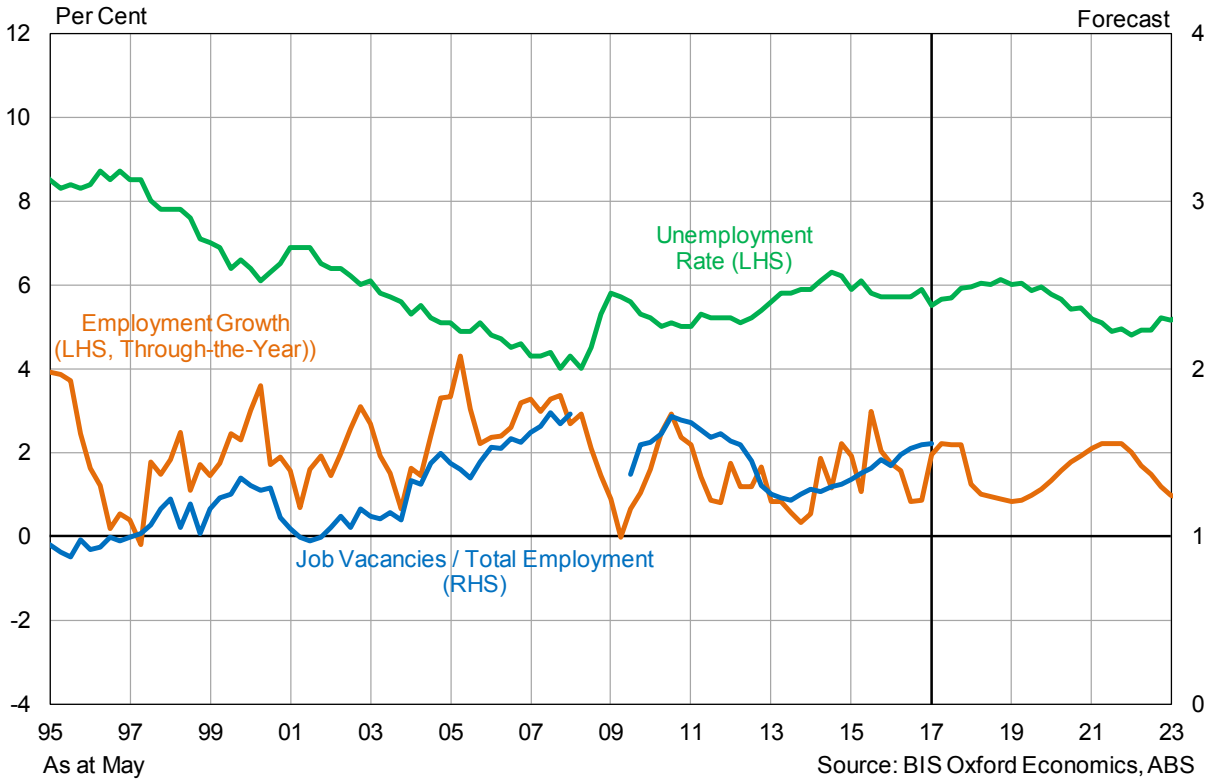


Fig. 8. Wages Growth All Industries: Australia

(By Workforce Segmented by Pay Setting Method)

Year Ended June	% of Workforce in 2010	Year Average Per Cent Change														Average	Average
		2010	2011	2012	2013	2014	2015	2016	2017	Forecasts 2018	2019	2020	2021	2022	2023	2018-23	2019-23
Wage Price Index																	
Awards Only	15.9%	0.5	2.6	3.4	2.9	2.6	3.0	5.1	2.4	3.3	2.7	2.6	2.8	2.9	3.2	2.9	2.9
Collective Agreements	37.1%	3.9	3.8	3.9	3.6	3.5	3.3	3.2	3.1	3.0	3.0	3.1	3.3	3.6	3.9	3.3	3.5
Individual Arrangements	47.0%	3.3	4.2	3.6	3.2	1.9	1.5	0.2	0.8	1.4	2.1	2.2	3.4	4.1	3.9	2.8	3.4
Wage Price Index (a)	**100%**	**3.1**	**3.8**	**3.6**	**3.3**	**2.6**	**2.4**	**2.1**	**2.0**	**2.3**	**2.6**	**2.6**	**3.3**	**3.7**	**3.8**	**3.0**	3.3
Compositional Effects + Bonuses,etc		2.5	0.4	0.7	1.3	0.4	0.0	-0.2	0.1	0.2	0.9	0.6	0.6	0.8	0.6	0.6	0.7
AWOTE (b)	**100%**	**5.6**	**4.2**	**4.3**	**4.6**	**3.0**	**2.4**	**1.9**	**2.0**	**2.6**	**3.4**	**3.3**	**3.9**	**4.5**	**4.4**	**3.7**	4.0

Source: BIS Oxford Economics, Haver Analytics, Department of Employment

(a) Ordinary time hourly rates of pay for full-time adult persons.
(b) Average Weekly Ordinary Time Earnings for Full-time Adult persons.

4. EXPECTED WAGE CHANGES FOR THE EGWWS INDUSTRY

In this section, we provide an outlook for the WPI (wage price index) for the EGWWS (electricity, gas, water and waste services) sector at the national level. In addition, we provide a discussion and forecasts of the WPI for the New South Wales EGWWS industry as measured by the public and private WPI for the utilities sector.

Wages growth in the EGWWS sector is invariably higher than the total Australian national (all industry) average.

The wage price index growth has consistently been above the national average since the index's inception in 1997 and averaged 0.6% higher over the decade to 2013 (see Fig 9, Fig 13 and Fig 15). While growth in average weekly ordinary time earnings (AWOTE) of the electricity, gas, water and waste services sector has displayed considerably more volatility over the past two decades (mainly related to compositional effects), AWOTE growth in the sector has also usually been higher than the national average over the past six years (see Fig 10 and Fig 13).

To a large extent, this has been underpinned by strong capital works program in the utilities sector since the beginning of the last decade (resulting in robust employment growth over the same period), strong competition from the mining and construction workers for similarly skilled labour and the powerful influence of unions in the utilities sector.

In addition, the electricity, gas and water sector is a largely capital intensive industry whose employees have higher skill, productivity and commensurately higher wage levels than most other sectors. Further, the overall national average tends to be dragged down by the lower wage and lower skilled sectors such as the Retail Trade, Wholesale Trade, Accommodation, Cafés and Restaurants, and, in some periods, also Manufacturing and Construction (see Fig 9 and Fig 10). These sectors tend to be highly cyclical, with weaker employment suffered during downturns impacting on wages growth in particular. The EGWWS sector is not impacted in the same way due to its obligation to provide essential services and the need to retain skilled labour.

4.1 STRONG UNION PRESENCE IN THE UTILITIES SECTOR WILL ENSURE COLLECTIVE AGREEMENTS REMAIN ABOVE THE ALL INDUSTRY AVERAGE

Strong Union presence in the industry.

Despite the relative weakness of the economy over 2008/09 and 2009/10, wages remained elevated in the utilities sector due to the comparative strength of demand for skilled labour, and particularly because of the strength of unions in what is an essential service sector. The industrial relations reality is that there are powerful utilities unions such as the Communications, Electrical and Plumbing Union (CEPU) and Australian Services Union (ASU), which have a history of achieving high wage outcomes for the sector. Other unions active in the sector include the Australian Workers Union (AWU).

The key elements of the utilities wage forecast are set out in Fig 12. This shows that collective bargaining dominates the pay setting arrangements in the utilities sector, while the relative absence of workers relying on (often) low-increase

awards (set in the National Wage Case) means the overall average for total utilities wages will generally be higher than the all industries average. Over the past five years, the outcomes from collective agreements have been 0.9% higher, on average, than the all industries average, at 3.4% compared to 2.5%. We expect this trend to continue over the outlook period, with collective agreements achieving average increases of 3.5% for the utilities sector, compared to 3% for all industries.

BIS Oxford Economics analysis shows collective agreements in the EGWWS sector have been on average around 1.5% higher than CPI inflation over the decade to 2010 (excluding the effects of GST introduction in 2000/01). In the five years to 2010 when the labour market was very tight, collective agreements were on average 1.7% above the CPI. Given the strength of unions in the sector and a still strong demand for skilled labour over the next four years (and possibly beyond) than for most of the 2000s, collective agreements are forecast to remain around 1.1% above the 'official' CPI over the forecast period.

As well as increases in CPI, increases in collective agreements under enterprise bargaining are also influenced by a combination of inflationary expectations, the recent profitability of relevant enterprises, current business conditions and the short-term economic outlook, and, as mentioned, by the industrial relations 'strength' of relevant unions. Because the average duration of agreements runs for two-to-three years, BIS Oxford Economics bases its near-term forecasts of Enterprise Bargaining Agreement (EBA) wages on the strength of recent agreements, which have been 'formalised' or 'lodged' (i.e. an agreement has been 'reached' or 'approved') over recent quarters.

We expect EBA outcomes to show modest growth over the next two years but remain above inflation and the 'all industries' average given that the demand for skilled labour remains strong and particularly given the recent high enterprise agreement outcomes in the construction sector. This will influence negotiations in the EGWWS sector, as some skills can be transferable. A mild recovery in EBA outcomes will occur over subsequent years as the labour market begins to tighten, unemployment falls and business profitability improves. However, forecast growth in wage agreements of around 3.7% per annum (i.e. during TransGrid's upcoming regulatory period) remains below that experienced over much of the past decade.

4.2 DEMAND FOR SKILLED LABOUR ALSO A KEY DRIVER OF UTILITIES WAGES

Employment growth in the utilities sector over the 2003/04 to 2013/14 inclusive averaged 5.4% per annum, the second fastest growth among the 18 main industry sectors behind the Mining sector (11% per annum), with Health and Social Assistance employment growth third at 4.1% per annum.

We believe investment in the sector, particularly engineering construction, has been the key driver of employment growth in the sector over the past decade. Fig. 16 illustrates this relationship, and shows employment has a stronger relationship with utilities engineering construction rather than utilities output.

As well as the pick-up in infrastructure work, this strong growth in utilities employment has also been associated with an ongoing reversal in the sharp

losses in employment seen through the 1990s. Privatisation and rationalisation were the drivers of the job cuts in the 1990s, but in some cases the desire to be streamlined left only a 'skeleton' crew in-house for routine operations and emergency disruptions, while capital and maintenance works (both minor and major) tended to be contracted out. Capital expenditure in the utilities sector during the 1990s was also relatively low, and this may also have contributed to weaker employment.

The emergence of skilled labour shortages across many industry sectors over the 2000s encouraged utilities businesses to boost their in-house response capabilities, while increasing competition shifted the business focus towards customer service in order to enhance product differentiation with an accompanying increase in employment not directly related to the provision of electricity, gas, and water services. The entrance of new players in the sector (such as new businesses related to renewable energy provision, new private electricity and gas businesses, etc.) has also exacerbated this situation as it has increased demand for all occupations within this sector.

The strong growth in employment in the Utilities, Mining and Construction sectors, and the associated sustained strong demand for skilled labour, contributed to above average wages growth in all three sectors. At the same time, the overall labour market tightened considerably during the 2000s, with the unemployment rate falling from around 7% in 2001 to 5% by 2005, and to 4% in early 2008. This saw skilled labour shortages worsen and employers in these sectors bid up wages.

That being said, the global financial crisis and the subsequent slowing in the economy over 2008/09 reduced labour demand resulting in excess capacity. This, in turn, has since kept a lid on wage pressures.

However, with the economy expected to return to balanced and trend growth early next decade, employment growth will outpace population and labour force growth and the unemployment rate is expected to drop below 5% by early next decade. Hence, from early 2020s, we expect to again witness the re-emergence of skilled labour shortages and competition for scarce labour particularly from the construction sector, which will push up wage demands in the utilities sector.

Individual agreements will strengthen from their current weakness

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

Wage growth from individual agreements rose by just 1% over the year to June 2015 and slowed to 0.7% last year, reflecting general weakness in the economy and the full-time labour market. However, this is expected to turn around from this year, albeit gradually. Stronger increases are expected from the beginning of next decade in line with a strengthening economy. Businesses will find they must 'meet the market' on remuneration in order to attract and retain staff and we expect wages under individual arrangements to continue to rise through the middle of the next decade.

Overall, BIS Oxford Economics expects total wage costs for the Australian Electricity, Gas, Water and Waste Services (EGWWS or 'Utilities) sector — expressed in Average Weekly Ordinary Time Earnings (AWOTE) — will average 4.1% per annum over the five years to 2022/23, 0.2% higher than the national 'All Industries' AWOTE average of 3.9% per annum over the same five-year period (see Fig.13). In terms of underlying wages growth in the 'utilities' sector for total Australia — expressed in wage price index (WPI) terms — BIS Oxford Economics is forecasting an average of 3.7% per annum (0.5 percentage points higher than the national 'All Industries' WPI average of 3.2% per annum) over the five years to 2022/23.

Our AWOTE forecasts are higher due to compositional effects. Apprentices, trainees and numbers of new staff have increased markedly over recent years, across the electricity, gas and water sector generally. Given slower growth in employment numbers over the next decade, it is likely that there will be overall up skilling of the existing workforce, which will see a commensurate movement by much of the workforce into higher grades (i.e. on higher pay), resulting in higher earnings per employee.

New South Wales is Australia's largest state economy. As a result, wage increases in New South Wales tends to track the Australian wage cycle fairly closely. That said, state wage increases can differ from the Australian average if the state's utilities sector is undertaking a larger volume of work (relative to the national average). In addition, state industry wages can grow faster than the national average if it faces stronger competition from related industries such as the construction section which employ similarly skilled labour.

BIS Oxford Economics is forecasting wages in the NSW utilities sector to dip below the national average over 2017/18 before converging to and then surpassing the national average early next decade as utilities investment picks up in the state. Overall, we expect wage increases in the NSW EGWWS sector to average 3.8% p.a. over the five years to 2022/23 (i.e. 0.1% above the national average).

Fig. 9. Wage Price Index Growth by Industry Sector and by State

Sector	% of Total Employment May'17	Jun'12	Jun'13	Jun'14	Jun'15	Jun'16	Sept'16	Dec'16	Mar'17	Jun'17	Five-Year Average (YE June)
Private		3.7	3.4	2.6	2.3	2.0	1.9	1.9	1.8	1.8	2.4
Public		3.2	3.2	2.8	2.6	2.5	2.4	2.3	2.3	2.3	2.7
Industry											
Mining	1.9%	4.4	4.5	2.8	2.3	1.6	1.3	1.2	1.0	1.0	2.4
Manufacturing	7.4%	3.8	3.2	2.9	2.7	2.4	2.2	2.1	2.0	2.0	2.6
Electricity, Gas, Water and Waste Services	1.0%	3.5	4.2	3.3	2.8	2.4	2.4	2.3	2.3	2.2	3.0
Construction	9.0%	4.1	3.3	3.0	2.1	1.6	1.6	1.6	1.6	1.7	2.3
Wholesale Trade	3.3%	4.4	4.4	2.2	2.2	1.9	1.9	1.9	2.0	1.8	2.5
Retail Trade	10.1%	2.9	2.5	2.6	2.2	2.4	2.4	2.2	2.0	1.9	2.3
Accommodation and Food Services	7.3%	3.4	2.5	2.3	2.6	2.3	2.3	2.3	2.3	2.3	2.4
Transport, Postal and Warehousing	5.1%	3.5	3.5	2.5	2.4	2.2	2.2	2.1	2.1	2.0	2.5
Information Media and Telecommunications	1.8%	3.7	2.9	2.4	2.5	2.2	2.1	2.0	1.9	1.9	2.4
Finance and Insurance Services	3.6%	4.0	3.2	2.7	2.7	2.6	2.4	2.2	2.1	2.1	2.6
Rental, Hiring and Real Estate services	1.7%	3.8	2.8	2.7	2.3	1.6	1.4	1.3	1.3	1.3	2.1
Professional, Scientific and Technical Services	8.5%	4.5	3.5	1.9	1.9	1.6	1.6	1.5	1.5	1.4	2.1
Administration and Support Services	3.3%	3.3	3.3	2.5	1.9	1.4	1.3	1.3	1.3	1.4	2.1
Public Administration and Safety	6.6%	3.1	3.5	2.9	2.2	2.2	2.1	2.1	2.2	2.2	2.6
Education	8.0%	3.7	2.8	2.9	3.0	2.7	2.5	2.5	2.4	2.4	2.8
Health Care and Social Assistance	13.0%	2.9	3.3	2.9	2.7	2.5	2.4	2.4	2.4	2.4	2.8
Arts and Recreation Services	1.8%	3.7	2.9	2.7	3.0	2.4	2.2	2.1	2.0	2.0	2.6
Other Services	4.1%	4.2	3.2	2.4	2.2	2.2	2.2	2.1	2.0	1.9	2.4
State/Territory											
New South Wales	31.7%	3.6	3.1	2.5	2.3	2.1	2.1	2.1	2.1	2.1	2.4
Victoria	25.8%	3.5	3.3	2.7	2.7	2.3	2.2	2.0	1.9	1.9	2.6
Queensland	19.7%	3.7	3.0	2.7	2.4	2.0	1.9	1.9	1.9	2.0	2.4
South Australia	6.7%	3.4	3.3	3.3	2.5	2.3	2.3	2.2	2.2	2.2	2.7
Western Australia	11.2%	4.3	4.0	2.8	2.2	1.9	1.8	1.7	1.5	1.4	2.4
Tasmania	2.0%	3.4	3.2	2.3	2.5	2.2	2.2	2.2	2.2	2.2	2.5
Northern Territory	1.1%	3.8	3.3	2.7	2.6	2.2	2.2	2.1	2.1	2.2	2.6
Australian Capital Territory (ACT)	1.8%	3.3	3.7	2.4	1.7	1.7	1.8	1.9	1.9	1.8	2.3
Total All[1,2]	100%	3.6	3.3	2.6	2.4	2.1	2.0	2.0	2.0	2.0	2.5

Source: BIS Oxford Economics, Haver Analytics

(1) Measures changes in the price of labour. Ordinary hourly rates of pay (excludes overtime and bonuses)
(2) Excludes Agriculture, Forestry & Fishing

Fig. 10. AWOTE Growth by Industry Sector: Australia

Industry Sector	% of Total Employment Jun'17	Average Weekly Earnings[1]												Five-Year YE Jun Average
		$ / Week Jun'17	Annual Percent Change (year-on-year)											
			Jun '07	Jun '08	Jun'09	Jun'10	Jun'11	Jun'12	Jun'13	Jun'14	Jun'15	Jun'16	Jun'17	
Mining	1.9%	2 551	6.5	8.1	7.3	7.2	6.5	6.2	6.8	4.2	1.5	1.7	0.6	3.0
Manufacturing	7.4%	1 329	4.7	4.2	5.3	1.8	2.8	2.3	3.9	4.8	4.3	1.0	-1.5	2.5
Electricity, gas, water and waste services	1.0%	**1 783**	**3.7**	**2.7**	**6.1**	**7.6**	**9.1**	**2.5**	**6.1**	**2.0**	**0.7**	**3.5**	**4.3**	3.3
Construction	9.0%	1 555	4.9	9.2	7.8	7.7	5.0	3.5	4.3	2.1	2.2	1.4	2.2	2.4
Wholesale trade	3.3%	1 490	3.7	3.8	5.9	2.2	3.9	11.3	4.6	0.5	0.3	0.9	2.5	1.8
Retail trade	10.1%	1 124	3.4	5.6	2.7	5.5	0.9	3.2	4.0	2.5	4.0	4.2	0.8	3.1
Accommodation and food services	7.3%	1 099	8.2	3.8	2.5	4.5	3.5	3.7	5.5	3.9	-0.1	2.3	2.6	2.8
Transport, postal and warehousing	5.1%	1 557	0.6	0.5	4.5	5.3	8.9	7.0	5.9	1.8	2.8	5.2	1.4	3.4
Information media and telecommunications	1.8%	1 851	6.3	7.7	4.3	5.4	4.6	3.0	4.8	1.7	1.0	4.2	4.3	3.2
Finance and insurance	3.6%	1 833	3.4	3.8	2.8	4.6	6.1	2.0	4.3	1.1	4.3	4.6	1.6	3.2
Rental hiring and real estate services	1.7%	1 433	2.4	8.6	6.5	3.8	-2.1	0.4	6.6	-1.1	-1.7	5.7	5.1	2.9
Professional, scientific and technical services	8.5%	1 806	2.5	7.8	5.8	5.6	4.5	4.3	3.2	3.8	2.7	-1.1	2.2	2.2
Administration and support services	3.3%	1 352	1.6	7.2	7.1	7.4	-0.1	-1.9	7.9	1.7	-1.5	-0.4	4.9	2.5
Public administration and defence	6.6%	1 592	3.7	3.7	5.4	6.7	5.7	3.2	4.7	3.5	0.9	1.8	1.5	2.5
Education and training	8.0%	1 682	3.7	3.0	4.6	5.6	4.8	4.6	3.8	3.3	2.7	2.4	3.6	3.2
Health and social assistance	13.0%	1 508	3.6	4.4	4.7	6.2	2.5	2.8	5.3	3.9	2.4	2.5	3.4	3.5
Arts and recreational services	1.8%	1 459	-0.6	6.4	7.2	4.1	5.6	3.5	5.5	4.6	-1.0	3.6	6.0	3.7
Other services	4.1%	1 206	2.0	3.3	6.8	3.1	3.6	2.7	4.2	-0.4	0.8	5.5	3.8	2.8
Total All Industries[2]	100%	1 543	3.6	4.9	5.5	5.6	4.2	4.3	4.6	3.0	2.4	1.9	2.0	2.8

(1) Average weekly ordinary time earnings for full-time adult persons.

(2) Excludes Agriculture, Forestry and Fishing sector

Source: BIS Oxford Economics, ABS

Fig. 11. Federal Wage Agreements – Collective Agreements by Industry

Average Annualised Wage Increase, Year-ended December

Selected Industry (ANZSIC 2006)	Average Annualised Wage Increase[1]												Average 2005-2016
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	
Electricity, Gas, Water and Waste Services	**4.3**	**4.3**	**4.3**	**4.6**	**4.6**	**4.5**	**4.2**	**4.1**	**3.7**	**3.6**	**3.3**	**2.9**	**4.0**
Agriculture, Forestry and Fishing	2.8	3.0	2.9	3.4	3.7	3.3	3.5	3.5	3.5	3.1	2.9	2.8	3.2
Mining	3.6	3.7	3.9	4.2	4.2	4.1	4.2	4.4	4.3	4.1	3.2	2.7	3.9
Manufacturing	4.2	4.1	4.1	4.0	3.9	3.7	3.7	3.8	3.6	3.3	3.0	2.8	3.7
Construction	4.5	4.7	4.7	4.6	5.1	5.2	4.5	5.0	5.0	4.9	4.0	3.1	4.6
Wholesale Trade	4.1	3.5	3.6	4.0	4.0	3.7	3.6	3.6	3.6	3.2	3.0	4.4	3.7
Retail trade	3.5	3.5	3.4	3.4	3.4	3.4	3.4	3.2	3.2	3.0	3.1	2.9	3.3
Accommodation and Food Services	3.3	3.4	3.2	3.4	3.9	3.7	3.7	3.5	3.3	3.0	2.9	3.0	3.4
Transport , Postal and Warehousing	3.9	3.8	3.9	4.0	4.1	3.8	3.6	3.7	3.7	3.5	3.3	3.2	3.7
Information Media and Telecommunications	3.1	3.1	3.2	3.6	3.6	3.4	3.3	3.4	3.4	3.3	2.8	2.8	3.2
Financial and Insurance Services	4.2	4.1	3.7	3.8	3.6	3.4	3.4	3.1	3.1	3.1	3.0	2.9	3.4
Rental, Hiring and Real Estate Services	4.4	4.5	4.6	4.3	3.5	3.7	3.8	4.2	4.2	4.1	3.4	3.4	4.0
Professional, Scientific and Technical Services	4.0	3.7	3.9	4.3	4.2	4.1	4.0	4.0	4.0	3.9	3.5	3.1	3.9
Administrative and Support Services	3.5	3.4	3.5	3.6	3.5	3.6	3.6	4.1	4.0	3.9	3.6	3.2	3.6
Public Administration and Safety	4.4	4.0	4.0	4.1	3.9	3.6	3.5	3.6	3.5	3.5	3.2	2.8	3.7
Health Care and Social Assistance	3.9	4.1	3.9	3.9	4.0	3.8	3.8	3.2	3.0	3.1	3.0	3.3	3.6
Education and Training	5.0	4.5	4.8	4.2	4.3	4.3	4.4	3.9	3.5	3.7	3.7	3.4	4.1
Arts and Recreation Services	3.8	3.6	3.8	4.0	3.8	3.3	3.2	3.3	3.2	3.3	3.2	2.8	3.4
Other Services	3.4	3.7	3.8	3.6	3.6	3.6	3.6	4.0	3.6	3.2	2.9	2.9	3.5
ALL INDUSTRIES	4.2	4.0	4.0	3.9	3.9	3.9	3.8	3.6	3.5	3.4	3.2	3.2	3.7

1) Current agreements in December of each year.

Source: Department of Employment

Fig. 12. Electricity, Gas, Water and Waste Services Forecasts – Australia

Year Ended June	% of Workforce in 2016	Year Average Per Cent Change															
										Forecast						Average	Average
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2018-23	2019-23
Awards Only	5.7%	0.7	4.8	3.4	2.9	4.8	8.2	2.8	2.4	3.3	2.7	2.6	2.7	2.9	3.2	2.9	2.8
Collective Agreements	60.6%	4.6	4.2	4.1	4.1	3.6	3.3	3.2	3.0	3.1	3.5	3.5	3.7	3.9	4.2	3.6	3.7
Individual Arrangements	33.6%	4.6	4.0	2.5	4.8	2.3	1.0	0.8	0.7	1.5	2.5	2.7	4.0	4.7	4.4	3.3	3.7
Wage Price Index	**100%**	**4.3**	**4.2**	**3.5**	**4.2**	**3.3**	**2.8**	**2.4**	**2.2**	**2.6**	**3.2**	**3.3**	**3.8**	**4.1**	**4.2**	3.5	3.7
Compositional Effects + Bonuses,etc		3.2	4.9	-1.0	1.9	-1.2	-2.2	1.1	2.1	0.5	0.5	0.4	0.2	0.4	0.3	0.4	0.4
AWOTE (a)	**100%**	**7.6**	**9.1**	**2.5**	**6.1**	**2.0**	**0.7**	**3.5**	**4.3**	**3.1**	**3.7**	**3.7**	**4.0**	**4.5**	**4.5**	3.9	4.1

Source: BIS Oxford Economics, ABS, Department of Employment

(a) Average Weekly Ordinary Time Earnings for Full-time Adult Persons (excludes overtime but includes bonuses).

Fig. 13. Average Weekly Ordinary Time Earnings and Wage Price Index Total Australia and Electricity, Gas, Water and Waste Services Sector (Year Average Growth)

Year Ended June	Average Weekly Ordinary Time Earnings ([1])				Wage Price Index			
	All Industries		Electricity, Gas, Water and Waste Services		All Industries		Electricity, Gas, Water and Waste Services	
	$	%CH	$	%CH	Index	%CH	Index	%CH
1999	741.4	3.5	827.1	3.9	69.6	3.1	65.7	3.0
2000	765.4	3.2	866.8	4.8	71.7	3.0	68.2	3.8
2001	804.2	5.1	918.5	6.0	74.2	3.5	70.8	3.8
2002	847.4	5.4	981.0	6.8	76.7	3.3	73.8	4.2
2003	890.0	5.0	1,001.3	2.1	79.3	3.5	76.8	4.1
2004	931.6	4.7	1,056.7	5.5	82.2	3.6	79.9	4.1
2005	972.9	4.4	1,090.6	3.2	85.3	3.7	83.3	4.3
2006	1 017.5	4.6	1,110.9	1.9	88.7	4.1	87.6	5.2
2007	1 054.1	3.6	1,151.9	3.7	92.2	3.9	91.8	4.8
2008	1 106.1	4.9	1,182.8	2.7	96.1	4.1	95.7	4.2
2009	1 166.5	5.5	1,255.5	6.1	100.0	4.1	100.0	4.5
2010	1 231.3	5.6	1,350.8	7.6	103.1	3.1	104.4	4.3
2011	1 282.5	4.2	1,473.9	9.1	107.0	3.8	108.7	4.2
2012	1 338.1	4.3	1,510.0	2.5	110.9	3.6	112.5	3.5
2013	1 400.3	4.6	1,602.5	6.1	114.6	3.3	117.3	4.2
2014	1 442.2	3.0	1,635.0	2.0	117.6	2.6	121.1	3.2
2015	1 477.3	2.4	1,646.0	0.7	120.4	2.4	124.5	2.8
2016	1 505.0	1.9	1,704.4	3.5	123.0	2.1	127.5	2.4
2017	1 535.8	2.0	1,777.3	4.3	125.4	2.0	130.3	2.2
Forecasts								
2018	1 576.3	2.6	1,832.4	3.1	128.3	2.3	133.7	2.6
2019	1 630.3	3.4	1,900.2	3.7	131.6	2.6	138.0	3.2
2020	1 683.8	3.3	1,970.5	3.7	135.0	2.6	142.5	3.3
2021	1 749.1	3.9	2,049.3	4.0	139.4	3.3	148.0	3.8
2022	1 828.5	4.5	2,141.5	4.5	144.6	3.7	154.0	4.1
2023	1 909.6	4.4	2,238.0	4.5	150.0	3.8	160.4	4.2
Compound Annual Growth Rates ([2])								
2000-2010	4.9		4.5		3.7		4.3	
2010-2017	3.2		4.0		2.8		3.2	
2017-2023	3.7		3.9		3.0		3.5	
2018-2023	3.9		4.1		3.2		3.7	

Source: BIS Oxford Economics, ABS

(1) Average weekly ordinary time earnings for full-time adult persons.

Fig. 14. EGWWS WPI – New South Wales versus Australia, Year Average Growth

Year Ended June	EGWWS Wage Price Index		EGWWS Wage Price Index		Consumer Price Index (^)	
	New South Wales		Australia		Australia	
	Index	%CH	Index	%CH	Index	%CH
1999			65.7	3.0	67.8	1.3
2000			68.2	3.8	69.4	2.4
2001			70.8	3.8	73.6	6.0
2002			73.8	4.2	75.7	2.9
2003			76.8	4.1	78.0	3.0
2004			79.9	4.1	79.9	2.4
2005			83.3	4.3	81.8	2.4
2006			87.6	5.2	84.4	3.2
2007			91.8	4.8	86.9	3.0
2008			95.7	4.2	89.8	3.4
2009	100.0		100.0	4.5	92.6	3.1
2010	104.0	3.9	104.4	4.3	94.8	2.3
2011	107.6	3.5	108.7	4.2	97.7	3.1
2012	111.1	3.2	112.5	3.5	100.0	2.3
2013	115.1	3.7	117.3	4.2	102.3	2.3
2014	118.6	3.0	121.1	3.2	105.0	2.7
2015	122.1	3.0	124.5	2.8	106.8	1.7
2016	123.8	1.3	127.5	2.4	108.3	1.4
2017	125.4	1.3	130.3	2.2	110.1	1.7
Forecasts						
2018	128.5	2.5	133.7	2.6	112.3	2.4
2019	132.6	3.2	137.9	3.2	114.8	2.4
2020	137.1	3.4	142.5	3.3	117.7	2.4
2021	142.4	3.9	147.8	3.8	120.6	2.4
2022	148.4	4.2	153.9	4.1	123.7	2.4
2023	154.7	4.2	160.5	4.2	126.7	2.4
Compound Annual Growth Rates						
2000-2010			4.3		3.2	
2010-2017	2.7		3.2		2.2	
2018-2023	3.6		3.5		2.4	
2019-2023	3.8		3.7		2.4	

Source: BIS Oxford Economics, ABS

(^) Headline CPI forecasts are official forecasts.

Fig. 15. Wage Price Index - Australia All Industries and Electricity, Gas, Water and Waste Services

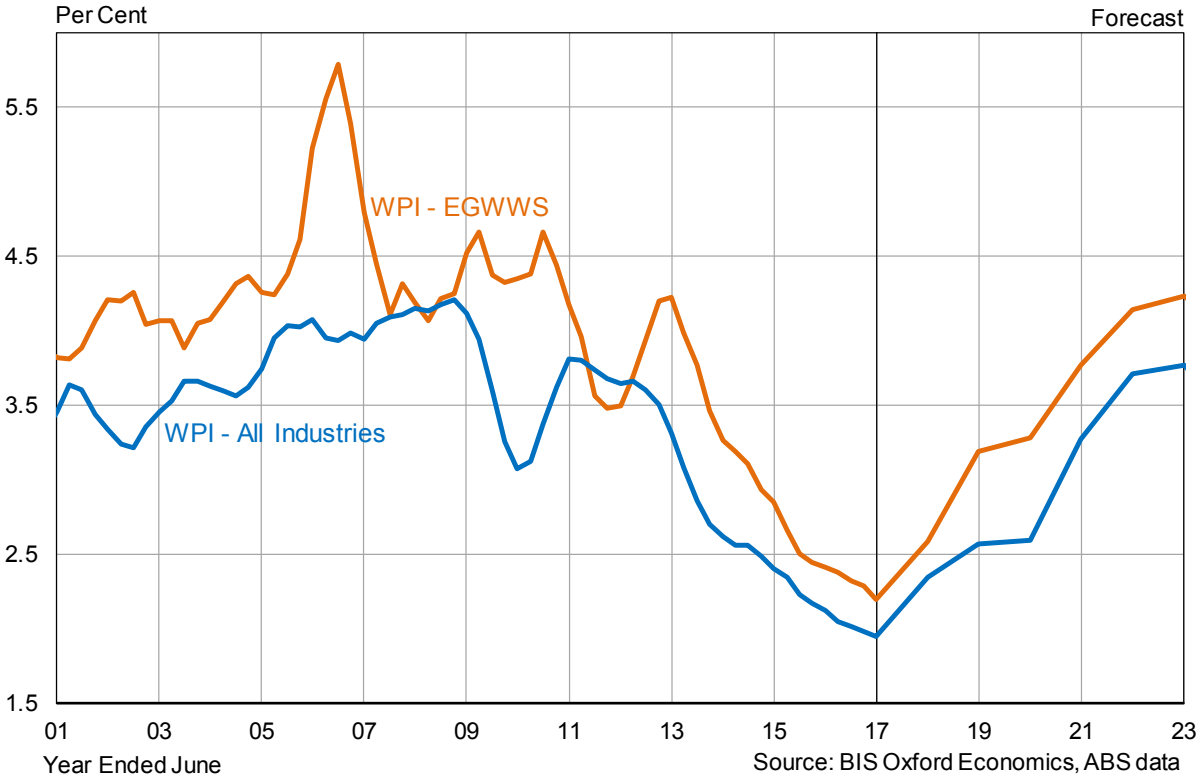
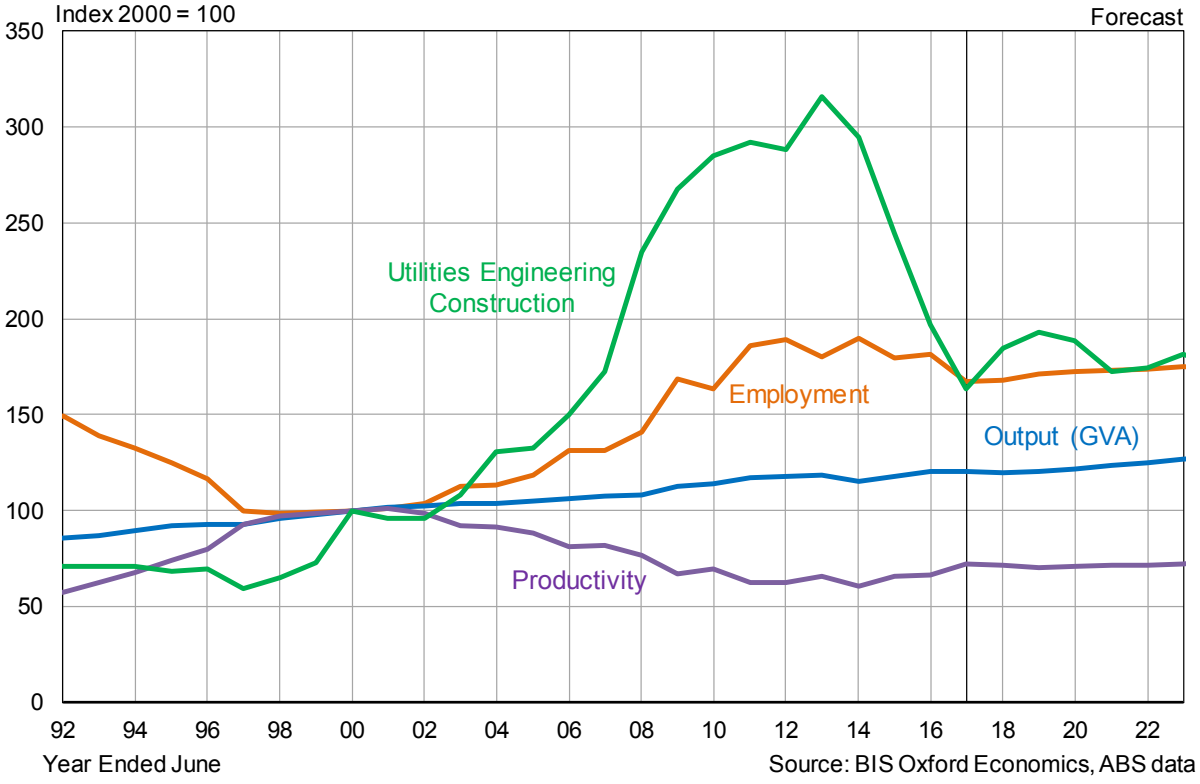


Fig. 16. Australia – Utilities Employment, Output and Investment



5. APPENDIX A: STATEMENT OF COMPLIANCE WITH EXPERT WITNESS GUIDELINES

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

6. APPENDIX B: CURRICULUM VITAES OF KEY PERSONNEL

Kishti Sen – Senior Economist

Kishti Sen is a senior economist at BIS Oxford Economics and is responsible for monitoring the Australian economy. In addition, he contributes to the modelling and production of economic forecasts for Australia and works on a variety of macro-related consultancy projects. Kishti is also the co-author of BIS Oxford Economics monthly Economic Outlook publication for Australia.

Prior to joining BIS Oxford Economics in 2007, Kishti was with the Reserve Bank of Fiji for 15 years where he held the position of Research Assistant/Research Analyst/Economist/Senior Economist and Senior Manager through internal rotations and staff promotions. As a senior economist, he built and managed the Reserve Bank's research and analytical work programme. In addition, he was a member of several high profile policy and forecasting committees including the Macro Policy Committee — the think tank for fiscal policy — and the Monetary Policy Committee which advised the Governor directly on interest-rate settings.

Kishti has a PhD in Economics from the University of Sydney.

Richard Robinson – Senior Economist and Associate Director - Economics

Richard Robinson has been employed with BIS Oxford Economics since 1986.

Richard is the company's principal economic forecaster, being largely responsible for the short term economic forecasts presented at BIS Economics' half yearly conferences in March and September. He contributes forecasts and analysis to the regular subscription services, Economic Outlook and Long Term Forecasts.

Richard regularly analyses and forecasts resources investment and civil engineering construction activity, and production of manufactures, consumer goods and commodities. In this work, he has developed considerable industry expertise in the construction, manufacturing, agriculture, services, commodity and resources sectors of the Australian and state economies.

Richard has also been involved in a wide range of consultancy and private client projects including formulating end-use sector demand models for forecasting product demand, project evaluation studies, cost-benefit analysis, assessments of individual property markets and analysing the consistency of escalators in contracts. Some other projects have included analysing and forecasting freight tonnages; a study of the repair and maintenance market; the preparation of economic arguments for the National Wage Case for a private industry group; regular analysis and detailed short and long term forecasts of economic variables in a number of overseas countries; and contributing discussion papers to CEDA (Committee for Economic Development of Australia).

Richard holds a Bachelor's Degree in Commerce with Honours from the University of Wollongong.

Husam El-Tarifi – Economist

Husam works across the Economics, the Infrastructure and Mining and the Asset Sales units at BIS Oxford Economics where he regularly contributes to the firm's renowned reports and is particularly valued in working through large datasets.

Husam has worked on privately commissioned studies for the finance, infrastructure, not-for-profit, government, utilities and mining sectors. He has been involved in the construction of a wide variety of quantitative models and has also provided model audit and validation services.

Husam joined BIS Oxford Economics in 2013 after obtaining his Bachelor of Economics degree with honours from the University of New South Wales.

Stella McMullen – Economic Analyst

Stella joined BIS Oxford Economics in 2016 after studying Economics and Mathematics at the University of Auckland, New Zealand. Stella works across Economics, Infrastructure and Mining and Asset Sales units.

7. APPENDIX C: TERMS OF REFERENCE

[See pages 35 – 52]

Expert Terms of Reference

Expected Wage Changes in the EGWWS Sector to 2022/23

TransGrid

2018/19-2022/23

Revenue Determination

21 September 2017

Contents

1. Background

TransGrid is the owner, operator and manager of the high voltage electricity network in New South Wales and the Australian Capital Territory. As such, TransGrid is a transmission network service provider (TNSP) regulated under the NEL and the NER.

Chapter 6A of the NER sets out rules for the economic regulation of prescribed transmission services and negotiated transmission services provided by TNSPs. This regime requires the AER to determine the revenue allowed to be earned by TransGrid for prescribed transmission services during each regulatory year, in accordance with the post-tax revenue model (PTRM), described in Chapter 6A of the NER for each regulatory control period. In addition, a pricing methodology, negotiating framework and negotiated transmission service criteria must also be determined by the AER. The process for making a transmission determination is set out in Part E of Chapter 6A of the NER.

TransGrid has a right to apply to the Federal Court for judicial review of the AER's final transmission determination.

TransGrid is currently preparing its revised revenue proposal for the next regulatory period. The changes in real wages is key input into the forecast used to determine TransGrid's allowed revenue. TransGrid is seeking expert advice on the expected wage changes in the EGWWS sector in relation to TransGrid's 2018/19-2022/23 revised revenue proposal.

The report will be submitted to the AER as part of the supporting documents to TransGrid's revised revenue proposal.

2. Scope of work

TransGrid requires

- a draft report:
    - to update the wage forecasts included in TransGrid's initial revenue proposal
    - provide an expert opinion on expected wage changes in the New South Wales Electricity, Gas, Water and Waste Services (EGWWS or the Utilities sector) as measured by the public and private WPI (wage price index).
    - Provide seven year numerical forecasts, covering financial years 2017/18 to 2022/23, of wages for the New South Wales utilities sector taking into account the macroeconomic conditions that are likely to prevail over the next six years including the likely investment profile and expected employment growth within the sector.
- An excel table of the forecast.

3. Other information to be considered

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

- The AER's "Framework and approach for TransGrid | For regulatory control period commencing 1 July 2018", published July 2016.

4. Proposal requirements

The service provider is requested to provide a proposal addressing the project brief, including:

- Approach to the engagement, including any suggested changes to the brief or value-adds;
- High level project plan with milestone dates;
- Proposed personnel, including CVs;
- Capped price.

5. Deliverables

At the completion of its review the Expert will provide an independent expert report which:

- is of a professional standard capable of being submitted to the AER and published in the public domain with no confidentiality provisions. It must also be prepared on the understanding that it may be referenced in a judicial review, should this eventuate;
- in case where analysis is undertaken or models are used, sufficient detail of the analysis must be provided to meet the requirements of the National Electricity Rules Schedule S6A.1.1 (2) and (4), and Schedule S6A.1.2 (2), (3) and (5). These schedules require a Revenue Proposal to include methods for developing forecasts, methods for developing forecasts of key variables and key assumptions that underlie forecasts. Specifically, the use of "black box" analysis is precluded.
- contains a section summarising the Expert's experience and qualifications, and attaches the Expert's curriculum vitae (preferably in a schedule or annexure);
- identifies any person and their qualifications, who assists the Expert in preparing the report or in carrying out any research or test for the purposes of the report;
- summarises TransGrid's instructions and attaches these terms of reference;
- includes an executive summary which highlights key aspects of the Expert's work and conclusions; and
- (without limiting the points above) carefully sets out the facts that the Expert has assumed in putting together his or her report, as well as identifying any other assumptions made, and the basis for those assumptions.
- Notes that the expert has read and understood the attached Federal Court Expert Evidence Practice Note and include the declaration in paragraph 5.2.

The Expert's report will include the findings for each of the parts defined in the scope of works (section 2).

6. Timetable

The Expert's report will deliver the excel table to TransGrid by 13 October 2017, a draft report by 20 October 2017, followed by the final report by 17 November 2017 for the final submission to the AER by 1 December 2017.

7. Terms of engagement

The terms on which the Expert will be engaged to provide the requested advice shall be as provided in accordance with the TransGrid's Regulatory Consultancy panel arrangement Terms and Conditions.

TransGrid intends to use this report as part of the revised revenue submission.

8. Remuneration

TransGrid, subject to the capped fees requested by this proposal, will pay you for time spent on this matter in accordance with the instructions of TransGrid at the agreed rates.

Attachment 1 – Expert Evidence Practice Note GPN-EXPT

EXPERT EVIDENCE PRACTICE NOTES (GPN-EXPT)

General Practice Note

1. INTRODUCTION

1.1 This practice note, including the *Harmonised Expert Witness Code of Conduct* ("**Code**") (see Annexure A) and the *Concurrent Expert Evidence Guidelines* ("**Concurrent Evidence Guidelines**") (see Annexure B), applies to any proceeding involving the use of expert evidence and must be read together with:

(a) the Central Practice Note (CPN-1), which sets out the fundamental principles concerning the National Court Framework ("**NCF**") of the Federal Court and key principles of case management procedure;

(b) the *Federal Court of Australia Act 1976* (Cth) ("**Federal Court Act**");

(c) the *Evidence Act 1995* (Cth) ("**Evidence Act**"**),** including Part 3.3 of the Evidence Act;

(d) Part 23 of the *Federal Court Rules 2011* (Cth) ("**Federal Court Rules**"**)**; and

(e) where applicable, the Survey Evidence Practice Note (GPN-SURV).

1.2 This practice note takes effect from the date it is issued and, to the extent practicable, applies to proceedings whether filed before, or after, the date of issuing.

2. APPROACH TO EXPERT EVIDENCE

2.1 An expert witness may be retained to give opinion evidence in the proceeding, or, in certain circumstances, to express an opinion that may be relied upon in alternative dispute resolution procedures such as mediation or a conference of experts. In some circumstances an expert may be appointed as an independent adviser to the Court.

2.2 The purpose of the use of expert evidence in proceedings, often in relation to complex subject matter, is for the Court to receive the benefit of the objective and impartial assessment of an issue from a witness with specialised knowledge (based on training, study or experience - see generally s 79 of the Evidence Act).

2.3 However, the use or admissibility of expert evidence remains subject to the overriding requirements that:

(a) to be admissible in a proceeding, any such evidence must be relevant (s 56 of the Evidence Act); and

(b) even if relevant, any such evidence, may be refused to be admitted by the Court if its probative value is outweighed by other considerations such as the evidence being unfairly prejudicial, misleading or will result in an undue waste of time (s 135 of the Evidence Act).

2.4 An expert witness' opinion evidence may have little or no value unless the assumptions adopted by the expert (ie. the facts or grounds relied upon) and his or her reasoning are expressly stated in any written report or oral evidence given.

2.5 The Court will ensure that, in the interests of justice, parties are given a reasonable opportunity to adduce and test relevant expert opinion evidence. However, the Court expects parties and any legal representatives acting on their behalf, when dealing with expert witnesses and expert evidence, to at all times comply with their duties associated with the overarching purpose in the Federal Court Act (see ss 37M and 37N).

3. INTERACTION WITH EXPERT WITNESSES

3.1 Parties and their legal representatives should never view an expert witness retained (or partly retained) by them as that party's advocate or "hired gun". Equally, they should never attempt to pressure or influence an expert into conforming his or her views with the party's interests.

3.2 A party or legal representative should be cautious not to have inappropriate communications when retaining or instructing an independent expert, or assisting an independent expert in the preparation of his or her evidence. However, it is important to note that there is no principle of law or practice and there is nothing in this practice note that obliges a party to embark on the costly task of engaging a "consulting expert" in order to avoid "contamination" of the expert who will give evidence. Indeed the Court would generally discourage such costly duplication.

3.3 Any witness retained by a party for the purpose of preparing a report or giving evidence in a proceeding as to an opinion held by the witness that is wholly or substantially based in the specialised knowledge of the witness[1] should, at the earliest opportunity, be provided with:

(a) a copy of this practice note, including the Code (see Annexure A); and

(b) all relevant information (whether helpful or harmful to that party's case) so as to enable the expert to prepare a report of a truly independent nature.

[1] Such a witness includes a "Court expert" as defined in r 23.01 of the Federal Court Rules. For the definition of "expert", "expert evidence" and "expert report" see the Dictionary, in Schedule 1 of the Federal Court Rules.

3.4 Any questions or assumptions provided to an expert should be provided in an unbiased manner and in such a way that the expert is not confined to addressing selective, irrelevant or immaterial issues.

4. ROLE AND DUTIES OF THE EXPERT WITNESS

4.1 The role of the expert witness is to provide relevant and impartial evidence in his or her area of expertise. An expert should never mislead the Court or become an advocate for the cause of the party that has retained the expert.

4.2 It should be emphasised that there is nothing inherently wrong with experts disagreeing or failing to reach the same conclusion. The Court will, with the assistance of the evidence of the experts, reach its own conclusion.

4.3 However, experts should willingly be prepared to change their opinion or make concessions when it is necessary or appropriate to do so, even if doing so would be contrary to any previously held or expressed view of that expert.

Harmonised Expert Witness Code of Conduct

4.4 Every expert witness giving evidence in this Court must read the *Harmonised Expert Witness Code of Conduct* (attached in Annexure A) and agree to be bound by it.

4.5 The Code is not intended to address all aspects of an expert witness' duties, but is intended to facilitate the admission of opinion evidence, and to assist experts to understand in general terms what the Court expects of them. Additionally, it is expected that compliance with the Code will assist individual expert witnesses to avoid criticism (rightly or wrongly) that they lack objectivity or are partisan.

5. CONTENTS OF AN EXPERT'S REPORT AND RELATED MATERIAL

5.1 The contents of an expert's report must conform with the requirements set out in the Code (including clauses 3 to 5 of the Code).

5.2 In addition, the contents of such a report must also comply with r 23.13 of the Federal Court Rules. Given that the requirements of that rule significantly overlap with the requirements in the Code, an expert, unless otherwise directed by the Court, will be taken to have complied with the requirements of r 23.13 if that expert has complied with the requirements in the Code and has complied with the additional following requirements. The expert shall:

(a) acknowledge in the report that:

(i) the expert has read and complied with this practice note and agrees to be bound by it; and

(ii) the expert's opinions are based wholly or substantially on specialised knowledge arising from the expert's training, study or experience;

(b) identify in the report the questions that the expert was asked to address;

(c) sign the report and attach or exhibit to it copies of:

(i) documents that record any instructions given to the expert; and

(ii) documents and other materials that the expert has been instructed to consider.

5.3 Where an expert's report refers to photographs, plans, calculations, analyses, measurements, survey reports or other extrinsic matter, these must be provided to the other parties at the same time as the expert's report.

6. CASE MANAGEMENT CONSIDERATIONS

6.1 Parties intending to rely on expert evidence at trial are expected to consider between them and inform the Court at the earliest opportunity of their views on the following:

(a) whether a party should adduce evidence from more than one expert in any single discipline;

(b) whether a common expert is appropriate for all or any part of the evidence;

(c) the nature and extent of expert reports, including any in reply;

(d) the identity of each expert witness that a party intends to call, their area(s) of expertise and availability during the proposed hearing;

(e) the issues that it is proposed each expert will address;

(f) the arrangements for a conference of experts to prepare a joint-report (see Part 7 of this practice note);

(g) whether the evidence is to be given concurrently and, if so, how (see Part 8 of this practice note); and

(h) whether any of the evidence in chief can be given orally.

6.2 It will often be desirable, before any expert is retained, for the parties to attempt to agree on the question or questions proposed to be the subject of expert evidence as well as the relevant facts and assumptions. The Court may make orders to that effect where it considers it appropriate to do so.

7. CONFERENCE OF EXPERTS AND JOINT-REPORT

7.1 Parties, their legal representatives and experts should be familiar with aspects of the Code relating to conferences of experts and joint-reports (see clauses 6 and 7 of the Code attached in Annexure A).

7.2 In order to facilitate the proper understanding of issues arising in expert evidence and to manage expert evidence in accordance with the overarching purpose, the Court may

require experts who are to give evidence or who have produced reports to meet for the purpose of identifying and addressing the issues not agreed between them with a view to reaching agreement where this is possible ("**conference of experts**"). In an appropriate case, the Court may appoint a registrar of the Court or some other suitably qualified person ("**Conference Facilitator**") to act as a facilitator at the conference of experts.

7.3 It is expected that where expert evidence may be relied on in any proceeding, at the earliest opportunity, parties will discuss and then inform the Court whether a conference of experts and/or a joint-report by the experts may be desirable to assist with or simplify the giving of expert evidence in the proceeding. The parties should discuss the necessary arrangements for any conference and/or joint-report. The arrangements discussed between the parties should address:

(a) who should prepare any joint-report;

(b) whether a list of issues is needed to assist the experts in the conference and, if so, whether the Court, the parties or the experts should assist in preparing such a list;

(c) **t**he agenda for the conference of experts; and

(d) arrangements for the provision, to the parties and the Court, of any joint-report or any other report as to the outcomes of the conference ("**conference report**").

Conference of Experts

7.4 The purpose of the conference of experts is for the experts to have a comprehensive discussion of issues relating to their field of expertise, with a view to identifying matters and issues in a proceeding about which the experts agree, partly agree or disagree and why. For this reason the conference is attended only by the experts and any Conference Facilitator. Unless the Court orders otherwise, the parties' lawyers will not attend the conference but will be provided with a copy of any conference report.

7.5 The Court may order that a conference of experts occur in a variety of circumstances, depending on the views of the judge and the parties and the needs of the case, including:

(a) while a case is in mediation. When this occurs the Court may also order that the outcome of the conference or any document disclosing or summarising the experts' opinions be confidential to the parties while the mediation is occurring;

(b) before the experts have reached a final opinion on a relevant question or the facts involved in a case. When this occurs the Court may order that the parties exchange draft expert reports and that a conference report be prepared for the use of the experts in finalising their reports;

(c) after the experts' reports have been provided to the Court but before the hearing of the experts' evidence. When this occurs the Court may also order that a

conference report be prepared (jointly or otherwise) to ensure the efficient hearing of the experts' evidence.

7.6 Subject to any other order or direction of the Court, the parties and their lawyers must not involve themselves in the conference of experts process. In particular, they must not seek to encourage an expert not to agree with another expert or otherwise seek to influence the outcome of the conference of experts. The experts should raise any queries they may have in relation to the process with the Conference Facilitator (if one has been appointed) or in accordance with a protocol agreed between the lawyers prior to the conference of experts taking place (if no Conference Facilitator has been appointed).

7.7 Any list of issues prepared for the consideration of the experts as part of the conference of experts process should be prepared using non-tendentious language.

7.8 The timing and location of the conference of experts will be decided by the judge or a registrar who will take into account the location and availability of the experts and the Court's case management timetable. The conference may take place at the Court and will usually be conducted in-person. However, if not considered a hindrance to the process, the conference may also be conducted with the assistance of visual or audio technology (such as via the internet, video link and/or by telephone).

7.9 Experts should prepare for a conference of experts by ensuring that they are familiar with all of the material upon which they base their opinions. Where expert reports in draft or final form have been exchanged prior to the conference, experts should attend the conference familiar with the reports of the other experts. Prior to the conference, experts should also consider where they believe the differences of opinion lie between them and what processes and discussions may assist to identify and refine those areas of difference.

Joint-report

7.10 At the conclusion of the conference of experts, unless the Court considers it unnecessary to do so, it is expected that the experts will have narrowed the issues in respect of which they agree, partly agree or disagree in a joint-report. The joint report should be clear, plain and concise and should summarise the views of the experts on the identified issues, including a succinct explanation for any differences of opinion, and otherwise be structured in the manner requested by the judge or registrar.

7.11 In some cases (and most particularly in some native title cases), depending on the nature, volume and complexity of the expert evidence a judge may direct a registrar to draft part, or all, of a conference report. If so, the registrar will usually provide the draft conference report to the relevant experts and seek their confirmation that the conference report accurately reflects the opinions of the experts expressed at the conference. Once that confirmation has been received the registrar will finalise the conference report and provide it to the intended recipient(s).

8. CONCURRENT EXPERT EVIDENCE

8.1 The Court may determine that it is appropriate, depending on the nature of the expert evidence and the proceeding generally, for experts to give some or all of their evidence concurrently at the final (or other) hearing.

8.2 Parties should familiarise themselves with the *Concurrent Expert Evidence Guidelines* (attached in Annexure B). The Concurrent Evidence Guidelines are not intended to be exhaustive but indicate the circumstances when the Court might consider it appropriate for concurrent expert evidence to take place, outline how that process may be undertaken, and assist experts to understand in general terms what the Court expects of them.

8.3 If an order is made for concurrent expert evidence to be given at a hearing, any expert to give such evidence should be provided with the Concurrent Evidence Guidelines well in advance of the hearing and should be familiar with those guidelines before giving evidence.

9. FURTHER PRACTICE INFORMATION AND RESOURCES

9.1 Further information regarding Expert Evidence and Expert Witnesses is available on the Court's website.

9.2 Further information to assist litigants, including a range of helpful guides, is also available on the Court's website. This information may be particularly helpful for litigants who are representing themselves.

J L B ALLSOP
Chief Justice
25 October 2016

Annexure A

HARMONISED EXPERT WITNESS CODE OF CONDUCT[2]

APPLICATION OF CODE

1. This Code of Conduct applies to any expert witness engaged or appointed:

   (a) to provide an expert's report for use as evidence in proceedings or proposed proceedings; or

   (b) to give opinion evidence in proceedings or proposed proceedings.

GENERAL DUTIES TO THE COURT

2. An expert witness is not an advocate for a party and has a paramount duty, overriding any duty to the party to the proceedings or other person retaining the expert witness, to assist the Court impartially on matters relevant to the area of expertise of the witness.

CONTENT OF REPORT

3. Every report prepared by an expert witness for use in Court shall clearly state the opinion or opinions of the expert and shall state, specify or provide:

   (a) the name and address of the expert;

   (b) an acknowledgment that the expert has read this code and agrees to be bound by it;

   (c) the qualifications of the expert to prepare the report;

   (d) the assumptions and material facts on which each opinion expressed in the report is based [a letter of instructions may be annexed];

   (e) the reasons for and any literature or other materials utilised in support of such opinion;

   (f) (if applicable) that a particular question, issue or matter falls outside the expert's field of expertise;

   (g) any examinations, tests or other investigations on which the expert has relied, identifying the person who carried them out and that person's qualifications;

   (h) the extent to which any opinion which the expert has expressed involves the acceptance of another person's opinion, the identification of that other person and the opinion expressed by that other person;

   (i) a declaration that the expert has made all the inquiries which the expert believes are

[2] Approved by the Council of Chief Justices' Rules Harmonisation Committee

desirable and appropriate (save for any matters identified explicitly in the report), and that no matters of significance which the expert regards as relevant have, to the knowledge of the expert, been withheld from the Court;

(j) any qualifications on an opinion expressed in the report without which the report is or may be incomplete or inaccurate;

(k) whether any opinion expressed in the report is not a concluded opinion because of insufficient research or insufficient data or for any other reason; and

(l) where the report is lengthy or complex, a brief summary of the report at the beginning of the report.

SUPPLEMENTARY REPORT FOLLOWING CHANGE OF OPINION

4. Where an expert witness has provided to a party (or that party's legal representative) a report for use in Court, and the expert thereafter changes his or her opinion on a material matter, the expert shall forthwith provide to the party (or that party's legal representative) a supplementary report which shall state, specify or provide the information referred to in paragraphs (a), (d), (e), (g), (h), (i), (j), (k) and (l) of clause 3 of this code and, if applicable, paragraph (f) of that clause.

5. In any subsequent report (whether prepared in accordance with clause 4 or not) the expert may refer to material contained in the earlier report without repeating it.

DUTY TO COMPLY WITH THE COURT'S DIRECTIONS

6. If directed to do so by the Court, an expert witness shall:

(a) confer with any other expert witness;

(b) provide the Court with a joint-report specifying (as the case requires) matters agreed and matters not agreed and the reasons for the experts not agreeing; and

(c) abide in a timely way by any direction of the Court.

CONFERENCE OF EXPERTS

7. Each expert witness shall:

(a) exercise his or her independent judgment in relation to every conference in which the expert participates pursuant to a direction of the Court and in relation to each report thereafter provided, and shall not act on any instruction or request to withhold or avoid agreement; and

(b) endeavour to reach agreement with the other expert witness (or witnesses) on any issue in dispute between them, or failing agreement, endeavour to identify and clarify

the basis of disagreement on the issues which are in dispute.

ANNEXURE B

CONCURRENT EXPERT EVIDENCE GUIDELINES

APPLICATION OF THE COURT'S GUIDELINES

1. The Court's Concurrent Expert Evidence Guidelines ("**Concurrent Evidence Guidelines**") are intended to inform parties, practitioners and experts of the Court's general approach to concurrent expert evidence, the circumstances in which the Court might consider expert witnesses giving evidence concurrently and, if so, the procedures by which their evidence may be taken.

OBJECTIVES OF CONCURRENT EXPERT EVIDENCE TECHNIQUE

2. The use of concurrent evidence for the giving of expert evidence at hearings as a case management technique[3] will be utilised by the Court in appropriate circumstances (see r 23.15 of the *Federal Court Rules 2011* (Cth)). Not all cases will suit the process. For instance, in some patent cases, where the entire case revolves around conflicts within fields of expertise, concurrent evidence may not assist a judge. However, patent cases should not be excluded from concurrent expert evidence processes.

3. In many cases the use of concurrent expert evidence is a technique that can reduce the partisan or confrontational nature of conventional hearing processes and minimises the risk that experts become "opposing experts" rather than independent experts assisting the Court. It can elicit more precise and accurate expert evidence with greater input and assistance from the experts themselves.

4. When properly and flexibly applied, with efficiency and discipline during the hearing process, the technique may also allow the experts to more effectively focus on the critical points of disagreement between them, identify or resolve those issues more quickly, and narrow the issues in dispute. This can also allow for the key evidence to be given at the same time (rather than being spread across many days of hearing); permit the judge to assess an expert more readily, whilst allowing each party a genuine opportunity to put and test expert evidence. This can reduce the chance of the experts, lawyers and the judge misunderstanding the opinions being expressed by the experts.

5. It is essential that such a process has the full cooperation and support of all of the individuals involved, including the experts and counsel involved in the questioning

[3] Also known as the "hot tub" or as "expert panels".

process. Without that cooperation and support the process may fail in its objectives and even hinder the case management process.

CASE MANAGEMENT

6. Parties should expect that, the Court will give careful consideration to whether concurrent evidence is appropriate in circumstances where there is more than one expert witness having the same expertise who is to give evidence on the same or related topics. Whether experts should give evidence concurrently is a matter for the Court, and will depend on the circumstances of each individual case, including the character of the proceeding, the nature of the expert evidence, and the views of the parties.

7. Although this consideration may take place at any time, including the commencement of the hearing, if not raised earlier, parties should raise the issue of concurrent evidence at the first appropriate case management hearing, and no later than any pre-trial case management hearing, so that orders can be made in advance, if necessary. To that end, prior to the hearing at which expert evidence may be given concurrently, parties and their lawyers should confer and give general consideration as to:

   (a) the agenda;

   (b) the order and manner in which questions will be asked; and

   (c) whether cross-examination will take place within the context of the concurrent evidence or after its conclusion.

8. At the same time, and before any hearing date is fixed, the identity of all experts proposed to be called and their areas of expertise is to be notified to the Court by all parties.

9. The lack of any concurrent evidence orders does not mean that the Court will not consider using concurrent evidence without prior notice to the parties, if appropriate.

CONFERENCE OF EXPERTS & JOINT-REPORT OR LIST OF ISSUES

10. The process of giving concurrent evidence at hearings may be assisted by the preparation of a joint report or list of issues prepared as part of a conference of experts.

11. Parties should expect that, where concurrent evidence is appropriate, the Court may make orders requiring a conference of experts to take place or for documents such as a joint-report to be prepared to facilitate the concurrent expert evidence process at a

hearing (see Part 7 of the Expert Evidence Practice Note).

PROCEDURE AT HEARING

12. Concurrent expert evidence may be taken at any convenient time during the hearing, although it will often occur at the conclusion of both parties' lay evidence.

13. At the hearing itself, the way in which concurrent expert evidence is taken must be applied flexibly and having regard to the characteristics of the case and the nature of the evidence to be given.

14. Without intending to be prescriptive of the procedure, parties should expect that, when evidence is given by experts in concurrent session:

    (a) the judge will explain to the experts the procedure that will be followed and that the nature of the process may be different to their previous experiences of giving expert evidence;

    (b) the experts will be grouped and called to give evidence together in their respective fields of expertise;

    (c) the experts will take the oath or affirmation together, as appropriate;

    (d) the experts will sit together with convenient access to their materials for their ease of reference, either in the witness box or in some other location in the courtroom, including (if necessary) at the bar table;

    (e) each expert may be given the opportunity to provide a summary overview of their current opinions and explain what they consider to be the principal issues of disagreement between the experts, as they see them, in their own words;

    (f) the judge will guide the process by which evidence is given, including, where appropriate:

        (i) using any joint-report or list of issues as a guide for all the experts to be asked questions by the judge and counsel, about each issue on an issue-by-issue basis;

        (ii) ensuring that each expert is given an adequate opportunity to deal with each issue and the exposition given by other experts including, where considered appropriate, each expert asking questions of other experts or supplementing the evidence given by other experts;

        (iii) inviting legal representatives to identify the topics upon which they will cross-examine;

        (iv) ensuring that legal representatives have an adequate opportunity to ask

all experts questions about each issue. Legal representatives may also seek responses or contributions from one or more experts in response to the evidence given by a different expert; and

(v) allowing the experts an opportunity to summarise their views at the end of the process where opinions may have been changed or clarifications are needed.

15. The fact that the experts may have been provided with a list of issues for consideration does not confine the scope of any cross-examination of any expert. The process of cross-examination remains subject to the overall control of the judge.

16. The concurrent session should allow for a sensible and orderly series of exchanges between expert and expert, and between expert and lawyer. Where appropriate, the judge may allow for more traditional cross-examination to be pursued by a legal representative on a particular issue exclusively with one expert. Where that occurs, other experts may be asked to comment on the evidence given.

17. Where any issue involves only one expert, the party wishing to ask questions about that issue should let the judge know in advance so that consideration can be given to whether arrangements should be made for that issue to be dealt with after the completion of the concurrent session. Otherwise, as far as practicable, questions (including in the form of cross-examination) will usually be dealt with in the concurrent session.

18. Throughout the concurrent evidence process the judge will ensure that the process is fair and effective (for the parties and the experts), balanced (including not permitting one expert to overwhelm or overshadow any other expert), and does not become a protracted or inefficient process.