Attachment 7.4

Wage price index (WPI) and Consumer price index (CPI) forecasts

Access Arrangement Information

2 October 2017

Access Arrangement Information (AAI) for the period 1 July 2017 to 30 June 2022





Wage price index (WPI) and consumer price index (CPI) forecasts

A report prepared for Western Power's access arrangement for the 2017-22 regulatory period

May 2017

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Executive Summary

Synergies Economic Consulting has been engaged by Western Power to provide an expert opinion on the outlook for cost escalation factors to support its access arrangement (AA4) for the regulatory period from 2017-18 to 2021-22. Accordingly, this report provides forecasts for:

- Wage Price Index (WPI) for the Electricity, Gas, Water and Waste Services sector (EGWWS); and
- Consumer Price Index (CPI).

Key economic drivers

Overall, Synergies expects that growth in both the WPI for EGWWS and the CPI will remain weak over the short term but recover to be slightly below trend over the medium term. This forecast outlook is consistent with that of the (WA) Department of Treasury.

The main factors driving these outcomes are:

- The Australian economy is currently experiencing a period of weakness, mainly driven by weak domestic demand as the mining investment boom unwinds. However, our economy is flexible and monetary policy and the floating exchange rate are acting to support demand in other sectors of the economy. As such, Australia's economic growth is expected to recover slowly in the next few years.
- In Western Australia, the economy has been impacted more severely by the completion of large mining projects given the resources sector contributes a dominant share of the economy. Although mining investment is expected to continue falling for the next few years, activity will continue to be supported by export volume growth from existing mines as commodity prices recover and continued efficiency gains are made. As in other parts of Australia, growth in non-mining sectors is also expected to provide support for economic growth.
- Recent weakness in inflation data is largely the result of spare capacity in the economy. As the economy adjusts to the post-mining investment boom, domestic demand will pick up, reducing spare capacity. This, along with the lagged effect of a lower exchange rate and an anticipated rise in oil prices is expected to result in CPI inflation approaching the midpoint of the RBA's target band by the start of the 2020s in both Australia and in Western Australia.
- The EGWWS sector has historically had higher than average wages growth, in part reflecting its high levels of unionisation. Recent weakness in the mining industry is prompting skilled workers to compete for jobs in other industries, which has pushed wages growth in the EGWWS sector down, in line with wages growth in the broader economy. As economic activity recovers and spare capacity in the labour market falls



over the next two years, wages growth is expected to increase. An increase in inflation is also expected to drive somewhat higher nominal wages increases. This combination of factors is expected to see wages growth in the EGWWS industry pick up but remain below the historical average.

Summary of CPI and WPI forecasts

Table 1 provides an overview of our CPI and wages forecasts, including for Western Power's AA4 (2017-18 to 2021-22 regulatory period).

		-	•	•	-	•	
	2016–17	2017–18	2018–19	2019–20	2020–21	2021-22	AA4 average
CPI							
Australia	1.6	1.9	2.2	2.4	2.4	2.5	2.3
Perth	1.0	1.8	2.2	2.3	2.4	2.3	2.2
Nominal WPI – EGWWS							
Australia	2.5	3.1	3.5	3.7	3.7	3.7	3.5
Western Australia	2.1	2.9	3.3	3.5	3.6	3.7	3.4
Nominal WPI – All Industries							
Australia	2.0	2.7	3.0	3.1	3.2	3.3	3.1
Western Australia	1.6	2.4	2.8	3.0	3.1	3.1	2.9
Real WPI – EGWWS							
Australia	0.9	1.2	1.3	1.3	1.3	1.2	1.3
Western Australia	1.1	1.1	1.1	1.2	1.2	1.4	1.2
Real WPI – All Industries							
Australia	0.4	0.8	0.8	0.7	0.8	0.8	0.8
Western Australia	0.6	0.6	0.6	0.7	0.7	0.8	0.7

 Table 1
 Overview of CPI and wages forecasts (% change, financial year average)

Source: Synergies forecasts

Table 1 indicates the somewhat weaker CPI and wage forecasts for WA compared to Australia over the 2017-22 regulatory period, which is reflected in modest average real labour escalation of 0.7% per annum.

Synergies' average CPI forecast for Australia for the 2017-22 period is 2.3% per annum, which is consistent with the RBA's current forecast for this period of 2.4%, although the profile of expected annual changes is somewhat different.¹

¹ RBA (2017), Statement on Monetary Policy, February, p 57



	•	0,	,	0 //		
	2017-18	2018–19	2019–20	2020–21	2021-22	Average
CPI – Australia	2.0	2.5	2.5	2.5	2.5	2.4

Table 2 RBA CPI forecast (% change, financial year average))

Source: RBA

Given the close alignment of Synergies' and RBA's CPI forecasts we recommend that the RBA's CPI forecasts be adopted for the AA4 regulatory period.

Real labour cost escalation

Table 2 presents our proposed real labour escalators based on the RBA forecasts of CPI and our nominal WPI annual increases for Western Australia set out in Table 1.

	2017-18	2018–19	2019–20	2020–21	2021-22	Average
Real WPI – EGWWS Western Australia	0.9	0.8	1.0	1.1	1.2	1.0

Table 3 Forecast real labour cost escalators (% change, financial year average))

Source: Synergies forecasts

We recommend that these forecast real labour escalators be used in the development of Western Power's operating and capital expenditure forecasts for the 2017-22 regulatory period.



Contents

Exe	cutive S	Summary	3
	Key e	economic drivers	3
	Summ	nary of CPI and WPI forecasts	4
1	Intro	duction	8
2	Elect	ricity Access Code requirements	10
	2.1	Inflation forecasts	10
	2.2	Labour cost forecasts	10
3	Over	view of methodology	12
	3.1	Stage 1: Economic forecasts	12
	3.2	Stage 2: Econometric modelling	12
4	Macr	oeconomic outlook	14
	4.1	International	14
	4.2	Commodities	15
	4.3	Australia	16
	4.4	Western Australia	20
	4.5	Conclusion	23
5	Prices	s and wages outlook	24
	5.1	CPI	24
	5.2	WPI	25
	5.3	Recommendation	28
Α	Syne	rgies' CPI and WPI models	30
B	The V	Victoria University Regional Model	32

Figures and Tables

Figure 1	RBA index of Australian commodity prices	15
Figure 2	Historical and forecast terms of trade	17
Figure 3	Actual and forecast mining investment, Australia	18
Figure 4	Value added shares, Mining and Construction industries, 2015-16	20



Figure 5	Actual and expected mining investment, Western Australia	21
Figure 6	CPI, Mar qtr to Mar qtr growth, Australia	24
Figure 7	Wages growth, June qtr to June qtr, Australia	26
Table 1	Overview of CPI and wages forecasts (% change, financial year averag	e) 4
Table 2	RBA CPI forecast (% change, financial year average))	5
Table 3	Forecast real labour cost escalators (% change, financial year average))	5
Table 4	Price and volume outlooks for key Australian commodities (% growth) 16
Table 5	Key macroeconomic variables, Australia (% growth)	19
Table 6	Employment, EGWWS, Construction and Mining, Australia (% growth	ה) 20
Table 7	Key macroeconomic variables, Western Australia (% growth)	22
Table 8	Employment, EGWWS, Construction and Mining, Australia, % growth	1 23
Table 9	Forecast CPI growth (% growth)	25
Table 10	Method of setting pay	26
Table 11	Federal wage agreements approved in the quarter (average annualised wage increase (%) ^a)	l 27
Table 12	Forecast Nominal and Real WPI (annual % growth)	28
Table 13	RBA CPI forecast (% change, financial year average))	29
Table 14	Forecast real labour cost escalators (% change, financial year average))	29



1 Introduction

Synergies has been engaged by Western Power to produce forecasts of the following economic indicators:

- Wage Price Index (WPI) for the Electricity, Gas, Water and Waste Services sector (EGWWS); and
- Consumer Price Index (CPI).

The forecasts are for the period from 2016-17 to 2021-22 and will be used to support Western Power's AA4 for the regulatory period from 2017-18 to 2021-22 period.

We expect the CPI forecasts will be used in the roll-forward of Western Power's regulatory asset base value and WPI forecasts used in the escalation of labour costs for its operating and capital expenditure forecasts.

We believe that the methodology outlined in this report provides a sound basis for forecasting the WPI for the EGWWS. Nevertheless, it should be recognised that the Australian economy is currently experiencing a significant structural adjustment following the end of the mining investment boom, while at the same time remaining exposed to ongoing instability in the global economy. Amongst other things, this has been reflected in very low interest rate and CPI outcomes.

These factors mean that the forecasts in this report may be subject to more uncertainty than would be the case in more 'normal' economic times.

We are aware that where actual measures of change in labour costs is not available, the ERA has previously adopted the use of wage forecasts consistent with indices published by the Australian Bureau of Statistics for the broader EGWWS sector rather than those that are specific to the energy sector, reflecting data availability.

The Australian Bureau of Statistics (ABS) publishes several measures of wage levels, each of which provide a slightly different measure of wages growth. The main measures include:

- Average Weekly Earnings (AWE) –separate estimates are available for ordinary time, total earnings and full and part-time workers. AWE are gross (before tax) earnings and include all base rates of pay, bonuses and incentive payments and leave pay.
- Wage Price Indices (WPI) again the ABS provides separate estimates for ordinary time and total earnings. However, WPI estimates differ from AWE as they are a weighted average of a combination of specified types of jobs. This means that they are unaffected by compositional shifts in the workforce. For example, an increase in the proportion of higher paid technical staff would not affect the WPI but it would increase the AWE across the industry.



Both measures cover the broad EGWWS sector and are only published at the national level.

In accordance with guidance provided by Western Power, Synergies has developed forecasts of WPI only.



2 Electricity Access Code requirements

The Access Code is not prescriptive in its requirements regarding the development of labour and inflation forecasts, leaving this to the discretion of Western Power and the Economic Regulation Authority (ERA).

2.1 Inflation forecasts

In its draft decision for AA3, consistent with Western Power's proposal, ERA approved inflation forecasts for the five year regulatory control period based on the geometric mean of the CPI forecasts from the most recent Statement on Monetary Policy by the Reserve Bank of Australia for the first two years and the midpoint of 2.5 per cent for remaining three years of the period.

However, in its Final Decision for Western Power's AA3, the ERA calculated the forecast inflation rate by taking market observations of nominal and indexed five year Commonwealth Government Securities (CGS) bond yields and then applying the Fisher equation, as follows:

$$1+i = (1+r) * (1+\pi)$$

where:

i= the nominal interest rate

r = the real interest rate

 π = expected inflation

In contrast, the AER forecasts inflation based on an average of the Reserve Bank of Australia's (RBA's) short term inflation forecasts (usually over two years) and the midpoint of the RBA's inflation target band over the remainder of a 10-year period encompassing the relevant regulatory control period. A simple geometric average of the short term and mid-point forecasts over the 10-year period is applied.²

2.2 Labour cost forecasts

For Western Power's current access arrangement (AA3), the ERA approved real labour cost forecasts developed using Western Power's actual labour costs as reflected in its CEPU Collective Agreement 2008 and forecasts developed using the WPI for the EGWWS sector.

² The AER is currently reviewing its inflation forecasting methodology.



The ERA noted that there is no perfect forecasting method for labour cost escalation but of the available options the WPI method provides the most reasonable forecasts for the forecasting period.³

The WPI for the EGWWS sector is also used by the AER under the national electricity framework in approving electricity and gas networks' real labour cost forecasts.

³ ERA ((2012), Final Decision on Proposed Revisions to the Access Arrangement for the Western Power Network, September, p 111



3 Overview of methodology

Our forecasting methodology includes a two stage process.

In the first stage a whole-of-economy model is used to develop economic forecasts for WA and Australia. In the second stage, these economic forecasts are then used as inputs into an econometric model, which quantifies the relationship between the variables of interest (CPI and WPI in the EGWWS industry) and their key economic drivers.

Each of these two stages is discussed in turn.

3.1 Stage 1: Economic forecasts

A computable general equilibrium model (CGE) based on the Victorian University Regional Model (VURM)⁴ is used to develop forecasts for economic activity in WA and Australia.

The VURM model is an industry-level whole-of-economy model that has been used extensively both in Australia and overseas for forecasting and policy analysis. The model is particularly suited for developing forecasts for industry due to its ability to deal with sectoral detail and price effects.

The most recent commodity and investment outlooks, trends from historical data (such as changes to savings rates and productivity growth) and demographic information have been incorporated into the model. The model's high level of detail then allows forecasts to be developed for industry-level employment, output and investment. The whole-of-economy framework ensures that the inputs used are internally consistent and that the forecasts provide a coherent and comprehensive forecast for the Australian and Western Australian economies.

The outputs from stage 1 are used to inform stage 2 econometric modelling.

More detail on the VURM model is provided in Attachment A.

3.2 Stage 2: Econometric modelling

An econometric model has been developed to produce forecasts of CPI and WPI for the Australian and Western Australian economies. Economic theory posits certain relationships between economic variables and their key underlying drivers. An econometric regression model allows us to quantify the magnitude of those relationships in the Australian setting, the relative importance of each key driver and the length of time it takes for changes in economic conditions to flow through to the variables of interest.

⁴ The VURM model was formerly known as the Monash Multi-Region model for Forecasting (MMRF).



Two regressions were specified:

- CPI regressed against employment, the exchange rate and the oil price; and
- EGWWS sector WPI regressed against the terms of trade, CPI and employment in the EGWWS, mining and construction industries.

These variables were found to have the most statistically significant impact on historical movements in the CPI and WPI. Each equation was tested for goodness of fit using a variety of statistical techniques, including the standard errors of the estimates, which measures the fit of each underlying driver, and the R², which measures the fit of the regression model.

More detail on the econometric models are provided in Attachment B.



4 Macroeconomic outlook

4.1 International

Economic growth in Australia's major trading partners eased in recent months, continuing a period where international growth outcomes were consistently lower than national and international forecasters expected. The International Monetary Fund now forecasts that global growth will increase moderately from 3.1% in 2016 to 3.4% in 2017 and subsequently to 3.6% in 2018.

Economic growth in China continues to ease. Growth in private fixed asset investment has fallen sharply over the past few years due to overcapacity in many industry sectors and weak demand for China's exports, which in turn stems from low global growth. The impact on overall investment growth has been partly offset by an increase in public investment. Total economic growth has been supported by relatively strong growth in the services sector, as China's economy moves toward more consumption driven growth. Growth is expected to gradually slow over the next few years, with continued overcapacity driving weakness in private investment. This impact will be partly offset by the growing services sector as well as fiscal and monetary stimulus required to meet official growth targets.

In the US, labour market outcomes remain generally strong, with the unemployment rate returning to around pre-GFC levels and some long-term unemployed returning to the workforce. Employment growth has been particularly strong in the professional services and health care industries, offsetting job losses in mining and related industries as lower commodity prices prompt cuts to jobs and investment plans. Total business investment has been weak and inflation low, causing monetary policy to remain accommodative despite the strong labour market indicators. At the end of 2015, a majority of the Federal Reserve's monetary policy committee were predicting at least four interest rate increases in 2016. As of April 2017, a rate increase has yet to occur. Economic growth is expected to gradually improve, supported by the improving labour market and associated stronger household consumption.

In the Eurozone, economic growth is recovering from the 2012 debt crisis. The economy grew 2.0% in 2015⁵, although growth was largely supported by quantitative easing undertaken by the European Central Bank. Some reductions in labour costs in less competitive countries have underpinned increased exports but significant underlying structural issues remain. The unemployment rate across the region remains elevated and inflation is very low. The recent decision by the United Kingdom to leave the Eurozone has also created considerable uncertainty, which is likely to remain for some time. This could lead to somewhat lower growth in the United Kingdom and to a lesser extent throughout the Eurozone.

⁵ International Monetary Fund, World Economic Outlook Update, p7



In Japan, overall growth continued to weaken in 2016 despite massive quantitative easing over the past three years by the Bank of Japan. Business investment fell in the first half, household consumption remains weak and price levels were down 0.4% in June compared to a year earlier. In response, the government will bring forward public spending in an attempt to stimulate the economy and the Bank of Japan's monetary policy announced on 21 September 2016 included a zero interest rate on ten year government bonds and a commitment to temporarily overshoot the inflation target. In combination with a delay to the next consumption tax increase, this may be able to lift economic growth somewhat in the near term. In the longer term, a declining working age population will limit growth potential.⁶

4.2 Commodities

The prices of many of Australia's key non-rural commodity exports have recently stabilised and even begun to rise, following declines over the past few years. As shown in Figure 1, the RBA's index of commodity prices has increased 7.5% since early 2016.



Figure 1 RBA index of Australian commodity prices

Index, 2014/15 = 100, A\$ Data source: RBA

Due to high initial investments, long mine lives and substantial fixed costs, producers were initially unable or reluctant to reduce production with many instead opting to cut costs. However, more recently high cost mines have closed or reduced production and investments that commenced before the international iron ore and coal prices declined have reached full production, meaning additions to supply have tapered off.

On the demand side, increased construction activity in China supported demand for iron ore and coking coal in the first half of 2016, which was reflected in a sharply falling

⁶ International Monetary Fund (2017), Regional Economic Outlook Update Asia and Pacific Department, p5



international spot iron ore price beginning to recover. Nevertheless, global growth remains moderate and indeed lower than many forecasters had expected. While stabilising commodity output levels will provide support to prices, the slow pace of global industrial production growth is likely to limit the extent of price increases over the next six years. International spot iron ore prices, while volatile, have increased by around 120% since the low of early 2013 to be around \$US88 in March 2017.

The commodity price outlook also remains sensitive to developments in China's property market and infrastructure investment, which is a large source of demand for Australia's iron ore and metallurgical coal exports.

Our commodity price and trade forecasts are consistent with those produced by the Commonwealth Office of the Chief Economist shown in Table 4.

	Compound Annual Growth Rate (CAGR) 2016-17 to 2021–22
Iron Ore export volumes	1.5
Iron Ore export value	-3.8
LNG volumes	7.7
LNG value	12.2
Metallurgical Coal volumes	1.2
Metallurgical Coal value	-8.4
Thermal Coal volumes	0.7
Thermal Coal value	-3.6

 Table 4
 Price and volume outlooks for key Australian commodities (% growth)

Source: Office of the Chief Economist, Resources and Energy Qrtly, March 2017

4.3 Australia

Over the last decade, growth in the Australian economy has largely been shaped by the global economy, and particularly demand for commodities. Earlier in this period there was a significant increase in commodity prices and investment in our mining sector. In more recent times, however, commodity prices have fallen and the investment pipeline has begun to shrink.

These events are reflected in our terms of trade, with recent falls reflecting movements in both world commodity prices and the exchange rate. As indicated in Figure 2, over the forecast period, the terms of trade are projected to rebound somewhat, reflecting the price outlook for key export commodities.



Figure 2 Historical and forecast terms of trade



Note: Terms of Trade forecasts reflect BREE commodity forecasts **Data source:** ABS Australian National Accounts, March 2016 and Synergies forecasts.

4.3.1 Business investment

Engineering construction has so far fallen 36% from its peak in mid-2013 and detracted three percentage points from economic growth. This change reflects the completion of large mining and gas projects, which form a significant portion of engineering construction. However, the transition is not yet complete as there are a number of large gas projects still under construction. After the completion of the current round of investment, new mining investments are likely only for high quality, low cost deposits or low cost expansions of existing LNG production. As such, mining investment will stabilise at a level reflecting the sustaining capital required for currently operating sites.

Engineering construction in other industries has historically been less volatile and is expected to remain so. Overall engineering construction is expected to remain broadly stable after 2018 as indicated in Figure 3 (over page).



Figure 3 Actual and forecast mining investment, Australia



Data source: ABS Private new capital expenditure and expected expenditure, Synergies estimates

Meanwhile other types of business investment; new buildings and machinery and equipment, have been relatively flat reflecting broader weakness in business' willingness to invest. Over the medium term, economic activity is expected to pick up based on continuing low interest rates and demand induced by the lower exchange rate. Since capacity utilisation is already above long term averages, this is expected to result in a gradual increase in total business investment.

4.3.2 Household consumption

Household consumption has been growing at an annual rate of around 3%. Despite slowing income growth, low interest rates and increasing asset prices have encouraged households to spend and consumption has been higher in states with little exposure to the resources sector. Over the forecast period, household income growth is expected to gradually increase as labour market conditions improve. Increasing income is expected to be offset by slow increases in interest rates toward the end of the period and a stabilisation in asset prices. As such, household consumption growth is expected to remain around current levels.

4.3.3 Dwelling investment

A combination of low interest rates and investor interest has spurred very strong growth in housing construction in some areas of Australia over the past four years. Construction has been exceptionally strong in New South Wales and Victoria where it is underpinned by strong population growth. Building approvals data suggest there will be a further increase in dwelling investment in the near term as the number of newly approved dwellings is above completions of current construction projects. This outcome is



contingent on stable or increasing house prices as some projects may not proceed if market conditions deteriorate.

Australia's population growth rate is expected to be somewhat lower over the medium term, compared with the prior decade. As a result, dwelling investment is expected to weaken slightly in the medium term before returning to long run growth.

4.3.4 **Exports and imports**

The complementary outcome to Australia's earlier expansion of mining investment is the current strength in exports, which is driven largely by LNG, iron ore and coal exports. Services exports including tourism, education and business services have also been growing, supported by the lower exchange rate and relatively slow growth in labour costs.

Looking ahead, resources exports are expected to remain strong, supported by Australia's low cost mines and relatively large market share in the iron ore and coking coal markets. This will offset weakness in thermal coal and metal exports. Meanwhile, Australia's agricultural and services exports are expected to grow based on demand from Asia and a stable lower exchange rate.

Table 5 Key macroeconomic variables, Australia (% growth)									
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22			
GDP	1.0	2.5	2.5	2.6	2.8	3.2			
Household consumption	3.0	3.0	2.5	2.5	2.9	3.3			
Investment	-3.9	1.0	2.0	2.4	2.6	3.6			
Dwellings	2.0	1.0	2.0	2.0	2.0	2.0			
Government consumption	2.0	2.0	2.0	2.0	2.0	2.0			
Exports	0.3	4.3	4.0	4.5	4.5	5.0			
Imports	0.9	3.0	2.9	2.9	3.7	4.4			
Employment	1.1	1.2	1.4	1.6	1.7	1.9			

Table 5 presents Synergies' forecasts of the key macroeconomic variables.

Source: Synergies forecasts

4.3.5 Employment

Employment growth in Australia has improved somewhat over the past year and is currently growing at an annual rate of around 2%. The improvement has been driven by growth in the services sector, particularly health care. Employment in the construction sector has also increased, underpinned by the expansion of dwelling investment.

On the other hand, employment in the mining, manufacturing and electricity, gas, water and waste services sectors has fallen as the mining investment boom unwinds and large manufacturing plants have closed. Similarly, employment outcomes have not been consistent across Australia, with most growth coming from the south-eastern states.



Over the forecast period, employment in services sectors is expected to continue to expand, driven by improved demand from domestic households and the lower exchange rate improving Australia's competitiveness. As the mining downturn becomes less of a drag on growth, total employment growth is expected to pick up towards the end of the period.

Table 6 presents Synergies' forecasts of employment in the Australian EGWWS, construction and mining sectors.

able o Employment, EOWWO, construction and mining, Australia (% growth)								
2016-17	2017-18	2018-19	2019-20	2020-21	2021-22			
0.1	1.0	1.0	1.1	1.4	1.5			
1.2	1.4	1.6	1.7	1.9	2.0			
	2016-17 0.1 1.2	2016-17 2017-18 0.1 1.0 1.2 1.4	2016-17 2017-18 2018-19 0.1 1.0 1.0 1.2 1.4 1.6	2016-17 2017-18 2018-19 2019-20 0.1 1.0 1.0 1.1 1.2 1.4 1.6 1.7	2016-17 2017-18 2018-19 2019-20 2020-21 0.1 1.0 1.1 1.4 1.2 1.4 1.6 1.7 1.9			

				• · · · · · · · · · · · · · · · · · · ·
Table 6	Employment.	, EGWWS,	Construction and Mining,	Australia (% growth)

Source: Synergies forecasts

4.4 Western Australia

The Western Australian economy is significantly more dependent on the resources sector than the rest of Australia. As shown in Figure 6 (over page), mining makes up almost 28% of the Western Australian economy compared to only 7% nationally. When construction is included, this share rises to just over 40%.





Data source: ABS Australian National Accounts, State Accounts, 2015-16

For this reason, the economic impacts of the mining investment boom and its subsequent unwinding have had a larger impact on the WA economy than elsewhere in the country.



4.4.1 Business investment

Mining investment in WA has fallen rapidly with the completion of several large iron ore mines and expansions. Over the medium term, investment will continue to fall as the large LNG projects – Gorgon and Wheatstone – reach completion.

As indicated in Figure 5, over the longer term, mining investment is expected to stabilise somewhat above the levels of the early 2000s, reflecting the capital required to sustain expanded production.



Figure 5 Actual and expected mining investment, Western Australia

Data source: ABS Private new capital expenditure and expected expenditure, Synergies estimates

Non-mining investment is a much smaller portion of total investment in WA. Increased competitiveness in non-mining industries, due to slower wages growth and a lower exchange rate, is expected to underpin expansions in these industries, although their comparatively small size means total business investment is expected to grow only moderately.

4.4.2 Household consumption

Declining investment in the resources sector, combined with weakness in the housing market has significantly reduced demand for labour in WA. Over the past year, the total wages paid to employees has fallen, both because of sluggish labour demand and a compositional shift to lower paying occupations. Weak price growth for consumer goods (including declining oil prices) has helped offset these factors somewhat.

These trends are expected to continue in the near term with household consumption remaining below trend over the forecast period.



4.4.3 Dwelling investment

The fundamentals underpinning the housing market in Western Australia are currently very weak. Net interstate and overseas migration has plummeted in recent times due to the weak labour market, causing population growth to slow considerably. In combination with falling compensation of employees, the slow population growth has seen house prices and dwelling investment fall. Consequently, it is expected that dwelling investment will continue to fall in 2016-17, before slowly recovering over the forecast period.

Exports and imports

Despite large declines in commodity prices, volumes of exports from Western Australia have increased considerably over the last two years. This largely reflects the expansion in mining capacity, particularly in iron ore. Over the medium term, export volume growth will be supported by LNG exports as the Gorgon and Wheatstone LNG facilities become fully productive.

The lack of large new resource sector projects in the pipeline will limit resource sector exports over the longer term, however an expected (partial) recovery in commodity prices, combined with efficiency gains across many mine sites will support some production increases from existing facilities, particularly in the iron ore sector.

As with Australia, a lower exchange rate and lower labour costs are expected to drive a recovery in non-mining exports, although the relatively small size of these industries will limit their contribution to total exports.

Table 7 presents Synergies' forecasts of the key macroeconomic variables for Western Australia.

	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
GSP	1.4	2.3	2.5	3.0	3.0	3.0
Household consumption	1.8	2.5	3.0	3.0	3.0	3.0
Investment	-13.9	-5.0	-4.1	3.0	3.0	3.0
Dwellings	-8.8	1.5	3.3	3.3	3.3	3.3
Government consumption	3.3	1.8	3.0	3.0	3.0	3.0
Exports	6.5	5.0	2.4	2.4	2.0	2.6
Imports	-1.9	0.8	0.9	2.9	3.7	3.9
Employment	0.5	0.8	1.1	1.4	1.4	1.7

 Table 7
 Key macroeconomic variables, Western Australia (% growth)

Source: Synergies forecasts

4.4.4 Employment

Employment conditions in Western Australia have been weaker than in Australia as a whole with total employment remaining around the same level for the past 18 months.



The weaker outcome is largely due to weak domestic conditions and Western Australia's higher dependence on the mining sector, with employment in the mining sector falling substantially between 2012 and 2015.

As is the case for Australia, the strongest areas of employment growth are the services sectors, particularly health care and accommodation and food services. In 2016-17, Western Australia's employment growth is expected to improve somewhat, with some growth in mining employment and broad-based growth across the services industries. The winding up of LNG construction in 2017-18 and 2018-19 will be a drag on total employment growth in those years before improving domestic demand drives improving labour market conditions over the remainder of the forecast period.

Table 8 presents Synergies' forecasts of employment in the Western Australian EGWWS, construction and mining sectors which are of most relevance to Western Power's costs.

 Table 8
 Employment, EGWWS, Construction and Mining, Australia, % growth

	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
EGWWS, Const. & Mining	0.8	-1.5	-0.1	1.4	1.6	1.6
All industry	1.7	1.2	1.1	1.4	1.4	1.7

Source: Synergies forecasts

4.5 Conclusion

The short term macroeconomic outlook both for Australia and Western Australia is subdued with weak price and wage inflation pressures evident, including due to weak labour market conditions. The impact of the unwinding of the mining boom continues to impact adversely on Western Australia given its significant contribution to economic activity in the State.

However, over the medium term, economic activity is expected to pick up based on continuing low interest rates and increased demand induced by the lower exchange rate. This is expected to underpin moderate growth in investment and employment, with flow-on implications for price and wages growth.



5 Prices and wages outlook

5.1 CPI

Following the end of the mining investment boom, Australia has entered a period of very low inflation and wages growth.

The Australian headline inflation rate was only 1.0% over the year to June 2016, the lowest rate of inflation growth in almost 20 years (refer Figure 6). This reflects weak domestic demand, low wages growth (in turn a result of significant spare capacity in the labour market) and a decline in fuel prices, which have been only partially offset by increases in import prices because of the lower exchange rate.

The Australian headline inflation rate has subsequently recovered somewhat with 0.5% growth in both the December 2016 and March 2017 quarters, reflected in annual growth of 2.1% over the 12 months to March 2017.



Figure 6 CPI, Mar qtr to Mar qtr growth, Australia

Data source: ABS Consumer Price Index, Australia, March 2017

In contrast to Australia, CPI growth in WA remains very subdued with no growth in the March quarter 2017 and growth over the 12 months to this quarter of only 1%.

Over the outlook period, we expect CPI growth to recover to rates a little below the historical average. Recent weak CPI data is largely the result of weak economic conditions following the end of the mining investment boom. While we expect conditions to remain somewhat subdued in the short term, economic activity will pick up over time as the economy adjusts.

On the domestic front, the RBA has significantly eased monetary policy. This easing is likely to stimulate domestic activity and assist construction activity outside of the non-



resources sector. Exchange rates have fallen significantly in recent years, and this too is helping the economy transition to a post-resources boom era.

On the international front, commodity prices appear to have stabilised and in some cases, are beginning to rise. Oil prices (which impact directly on the CPI) have begun to recover from the lows in 2015, with some forecasters suggesting a significant increase is likely to occur over the next few years.

Over the short run we forecast that inflation will return to around 1.3% in 2016-17, largely a result of increased activity spurred by easier monetary policy, the lagged effects of exchange rate depreciation, and the projected increases in oil prices. Over the longer run we forecast the CPI to remain comfortably within the RBA's target range as the economy rebalances. These forecasts are in line with the RBA's own forecasts, which are for year-ended inflation between $1\frac{1}{2}$ and $2\frac{1}{2}\%$ in both June 2017 and June 2018.

We expect that the CPI growth in WA will largely follow rates in the rest of Australia. This reflects the relatively mobile workforce in Australia (which tends to keep general wages growth similar between states) and the fact that consumer goods and services are traded between states.

Table 9 presents our annual Australian and Perth CPI forecasts up to 2021-22.

	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Australia	1.6	1.9	2.2	2.4	2.4	2.5
Perth	1.0	1.8	2.2	2.3	2.4	2.3

Table 9 Forecast CPI growth (% growth)

Source: Synergies forecasts

5.2 WPI

The most recent data release from the Australian Bureau of Statistics (ABS) shows that the WPI grew by only 0.5% during the June quarter 2016, leaving annual growth at 2.1%. Annual wages growth was faster in the EGWWS sector, at 2.6%.⁷

Historically, wages have grown faster in the EGWWS sector than for the industry average (Figure 7 over page).

⁷ Australian Bureau of Statistics series 6345.0 Wage Price Index, Australia is a financial year index for year ended June quarter. June 2016 is the latest data available in this series.





Figure 7 Wages growth, June qtr to June qtr, Australia

Data source: ABS Wage Price Index, Australia, June 2016

This reflects both:

- The strong bargaining power of unions in the utilities sector and high level of unionisation in the EGWWS workforce; and
- Strong competition for skilled labour from the construction and mining industries during the mining investment boom (which has eased considerably over the last few years).

Despite these structural characteristics of EGWWS labour, wages growth for EGWWS has slowed roughly in line with wages in other sectors.

Wage setting in the EGWWS sector is dominated by collective agreements (refer Table 10 below), reflecting the high level of unionisation in the workforce. This sector's dependence on the use of collective agreements will temper somewhat the influence of market conditions (such as reduced competing demand for skilled labour from the mining and construction sectors) on wages.

Table 10 Method of setting pay

	Award Only	Collective Agreement	Individual arrangement
EGWWS	6.5%	59.9 %	33.6%
All industries	24.5 %	38.9%	36.6 %

Source: ABS, Employee Earnings and Hours, Australia, May 2016

A recent report by the Department of Employment on *Trends in Federal Enterprise Bargaining* shows that the average annualised wage increases of more recent collective agreements have fallen. This may reflect a combination of;



- lower inflation, meaning nominal wages growth can be lower while maintaining growth in real wages; and
- increased bargaining power of businesses due to softer labour market conditions.

As indicated in Table 11, the latest report shows that federal enterprise bargaining agreements approved in the September quarter 2016 included an average annualised wage increase per employee of 3.4%.⁸ In Western Australia, wage increases in collective agreements in the EGWWS sector and across all industries were lower than the national average at 2.2%.

Table 11 Federal wage agreements approved in the quarter (average annualised wage increase (%)^a)

	Dec-14	Mar-15	Jun-15	Sep-15	Dec-15	Mar-16	Jun-16	Sep-16
EGWWS								
Australia	3.4	3.4	2.8	2.7	2.9	2.2	2.3	3.0
Western Australia ^b						2.4	2.8	2.1
All industries								
Australia	3.4	3.1	3.2	3.4	3.0	2.7	3.0	3.4
Western Australia	3.3	3.0	3.0	3.2	2.9	3.0	2.5	2.2

a Average annualised wage increases relates only to base rates of pay and does not take into account allowances and bonus payments.b When segmented by state and industry the number of agreements is very small and may be impacted by outliers.

Source: Department of Employment

Wages outlook

Due to the absence of a wage price index for the EGWWS sector in Western Australia, we have forecast wage increases for the industry across Australia and then assessed whether any adjustment to the national forecasts are appropriate given the economic outlook in Western Australia.

Over the outlook period we expect national wages growth to rebound from current depressed levels but remain below the historical average for the EGWWS labour sector.

The recent softness in wages growth in the EGWWS labour sector largely reflects weakness in the general economy and in industries competing for similar skilled labour, particularly in mining and construction. As the economy recovers we expect that the current slack in the labour market will be taken up, with upward pressure on wages as firms compete to attract skilled workers.

The declining terms of trade has also impacted wage outcomes in some sectors. Falling corporate profits lead managers to seek cost reductions, including through reducing the wages bill. As the terms of trade stabilises, this downward pressure on wages will be removed.

⁸ Department of Employment (2016). Trends in Federal Enterprise Bargaining, <u>http://employment.gov.au/trends-federal-enterprise-bargaining</u> [accessed24 March 2017]



The other key factor in determining wages growth is inflation. As inflation increases, nominal wages also tend to rise to preserve real wages. The forecast rebound in CPI towards the centre of the RBA's inflation target band is expected to underpin an increase in nominal wages growth over the forecast period.

In the near term, we expect wages growth across all industries in Western Australia will be somewhat lower than for Australia as a whole. This reflects the weaker labour market and inflation outlook in Western Australia, as described in section 3.4. In the medium term, however, economic conditions in Western Australia are expected to improve. Combined with a relatively mobile labour market in Australia, this is expected to result in wages in Western Australia growing at a similar rate to those in Australia as a whole.

We expect wages growth for the EGWWS sector in Western Australia will follow a similar growth profile. That is, we expect in the short term EGWWS wages in Western Australia will grow at a somewhat slower pace than in Australia. As economic conditions improve we expect the growth rates to be comparable from 2018-19 onwards.

Table 12 presents our Western Australian and Australian WPI forecasts up to 2021-22.

	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Nominal EGWWS						
Australia	2.5	3.1	3.5	3.7	3.7	3.7
Western Australia	2.1	2.9	3.3	3.5	3.6	3.7
Nominal All industries						
Australia	2.0	2.7	3.0	3.1	3.2	3.3
Western Australia	1.6	2.4	2.8	3.0	3.1	3.1
Real EGWWS						
Australia	0.9	1.2	1.3	1.3	1.3	1.2
Western Australia	1.1	1.1	1.1	1.2	1.2	1.4
Real All industries						
Australia	0.4	0.8	0.8	0.7	0.8	0.8
Western Australia	0.6	0.6	0.6	0.7	0.7	0.8

Table 12 Forecast Nominal and Real WPI (annual % growth)

Source: Synergies forecasts

5.3 Recommendation

Synergies' average CPI forecast for Australia for the 2017-22 period is 2.3% per annum (refer Table 9), which is consistent with the RBA's current forecast for this period of 2.4%, although the profile of expected annual changes is somewhat different.⁹

Table 13 below presents the RBA's CPI forecasts over this period.

⁹ RBA (2017), Statement on Monetary Policy, February, p 57



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	2017-18	2018–19	2019–20	2020–21	2021-22	Average
CPI – Australia	2.0	2.5	2.5	2.5	2.5	2.4

Table 13 RBA CPI forecast (% change, financial year average))

Source: RBA

Given the close alignment of Synergies' and RBA's CPI forecasts we recommend that the RBA's CPI forecasts be adopted for the AA4 regulatory period.

Real labour cost escalation

Table 14 presents our proposed real labour escalators based on the RBA forecasts of CPI and our nominal WPI annual increases for Western Australia set out in Table 12.

Table 14 Tolecast leal labour cost escalators (70 change, infancial year average)	Table 14	Forecast real	labour cost	escalators	(% change,	financial ye	ear average))
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	2017-18	2018–19	2019–20	2020–21	2021-22	Average
Real WPI – EGWWS Western Australia	0.9	0.8	1.0	1.1	1.2	1.0

Source: Synergies forecasts

We recommend that these forecast real labour escalators be used in the development of Western Power's operating and capital expenditure forecasts for the 2017-22 regulatory period.



A Synergies' CPI and WPI models

Synergies' CPI and WPI models have been developed to estimate the impact of underlying economic drivers on the CPI and WPI series.

An error correction model was estimated due to the use of variables with a co-integrating relationship. This method is commonly used for time series economic data to avoid spurious results. The drivers of the model are based on economic theory and refined through an iterative process of model estimation to determine the appropriate economic relationships and lag structures underlying the determination of model outcomes.

The appropriateness of the regression was determined with reference to;

- the in-sample fit of the regression, as measured by the R² value,
- overall significance of the regression, tested using the F-statistic, and
- the significance of individual explanatory variables, tested using the t-statistic.

A.1 CPI forecasting

The CPI model is estimated for data from 1993, being the year that the RBA began explicitly targeting inflation in the 2-3% range, on average over the cycle. This move by the RBA anchored inflation expectations and changed the sensitivity of inflation to changes in its determinants in Australia. The RBA has previously found empirical evidence of a structural break in the determinants of inflation around 1990.¹⁰

The inflation model has three explanatory variables. One of the main determinants of inflation in the short to medium term is the degree of spare capacity in the economy. Our model includes changes in the labour market to capture this impact.

Other determinants are Australia's exchange rate, which feeds directly to the CPI through changes to import prices but also impacts the CPI indirectly through increasing Australia's competitiveness and thus increasing capacity utilisation.

A third determinant in the model is the price of oil, which influences not only the price consumers pay for fuel for their car, but also the price of inputs for most businesses.

A.2 WPI forecasting

The wages model has three explanatory variables.

¹⁰ Norman, D. and Richards, A. (2010). Modelling inflation in Australia, Reserve Bank of Australia Research Discussion Paper 2010-03



The first relates to the degree of spare capacity in the labour market which is a key determinant of wages growth as it reflects the relative bargaining power between employees and employers.

Second, large changes in the terms of trade can also flow through to wages when falling corporate profits cause companies to seek lower input costs, including labour costs.

Finally, nominal wages are often determined with explicit or implicit reference to CPI inflation.



B The Victoria University Regional Model

The Victoria University Regional Model (VURM), formerly known as MMRF, is a multiregional, dynamic computable general equilibrium (CGE) model developed by the Centre for Policy studies (CoPs).

The model recognises:

- Domestic industries for WA and rest of Australia;
- Investors by industry for WA and the rest of Australia;
- An aggregate foreign purchaser of exports;
- State and Territory governments;
- Australian Government;
- Households;
- Imports by detailed commodity;
- Energy use by user and production by type; and
- Flows of greenhouse gas emissions by producer.

The model contains explicit representations of intra-regional, inter-regional and international trade flows based on regional input-output data developed at CoPS, and includes detailed data on state and Federal governments' budgets. As each state is modelled as a mini-economy, VURM is ideally suited to determining the impact of region-specific economic shocks. Second round effects are captured via the model's input-output linkages and account for economy-wide and international constraints. Outputs from the model include projections of:

- GDP and aggregate national employment;
- sectoral output, value-added and employment by region;
- export earnings, import expenditure and the balance of trade;
- greenhouse gas emissions by fuel, fuel user and region of fuel use;
- energy usage by fuel, energy user and region of energy use;
- State and Territory revenues and expenditures;
- regional gross products and employment; and
- regional international export earnings, international import expenditures and international balance of payments.



CGE models have become the pre-eminent tools for analysing the economic impacts of events, projects and policies and have been used extensively in Australia and globally for these purposes. Typical usages include:

- tax reforms, including carbon taxes
- natural disasters or other events
- industry policies and programs
- infrastructure projects
- art, sport and other cultural events
- labour market reforms
- regulatory changes
- fiscal policy

A full description of the model can be found at: http://www.copsmodels.com/mmrf.htm.