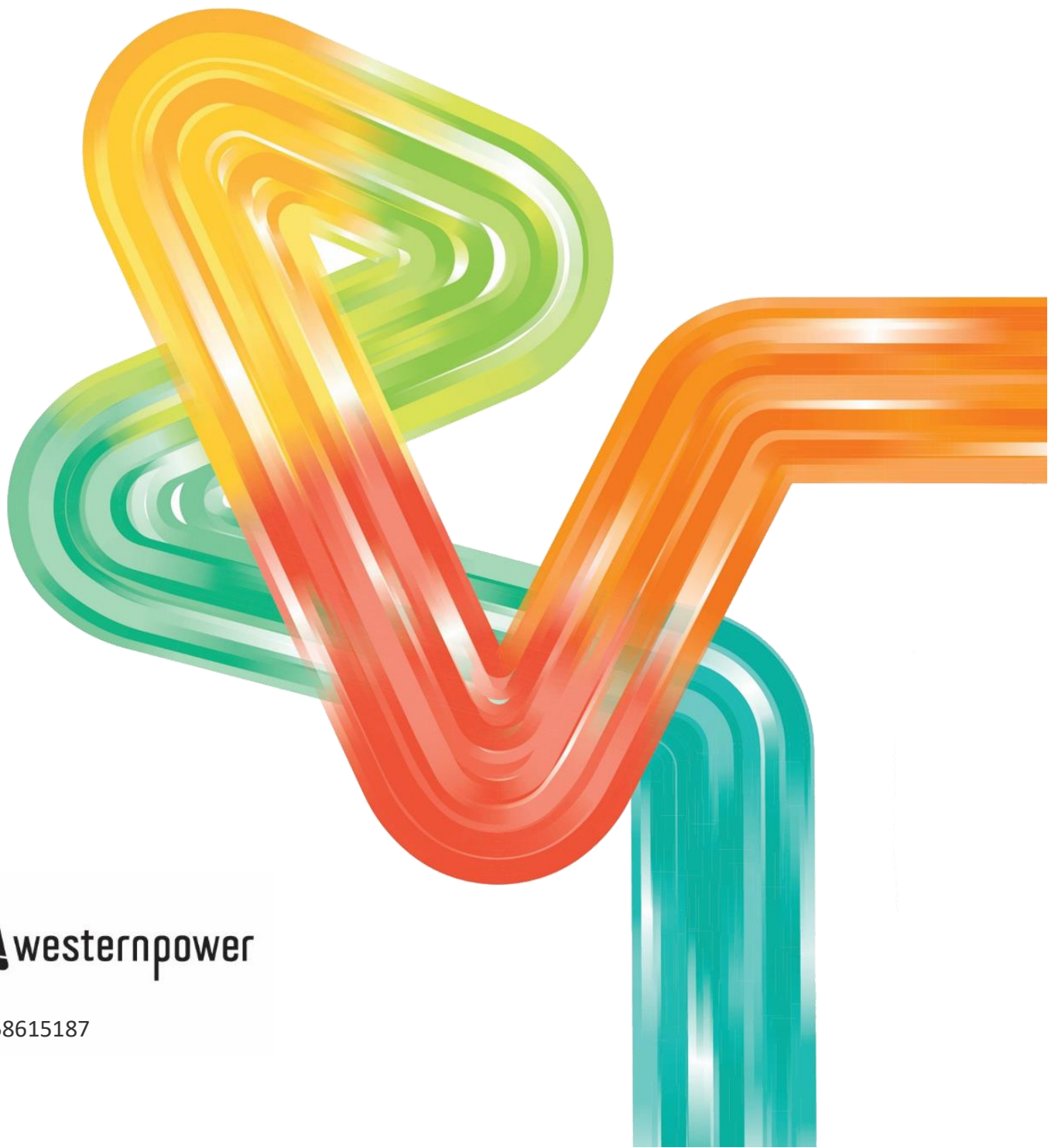


Attachment 7.3

Forecast Cost Escalators for Western Power's 2022-27 regulatory period

Access Arrangement Information

1 February 2022



EDM 58615187



Forecast cost escalators for Western Power's 2022-27 regulatory period

A report prepared for Western Power's AA5 submission

4 October 2021

Synergies Economic Consulting Pty Ltd
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Executive Summary

Synergies has been engaged by Western Power to develop the following forecast growth escalators for its AA5 submission relating to the 2022-27 regulatory period:

- Consumer Price Index (CPI).
- Nominal Wage Price Index (WPI) for the Energy, Gas, Water and Waste Services sector (WPI EGWWS).
- Real WPI EGWWS.
- Materials
- Operating cost productivity.

Key economic drivers

It is important to note that this is a particularly challenging time to develop price, labour and materials escalation forecasts given the economic effects of Covid-19, as well as the potential inflationary effects of significant government financial stimulus provided to the Australian economy in response to the pandemic.

Further, WA's important iron ore sector has been experiencing strong economic conditions, reflected in record iron ore sale volumes and until recently prices, flowing through to strong employment growth. The income effect of this upturn in mining activity is likely to have a strong positive effect on WA economic growth in the next few years, which could result in a pick-up in wage and price inflation compared to relatively subdued growth over the AA4 period.

Our approach to forecasting each of the above variables is summarised below.

Our forecasting methodologies

CPI escalation

We have adopted what is generally known as the 'break-even' CPI forecasting method and applied it in accordance with the Economic Regulation Authority's (ERA's) Rate of Return Guideline. This method reflecting the difference between nominal and index-linked Australian government long-term bond yields, provides a market-based forecast of inflation, which evidence suggests is more reliable than alternative methodologies used by Australian economic regulators.

In accordance with ERA's Rate of Return Guideline, we have used 5-year nominal and inflation-linked bonds that match the term of the AA5 regulatory period.

Nominal and real WPI EGWWS escalation

Our WPI forecasts for the WA EGWWS sector are based on estimating WA WPI for the regulatory period based on an average of published WA Treasury forecasts. We then estimate the premium (if any) of the historical EGWWS WPI growth over the Australian All Industries WPI, which we add to the WA WPI forecast to derive the nominal labour escalation forecast. We finally apply forecast CPI from the WA Treasury to our nominal EGWWS WPI forecast to derive the EGWWS WPI real labour cost escalation forecast.

Opex productivity escalation

Our operating cost (opex) productivity forecast is based on analysis of National Electricity Market (NEM) electricity distributors' opex productivity performance, including those we consider bear the closest resemblance to Western Power (noting that even these comparators are imperfect), which are South Australia Power Networks, Powercor, AusNet Services, Essential Energy and Ergon Energy.

Our opex productivity forecast is developed using our Multilateral Total Factor Productivity (MTFP) model including 2019-20 data from the Australian Energy Regulator's (AER's) Regulatory Information Notice (RIN) data set.

Depending on whether a five or ten year averaging period is used, annual productivity growth for the five NEM distributors most similar to Western Power has generally ranged between 0 and 0.5 per cent per annum such that we consider taking the mid-point of this range to be reasonable as an AA5 forecast.

However, we also consider that the application of our proposed 0.25% productivity estimate should depend on the relative efficiency of Western Power's base year opex and what it is planning to do in terms of the total AA5 opex forecast. It is feasible to support a zero-productivity assumption in the context of high base level opex efficiency and a flat or declining total AA5 opex forecast.

Summary of AA5 cost escalator forecasts

Table 1 provides an overview of our proposed CPI and WPI forecasts for Western Power's AA5 regulatory period. The annual average growth over the AA5 period is also presented. We note there are two CPI forecasts recognising ERA's two different forecasting approaches for CPI used for general escalation and real WPI escalation purposes.

Table 1 Proposed AA5 cost escalation forecasts

Variable	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	AA5 forecast average
CPI - Australia	1.75%	2.03%	2.03%	2.03%	2.03%	2.03%	2.03%
WA Treasury CPI used in real WPI calculation	1.75%	1.82%	1.82%	1.82%	1.82%	1.82%	1.82%
Nominal WPI – EGWWS Western Australia	2.65%	2.60%	2.60%	2.60%	2.60%	2.60%	2.60%
Real WPI – EGWWS Western Australia	0.88%	0.77%	0.77%	0.77%	0.77%	0.77%	0.77%
Materials escalation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Opex productivity	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%

Source: Synergies

For DNSPs, we recommend a real WPI (labour) escalator weighting of 59.2% and materials escalator weighting of 40.8% be applied in developing the distribution opex and capital expenditure (capex) forecasts for the 2022-27 period. For TNSPs, we recommend a real labour escalator weighting of 70.4% and materials escalator of 29.6% be applied in developing the transmission opex and capex forecasts. These weightings are the input price benchmark weightings approved by the AER in its most recent distribution and transmission determinations.

Recognising the current highly uncertain inflation outlook, including what we consider to be the strong potential for an increase in inflation expectations given the economy's rebound from the Covid-19 pandemic and associated government stimulus funding, we recommend that the CPI and WPI forecasts for the AA5 regulatory period be updated after the release of the ERA's Draft Decision on Western Power's AA5 submission expected in September 2022.

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1 Introduction

The purpose of this report is to develop forecasts for the 2021/22 – 2026/27 period for the following economic indicators, which will be used in Western Power's AA5 submission:

- Consumer Price Index (CPI);
- Nominal Wage Price Index (WPI) Electricity Gas Water and Waste Services (EGWWS);
- Real WPI EGWWS
- Materials
- Operating cost productivity.

In preparing this report, we have reviewed the most recent publicly available forecasts for economic activity in WA and Australia, including that sourced from WA Treasury, Australian Treasury and the Reserve Bank of Australia. We have also cross-checked these government entities' forecasts against market economists' macroeconomic forecasts and reconciled as required. These macroeconomic forecasts will reflect the latest economic data, including commodity and investment outlooks, trade data and employment trends.

Further, the WA Electricity Network 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 ERA.

The remainder of this report is structured as follows:

- Chapter 2 presents a macroeconomic outlook for Australia and WA based on recent credible economic agency positions;
- Chapter 3 presents our CPI forecasts;
- Chapter 4 presents our WPI EGWWS and real price forecasts;
- Chapter 5 presents our materials price forecasts;
- Chapter 6 presents our operating cost productivity forecasts; and
- Appendix A provides a summary of relevant recent regulatory precedent regarding cost escalation.

2 Macroeconomic outlook

The purpose of this chapter is to provide a high level summary of international, Australian and WA economic conditions that are likely to impact on price and wage outcomes over the 2022-27 period.

2.1 International economy

Economic growth in Australia's major trading partners is expected to be reasonably strong in the immediate future albeit with growth risks associated with the Covid 19 pandemic and virus variants, and a possible tightening in financial conditions if inflation expectations increase more rapidly than anticipated.

In July 2021, the International Monetary Fund in its latest World Economic Outlook Update (WEO Update) forecasts that global growth will increase strongly at 6.0% in 2021 and 4.9% in 2022.¹ The 2021 global forecast is unchanged from the IMF's April 2021 WEO, but with offsetting revisions. Forecasts for emerging market and developing economies, excluding China, have been marked down for 2021, especially for Emerging Asia. In contrast, stronger growth is forecast for advanced economies. A 0.5 percentage-point increase in the growth forecast for 2022 derives largely from the forecast upgrade for advanced economies, particularly the United States.

Forecast economic growth in China, by far WA's largest trading partner due to iron ore sales, is strong at 8.1% and 5.7% in 2021 and 2022 respectively. Activity in China's construction sector is expected to remain strong driven by investments in new infrastructure projects, including transport projects, 5G networks, Artificial Intelligence, the Internet of Things and data centres.² The more recent debt-related problems of major Chinese property developer Evergrande may have a negative effect on the Chinese construction sector, although this is likely to be mainly focussed on the real estate sector. Overall, the Chinese economic outlook could still be expected to flow through to elevated demand for construction raw materials, such as iron ore.

The IMF noted in relation to inflation expectations that there were many factors at work in the recovery from the unprecedented Covid-19 driven recession, including accelerating demand running up against temporary supply shortages and logistical bottlenecks; rising commodity prices; still-substantial fiscal support and accommodative

¹ IMF (2021) World Economic Outlook Update, July, p 1
<https://www.imf.org/en/Publications/WEO/Issues/2021/07/27/world-economic-outlook-update-july-2021>

² <https://www.prnewswire.com/news-releases/chinese-construction-market-outlook-to-2024---china-is-expected-to-spend-us1-4-trillion-on-new-infrastructure-projects-between-2020-and-2025--301212714.html>

monetary policy; and excess household savings that will likely be drawn down going forward with economies fully reopening.³

More recently, the RBA in its August 2021 Statement on Monetary Policy noted that while the near-term outlook for many economies remains uncertain and uneven, a solid global economic recovery is underway.⁴ Importantly, it also considered that the outlook remains solid for Australia's major trading partners, underpinned by China's economy continuing to expand along its pre-pandemic path, with year-average growth expected to be around 7 per cent in 2021 and 5 per cent in 2022.⁵ This would see the level of output in these economies in late 2022 only a little below what was expected prior to the pandemic.

2.2 Australian economy⁶

2.2.1 Economic growth

The Australian economy is expected to record moderate rates of economic growth over the near term. Nominal Gross Domestic Product (GDP) outcomes are expected to grow by 3.5 and 2.0 per cent in 2021-22 and 2022-23, respectively.⁷

The economic growth forecasts are underpinned by assumptions regarding the expansionary effects both of continued fiscal policy support for the economy, and an increasing proportion of fully vaccinated citizens through management of the COVID-19 virus. It also reflects:

- strong commodity prices, supporting profitability in the mining sector and investments that help stimulate the broader economy;
- faster improvement in the labour market (five times faster than the 1990s recession);
 - unemployment is expected to fall to 4.75 per cent in mid-2023, supporting household income as well as consumption activity; and
 - unemployment was last sustainably below 5 per cent during the early 2000s mining boom (just before the global financial crisis), which resulted in the highest annual changes in wage growth in recent decades.

³ IMF (2021) World Economic Outlook Update, July, p 8

⁴ RBA (2021), Statement on Monetary Policy, August, p 69

⁵ Ibid., p 5

⁶ Commonwealth Treasury (2021). Budget 2021-22: Budget Strategy and Outlook. Budget Paper No. 1, Commonwealth of Australia, Canberra.

⁷ Ibid., p. 8.

Although the Australian economic outlook is generally positive, ongoing public health risks remain over the near to medium term and could adversely impact on growth in the Australian economy, as witnessed with lockdowns in some Australian eastern seaboard capital cities in August and September 2021.

In a more recent assessment of the economic outlook for the Australia economy, the RBA in its August 2021 Statement on Monetary Policy noted that under its baseline scenario, GDP is forecast to grow by a little above 4 per cent over 2022, and 2½ per cent over 2023.⁸

2.2.2 Commodity prices

Whilst the elevated levels of the international iron ore price in the first half of 2021 and strong coal and LNG prices have improved Australia's terms of trade in the near term, the Australian Treasury forecast that a softening in these prices would decrease terms of trade by 8 per cent in 2021-22 and subsequently by an additional 10.5 per cent in 2022-23.⁹

The Australian Treasury forecasts iron ore prices to fall to the long term average of US\$55 per tonne FOB (free on Board) in 2022.¹⁰ A slower decline in price out to mid-2023 is envisaged by the RBA.¹¹

2.2.3 Consumer and business confidence

The emergence of COVID-19 initially dealt a significant blow to consumer demand. By late 2020, however, consumer demand had recovered by around 80 per cent. The Australian Treasury forecasts consumer demand to grow by 5.5 and 4 per cent in 2021-22 and 2022-23, respectively.¹² These modest consumer demand gains are reflective of the continued employment gains absorbing spare capacity in the labour market, in addition to the Australian consumer sentiment index being at an 11 year high.

Similarly, growth in new business investment is expected to rise by 1.5 and 10 per cent in 2021-22 and 2022-23, respectively.¹³ This growth in the near term reflects business tax cuts, skills and training programs and subsidies, and infrastructure spending and fiscal support aimed at boosting/supporting public demand as well as worst-hit sectors.

⁸ RBA (2021), Statement on Monetary Policy, August, p 69

⁹ Commonwealth Treasury (2021). Budget 2021-22: Budget Strategy and Outlook. Budget Paper No. 1, p. 63.

¹⁰ Ibid., p. 63.

¹¹ RBA (2021), Statement on Monetary Policy, May, p 71

¹² Commonwealth Treasury (2021). Budget 2021-22: Budget Strategy and Outlook. Budget Paper No. 1, Commonwealth of Australia, p. 46.

¹³ Ibid., p. 51.

Growth in mining investment is expected to rise by 3 and 3.5 per cent in 2021-22 and 2022-23, respectively.¹⁴

2.2.4 Labour market

Almost one million jobs have been created or restored since the downturn from the COVID-19 pandemic. According to the Australian treasury:

“By March 2021 almost 75,000 more people were in work than before the pandemic. This, along with a faster-than-anticipated fall in the unemployment rate and participation reaching a record high, has laid a strong foundation for Australia’s economic recovery to continue. Initial indicators suggest that the conclusion of the JobKeeper Payment will not hinder growth in the broader economy and strong momentum in the labour market has been sustained during the early stages of transition.”¹⁵

The unemployment rate is forecast to fall to 4.75 per cent in mid-2023,¹⁶ whilst growth in employment is expected to rise by 1 per cent in both 2021-22 and 2022-23.¹⁷

The forecast gradual decline in unemployment to reach 4.75 per cent will mark only the second time Australia has seen sustained period of unemployment under 5 per cent since the early 1970s.¹⁸ The stronger labour market conditions coupled with ongoing international border closures reducing the supply of migrant labour are expected to put upward pressure on wage growth.

The RBA expects that the underlying strength in economic conditions (including high levels of job vacancies) should see the recovery in the labour market regain momentum towards the end of 2021 and into the first half of 2022 following the lockdowns in NSW and Victoria in the 2021 September quarter.¹⁹ It also expects the unemployment rate to decline to around 4 per cent by the end of 2023, the lowest rate in many years.

2.2.5 Wages and inflation

Wage gains are forecast to remain modest in the near term due to labour market spare capacity and, therefore, strong growth in labour supply. It is expected to accelerate

¹⁴ Ibid., p. 54.

¹⁵ Ibid., p. 57.

¹⁶ Ibid., p. 1.

¹⁷ Ibid., p. 58.

¹⁸ The first being observed during the mining boom just before the global financial crisis.

¹⁹ RBA (2021), Statement on Monetary Policy, August, p 74

marginally from the 1.25 per cent growth in the June quarter of 2021 to 1.5 and 2.25 per cent growth in the June quarters of 2022 and 2023, respectively.²⁰ This reflects a faster recovery than anticipated from COVID-19, a sustained lift in consumer and business confidence, spending from governments to support aggregate demand, and continued employment gains.

The outlook for CPI growth is also expected to remain moderate over the near term. It is forecast to grow by 1.75 and 2.25 per cent in the year to June quarters of 2022 and 2023, respectively.²¹ The forecasts reflect a reduction in labour market slack, continued recovery in commodity prices and easing of monetary policy. The Australian Treasury, however, noted the annual growth rates in the near term to be transitory and underlying measures of price growth expected to remain subdued (below the RBA's target band).

The RBA's more recent analysis of the Australian economy suggests a similar inflation and wages outlook. Inflation is forecast to rise a little above 2 per cent by the end of 2023 in its baseline scenario.²² The WPI is anticipated to pick up to above 2 per cent by the end of 2021 and gradually increase to around 2.75 per cent by 2023.²³

2.3 WA economy²⁴

2.3.1 Economic growth

The 2020-21 Pre-Election Financial Projections Statements (published by the WA Department of Treasury in February 2021) forecasts the WA economy, as measured by Gross State Product (GSP), to grow by 2.75, 1.25 and 1.5 per cent in 2021-22, 2022-23 and 2023-24, respectively.²⁵

Growth in the near term reflects strong household consumption and positive business, as well as market, sentiment (e.g. mining sector activity following strong price rises for iron ore and other commodities).

The mining industry made the largest contribution to Western Australia's real GSP growth in 2019-20, with gross value added by Western Australia's mining industry

²⁰ Commonwealth Treasury (2021). Budget 2021-22: Budget Strategy and Outlook. Budget Paper No. 1, Commonwealth of Australia, p. 62.

²¹ Ibid., p. 62.

²² RBA (2021), Statement on Monetary Policy, August, p 69,

²³ RBA (2021), p 74

²⁴ Department of Treasury (2021). 2020-21 Pre-Election Financial Projections Statement. Government of Western Australia, Perth.

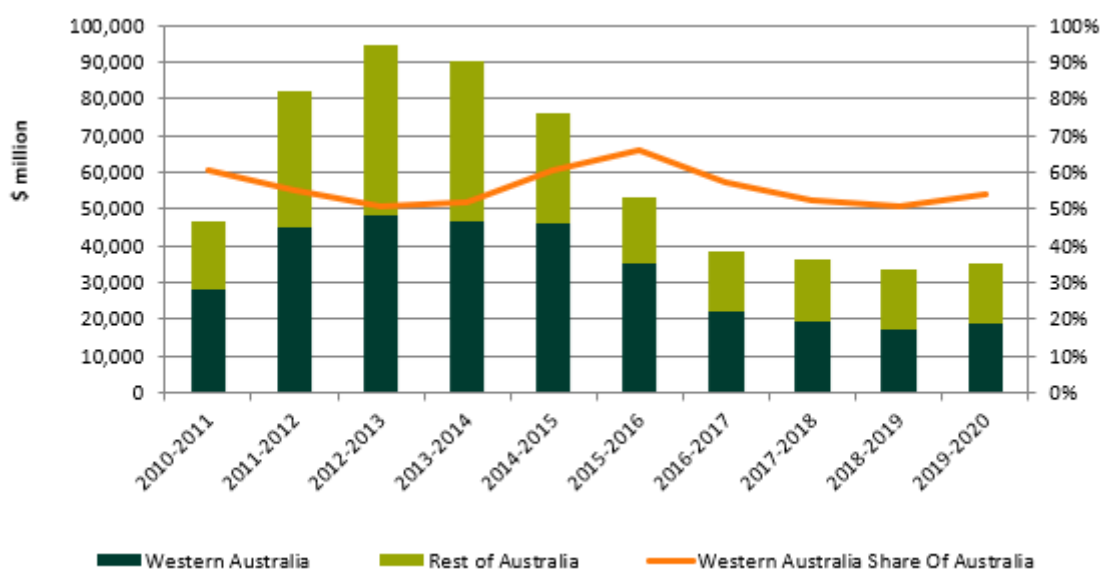
²⁵ Ibid., p. 27.

rising in real terms by 4.9% in 2019-20. The mining sector also accounted for 43 per cent (\$135.3 billion) of Western Australia's GSP in 2019-20.²⁶

Further, as illustrated in Figure 1 below, during the 2019-20, WA recorded its first year-on-year increase in mining investment since the peak of the iron ore and liquified natural gas (LNG) investment boom in 2012-13. The almost \$19 billion mining investment in WA was on the back of major iron ore investments, representing 54 per cent of national investment (only 2 per cent below the previous 10-year average).

The RBA's August 2021 Statement on Monetary Policy noted that mining investment, including machinery & equipment, is forecast to increase over coming years, continuing the steady growth seen since 2019, with this investment intended to sustain production levels rather than to expand capacity.²⁷

Figure 1 Mining investment (last 10 financial years)



Data source: ABS (via DMP's Economic Indicators Database)²⁸

Given the short supply of skilled workers in WA's mining industry (due to an unprecedented infrastructure boom along the Eastern Seaboard), we expect there will be pressure on mining companies to further increase the salaries on offer.

²⁶ WA Department of Jobs, Tourism, Science and Innovation, Western Australia Economic Profile 2021.

²⁷ RBA (2011), Statement on Monetary Policy, August, p 72

²⁸ Department of Mines, Industry Regulation and Safety (2020). Latest statistics release – 2020 Economic indicators resources data. Government of Western Australia, Perth.

As will be discussed further in Chapter 4 of our report, the strength of the WA mining sector has implications for the EGWWS sector in terms of wage outcomes given the substitutability of labour skill sets between the two sectors.

2.3.2 Consumer and business confidence

Household consumption is expected to grow by 3.0, 2.5 and 2.5 per cent in 2021-22, 2022-23 and 2023-24, respectively.²⁹ The forecasts reflect a gradual rise in population and income growth, in addition to easing monetary policy, positive consumer sentiment and an increase in household savings through 2020.

Business investment is expected to grow by 2.5, 3.25 and 4.75 per cent in 2021-22, 2022-23 and 2023-24, respectively.³⁰ The forecasts reflect positive business sentiment (supported by spending to maintain current levels of output from mineral and energy operations), the construction of several large iron ore back-fill projects and contributions from non-mining investments.

2.3.3 Labour market

The unemployment rate is expected to drop from 6.0 per cent in 2021-22 to 5.5 per cent in 2023-24, whilst employment is expected to grow by 1.5, 1.75 and 1.5 per cent in 2021-22, 2022-23 and 2023-24, respectively. This reflects faster-than-anticipated recovery in the labour market (with almost 99 per cent of jobs initially lost recovered by the end of 2020) coupled with the high number of advertised job vacancies.³¹

Importantly, recent research from consultancy Pit Crew, commissioned by WA's Chamber of Minerals and Energy (CME), highlights deepening skills shortages in most occupations over 2021 through to at least 2025. It notes that the mining and resources sector in WA currently has \$140 billion of projects in the pipeline; to fully realise this, the sector will need 40,000 new workers by mid-2023. Factors noted to impede this include closed international borders and competition for skilled and experienced workers across the country due to government-backed infrastructure and construction projects.³²

The WA Department of Mines, Industry Regulation and Safety recently released data for 2020 which indicated WA's mining, mineral exploration and petroleum industries employed an average of 140,941 people (113,056 in full-time-equivalent or FTE terms)

²⁹ Ibid., p. 27.

³⁰ Ibid., p. 27.

³¹ Ibid., p. 27.

³² CME (2021). WA mining and resources sector could need another 40,000 workers over the next two years. Available from: <https://www.cmewa.com.au/media-release/wa-mining-and-resources-sector-could-need-another-40000-workers-over-the-next-two-years/>

during 2020, representing a new record for a single calendar or financial year.³³ The Department noted that by the end of 2020, both FTE employment and average employment numbers had surpassed pre-COVID levels and continued to strengthen.

The overall picture for the WA labour market is one of tightening labour supply, which we consider has implications for wage pressures across the WA economy, including the EGWWS sector.

2.3.4 Wages and inflation

WPI is expected to grow by 1.75, 2.0 and 2.25 per cent in 2021-22, 2022-23 and 2023-24, respectively.³⁴ The gradual lift over the forecast period reflects the emerging wage pressure in some industries experiencing skilled labour shortages, in addition to improvements in labour market conditions that could spill over to the broader economy.

CPI is expected to grow by 1.75, 1.75 and 2.0 per cent in 2021-22, 2022-23 and 2023-24, respectively.³⁵ This gradual lift reflects tightening labour market conditions putting upward pressure on inflation in WA, in addition to the unwinding of early childhood education subsidy payments and fuel price increases more broadly across Australia.

2.4 Conclusion

Major Australian economic agencies, including the RBA, Australia Treasury and WA Treasury are all forecasting an improved economic outlook in the medium term as the world and Australia economies emerge from the worst economic effects of the Covid-19 pandemic.

Prior to the recent Covid-19 Delta variant outbreak in east coast Australian States, the Australian economy's recovery had been stronger than anticipated and it is expected to bounce back again when lockdown restrictions ease. A sustained improvement in economic activity and labour market conditions in the medium term is expected to result in an increase in inflation and wages from current low levels.

Our inflation and wage growth forecasts for the 2022-27 period are discussed in Chapters 3 and 4 of our report respectively.

³³ WA Department of Mines, Industry Regulation and Safety, website viewed 06/08/21
<http://dmp.wa.gov.au/About-Us-Careers/Latest-Resources-Investment-4083.aspx>

³⁴ Ibid., p. 27.

³⁵ Ibid., p. 27.

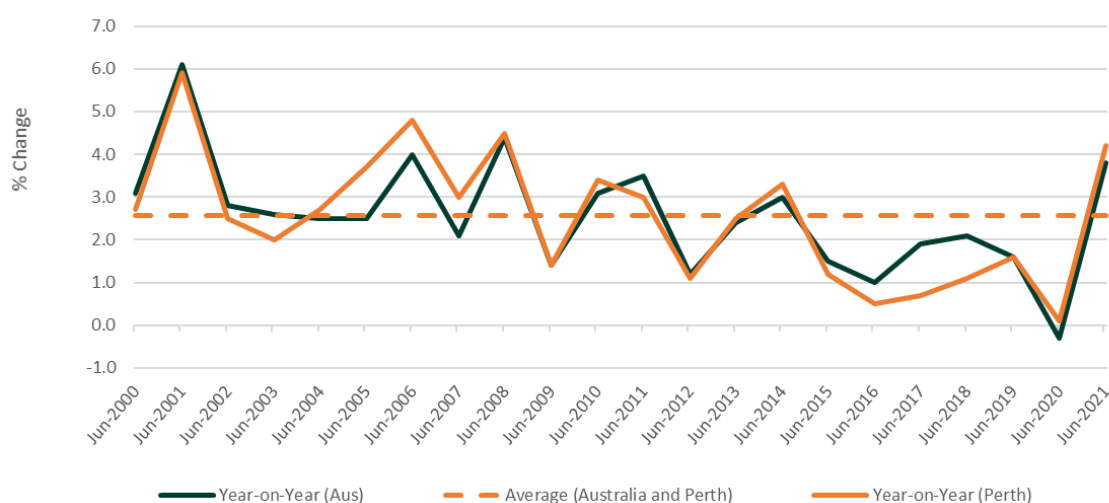
3 CPI forecasts

The purpose of this chapter is to present our CPI forecasts for the 2022-27 period.

3.1 Background

The following figure shows historical movements in CPI for both Australia and Perth since 2000. Over this timeframe, CPI growth averaged 2.5% for both Perth and Australia as a whole, although June 2021 was the first time that CPI has exceeded this level on a year-on-year basis since June 2014.

Figure 2 Historical CPI movements for Australia and Perth



Data source: ABS data

As a result of the COVID-19 pandemic, Australia experienced CPI deflation for the year up to June 2020. Despite the economic recovery from the pandemic and interest rates at all-time lows, inflation continues to remain below the RBA's target band of 2% to 3%.

However, we have observed a recent upward movement in the market's inflation expectations over five and ten year horizons to now be within the RBA's inflation target band.

3.2 Our forecasting approach

In practice, the most important and desirable feature of any forecasting methodology is that, over time, it reliably generates unbiased estimates of the variable that is being forecast. This is particularly the case where a regulated entity's allowable return and efficient cost recovery is dependent on the economic regulator's inflation forecast.

Other desirable, albeit secondary, features of forecasting methodologies include transparency, replicability and simplicity. These features are more likely to be satisfied where a forecasting methodology is based on a publicly available data set and the methodology is well-documented (facilitating transparency and allowing replicability).

The ERA has used what it calls the ‘Treasury bond implied’ inflation methodology, often referred to as the ‘break-even’ approach or the indexed bond approach over a long period.³⁶

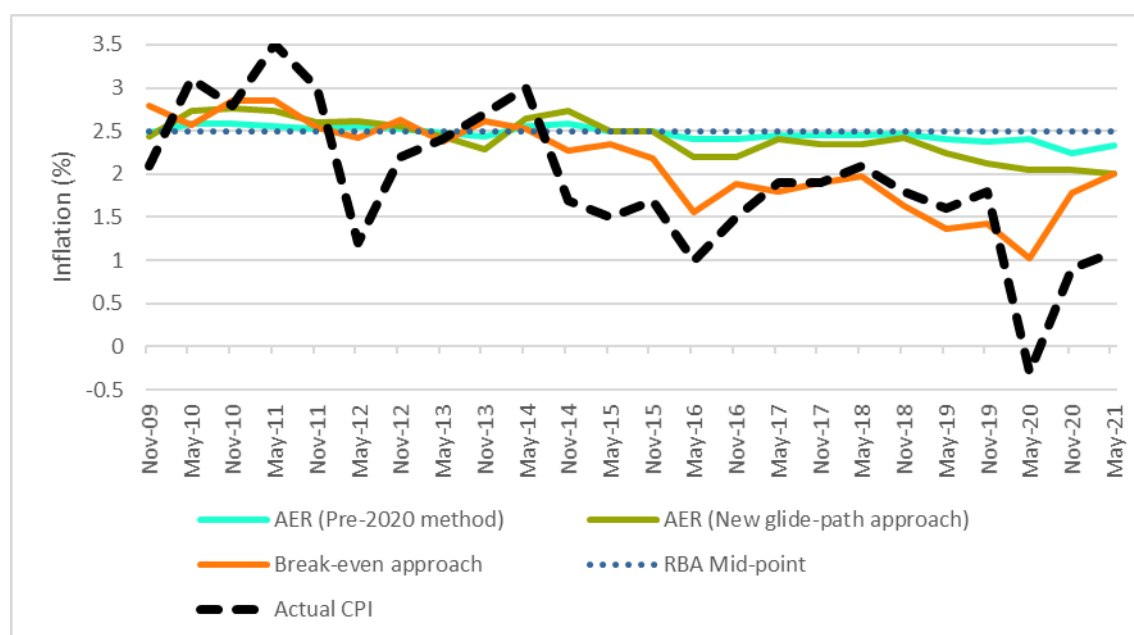
The break-even methodology calculates inflation based on the difference between the forward-looking yields on nominal long-term government bonds (which provides the nominal risk-free rate) and the yield on indexed bonds (which reflects a market-based estimate of the real risk-free rate) that straddle the relevant regulatory period.

While this approach is not as simple as the RBA-based forecasting methodologies favoured by several other Australian economic regulators, it is nevertheless transparent and replicable. All the bond data used for its application are publicly available on the RBA’s website. Importantly, it is informed by investors’ actual expectations in financial markets, as represented by the yields they require to be adequately compensated for expected inflation.

Figure 3Figure 3 shows the respective forecasting performance of the AER’s pre-2020 and new forecasting approaches relative to the breakeven approach and mid-point of the RBA’s target inflation band since 2009. We consider the chart shows flaws in both of the AER’s forecasting approaches due to their unduly heavy reliance on the mid-point of the RBA’s inflation band as a guide to inflation expectations, when there is no historical evidence to suggest that this has been the case.

³⁶ ERA (2019). 2018 and 2019 weighted average cost of capital for the freight and urban networks, and the Pilbara Railways, 22 August, p.79.

Figure 3 Performance of ERA break-even approach against alternative methodologies



Data source: ABS CPI Series, AER regulatory determinations, RBA Statement on Monetary Policy

Based on its performance compared to actual CPI, we consider that, as a market-based measure of inflation, the break-even approach is more likely to provide an unbiased estimate of expected inflation than other regulatory approaches currently in use.

We have developed a CPI forecast for the 2022-27 regulatory period using the break-even method favoured by ERA based on the difference between nominal and real bond yields using bonds that straddle the AA5 regulatory period.

3.3 Our 2022-27 forecasts

Our forecasts of inflation based on the break-even methodology for 5-year and 10-year time horizons are shown in Table 2. ERA's Rate of Return Guideline requires an inflation forecast that is aligned in terms to the 5-year regulatory period. The 10-year forecast is presented for completeness and shows the upward move in inflation expectations in the longer term.

Table 2 June 2021 break-even inflation estimates

Forecasting horizon	Break-even estimate
5-year inflation forecast (used for Western Power)	2.03%
10-year inflation forecast	2.23%

Note: These estimates follow the ERA's methodology and are based on a 20-day average to 30 June 2021, consistent with the averaging period adopted by the ERA for Western Power.

Source: Synergies analysis using RBA data.

The estimates shown in Table 2 are materially higher than those observed in ERA's 2020 regulatory determinations where the break-even methodology was used. For its annual

update of rail WACCs, the ERA calculated a 10-year inflation rate of 0.93% as at 30 June 2020, and the ERA's final decision for the Dampier to Bunbury Natural Gas Pipeline (DBNGP) applied a 5-year inflation rate of 1.15% as at 27 November 2020.³⁷

More recently, the ERA published a 10-year inflation estimate of 2.16% for its annual rail WACC update as at 30 June 2021.³⁸ Note that the ERA uses a 40-day averaging period for its rail WACC determinations, rather than the 20-day averaging period for electricity and gas, hence the slight difference from the 10-year forecast in Table 2. In the September 2021 Issues Paper for the Pilbara electricity networks rate of return, the ERA estimated a 5-year forecast inflation rate of 2.03% for the 20-day averaging period to 30 June 2021, consistent with our estimate in Table 2.³⁹

This trend in recent data suggests that break-even inflation estimates appear to be quickly incorporating investor expectations of higher inflation in the medium to long term.

3.4 Alternative inflation forecasts

We have tested the reasonableness of our CPI forecast having regard to recent CPI forecasts developed by the WA Treasury, Commonwealth Treasury and RBA. It is apparent that all government agencies are forecasting a pick-up in CPI inflation in the short to medium term as economic conditions strengthen.

3.4.1 WA Treasury

Table 3 WA Treasury CPI forecasts

	2020-21 estimated actual	2021-22 budget estimate	2022/23 forward estimate	2023/24 forward estimate	2024/25 forward estimate
CPI growth	1.60%	1.75%	1.75%	2.00%	2.00%

Source: WA Treasury Economic Forecasts – Major Economic Aggregates

As discussed in Chapter 2, the WA Treasury CPI forecasts are based on an assumption of tightening labour markets putting upward pressure on inflation such that CPI approaches the lower bound of the RBA's inflation target band.

³⁷ ERA (2020). Determination on the 2020 weighted average cost of capital for the freight and urban railway networks, and for Pilbara railways, 11 August, p.4; ERA (2021). Final decision on proposed revisions to the Dampier to Bunbury Natural Gas Pipeline access arrangement 2021 to 2025, p.312.

³⁸ ERA (2021). Determination on the 2021 weighted average cost of capital for the freight and urban railway networks, and for Pilbara railways, 21 July, p.4.

³⁹ ERA (2021). Determination of Pilbara networks rate of return – Issues paper, 2 September, p.

3.4.2 Australian Treasury

As discussed in Chapter 2, the Australian Treasury assumes a moderate outlook for CPI growth in the next few years. However, it is forecasting annual CPI to grow by 1.75 and 2.25 per cent in the June quarters of 2022 and 2023, respectively.

3.4.3 RBA

The RBA publishes its Statement on Monetary Policy (SMP) in February, May, August and November of each year. Each SMP contains CPI forecasts at intervals of six months for the following two years. The RBA's latest CPI forecasts at August 2021 are displayed in Table 4.

Table 4 CPI annual growth estimates from August 2021 RBA Statement on Monetary Policy (SMP)

	June 2021 (ABS actual)	December 2021	June 2022	December 2022	June 2023	December 2023
CPI growth	3.80%	2.50%	1.50%	1.75%	2.00%	2.25%

Note: RBA forecasts are calculated as the percentage change over the year to the quarter shown

Source: RBA Statement on Monetary Policy (SMP) – May 2021

While short-term volatility in CPI growth is evident, largely attributable to the recovery from the Covid-19 pandemic, the RBA's June and December 2023 forecasts of 2.00% and 2.25% respectively are very close to the current break-even inflation estimate of 2.03%. Notably, the RBA's latest CPI forecasts are stronger than in its May 2021 Statement on Monetary Policy and indicates that it is expecting inflation to reach the inflation target band of 2-3% from June 2023.

3.5 Recommendation

Based on the above analysis, we recommend that the break-even method be used to develop a CPI forecast for Western Power's 2022-27 regulatory period.

A five-year forecast based on June 2021 data is 2.03%. Given the current high degree of uncertainty regarding inflation expectations, but which also appear to be increasing as time passes, we recommend that an updated inflation forecast be developed after the release of ERA's Draft Decision on Western Power's AA5 submission expected to be in September 2022.

Our forecast of 2.03% for the 2022-27 regulatory period is consistent with recent forecasts for 2023-24 developed by the WA Treasury and RBA. Our 2021-22 forecast is the most recent WA Treasury forecast.

Table 5 CPI escalation forecasts

	2021-22	2022-23	2023-24	2024-25	2025-26	2025-26	2026-27
CPI	1.75%	2.03%	2.03%	2.03%	2.03%	2.03%	2.03%

Source: Synergies

4 WPI forecasts

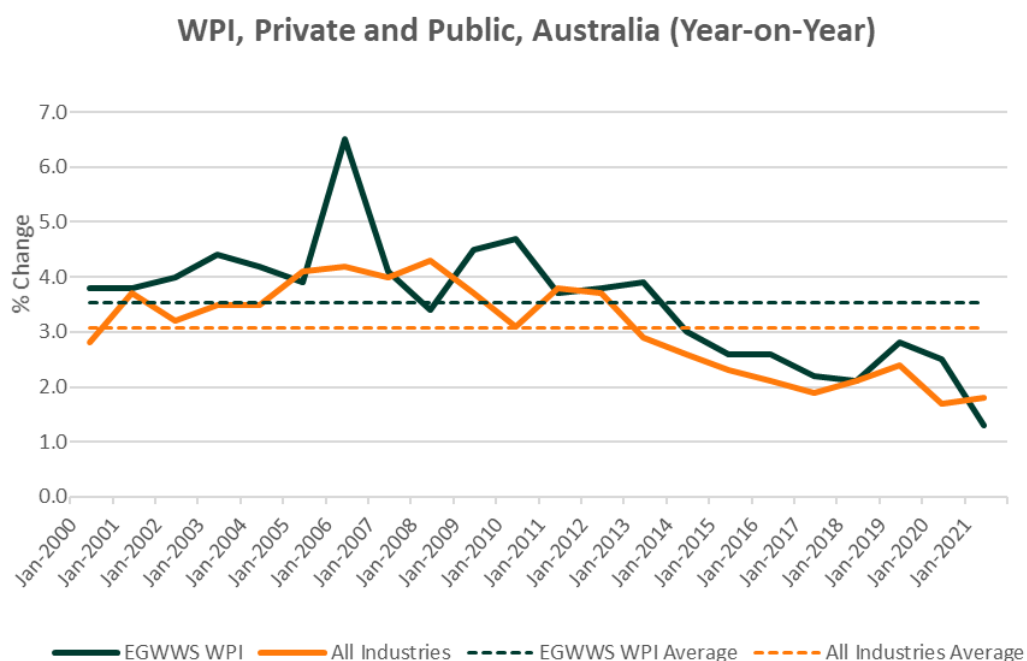
The purpose of this chapter is to present our WPI EGWWS forecasts for the 2022-27 regulatory period.

4.1 Background

The Wage Price Index (WPI) is ERA's and the AER's preferred wage price series, primarily because it reflects a weighted average of a combination of different types of jobs, which means that the series is unaffected by compositional shifts in the workforce.

Figure 4 shows historical movements in WPI since 2000 for the All Industries group, as well as the EGWWS sub-group. Wage growth has remained persistently below the long-run average over the last five years, although wage growth in the EGWWS sector has generally outpaced growth across All Industries. In fact, for the first quarter of 2021, the EGWWS sector reported the second highest year-on-year WPI growth (second only to Education and Training) among all industry sectors measured by the ABS.⁴⁰ However, in the June 2021 quarter, annual growth in the All Industries WPI of 2.8% was higher than EGWWS WPI annual growth of 1.3% for the first time since June 2011.

Figure 4 WPI All Industries and EGWWS historical annual growth



Data source: ABS data

⁴⁰ Western Australian Treasury Corporation (2021). Economic Analysis – Wage Price Index Q1 2021.

4.2 Use of the EGWWS sector

While the EGWWS sector provides a reasonable basis for determining wage escalation for the electricity and gas network sectors, it should be noted that there are substantial intra-utility differences in skills and labour market positions between electricity workers and those in gas, water and sewerage services. For example, within the EGWWS sector there are several differentiated activities which require different labour force skills reflecting the relatively large number of segmented labour market areas including:

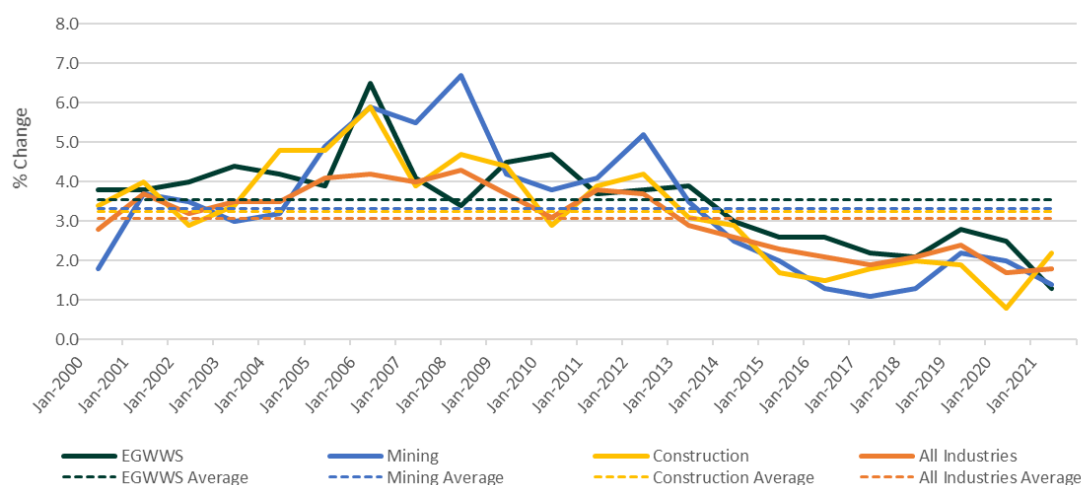
- Electricity Supply
- Electricity Generation
- Electricity Transmission
- Electricity Distribution
- On Selling Electricity and Electricity Market Operation
- Gas Supply
- Water Supply, Sewerage and Drainage Services
- Waste Collection, Treatment and Disposal Services
- Waste Collection Services
- Waste Treatment, Disposal and Remediation Services.

In this sense using the broad EGWWS sector to proxy labour cost movements in the electricity network sectors is likely to reflect a downward influence on the reported wage growth in electricity network employees employed by Western Power.

Further, employers in the electricity supply industry seeking skilled and semi-skilled labour are more likely to be in competition for labour with employers in the Mining and Construction industries than with employers in the water collection, treatment and disposal services sub-industry, or other waste-related sectors within the EGWWS sector. Given the current and prospective strength of the WA mining industry and its importance to the WA economy, we anticipate that this will likely at a minimum place a floor under EGWWS wages growth and more likely create wage pressures as the Mining sector competes for workers in other sectors of the WA economy.

Figure 5 below shows annual changes in WPI growth in the EGWWS, Mining, Construction and All Industries sectors since 2000. After a marked slowing in growth between around 2011 and 2018, there has been a recovery in all sectors since then. Interestingly, growth in the EGWWS sector slowed less and remains higher than in the other sectors.

Figure 5 WPI All Industries, EGWWS, Mining and Construction historical growth



Data source: ABS data

4.3 Our forecasting approach

We have estimated WPI and resulting the real labour escalation factor using the same approach that the ERA applied for Western Power's AA4 period. The ERA's approach to the determination of the real labour escalation factor consists of five steps:⁴¹

1. Estimating WA WPI for the regulatory period based on an average of WA Treasury forecasts.
2. Estimating the premium (if any) of EGWWS WPI over the Australian All Industries WPI.
3. Adding together the WA WPI forecast and the EGWWS premium to derive the nominal labour escalation forecast.
4. Estimating forecast CPI using WA Treasury forecasts using the same method applied for WA WPI.
5. Deducting CPI from the nominal labour escalation forecast to derive the real labour cost escalation factor.

⁴¹ ERA (2018). Final decision on proposed revisions to the access arrangement for the Western Power network 2017/12-2021/22, 20 September, p.100.

4.4 Our 2022-27 forecasts

We consider each of the above five steps to develop our nominal and real WPI EGWWS forecasts for the 2022 (last year of AA4) and 2023-27 regulatory period.

4.4.1 Step 1: Western Australian WPI estimate

The ERA uses WA Treasury forecasts to derive a single estimate of WPI for the duration of the regulatory period. At any given point in time, WA Treasury forward estimates are usually available only for the next three years, as opposed to the full five years that typically comprise the regulatory period. The ERA then supplements these three forward estimates with the latest actual WPI growth rate and the latest WA Budget or Mid-year Revision Estimate (whichever is most recent). This process results in five data points, which the ERA averages in order to estimate WPI for the regulatory period.⁴²

Table 6 indicates the calculation using the latest WA Treasury data. The WPI estimate of 2.20% is based on the average of the 2020-21 actual WPI (published by the ABS), the WA Treasury 2021-22 budget estimate, and its three forward estimates for 2022-23, 2023-24 and 2024-25. We note that the actual WPI growth for the 2020-21 financial year of 1.5% is the same as WA Treasury's 'estimated actual' forecast for that year.⁴³

Table 6 WPI growth estimate based on ERA approach

	2020-21 ABS actual	2021-22 budget estimate	2022/23 forward estimate	2023/24 forward estimate	2024/25 forward estimate	Average
WPI growth	1.50%	2.25%	2.25%	2.50%	2.50%	2.20%

Source: WA Treasury Economic Forecasts – Major Economic Aggregates

4.4.2 Step 2: Estimated premium of EGWWS WPI over Australian All Industries estimate

Historically, EGWWS WPI has grown more quickly than the All Industries group reflecting the relatively more skilled EGWWS worker compared to the average worker, which provides some additional bargaining power in negotiating wage increases.

In Western Power's AA4 regulatory period, the ERA allowed a premium of 0.2%. As elaborated in Attachment A though, the ERA did not apply an EGWWS premium in its

⁴² ERA (2021). Final decision on proposed revisions to the Dampier to Bunbury Natural Gas Pipeline access arrangement 2021 to 2025, 1 April, p.121.

⁴³ We have used the 2020-21 financial year growth rate rather than the 2021 June quarter on 2020 June quarter growth to align this growth rate with our use of a 2020-21 financial year growth rate for our 2020-21 CPI estimate. The reason for taking this approach to the CPI estimate is discussed in section 4.4.4 of our report.

recent decisions for ATCO or DBP because they did not submit a non-zero productivity factor offset to their wage growth forecast.

Proceeding on the basis that Western Power will submit a non-zero productivity factor for its AA5 submission, we consider that the precedent above is not directly applicable to Western Power. Nevertheless, the ERA has made clear that the inclusion of a productivity factor does not automatically guarantee the inclusion of an industry premium to real wage growth.⁴⁴ While the ERA considers that a business with no productivity growth is unlikely to sustain real wage growth at above average rates in the long term, a business with productivity growth would still be expected to demonstrate why it proposed its real wage growth would be above average rates and not just automatically include a premium as a result of a productivity factor being applied to expenditure.

Estimates of the EGWWS premium for various averaging periods are shown in Table 7.

Table 7 EGWWS WPI growth premium over Australian All Industries WPI over time

Averaging period	EGWWS WPI growth	All Industries WPI Growth	Premium
2000-2021	3.5%	3.1%	0.5%
2005-2021	3.4%	3.0%	0.4%
2010-2021	2.9%	2.5%	0.4%
2015-2021	2.3%	2.0%	0.3%
2017-2021 (AA4)	2.2%	2.0%	0.2%

Source: ABS, Synergies calculations

While there is evidence that the EGWWS premium over All Industries has narrowed slightly over time, growth in the EGWWS sector persistently exceeds that in the economy as a whole over an array of averaging periods reflecting the relatively high skills of EGWWS workers.

In particular, while the average premium over AA4 (to date) has been 0.2%, the average premium since 2010 has been 0.4%, higher than the ERA's allowed premium of only 0.2% in the AA4 period.⁴⁵ Having regard to this updated data, we consider that a premium of 0.4% is reasonable given the expected strengthening of labour market conditions in the AA5 regulatory period.

⁴⁴ ERA (2021). Final decision on proposed revisions to the Dampier to Bunbury Natural Gas Pipeline access arrangement 2021 to 2025, 1 April, p.121.

⁴⁵ The ERA's final decision for Western Power was not explicit about the averaging period that had been used to reach this premium.

Accordingly, we have adopted an EGWWS premium of 0.4% for use in the real labour escalation forecast, based on a 10-year average which captures the effect of stronger labour market conditions prior to the AA4 period.

4.4.3 Step 3: Nominal labour escalation forecast

The nominal labour escalation forecast is calculated by adding together the WA WPI estimate from Step 1 (2.20%) and the estimated premium from Step 2 (0.40%).

The resulting nominal labour escalation forecast is **2.60%**.

4.4.4 Step 4: CPI estimate for use in real labour escalation factor

An important feature of the ERA's WPI methodology is that it has not accepted an inflation estimate based on the break-even approach for the purposes of calculating the labour escalation rate.⁴⁶

While the estimate of expected inflation obtained from the ERA's break-even approach would be equally robust and fit-for-purpose in this context, the WPI growth estimate is based on Western Australian Treasury data. In this regard, the ERA considered that, when it is possible to obtain WPI data and inflation data from the same source, applying data from the same source yields the best possible forecasts of the labour escalation rate.⁴⁷ Using forecast data from the same source on inflation and WPI growth to calculate real labour escalation minimises the possibility of differences between inflation estimates from one source and the inflation assumptions implicit in constructing WPI forecasts.

In line with the ERA's approach for ATCO and DBP, we have applied the most recently available WA Treasury CPI data as the measure of inflation for determining the labour escalation rate. The time period covered by the CPI growth data applied to calculating the labour escalation rate aligns with the time period covered by the WPI growth data.

In alignment with the WA Treasury forecasts for WPI, CPI is based on an average of actual CPI for 2020-21 (published by the ABS), one WA Treasury budget estimate, and its three forward estimates. As demonstrated in Table 8, the average of these five data

⁴⁶ ERA (2019). Final decision on proposed revisions to the Mid-West and South-West Gas Distribution Systems access arrangement for 2020 to 2024, 15 November, p.143.

⁴⁷ ERA (2019). Final decision on proposed revisions to the Mid-West and South-West Gas Distribution Systems access arrangement for 2020 to 2024, 15 November, p.144.

points is 1.82%. We note that actual CPI growth for the 2020/21 financial year of 1.6% is the same as WA Treasury's 'estimated actual' forecast for that year.⁴⁸

Table 8 CPI growth estimate based on ERA approach

	2020-21 ABS actual	2021-22 budget estimate	2022/23 forward estimate	2023/24 forward estimate	2024/25 forward estimate	Average
CPI growth	1.60%	1.75%	1.75%	2.00%	2.00%	1.82%

Source: WA Treasury Economic Forecasts – Major Economic Aggregates

4.4.5 Real labour escalation factor

The ERA uses the following formula to calculate real labour escalation:⁴⁹

$$\text{Real labour escalation growth rate \%} = \frac{1 + \text{Average growth in WPI}}{1 + \text{Average growth in CPI}} - 1$$

Substituting our WPI estimate (inclusive of the EGWWS premium) and CPI estimate from the preceding sections gives the following estimate for the real labour escalation growth rate:

$$\text{Real labour escalation growth rate \%} = \frac{1 + 2.60\%}{1 + 1.82\%} - 1 = 0.77\%$$

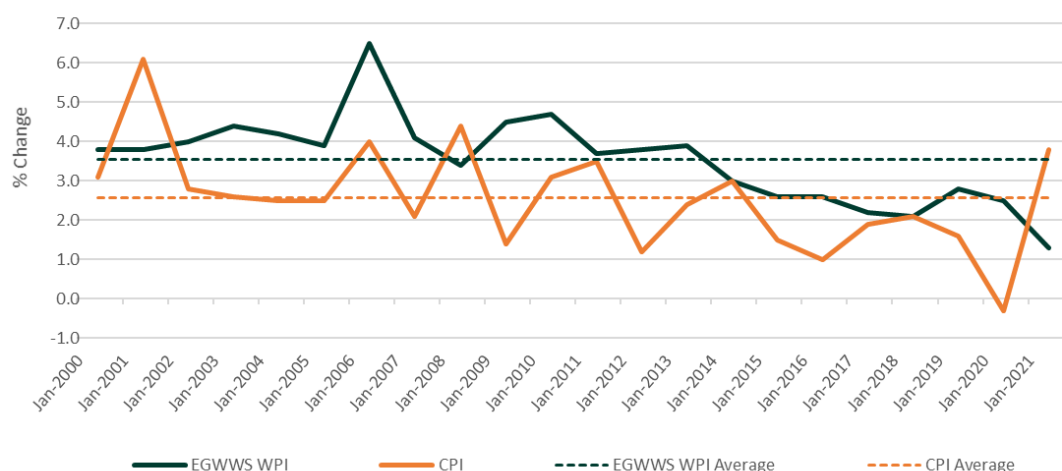
Therefore, our estimate of the real labour escalation growth rate is **0.77%**.

Figure 6 below shows real WPI growth in the EGWWS sector since 2000. It demonstrates that the premium of EGWWS WPI over CPI historically has been around 1.00%, which is higher than the 0.77% real wage premium that we are proposing.

⁴⁸ We have used the 2020-21 financial year growth rate rather than the 2021 June quarter on 2020 June quarter growth rate because the latter is significantly affected by what we consider to be one-off effects of the Covid-19 pandemic on quarterly movements in inflation over this period.

⁴⁹ ERA (2021). Final decision on proposed revisions to the Dampier to Bunbury Natural Gas Pipeline access arrangement 2021 to 2025, 1 April, p.119.

Figure 6 Historical premium of EGWWS WPI over CPI



Source: Synergies using ABS CPI and WPI data

Given the WPI series is released quarterly, our real labour escalation forecast should ideally be updated following the publication of ERA’s Draft Decision on Western Power’s AA5 submission, expected to be September 2022. The June 2022 WPI is scheduled to be released by the ABS on 17 August 2022, which would appear to provide the appropriate data set for updating purposes. Similarly, the ABS CPI series for June 2022 is expected to be released in late August 2022.

4.5 Weighting of real labour cost escalator

Recognising that the real labour cost escalator will be used in Western Power’s base-step-trend opex forecasting model, a decision is required regarding the weighting of this escalator (and the materials cost escalator discussed in the next chapter).

In its most recent determinations, the AER applies a real labour escalator benchmark weighting of 59.2% for Distribution Network Service Providers (DNSPs)⁵⁰ and 70.4% benchmark weighting for Transmission Network Service Providers (TNSPs)⁵¹, which recognises the higher labour component of transmission services opex.

⁵⁰ AER (2021), Final Decision, Final Decision, Powercor Distribution Determination 2021 to 2026, Attachment 6: Operating expenditure, April 2021, p 25. The AER’s final decisions for the Victorian DNSPs are its most recent distribution determinations.

⁵¹ AER (2021), Draft Decision, Powerlink Queensland, Transmission Determination, 2022-27, Attachment 6: Operating expenditure, September 2021, p 17. The approved real labour escalator weighting in this draft decision is the same as that in the AER’s draft decision for AusNet’s transmission network released in June 2021.

We recommend that these contemporary benchmark weightings approved by the AER be adopted by Western Power in developing its distribution and transmission opex and capex forecasts for the 2022-27 regulatory period.

4.6 2022-27 forecasts summary and conclusion

We recognise that WA labour market conditions remain relatively subdued currently but are likely to pick-up in the forecast period, including in those sectors that compete for EGWWS workers (e.g. mining and construction). As discussed in Chapter 2 of our report, growth in employment in the mining sector was strong.

In simple terms, the tighter the expected market for EGWWS workers, the more likely that wages will grow more quickly for this cohort than the All Industries. For this reason, we consider that an EGWWS premium of 0.4% is conservative and reflective of the market conditions that are expected to prevail during AA5. A premium of 0.5% based on a longer historical timeframe that captures stronger labour market conditions prior to the AA4 regulatory period could be justified given an improving outlook for employment and wages in the AA5 period.

Table 9 presents our real labour escalation forecasts for the 2022-27 regulatory period. We consider that these forecasts should be used in the development of Western Power's opex and capex forecasts. We anticipate that the real labour escalation forecasts would be applied to the labour and labour contractor components of these forecasts.

Table 9 Real labour escalation forecasts

	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Real labour cost	0.88%	0.77%	0.77%	0.77%	0.77%	0.77%

Source: Synergies

We have also included a forecast for 2021-22, which is the final year of the AA4 regulatory period. This forecast is based on applying an adapted version of the ERA's preferred forecasting methodology by using the WA Treasury CPI and WPI forecasts only for 2021-22 rather than a five-year average. CPI is forecast to grow by 1.75% in 2021-22, while WPI is forecast to grow by 2.25% in 2021-22 and we apply a 0.4% EGWWS premium to the WPI forecast before deflating it to calculate the real WPI forecast. The reason for using this adaptation is that WA Treasury's forecast increase in WPI growth in coming years results in a five-year average WPI growth forecast that is likely to be too high for 2021-22.

We recommend a real labour escalator weighting of 59.2% for DNSPs and 70.4% for TNSPs be applied in developing the respective opex and capex forecasts for the 2022-27 period.

5 Materials cost escalation

The purpose of this chapter is to present our materials escalation forecasts for the 2022-27 period.

5.1 Regulatory precedent

In recent years, the ERA and AER have used their CPI forecasts as the basis to forecast materials prices which, in practice, means zero escalation in real terms. This is notwithstanding the fact that CPI captures movements in prices of a representative household basket of goods and services rather than the prices of materials or equipment purchased by the producers of goods and services supplied to households.

Further, both economic regulators have appeared unwilling to consider alternative forecasting approaches, instead preferring the simplicity of CPI and expressing concerns about composite input cost indexes proposed by some networks.

For example, Jacobs developed a weighted cost index, which modelled changes in network equipment prices by combining independent forecast movements in the real price of input commodities, such as copper and steel, with weightings for the relative contribution of each commodity to the final equipment cost.⁵²

The current Australian regulatory stance represents a change from the first decade of the 2000s when the AER was more willing to consider composite materials indexes. For example, in its 2009 final decision for the NSW DNSPs, the AER stated:⁵³

The methodology employed to determine the cost escalators generally combines independent forecast movements in the price of input components with 'weightings' for the relative contribution of each of the components to final equipment/project costs. This in turn generates real capex and opex forecasts for the regulatory control period. The weightings are typically specific to each regulated business given differences in composition of their respective expenditure forecasts.

The underlying objective of real cost escalations was to take account of the commodities boom and skills shortages in the engineering field in Australia. In light of these external factors, it was considered that cost escalation at CPI no longer reasonably reflected a realistic expectation of the movement in some of the equipment and labour costs faced by electricity network service providers (NSPs).

⁵² Jacobs (2015), ActewAGL - Cost Escalation Factors, ACTEWAGL Commodity Price Forecasting, January

⁵³ AER (2009), New South Wales distribution determination, 2009-10 to 2013-14, p 478

The composite input cost indexes assumed that materials and equipment purchased by distribution and transmission networks were strongly linked to the prices of key commodity inputs such as steel, copper and aluminium.

5.2 Other potential materials escalators

Recognising that recent regulatory precedent is not supportive of composite materials indexes, there are some publicly available alternatives that could be considered.

5.2.1 ABS Producer Price Indexes

The ABS produces several Producer Price Indexes (PPIs), which measure input and output prices of producer goods and services.

These are potentially important measures that capture input price inflation facing electricity networks and are likely to be more representative of materials price inflation than CPI.

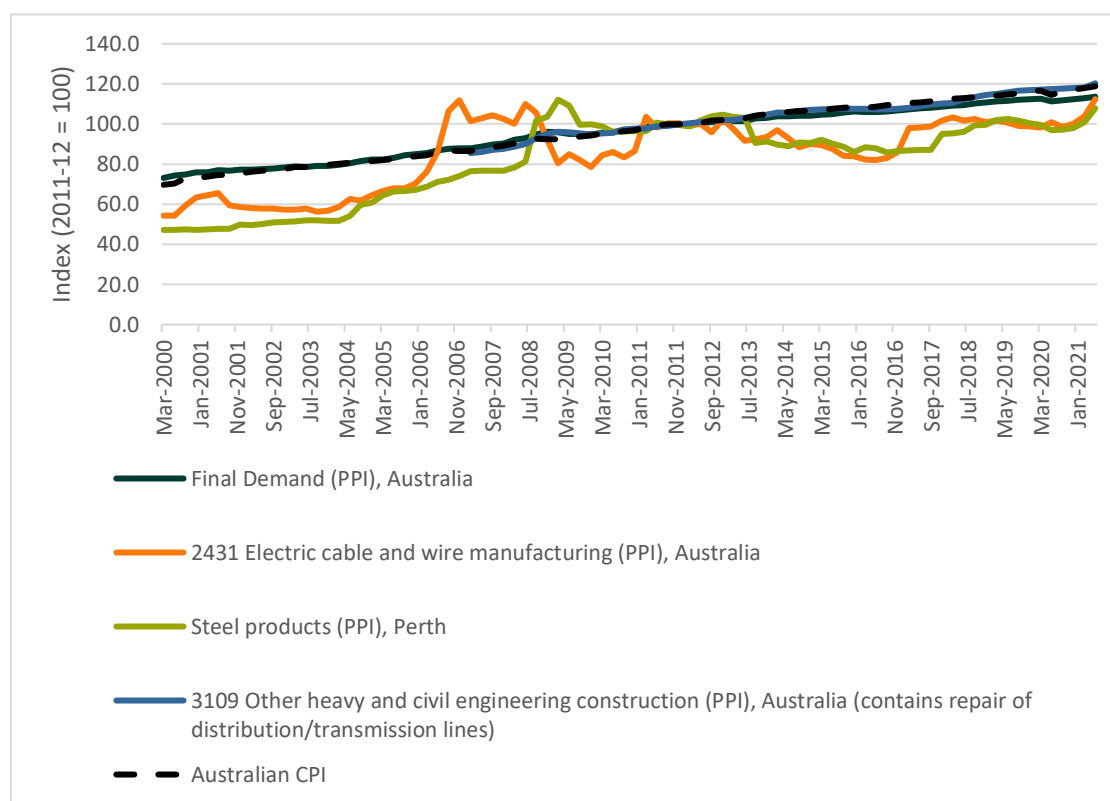
However, of the PPIs being published, none provide a close proxy to the materials purchases of electricity networks. Our review of the PPIs indicates the following as likely being the best proxy for electricity networks:

- Electric Cable and Wire Manufacturing
- Steel Products (Manufacturing)
- Other Heavy and Civil Engineering Construction (including construction and repairs to major water and energy infrastructure).

Figure 8 below shows movements in these indexes since 2000 compared to the CPI and the Final Demand PPI.

Interestingly, movements in the CPI, Final Demand PPI and Other Heavy and Civil Engineering Construction indexes are very closely aligned, compared to the Electric Cable and Wire Manufacturing and Steel Products PPIs which are volatile.

Figure 7 Index movements in CPI and selected PPIs



On balance, we are not convinced that there is a PPI index that would provide a robust base for materials cost indexation that would reliably out-perform the CPI, notwithstanding the latter's limitations.

5.2.2 Composite commodity price index

Consistent with the composite price indexes referred to in Section 5.1 above, it would be possible to identify a representative selection of commodities whose prices could reasonably be expected to flow through to final materials input prices. The extent of flow-through would depend on the proportion of the commodity required in the provision of the relevant materials good/service and the extent of competition in input markets (which will affect how much of a commodity price increase or decrease flows through to final input prices).

Relevant commodities for such an index, such as copper and steel, have quoted forward prices that would facilitate the development of forecasts.

It is evident that development of such a composite index would be time-consuming and require judgement in the choice of commodities and associated weightings. As discussed in Section 5.1 above, the likelihood of acceptance by the ERA (or the AER) is currently

limited. Consequently, we see little reason for the development of such as index in the current circumstances.

5.3 Weighting of materials cost escalator

Further to our discussion in section 4.5 of the preceding chapter on real labour cost escalators, a materials escalator weighting will also be required in Western Power's base-step-trend opex forecasting model.

Given our recommendation of a real labour escalator benchmark weighting of 59.2% for DNSPs and 70.4% for TNSPs based on the most recent AER determinations, we recommend that a materials escalator weighting of 40.8% for DNSPs and 29.6% for TNSPs be used in developing Western Power's distribution and transmission opex and capex forecasts for the 2022-27 regulatory period.⁵⁴

5.4 Our 2022-27 forecasts

Recognising recent unfavourable regulatory precedent regarding choice of non-CPI materials escalators, we recommend that Western Power apply CPI escalation to its materials costs in its AA5 submission.

In making this recommendation, we note that the use of the breakeven method to determine CPI forecasts (as opposed to the AER's inflation forecasting methodology) is more likely to capture broader and potentially increasing inflation expectations in the economy and so provides some form of hedge for future materials escalation even though it will not provide any real escalation.

Table 10 presents our materials escalation forecasts for the 2022-27 period. We anticipate that these materials escalation forecasts would be applied to the non-labour components of Western Power's opex and capex forecasts.

Table 10 Materials cost escalation forecasts

	2021-22	2022-23	2023-24	2024-25	2025-26	2025-26	2026-27
Real materials cost	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Source: Synergies

We recommend a materials escalator weighting of 40.8% for DNSPs and 29.6% for TNSPs be used in developing the respective opex and capex forecasts for the 2022-27 period.

⁵⁴ Refer to footnotes 51 and 52 of this report for the AER references for the materials escalator benchmark weightings.

6 Opex productivity forecast

The purpose of this chapter is to present our opex productivity forecasts for the 2022-27 period.

6.1 Background

6.1.1 Productivity growth factor

Western Power proposed and the ERA accepted a 1% productivity adjustment factor used in the opex forecast for the AA4 regulatory period. However, as presented in Appendix 1, recent gas access arrangements for ATCO and DBP have included a zero productivity adjustment factor.

In its March 2019 final decision for electricity distributors, the AER adopted an opex productivity growth factor of 0.5 per cent per annum. This was based on the AER's own opex total partial factor productivity model (PTFP) and estimates of the time trend from its econometric opex models, which proxy for the rate of technical change or productivity.

The AER's analysis was supplemented by estimates and forecasts from gas distribution productivity and labour productivity growth for utilities and other sectors. The reliance on data from other sectors was deemed consistent with international regulatory practice (e.g. Ofgem).

To be clear, the AER's productivity growth assumption is a forward-looking view about productivity growth rather than an opex base year efficiency adjustment that would be applied separately before the opex forecast is developed.

6.2 Our forecasting approach

6.2.1 Productivity growth factor

While the 0.5 per cent per annum productivity growth factor currently assumed by the AER is not an unreasonable starting point for Western Power, two considerations may warrant adjustments to this assumption. Namely:

- the AER's analysis used data only up to 2017 in its productivity review and this needs to be updated for the latest data; and
- the AER's analysis of electricity distributors relied only on the top four ranked networks in the NEM, and it is unclear whether each of these networks is sufficiently comparable to Western Power to inform a robust productivity estimate.

We consider each of these issues in turn.

Updating the AER's productivity analysis

We have used our Multilateral Total Factor Productivity (MTFP) model to generate opex productivity estimates for 2019-20 using the AER's Regulatory Information Notice (RIN) data. Synergies has developed MTFP models for the NEM distribution and transmission network service providers (NSPs) based on the AER's methodology, which we periodically update as the AER's RIN benchmarking data becomes available. These models also allow derivation of opex and capex PTFP measures. We have previously used these models in our economic benchmarking reports to Western Power, including for the AA4 regulatory period.

The output specification used in the AER's MTFP analysis comprises energy delivered, customer numbers, circuit length, ratcheted maximum demand and reliability. Reliability is measured as the number of customer minutes off-supply.⁵⁵ The input specification comprises the observed opex spent on 'network services'. Network services are defined by the AER to be a DNSP's core network services. This series has a lower value than the total opex category, which includes costs associated with street lighting, connection services and metering services.

In its 2019 final decision for forecasting productivity growth for electricity distributors, the AER used results from its opex partial factor productivity model for the period 2011-2017, which resulted in an estimated productivity range of 0.35 to 0.97 per cent per annum. The AER relied upon this range in setting its productivity growth factor assumption of 0.5 per cent per annum.

In the AER's final decisions for Victorian DNSPs released in April 2021, the AER retained its position of a productivity growth factor assumption of 0.5 per cent per annum. It should be noted that each of the DNSPs had proposed this productivity assumption to the AER. The Victorian final decision means that the 0.5% productivity assumption was applied in all NEM electricity determinations in the current round.

Relevant NEM comparators to inform the productivity growth factor

In our previous economic benchmarking work for Western Power, which formed part of the AA4 submission, we identified five distribution networks that we considered were the closest possible comparators in the NEM to Western Power. These were:

- SA Power Networks (South Australia)
- Powercor (Victoria)

⁵⁵ Reliability is a negative output because a decrease in supply interruptions is equivalent to an increase in output.

- AusNet Services (Victoria)
- Essential Energy (NSW)
- Ergon Energy (Queensland)

In contrast, the AER's productivity growth estimate was informed by only the four highest ranked distributors in the NEM based on MTFP results, which were CitiPower (Victoria), Powercor (Victoria), United Energy (Victoria) and SA Power Networks. Of these, we consider only Powercor and SA Power Networks are close comparators for Western Power given similar network characteristics, including rural network segments. In contrast, Citipower and United Energy are Melbourne-based urban distributors with no rural network segments.

As a result, we consider it more appropriate for Western Power's productivity growth factor to be informed by data from those networks that bear the closest resemblance to it (noting that even these comparators are imperfect). Productivity growth estimates for Western Power's closest five comparators over the last 10 years (2011-2020) and over the last five years (2016-2020) are presented in Table 11.⁵⁶

Table 11 Annual productivity growth estimates for NEM distributors comparable to Western Power

Distributor	2011-2020 annual productivity growth	2016-2020 annual productivity growth
SA Power Networks	0.4%	0.0%
Powercor	-1.8%	0.2%
AusNet Services	-1.3%	1.8%
Essential Energy	-0.8%	-7.4%
Ergon Energy	2.4%	0.7%
Average	-0.2%	-0.9% (0.7% with Essential Energy excluded)
Median	-0.8%	0.2% (0.5% with Essential Energy excluded)
Minimum	-1.8%	-7.4%
Maximum	2.4%	1.8%

Note: All productivity growth estimates in the table are expressed on a per cent per annum basis.

Source: Synergies analysis of AER Economics Benchmarking RIN data

Over the last 10 years, annual productivity growth estimates have been highly variable, ranging between -1.8% and 2.4% per annum, with an average (median) of -0.2% (-0.8%) per annum. This implies that there has been no or even slightly negative productivity growth for comparators most relevant to Western Power over the last decade.

Over the last 5 years, the average (median) of the five comparators was -0.9% (0.2%). That being said, we note that Essential Energy appears to be an outlier over this period,

⁵⁶ 2011 was chosen as the starting point for our analysis as this was also the AER's preferred starting point in its 2019 productivity review (specifically, the AER used data from 2011-2017).

with its opex having increased almost 26% over that timeframe. Accordingly, we also present averages and medians with Essential Energy excluded. This results in a revised average (median) of 0.7% (0.5%) per annum.

Therefore, depending on the averaging period used, annual productivity growth for the five NEM distributors most similar to Western Power has generally ranged between 0 and 0.5 per cent per annum.

6.3 Our 2022-27 forecasts

In summary, our updated productivity analysis for NEM distributors, combined with our scan of regulatory precedent, suggests a range for the productivity growth factor of 0 to 0.5 per cent per annum. We note that this range sits below the 1 per cent per annum productivity growth factor that Western Power submitted in the AA4 regulatory period.

In regard to a position of zero productivity growth, we consider that this is defensible on the basis of the latest NEM distributor data, but we would highlight the ERA's past reluctance to allow an EGWWS premium in the context of labour escalation for businesses that adopted a zero productivity growth assumption. On the other hand, the AER's current assumption of 0.5 per cent productivity growth is at best an upper bound for the recent productivity trajectories of the five NEM comparators that we consider are of most relevance to Western Power.

Acknowledging that there is considerable judgement around the appropriate productivity assumption, including because of its observed annual volatility, we recommend a productivity growth factor of 0.25 per cent per annum, which corresponds to the mid-point of our identified range. This forecast assumption would remain fixed for the duration of AA5.

Table 12 presents our productivity forecasts for the 2021-27 period.

Table 12 Productivity growth forecasts

	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Productivity growth	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%

Source: Synergies

However, in making this recommendation, if Western Power's base year opex appears highly efficient when benchmarked against NEM NSPs, then this could have implications for the size of the productivity assumption. Further, if Western Power is likely to forecast flat or declining opex in the AA5 period, then the appropriateness and size of any productivity adjustment should be carefully considered.

Hence, in terms of the AA5 submission, the application of our proposed 0.25% productivity estimate should depend on the relative efficiency of Western Power's base year opex and what it is planning to do in terms of the total AA5 opex forecast (e.g. will further reductions be built into the forecasts or will the AA4 reductions be reversed?). If Western Power assesses that it can make a strong case that its opex base and AA5 opex forecast are efficient, then we would recommend an opex productivity assumption of zero for AA5.

A. ERA and AER cost escalation precedent

We have reviewed relevant AER and ERA cost escalation decisions, including the approaches approved by the economic regulator and the reasons (and wider context) for each of those decisions. We have also captured what networks have proposed to the regulator including any new approaches to cost escalation. Any outliers in regulatory decisions have also been identified.

Our review has covered the most recent final electricity regulatory determinations by the AER for the following entities:

- Victoria Distribution Network Services Providers (Citipower, Powercor, Jemena, United Energy and AusNet Services)
- Queensland Distribution Network Services Providers (Energex and Ergon Energy)
- NSW Distribution Network Services Providers (Ausgrid, Endeavour Energy, Essential Energy)
- South Australia Power Networks
- TasNetworks
- Evoenergy
- Directlink.

We have also reviewed the most recent gas regulatory determinations for the following entities:

- Dampier to Bunbury Gas Pipeline (ERA)
- ATCO Gas (ERA)
- Australian Gas Networks (SA) (AER)
- Jemena Gas Networks (NSW) (AER).

The purpose of this Appendix is to present recent regulatory decisions by the AER and ERA regarding the following cost escalators:

- CPI price inflation
- Real labour escalation based on WPI
- Opex productivity.

A.1 CPI price inflation

Table 9 presents the CPI forecasts for the recent final decisions of the AER and ERA, covering a period from April 2019 to April 2021. The AER's final CPI forecasts range from 2.00% in April 2021 to 2.42% in April 2019.

It is important to note that the AER changed its CPI forecasting methodology in December 2020. From December 2020, it has applied a 5-year geometric mean of 1-year and 2-year forecasts from the RBA's Statement on Monetary Policy (SMP), followed by a 3-year linear glide path (i.e. until year 5) to the midpoint of the RBA target band (2.5%).⁵⁷

Prior to December 2020, the AER applied a 10-year geometric mean of Reserve Bank of Australia (RBA) short-term inflation forecasts for the first two years, and target inflation band mid-point (2.5%) for the remaining 8 years.

ERA's forecasting methodology is based on the break even method.

Table 13 CPI Inflation – AER and ERA final determinations

Entity	2020-21 Forecast	2021-22 Forecast	2022-23 Forecast	2023-24 Forecast	2024-25 Forecast	2025-26 Forecast
AER determinations						
Powerlink (Draft Decision) – September 2021	N/A	N/A	2.25%	2.25%	2.25%	2.25%
Victorian DNSPs (AusNet Services; Citipower; Jemena; Powercor; United Energy) – April 2021	N/A	2.00%	2.00%	2.00%	2.00%	2.00%
Australian Gas Networks (SA) – April 2021	N/A	2.00%	2.00%	2.00%	2.00%	2.00%
Qld DNSPs (Energyex, Ergon Energy) – June 2020	2.27%	2.27%	2.27%	2.27%	2.27%	N/A
South Australia Power Networks – June 2020	2.27%	2.27%	2.27%	2.27%	2.27%	N/A
Directlink – June 2020	2.27%	2.27%	2.27%	2.27%	2.27%	N/A
Jemena Gas Networks (NSW) – June 2020	2.27%	2.27%	2.27%	2.27%	2.27%	N/A
NSW DNSPs (Ausgrid; Endeavour Energy; Essential Energy) – April 2019	2.42%	2.42%	2.42%	2.42%	N/A	N/A
Evoenergy (ACT) – April 2019	2.42%	2.42%	2.42%	2.42%	N/A	N/A
TasNetworks – April 2019	2.42%	2.42%	2.42%	2.42%	N/A	N/A
ERA determinations						

⁵⁷ This approach is new and follows the recent completion of the AER's review of its inflation forecasting methodology.

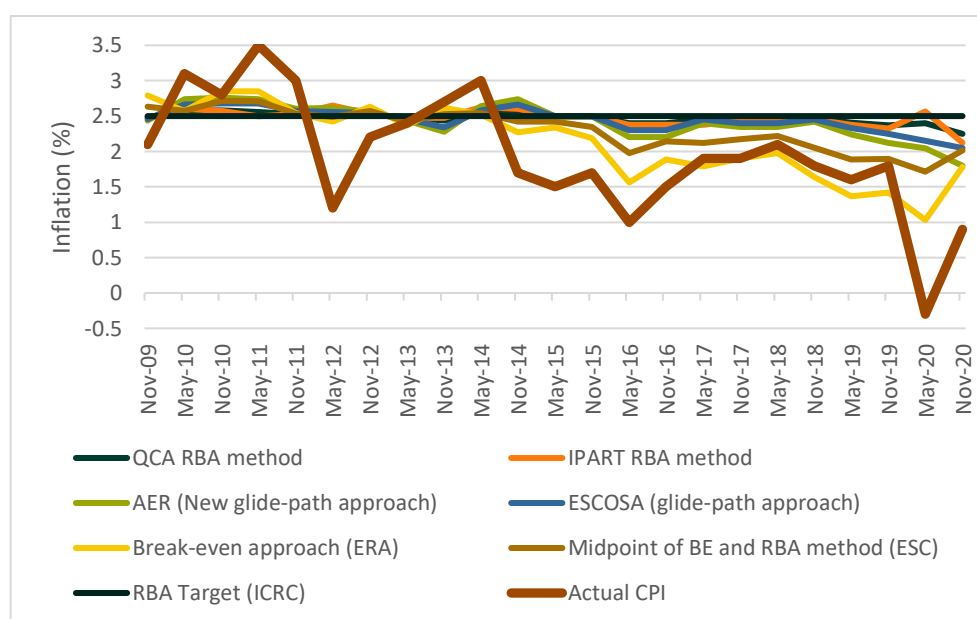
Entity	2020-21 Forecast	2021-22 Forecast	2022-23 Forecast	2023-24 Forecast	2024-25 Forecast	2025-26 Forecast
Dampier to Bunbury Gas Pipeline – April 2021	1.50%	1.75%	1.75%	2.00%	N/A	N/A
ATCO Gas – November 2019	2.25%	2.50%	2.50%	N/A	N/A	N/A

Note: 2019-20 is an historical value

Source: AER and ERA determinations

Figure 8 below illustrates the comparative performance of Australian economic regulators' various inflation forecasting methodologies since the beginning of 2010, including AER and ERA.⁵⁸

Figure 8 CPI and regulatory inflation allowances, 2010-present (% change on corresponding quarter of previous year)



Data source: ABS, RBA, Synergies analysis

It is evident that the break-even approach used by ERA tracks actual CPI very closely, especially over the last 5 years. Likewise, the inflation estimates based on the mid-point of the break-even and RBA approaches perform reasonably well from 2017 onwards.

Meanwhile, all other regulatory approaches remain anchored close to 2.5% (given the relatively heavy weighting given to the mid-point of the RBA's target inflation range), although estimates incorporating glide paths have tracked lower in the last two years.

⁵⁸ The only major economic regulator to be omitted here is the ACCC. Recent ACCC determinations (e.g. for Australia Post or ARTC Interstate) have not involved specific inflation estimates. However, in the draft decision for ARTC Interstate, the ACCC noted that an appropriate method is to use a geometric average of the RBA's inflation forecasts and mid-band target inflation over a 10-year period" (p.145). This implies a method virtually identical to that historically applied by the QCA.

It is important to note that the varying but heavy weighting given to the mid-point of the RBA's target inflation range means that these forecasting methodologies are only likely to provide a reliable forecast of inflation when actual inflation is tracking within the RBA's inflation target range (ie between 2% and 3%).

In light of the flawed nature of the AER's inflation forecasting methodology the lowering of its inflation forecasts since 2019 are more a function of the change in its forecasting methodology than what we consider to be a change in market-driven inflation expectations.

A.2 Real price escalation

Table 14 presents the AER's and ERA's real price forecasts, which are a weighted and indexed price of labour and non-labour (materials). The AER and ERA assume that materials escalation is equivalent to CPI growth such that in real terms its growth is zero.

Table 14 Real price growth – AER and ERA Final Determinations (unless otherwise stated)

Entity	2021-22 Forecast	2022-23 Forecast	2023-24 Forecast	2024-25 Forecast	2025-26 Forecast	Average
AER determinations						
Powerlink (Draft Decision)	N/A	0.60%	0.60%	0.60%	0.60%	0.60%
Victorian DNSPs (AusNet Services; Citipower; Jemena; Powercor; United Energy) – April 2021	0.48%	0.39%	0.36%	0.43%	0.56%	0.4%
Australian Gas Networks (SA) – April 2021	0.44%	0.21%	0.21%	0.32%	0.41%	0.3%
Queensland DNSPs (Energex; Ergon Energy) – June 2020	0.59%	0.63%	0.61%	0.58%	N/A	0.6%
South Australia Power Networks – June 2020	0.51%	0.52%	0.54%	0.51%	N/A	0.5%
Directlink – June 2020	0.59%	0.69%	0.69%	0.73%	N/A	0.65%
Jemena Gas Networks (NSW) – June 2020	0.50%	0.59%	0.58%	0.62%	N/A	0.56%
NSW DNSPs (Ausgrid; Endeavour Energy; Essential Energy) – April 2019	0.70%	0.74%	0.61%	N/A	N/A	0.60%
TasNetworks – April 2019	0.25%	0.25%	0.28%	N/A	N/A	0.21%
Evoenergy – April 2019	0.58%	0.57%	0.52%	N/A	N/A	0.49%
ERA determinations						
ATCO Gas	0.33%	0.33%	0.33%	0.33%	N/A	0.33%

Note: The Dampier to Bunbury Gas Pipeline does not include a real price growth figure but did include a real wage price growth of 0.18%.

Source: AER and ERA determinations

A.3 Productivity growth

Table 15 presents the AER's and ERA's productivity growth forecasts.

Table 15 Productivity growth factor – AER and ERA Final Determinations (unless otherwise stated)

Entity	Five year average
AER determinations	
Victorian DNSPs (AusNet Services; Citipower; Jemena; Powercor; United Energy)- April 2021	0.5%
Australian Gas Networks (SA) – April 2021	0.4%
AusNet Services (Transmission) – June 2021 (Draft Decision)	0.31%
Queensland DNSPs (Energex; Ergon Energy) – June 2020	0.5%
South Australia Power Networks – June 2020	0.5%
Directlink – June 2020	0.0%
Jemena Gas Networks (NSW)	0.74%
NSW DNSPs (Endeavour Energy; Essential Energy, Ausgrid) – April 2019	0.5%
TasNetworks – April 2019	0.5%
Evoenergy – April 2019	0.5%
TransGrid – September 2017	0.2%
ERA determinations	
Dampier to Bunbury Gas Pipeline – April 2021	0.0%
ATCO Gas – November 2019	0.0%

Source: AER determinations