7. Escalation Rates and Project Cost Estimation

7.1 Introduction

This chapter explains how Powerlink has determined escalation rates for internal labour, external labour and materials. We have used these escalation rates as an input to forecast our operating and capital expenditure.

The chapter also explains our approach to estimate the cost of projects included in our capital expenditure forecast and the unit rates used in the Repex Model.

Key highlights:

- As inputs to forecast our capital and operating expenditure, we have used:
  - an average annual growth rate of 0.7% for internal labour costs and 0.7% for external labour costs over the 2023-27 regulatory period. These include Superannuation Guarantee (SG) increases of 0.5% in the years 2021/22 to 2025/26; and
  - an annual increase in the costs of materials based on the Consumer Price Index (CPI). This results in a zero real (or inflation-adjusted) increase.
- Our updated unit rates in the Repex Model have increased by an average nominal rate of 2.5% per annum from the unit rates provided in our 2018-22 Revenue Proposal.
- We sought independent advice from BIS Oxford Economics (BISOE) on wage growth forecasts and GHD Advisory on unit rates to inform our respective positions.
- We have applied our standard internal cost estimating approach for bottom-up estimates of capital projects. In 2018-22, we transitioned to a new cost estimating approach that better aligns with international standards.

7.2 Regulatory requirements

The National Electricity Rules (the Rules)[1] require our operating and capital expenditure forecasts to reasonably reflect prudent and efficient costs with a realistic expectation of demand and cost inputs required to achieve the operating and capital expenditure objectives.

7.3 Cost escalation overview

We have adopted real input cost changes for internal labour, external labour and materials as presented in Table 7.1. Our forecasts for the remaining two years of the current 2018-22 regulatory period are also shown for completeness.

Table 7.1: Real input price growth (% per annum)

	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	Average 2023-27
Internal Labour	0.5	0.6	0.4	0.5	0.9	1.1	0.7	0.7
External Labour	(0.5)	0.4	0.3	0.5	0.8	1.2	0.6	0.7
Materials	-	-	-	-	-	-	-	-

Source: BISOE, Deloitte Access Economics (DAE).

[1] National Electricity Rules, clauses 6A.6.6(c) and 6A.6.7(c).

7.4 Cost escalation approach

A summary of the approach used to determine our cost escalation forecasts is provided in Table 7.2.

Table 7.2: Approach used to forecast cost escalation

Escalation factor	Basis of forecast
Internal Labour	Simple average of two forecasts over the 2023-27 regulatory period: • BISOE - Electricity, Gas, Water and Waste Services (EGWWS) Wage Price Index (WPI) for Queensland; and • Deloitte Access Economics (DAE) National Utilities WPI forecast prepared for the AER(1). The SG increase of 0.5% was then added for the years 2021/22 to 2025/26(2).
External Labour	Simple average of two forecasts over the 2023-27 regulatory period: • BISOE Construction WPI for Queensland; and • DAE National All Industries WPI forecast prepared for the Australian Energy Regulator (AER)(1). The SG increase of 0.5% was then added for the years 2021/22 to 2025/26.
Materials	CPI – assumed forecast of 2.25%.

(1) Deloitte Access Economics, Wage Price Index forecasts prepared for the Australian Energy Regulator, August 2020 – as presented in the Draft Decisions for the Victorian Distribution Network Service Providers - AusNet Services, Jemena, United Energy, CitiPower and Powercor in September 2020.

(2) The minimum employer superannuation contribution will increase by 0.5% each year from 1 July 2021 to 1 July 2025[2].

We applied a simple average of two independent forecasts of the WPI for relevant employment sectors for the 2023-27 regulatory period. This is consistent with the AER's approach[3]. We then added SG increases of 0.5% for the years 2021/22 to 2025/26, which is also consistent with the AER's approach in recent determinations[4].

We engaged BISOE to provide an independent WPI forecast specific to Queensland's business environment and economic outlook. BISOE is a leading provider of industry research, analysis and forecasting services. BISOE's wage growth forecasts for Queensland and nationally leverage their comprehensive knowledge of the Australian economy and industrial sectors, to link labour market conditions to overarching macroeconomic and regional drivers. BISOE's forecast was developed in October 2020 and took into account the impact of COVID-19. BISOE's report is provided in Appendix 7.01 Labour Cost Escalation Forecasts to FY2027 Report.

BISOE provided WPI forecasts over the seven year period from 2020/21 to 2026/27. This captures the last two years of our current 2018-22 regulatory period and the five years of our 2023-27 regulatory period. Separate forecasts were prepared for internal and external labour. This reflects the use of our own workforce and external contractors to deliver our operational and capital works.

Consistent with the approach it has applied in its recent regulatory determinations, we anticipate that the AER will engage DAE to provide alternative WPI forecasts for our Draft Decision. In the interim, we have used the most recent available and relevant DAE forecast. That is, the National Utilities and National All Industries forecasts that were prepared for the AER's Victorian Distribution Network Service Providers (DNSPs) Draft Decisions released in September 2020[5].

We propose a real price growth for materials of zero in our expenditure forecasts for the 2023-27 regulatory period. This reflects the expectation that materials costs will increase in line with CPI and is consistent with other recent regulatory determinations[6].

Further detail on each approach is provided below.

2 *Superannuation Guarantee (Administration) Act 1992*, as amended by the *Minerals Resource Rent Tax Repeal and Other Measures Act 2014*.

3 Final Decision, SA Power Networks Distribution Determination 2020-2025: Attachment 6 Operating Expenditure, Australian Energy Regulator, June 2020, pages 6-14. This approach was also applied to Final Decisions published in 2020 for Energex, Ergon Energy, DirectLink and Jemena Gas Networks.

4 Draft Decision, AusNet Services Distribution Determination 2021-26: Attachment 6 Operating Expenditure, Australian Energy Regulator, September 2020, page 48. This approach was also applied consistently to Draft Decisions published in September 2020 for Jemena, United Energy, CitiPower and Powercor.

5 Draft Decisions for AusNet Services, Jemena, United Energy, CitiPower and Powercor, Australian Energy Regulator, September 2020.

6 Final Decisions for Energex, Ergon Energy and SA Power Networks, Australian Energy Regulator, June 2020.

7.4.1 Internal labour price growth

We used the EGWWS WPI forecast for Queensland provided by BISOE as one of the two WPI forecasts for internal labour. We consider that this is an appropriate forecast as it specifically relates to Queensland based EGWWS ('utilities') companies and the specialised resources that the sector includes.

BISOE found that the utilities sector has been impacted less than most employment sectors by the economic consequences of the COVID-19 pandemic[7]. It attributes this to the essential nature of the services that the utilities sector provides, and the need to retain skilled labour. Further, BISOE expect demand for such skilled labour to increase over the forecast period.

> *With strong competition for similarly skilled labour from the mining and construction industries, firms in the utilities sector will need to raise wages to attract and retain workers. In other words, the mobility of workers between the EGWWS, mining and construction industries means that demand for workers in those industries will influence employment, the unemployment rate and hence spare capacity in the EGWWS labour market. Businesses will find they must 'meet the market' on remuneration in order to attract and retain staff and we expect wages under both individual arrangements and collective agreements to increase markedly over the FY24 to FY26 period*[8].

In the absence of a recent and appropriate WPI forecast from DAE for the utilities sector in Queensland, we used the National Utilities WPI forecast provided to the AER for the Victorian DNSPs[9] as a second WPI forecast for internal labour. This presented DAE's forecast of the national average annual wage growth in the utilities sector to 2025/26. To derive the wage growth for the final year of our 2023-27 regulatory period from the DAE forecast, for simplicity we maintained the growth to that forecast for 2025/26. We considered that an alternative approach to extrapolating the forecast, such as linear regression, would overstate the final year forecast due to the negative real growth in previous years of the DAE forecast.

We recognise that this forecast may change by the time the AER publishes its Draft Decision on our 2023-27 Revenue Proposal in September 2021, especially if the uncertainty and impacts of COVID-19 are prolonged. However, we expect the AER will substitute its updated forecasts from DAE at that time.

Our real internal labour price growth calculation is included in Table 7.3 at the end of this section.

7.4.2 External labour price growth

We have used the Construction WPI forecast for Queensland provided by BISOE as one of the two WPI forecasts for external labour. We consider this to be an appropriate forecast as it reflects locational factors and recognises that the labour market for specialised resources employed in high voltage transmission works accessed by contractors is not constrained to Queensland.

BISOE expects construction activity across Australia to increase consistently from 2022/23, with activity peaking in 2024/25. It expects that this increased construction activity will result in the re-emergence of skilled labour shortages and competition for scarce labour, particularly from the mining and construction sectors, placing significant upward pressure on external labour required to deliver our capital works programme in the 2023-27 regulatory period[10].

> *Australian construction wages are expected to pick up over FY23 and strengthen appreciably over FY24 to FY26, particularly as construction activity levels surpass the previous highs of FY18 and skills shortages begin to manifest. The increases in construction activity from FY22 will be driven by the recovery in residential building activity which is expected to rise out of its trough from FY23, while higher levels of non-dwelling building and rising engineering construction will also underpin higher wages. Engineering construction driven by a new wave of mining investment and a plethora of publicly funded transport infrastructure projects (particularly in the eastern states of the nation). Declines in construction activity over FY26 to FY27, coupled with a general weakening across overall labour markets will then cause construction wages growth to ease in FY27.*
>
> *Given that the growth in construction activity in Queensland is forecast to be much stronger than the national average over the next three years, we expect Queensland construction wages to outpace the national average over FY22 and FY23. Thereafter, we expect it will match the national average to FY27*[11].

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7 Labour Cost Escalation Forecasts to FY2027, BIS Oxford Economics, November 2020, page 28.
8 *Ibid*, pages 3-4.
9 Draft Decisions for AusNet Services, Jemena, United Energy, CitiPower and Powercor, Australian Energy Regulator, September 2020.
10 Labour Cost Escalation Forecasts to FY2027, BIS Oxford Economics, November 2020, pages 30-31.
11 *Ibid*, pages 4-5.

This growth in construction activity is further exacerbated by the proposed electricity transmission interconnector investments identified in Australian Energy Market Operator's (AEMO's) 2020 Integrated System Plan (ISP) and the ongoing significant investment in renewable generation throughout Queensland. This will lead to additional competition for scarce skilled labour.

BISOE also warn that the skills shortage to service these sectors will not be resolved in the near term. BISOE forecast a shortfall in the number of TAFE graduates required to meet the attrition rate of the relevant skilled trade categories, while the suspension of skilled immigration prevents this shortfall from being addressed by migration[12].

Again, as a more recent and appropriate WPI forecast from DAE is not yet available, we used the National All Industries WPI forecast provided to the AER for the Victorian DNSPs[13] as the second WPI forecast for external labour. Similar to the internal labour forecast, for simplicity we maintained the growth for 2026/27 to that forecast for 2025/26.

We recognise this forecast will be substituted with a revised forecast published with the AER's Draft Decision.

We note the AER has applied no real growth to external labour in recent regulatory decisions[14]. External labour growth in line with CPI does not reflect the contracting environment that we experience, and does not appear to recognise the increasing competition for specialist skilled labour in the transmission sector. We encourage the AER to apply a construction sector specific WPI forecast to inform external labour wage growth forecasts for our 2023-27 regulatory period. Alternatively, an All Industries WPI forecast would at least partly recognise these factors and be consistent with the approach the AER applied to underpin expenditure allowances for our current regulatory period. These constraints are discussed in detail in BISOE's report[15].

Our real external labour price growth calculation is included in Table 7.3 at the end of this section.

Superannuation Guarantee increase

The Australian Government committed to increasing the SG such that the minimum employer superannuation contribution will increase from the current 9.5% of an employee's ordinary time earnings to 12.0%, increasing by 0.5% each year from 1 July 2021 to 1 July 2025[16].

Although the statutory obligation to pay the SG rests with the employer, BISOE and DAE have both stated that they expect a proportion of the SG increase will be passed on by employers to employees in the form of reduced wage growth. As a result, this assumption has been included in their respective WPI forecasts[17].

The WPI published by the Australian Bureau of Statistics (ABS) excludes employer contributions to superannuation and other non-direct employment costs[18]. BISOE has confirmed that their WPI forecasts specifically exclude such employer 'on costs'[19]. This was also confirmed by DAE for the AER Draft Decisions for the Victorian DNSPs in September 2020[20]. Hence, in line with recent regulatory decisions, we have added the 0.5% employer cost arising from the SG to our internal and external labour forecasts for the five years from 2021/22 to 2025/26[21].

We note that the increase to the SG that is due to take effect from 1 July 2021 remains subject to Federal Government consideration[22], largely due to the current economic climate and the potential impacts of the SG increase on wage growth. The wage growth assumptions and forecasts by both BISOE and DAE reflect the cost of the SG increase being partially passed through to employees through lower wage growth than would otherwise be expected. Therefore, in the event of the SG increase being deferred, the wage growth assumptions and forecasts would need to be revised. The removal of the SG increase from internal and external labour forecasts alone would not be appropriate.

12 *Ibid*, pages 31-32.
13 Draft Decisions for AusNet Services, Jemena, United Energy, CitiPower and Powercor, Australian Energy Regulator, September 2020.
14 Draft Decision, AusNet Services Distribution Determination 2021 to 2026, Attachment 5 Capital Expenditure, Australian Energy Regulator, September 2020, pages 17-18.
15 Labour Cost Escalation Forecasts to FY2027, BIS Oxford Economics, November 2020, pages 30-32 and pages 35-37.
16 *Superannuation Guarantee (Administration) Act 1992*, as amended by the *Minerals Resource Rent Tax Repeal and Other Measures Act 2014*.
17 For a detailed description of how BISOE allowed for this in their WPI forecasts, see Labour Cost Escalation Forecasts to FY2027, BIS Oxford Economics, November 2020, pages 23-24.
18 Wage Price Index: Concepts, Sources and Methods, Australian Bureau of Statistics, November 2012, Paragraph 9.3 (ABS catalogue no. 6351.0.55.001).
19 Labour Cost Escalation Forecasts to FY2027, BIS Oxford Economics, November 2020, page 23.
20 Impact of changes to the superannuation guarantee on forecast labour price growth, Deloitte Access Economics, July 2020.
21 Draft Decision, AusNet Services Distribution Determination 2021-26: Attachment 6 Operating Expenditure, Australian Energy Regulator, September 2020, page 48. This approach was also applied consistently to Draft Decisions published in September 2020 for Jemena, United Energy, CitiPower and Powercor.
22 Press Conference, Prime Minister of Australia, https://www.pm.gov.au/media/press-conference-1.

Table 7.3: Real labour price growth (% per annum)

	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	Average 2023-27
Internal labour								
BISOE EGWWS WPI - Queensland	0.6	0.8	0.6	0.5	0.8	0.8	0.9	0.7
DAE Utilities WPI - National	0.4	(0.5)	(0.8)	(0.5)	(0.1)	0.5	0.5	(0.1)
Average (excluding SG)	**0.5**	**0.1**	**(0.1)**	**0.0**	**0.4**	**0.6**	**0.7**	**0.3**
SG increase	-	0.5	0.5	0.5	0.5	0.5	-	
Average (including SG)	**0.5**	**0.6**	**0.4**	**0.5**	**0.9**	**1.1**	**0.7**	**0.7**
External labour								
BISOE Construction WPI – Queensland	(1.2)	0.2	0.2	0.2	0.6	0.6	0.5	0.4
DAE All Industries WPI – Aus	0.2	(0.5)	(0.6)	(0.3)	0.1	0.7	0.7	0.1
Average (excluding SG)	**(0.5)**	**(0.1)**	**(0.2)**	**0.0**	**0.3**	**0.7**	**0.6**	**0.3**
SG increase(1)	-	0.5	0.5	0.5	0.5	0.5	-	
Average (including SG)	**(0.5)**	**0.4**	**0.3**	**0.5**	**0.8**	**1.2**	**0.6**	**0.7**

(1) The minimum employer superannuation contribution will increase by 0.5% each year from 1 July 2021 to 1 July 2025[23].

Source: BISOE, DAE, Australian Taxation Office (ATO)

7.4.3 Real materials price growth

We propose a real price growth for materials of zero in our expenditure forecasts for the 2023-27 regulatory period. This reflects the expectation that materials costs will increase in line with CPI and is consistent with other recent regulatory determinations[24].

Under current economic conditions, which include historical low levels of inflation and the impacts of COVID-19, it may be appropriate to apply materials cost escalators above CPI. We have chosen not to do this due to the uncertainty that exists in any alternative (non-CPI) materials forecast.

7.5 Repex Model unit rates

We have used a calibrated version of the AER's Repex Model, complemented by more detailed bottom-up analysis for significant projects, to forecast our non load-driven network capital expenditure (refer Chapter 5 Forecast Capital Expenditure).

We have developed cost estimates to establish unit rates for each of the asset types used in the Repex Model. To do this, we:

- prepared a cost estimate for each asset type based on that single asset being delivered as a stand-alone project;
- considered the opportunities to coordinate reinvestment works to form larger projects to extract economies of scale, which reduces the per unit project management, design and commissioning costs and reflects our standard delivery approach; and
- applied an efficiency factor based upon a standard package of works for each individual type of asset and the opportunity to realise efficiencies during delivery, such as reinvestment in four primary plant bays at a substation of similar condition.

23 *Superannuation Guarantee (Administration) Act 1992*, as amended by the *Minerals Resource Rent Tax Repeal and Other Measures Act 2014*.
24 Final Decisions for Energex, Ergon Energy and SA Power Networks, Australian Energy Regulator, June 2020.

Based on this approach, our updated unit rates have increased by an average nominal rate of 2.5% per annum from the unit rates applied in our Revenue Proposal for the 2018-22 regulatory period.

7.5.1 Validation of Repex Model unit rates

To validate the Repex Model unit rates we compared the rates to contracted costs and outturn costs of capital projects we have undertaken.

We also engaged GHD to provide an independent expert opinion of a reasonable industry benchmark cost for each of the unit rates used in the Repex Model. We have compared our unit rates to those provided by GHD and found them to be prudent and efficient. On average, our unit rates are 10% less than the equivalent GHD rates.

While there are some variances in specific unit rates contained in GHD's report, these can largely be explained by differences in the underlying assumptions of the unit rates. In particular, the differences in the unit rates to replace primary plant are driven by an alternative approach to how costs of the full-bay replacement are assigned to each individual unit. When the individual unit rates are combined, the resulting full-bay cost from GHD is within the stated estimated accuracy range of Powerlink's unit rate.

We consider the unit rates applied in the Repex Model are realistic and generate a reasonable estimate of forecast costs.

GHD's report is provided in Appendix 7.02. Details of our unit rates, our approach to estimating the unit rates and the comparison to GHD's benchmark unit costs are included in Appendix 7.03 Cost Estimating Methodology. Note that all GHD and Powerlink unit rates provided to the AER are market sensitive and therefore commercial-in-confidence. As a result, they have been treated as confidential.

7.5.2 Reconciliation between Category Analysis RIN Return and Repex Model unit rates

The unit rates adopted in the Repex Model differ from those reported in our annual Category Analysis Regulatory Information Notice (CA RIN) and Reset RIN returns due to three factors:

- the Repex Model unit rates include a corporate overhead (indirect cost) allocation. The AER requires annual CA RIN and Reset RIN data to be estimated on an 'unburdened' basis. That is, any allocation for corporate overheads must be excluded;
- unit rates for new assets derived from the CA RIN information do not include costs to modify or enhance an existing asset or costs incurred after the asset has been capitalised[25]. For example, when a new replacement substation asset is commissioned and work on an existing asset at a remote location is required, the cost of the complementary works is capitalised into the existing asset's value, not the new asset's value; and
- Repex Model unit rates have been developed using bottom-up estimates. This differs from CA RIN return unit rates that are developed by disaggregating project costs to an asset level (top-down). The assumptions applied in the disaggregation of the CA RIN unit rates do not align with the requirements for forecast unit rates applied in the Repex Model.

The impact of these differences is that the unit rates reported in our annual CA RIN and Reset RIN returns will tend to be lower than our observed project costs.

To forecast our reinvestment capital expenditure for the 2023-27 regulatory period using the Repex Model, we consider it appropriate to capture the costs identified above in the unit cost input module.

7.6 Cost estimates

Cost estimates are developed from a scope of work based upon an identified network need. Identified network needs may be triggered, for example, by growth in customer demand exceeding existing network capacity, the condition or obsolescence of existing network assets or the need to maintain network performance standards.

Throughout the stages of investment development and approval, a number of options will be considered, including non-network options where identified. The technically feasible options will be scoped and estimated to ensure the most cost-effective solution is chosen. In the normal course of business, we develop different types of capital and operating project cost estimates to assess options under the public Regulatory Investment Test for Transmission (RIT-T) and for input to internal governance documentation to support project approvals.

The type and level of accuracy of the estimate will vary depending on the stage in the investment development life-cycle. Typically, the more developed the need, justification and scope of works, the more detailed and accurate the cost estimate.

[25] Category Analysis Regulatory Information Notice 2019/20, Basis of Preparation, Powerlink Queensland, October 2020.

The different approach to project cost estimates and escalators applied is summarised in Table 7.4.

Table 7.4: Project cost estimates and escalators

Phase of investment development	Description	Basis of cost estimate
Project in construction	Already received full financial approval consistent with corporate governance framework.	Business-as-usual estimates, typically detailed bottom-up (Project Proposal) or contracted prices where available.
Confirmed need	Projects not yet approved but the need has been confirmed and options are being assessed in preparation for seeking financial approval.	Combination of: • business-as-usual estimates, typically detailed bottom-up (Project Proposal) or contracted prices where available; and • concept estimates that adopt real labour cost escalators and CPI for materials cost escalation;
Future need	Based on normal business practices there is an expected future need. However, specific project details are not yet finalised or ready to seek financial approval.	Combination of: • concept estimates that adopt real labour cost escalators and CPI for materials cost escalation; • unit rates for reinvestments. These are inputs to the Repex Model. The model also adopts the real labour cost escalators and CPI for materials cost escalation; and • historical trends in expenditure.

During the current 2018-22 regulatory period we implemented a change to how we prepare preliminary estimates. We previously based our preliminary estimates on established estimating building-blocks, called Base Planning Objects. This was similar to the unit rate approach used in the Repex Model. We have transitioned to a cost estimating approach that is consistent with international recommended practice[26].

Our current cost estimation approach is based on an assessment of the resources required (labour, equipment, materials and sub-contracts) to complete each item of work specific to the project scope and design. We also identify and cost items peculiar to the project site to account for project-specific site conditions.

We consider that our current approach better aligns with international recommended practice. We will continue to update our approach as necessary to ensure our cost forecasts remain appropriate and reflective of efficient costs.

7.7 Summary

We have developed our real labour price growth escalators for the 2023-27 regulatory period based on a simple average of two independent forecasts from BISOE and DAE.

We used our internal cost estimating process to develop unit rates for reinvestment works that are reflective of our delivery approach, and tested these against independent benchmark costs from GHD.

We have developed our project cost estimates in line with international recommended practice.

[26] Association for the Advancement of Cost Engineering (AACE International) Recommended Practice No. 18R-97.