2023-27
POWERLINK QUEENSLAND REVENUE PROPOSAL

Appendix 6.01 – PUBLIC

Forecast Operating Expenditure Methodology and Model

1. Purpose

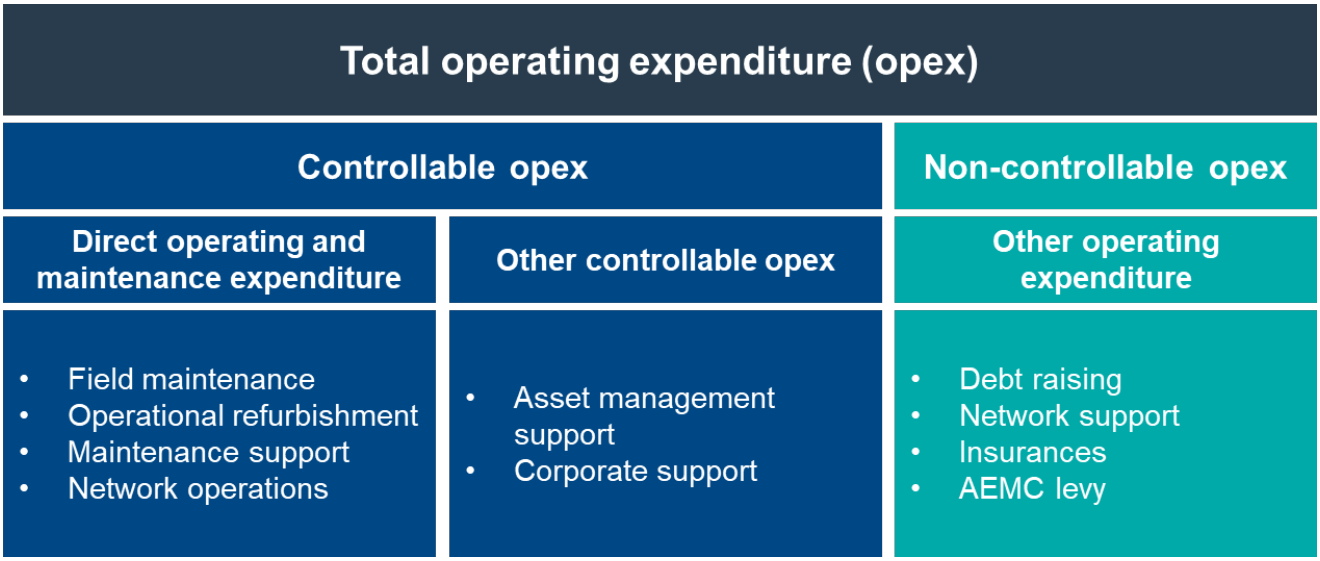
Powerlink's operating expenditure enables the planning, operation and maintenance of our network and other assets, as well as the business activities required to support those areas of work.

This document sets out our approach to forecasting operating expenditure in a manner that meets the requirements of the National Electricity Rules (NER).

2. Operating expenditure categories

To forecast our operating expenditure, we have retained the same broad categories of operating expenditure as adopted for the 2018-22 regulatory period. This should assist the Australian Energy Regulator (AER) and customers to understand the nature of the forecast for the 2023-27 regulatory period. Figure 2.1 shows how our operating expenditure categories fit within the total operating expenditure framework.

Figure 2.1: Operating expenditure categories



Our operating expenditure model presents the AER's allowance, historical and forecast operating expenditure consistent with the categories described in Figure 2.1.

2.1 Controllable – direct operating and maintenance expenditure

Controllable operating expenditure is the largest component of operating expenditure and relates to costs directly associated with maintaining and operating the network and key business support functions. The four elements of direct operating and maintenance costs are broken down for business-as-usual reporting and have been maintained for forecasting purposes.

2.1.1 Field maintenance

Field maintenance includes all field activities required to ensure network assets continue to perform their required functions. There are three types of field maintenance:

1. Routine maintenance - is defined by maintenance plans implemented in our corporate asset management system (SAP) for routine inspection, testing or servicing of plant and equipment.
2. Condition-based maintenance - usually evolves out of routine maintenance, where it is identified that the condition of plant or equipment is such that action must be taken to avoid future defects (e.g. equipment operating outside of tolerance limits).

3. Corrective maintenance - involves rectification of defects in plant or equipment that must be attended to preserve (personal or equipment) safety, manage environmental issues or return plant to service to reduce the impacts of network outages on customers.

Our Asset Maintenance Standard sets out the overarching principles which determine maintenance needs, plans and work program.

2.1.2 Operational refurbishment

Operational refurbishment involves activities that return an asset to its pre-existing condition or function, or activities undertaken on part of an asset to return that specific component to its pre-existing condition or function. These refurbishment activities do not involve increasing the capacity or capability of the plant, or extending its working life beyond its original design (which would then be defined as capital reinvestment).

Operational refurbishment typically involves quite extensive works performed only once or twice over an asset's life which are of such complexity that they are delivered as an integrated project.

Our Asset Refurbishment Standard sets out the overarching principles which determine operational refurbishment needs, plans and projects.

2.1.3 Maintenance support

Maintenance support includes activities required to develop and maintain the systems to support field maintenance. This includes provision of asset support functions in the field (such as engineering technical support and management of safety and environmental compliance) as well as non-field functions, such as developing maintenance strategies, maintenance auditing and overall performance management.

2.1.4 Network operations

Network operations includes the control centre functions as well as those additional activities required to ensure the safe, reliable and efficient operational management of the Queensland transmission network. There are four main functions carried out within network operations:

1. Real-time control room function - this is a 24-hour continuous requirement. Network operators provide the functions of network operation, coordination and support switching sheet preparation for all plant outages.
2. Operational planning and engineering support - includes operational planning, system security analysis, contingency and outage planning, customer negotiation on outages and switching sheet preparation for plant and network outages.
3. Technical support - for the Energy Management System (EMS) and Supervisory Control and Data Acquisition (SCADA) systems – support functions such as EMS maintenance configuration, database management, hardware installation, software upgrade and maintenance.
4. Network performance - monitoring and reporting on network asset performance and condition, which includes response management, auditing network configurations and performing fault diagnosis.

2.2 Controllable - other controllable expenditure

2.2.1 Asset management support

Asset Management (AM) support includes those operational activities required to support the strategic development and ongoing asset management of the network. AM Support has four major sub-elements:

1. Network planning - includes analysing future network capability requirements to meet load driven risks and risks arising from the condition and performance of existing assets, developing network investment plans and joint planning activities;
2. Asset management - includes costs associated with the development of strategies, policies and procedures for the life cycle management of our network assets;
3. Network customer and regulatory support - includes our customer management, network pricing and regulatory functions; and
4. Operational support - includes the costs associated with the development of strategies, policies and procedures for the operational and security aspects of our network assets.

2.2.2 Corporate support

Corporate support encompasses the support activities required by Powerlink in order to ensure adequate and effective corporate governance. Corporate Support has four major sub-elements:

1. Corporate support - provision of business administrative services to support our corporate operations.
2. Direct corporate support charges - direct charges component of corporate support incorporates the costs associated with corporate governance and corporate support.
3. Revenue reset costs - are costs associated with the preparation of our Revenue Proposal and determination process.
4. IT support - includes the costs associated with the future strategy development, planning and support of our information technology infrastructure.

2.3 Non-controllable - other operating expenditure

Other operating expenditure is predominantly driven by exogenous factors that are generally outside our control (e.g. borrowing and insurance costs). Currently, other operating costs comprise four categories.

2.3.1 Insurances

Insurance includes both insurance premiums and a self-insurance allowance to provide cover for below deductible losses contained in our insurance portfolio, for which it is not efficient to procure additional insurance coverage.

2.3.2 Network support

Network support refers to costs associated with non-network solutions used by Powerlink as an efficient alternative to network augmentation or reinvestment. Potential non-network solutions may include local generation, cogeneration, demand side response and services from a Market Network Service Provider (MNSP).

2.3.3 Debt raising

Debt raising costs relate to costs incurred by Powerlink over and above the benchmark debt margin approved by the AER. These costs are encountered when new debt is raised, or current lines of credit are renegotiated or extended.

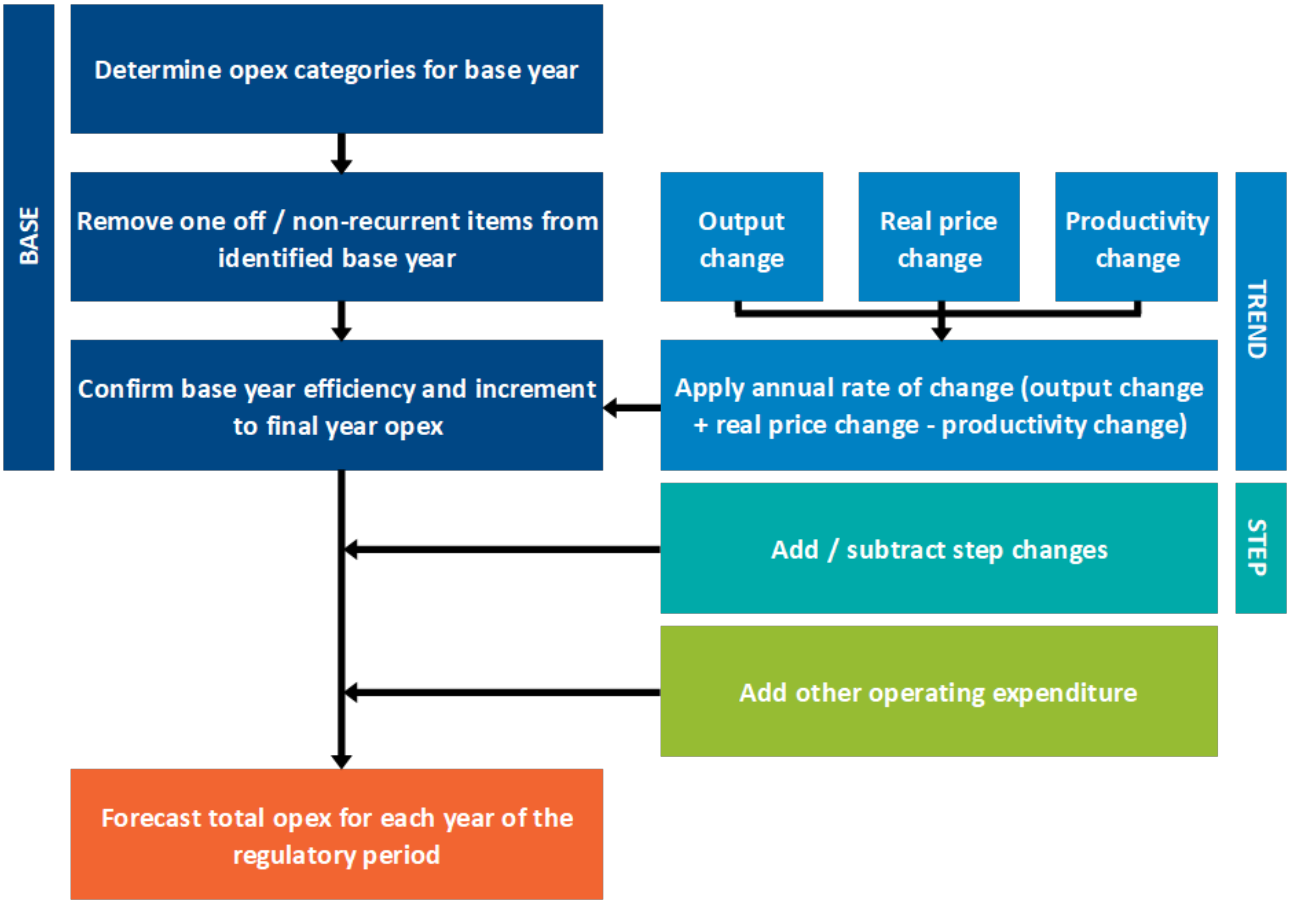
2.3.4 Australian Energy Market Commission (AEMC) Levy

In 2014, the Queensland Government enacted changes to the *Electricity Act 1994*[1]. These changes required Powerlink, as holder of a Transmission Authority in Queensland, to pay an annual fee that is a portion of the Queensland Government's funding commitments to the AEMC.

3. Operating expenditure forecasting methodology

The methodology used to prepare our operating expenditure forecast is summarised in Figure 3.1 and explained in the following sections.

Figure 3.1: Powerlink's operating expenditure forecasting methodology



3.1.1 Overview of the base-step-trend model

The application of the base-step-trend approach first requires the selection of a base year with revealed costs in the 2018-22 regulatory period.

One-off or non-recurrent expenditure items are removed from the base year and further analysis of the recurrent expenditure undertaken (including trend analysis, category analysis and external benchmarking) to determine any adjustments required to the base year to establish an efficient level of recurrent expenditure.

An annual real rate of change factor is then applied to the controllable operating expenditure categories from the efficient base year, for each year of the forecast regulatory period. The annual real rate of change is a function of the forecast change in real input costs (labour and materials), the forecast change in productivity, and the forecast change in network output.

[1] *Electricity and Other Legislation Amendment Bill 2014*, Queensland Government, Part 2, Amendment of Electricity Act 1994.

An assessment of new or reduced requirements and other factors that may require a step change in controllable operating expenditure is conducted and zero-based estimates established for items in the other operating expenditure category. While our operating expenditure forecasting methodology provides for the assessment of step changes, we have not proposed any for the 2023-27 regulatory period.

The forecast of other operating expenditure is then added to the expenditure forecast established under the base step trend approach for controllable operating expenditure to produce total forecast operating expenditure for the 2023-27 regulatory period.

3.1.2 Application of forecasting methodology

Our forecasting methodology is based on the approach set out in the AER's Expenditure Forecast Assessment Guideline (EFA Guideline)[2]. The AER's base-step-trend methodology has been used for the majority of operating expenditure categories, with category-specific (or bottom-up) forecasts developed for the AEMC Levy, network support costs and debt raising costs.

Our forecasting approach is largely consistent to that used in for our 2018-22 Revenue Proposal. It is also largely consistent with our Expenditure Forecasting Methodology submitted to the AER in June 2020, other than a change in approach to forecasting insurance. We have updated our Expenditure Forecasting Methodology provided with this Revenue Proposal to reflect this amended forecasting approach (refer Appendix 5.03 Expenditure Forecasting Methodology).

Our change to forecasting insurance is to include our insurance costs (premiums and self-insurance) within our base year, rather than forecast them through a bottom-up approach. Due to the significant uncertainty in the insurance market, our view is that the application of the base-step-trend approach to forecast insurance is more appropriate than a bottom-up approach.

We also noted in our June 2020 Expenditure Forecasting Methodology that we would consider alternative treatments for the AEMC Levy. Ultimately we have not proposed any alternative treatment for our 2023-27 Revenue Proposal.

The breakdown of operating expenditure categories by forecasting method is shown in Figure 3.2.

Figure 3.2: Operating expenditure category by forecasting method

	Total operating expenditure (opex)			
High-level operating expenditure categories	Controllable opex		Non-controllable opex	
	Direct operating and maintenance expenditure	Other controllable opex	Other operating expenditure	
Forecasting method	Base year trended			Category specific
Operating expenditure category	• Field maintenance • Operational refurbishment • Maintenance support • Network operations	• Asset management support • Corporate support	• Insurances	• Debt raising • Network support • AEMC levy

[2] *Expenditure Forecast Assessment Guideline for Electricity Transmission,* Australian Energy Regulator, November 2013.

4. Forecast operating expenditure model

4.1 General model inputs

Our operating expenditure model includes a number of general inputs for the purposes of modelling forecast expenditure:

1. *Inflation (Input|Inflation)* - forecast operating expenditure is presented in real 2021/22 (June) dollars. To enable the forecast and historical data to be presented on the same basis, the Operating Expenditure Model applies Consumer Price Index (CPI) (June - June) to convert, as required, from:
    - real to real (end of year);
    - nominal (mid year) to real (end of year);
    - nominal (mid year) to nominal (mid year); and
    - real (end of year) to nominal (mid year).
2. *AER allowance (Input|Allowance)* - the Operating Expenditure Model incorporates the AER's operating expenditure allowances for the current and previous regulatory periods (expressed in mid-year $2011/12 for the 2013-17 regulatory period and end year $2016/17 for the 2018-22 regulatory period), aligned with each category of forecast operating expenditure.
3. *Historical operating expenditure (Input|Historic)* - the forecast operating expenditure model presents actual operating expenditure for the current and previous regulatory periods (expressed in nominal $'s), including the proposed 2018/19 base year.

4.2 Establishing the efficient base year

Consistent with our operating expenditure forecasting methodology, we have selected the 2018/19 financial year as the base year for our forecast of base year operating expenditure. This base year has been selected as it is reflective of a typical year of operations (i.e. without the potential uncertainties and inconsistencies in expenditure associated with COVID-19 in 2019/20 and 2020/21). It also reflects a 'revealed cost' approach as is the AER's preference.

Actual expenditure in the base year has been reviewed and expenditure items removed that are non-recurrent or not considered to reflect an efficient level of recurrent controllable operating expenditure based on a range of analysis techniques (including trend analysis, category analysis and independent benchmarking advice).

Adjustments that have been made include:

- A minor adjustment of $0.27m (2018/19 nominal) has been made to remove non-recurrent expenditure associated with a Network Capability Incentive Parameter Action Plan (NCIPAP) project, which occurred under the Service Target Performance Incentive Scheme (STPIS). This is consistent with clause 5.2(r)(1) of Version 5 of the STPIS.
- An adjustment of $0.97m (2018/19 nominal) has been made to remove movements in provisions. This is consistent with the AER's 2013 Expenditure Forecast Assessment Guideline[3].

In the forecast operating expenditure model, the worksheet *Input|Base Year Adjustment* in Figure 4.1 records the adjustment made to 2018/19 controllable operating expenditure.

[3] Expenditure Forecast Assessment Guideline for Electricity Transmission, Australian Energy Regulator, November 2013, p27.

Figure 4.1: Input|Base Year Adjustment worksheet

Provider	Comment	Adjustment for Efficient Base Year 2018/19
Controllable Opex		
Direct Operating and Maintenance Expenditure		
Operational Refurbishment	Removal of NCIPAP project costs for 2018/19	(0.27)
Other Controllable Opex		
Corporate Support	Movement in Provisions	(0.97)
Other Operating Expenditure		
Total		**(1.24)**

Source: Powerlink Operating Expenditure Model

4.3 Final Year Increment

Final year operating expenditure was calculated by adding the final year increment to the efficient base year. The final year increment is the difference between the operating expenditure allowance for the final year of the 2018-22 regulatory period (considering only base-step-trend expenditure categories) and the operating expenditure of the efficient base year within the 2018-22 regulatory period (2018/19). The final year increment is -$1.74m (real 2021/22).

4.4 Determine annual real rate of change

This section describes how the annual real rate of change is determined within the Operating Expenditure Model and applied to establish forecast controllable operating expenditure. The real annual rate of change function is described in Figure 4.2.

Figure 4.2: Real annual rate of change function

We have defined the parameters and calculation of the annual real rate of change in the *Calc|Rate of Change* worksheet (Figure 4.3) in the forecast operating expenditure model.

4.4.1 Forecast output growth change

Output change is the expected change in the following measures of network output identified by the AER in its EFA Guideline:

- energy throughput;
- ratcheted non-coincident maximum demand;
- number of Customers; and
- transmission line circuit length.

These network output measures are utilised in AER benchmarking and are exclusive of productivity and price impacts.

In the *Calc*|*Rate of Change* worksheet (Figure 4.3), we developed a forecast for these quantities over the 2023-27 regulatory period, described as output measures. The annual rate of change for each of these quantities is calculated within the *Calc*|*Rate of Change* worksheet, to derive the growth factor for each year of the forecast.

The methodology applied to derive each output measure forecast quantity is described below.

Energy throughput

Our energy forecasts are based on Australian Energy Market Operator's (AEMO's) 2020 Electricity Statement of Opportunities (ESOO) report and supplemented with electricity flow forecasts across the Queensland/New South Wales border via the Queensland/New South Wales Interconnector (QNI) and Terranora interconnectors taken from AEMO's 2020 Integrated System Plan (ISP).

Ratcheted maximum demand

Ratcheted Maximum Demand is the ratcheted non-coincident maximum demand. Non-coincident maximum demand is the maximum demand of each individual connection point in a year measured in MVA. This information is sourced from the Central Scenario of AEMO's 2020 ESOO and Powerlink's 2020 Transmission Annual Planning Report (TAPR).

Number of Customers

Powerlink's customer numbers are based on an aggregate of customers from the Distribution Network Service Providers (DNSP), Ergon Energy and Energex, identified in the AER's 2020-25 Final Decision models. For 2026-27, Ergon Energy and Energex's customer numbers were trended based on a simple linear regression. We then added our own directly-connected customers for the 2023-27 regulatory period.

Circuit length

We have forecast no increase in circuit length over the 2023-27 regulatory period and have adjusted the forecast of circuit kilometre length to reflect planned line decommissioning over the 2023-27 regulatory period.

In the *Calc*|*Rate of Change* worksheet (Figure 4.3), weightings are applied to each growth rate in accordance with the factors described by the AER in its Multilateral Total Factor Productivity (MTFP) analysis.[4] This results in a weighted annual forecast of output growth change for the 2023-27 regulatory period, presented in Figure 4.3.

[4] Annual Benchmarking Report – Electricity Transmission Network Service Providers, Australian Energy Regulator, November 2020.

Figure 4.3: Output growth

		2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27
Forecast output growth									
Output measure	Energy	52757	50589	51778	53223	56553	54193	53878	54094
	Ratcheted maximum demand	12583	12583	12583	12583	12775	12829	12865	12890
	Number of Customers	2243708	2270019	2298448	2327241	2356124	2385348	2413002	2441422
	Circuit length	14528	14528	14528	14459	14457	14472	14472	14472
Growth rate	Energy		-4.20%	2.32%	2.75%	6.07%	-4.26%	-0.58%	0.40%
	Ratcheted maximum demand		0.00%	0.00%	0.00%	1.51%	0.42%	0.28%	0.19%
	Number of Customers		1.17%	1.24%	1.24%	1.23%	1.23%	1.15%	1.17%
	Circuit length		0.00%	0.00%	-0.48%	-0.02%	0.10%	0.00%	0.00%
Weights	Energy		14.91%						
	Ratcheted maximum demand		24.71%						
	Number of Customers		7.59%						
	Circuit length		52.79%						
			TRUE						
Output Growth			*-0.54%*	*0.44%*	***0.25%***	***1.36%***	***-0.38%***	***0.07%***	***0.20%***

Source: Powerlink Operating Expenditure Model

4.4.2 Forecast price change

In determining aggregate real input escalation forecasts, we applied a weighting of 70.4% for labour and 29.6% for materials. These weightings reflect those that have been applied by the AER and their consultant (Economic Insights) in Annual TNSP Benchmarking Reports since 2017[5]. We have investigated the appropriateness of this weighting and found that this it is consistent with the split of labour and materials costs in our historical controllable operating expenditure. Accordingly, we have applied these weightings to develop our real input escalation forecasts for the 2023-27 regulatory period. Application of these weightings to the real labour and materials price growth results in an average real price change of 0.5% over the 2023-27 regulatory period.

Labour input price change

Our forecast of labour input price changes is based on a simple average of two Wage Price Index (WPI) forecasts:

- An independent forecast of Electricity, Gas, Water and Waste Services (EGWWS) WPI for Queensland developed by BIS Oxford Economics (BISOE).
- The Deloitte Access Economics (DAE) National Utilities WPI forecast prepared for the AER for the draft decisions of the Victorian Distribution Network Service Providers (DNSPs) in September 2020[6].

Both forecasts have been adjusted to account for the impact of the Federal Government's Superannuation Guarantee increase, to be implemented over the period 1 July 2021 to 1 July 2025 in line with recent AER draft decisions for Victorian DNSPs in September 2020[7]. Our approach to forecasting WPI is detailed in Chapter 7 Escalation Rates and Project Cost Estimation.

As these forecasts are projections of the changes in the price of labour and not the cost of labour, they do not compensate for any form of labour productivity change.

The labour input price changes are recorded as the Forecast Price Change - Labour in the *Calc|Rate of Change* worksheet.

[5] Economic Benchmarking Results for the Australian Energy Regulator's 2020 TNSP Annual Benchmarking Report, Economic Insights, October 2020, page 62.
[6] Draft Decisions for AusNet Services, Jemena, United Energy, CitiPower and Powercor, Australian Energy Regulator, September 2020.
[7] Impact of changes to the superannuation guarantee on forecast labour price growth, Deloitte Access Economics, July 2020.

Materials input price change

We have used the Consumer Price Index (CPI) as a proxy to forecast price increases in the materials component of controllable operating expenditure for the 2023-27 regulatory period.

The material input price changes are defined as the Forecast Price Change - Materials in the *Calc|Rate of Change* worksheet.

Based on the weightings determined for labour and materials price growth an aggregate forecast for real input growth is derived in accordance with the Real Price Change shown in the *Calc|Rate of Change* worksheet (Figure 4.4).

Figure 4.4: Forecast real price change (%)

		2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27
Forecast price change									
Forecast price change	WPI				0.38%	0.51%	0.85%	1.14%	0.68%
	CPI				0.00%	0.00%	0.00%	0.00%	0.00%
Weights	WPI				70.40%	70.40%	70.40%	70.40%	70.40%
	CPI				29.60%	29.60%	29.60%	29.60%	29.60%
					TRUE	*TRUE*	*TRUE*	*TRUE*	*TRUE*
Price Growth					***0.27%***	***0.36%***	***0.60%***	***0.80%***	***0.48%***

Source: Powerlink Operating Expenditure Model

4.4.3 Forecast productivity change

We have proposed a productivity factor of 0.50% per annum, which is higher than the AER's 0.31% benchmark industry average[8]. This productivity target contributes to meeting our goal of no real growth in operating expenditure and is discussed further in Chapter 6 Forecast Operating Expenditure of our 2023-27 Revenue Proposal.

The annual productivity change factor is defined as Productivity Change in the *Calc|Rate of Change* worksheet shown in Figure 4.5. This productivity measure does not include any productivity change compensated for by the labour price measure used to forecast the change in the price of labour.

Figure 4.5: Forecast productivity change (%)

	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27
Forecast productivity change								
				0.50%	0.50%	0.50%	0.50%	0.50%
Productivity change				***0.50%***	***0.50%***	***0.50%***	***0.50%***	***0.50%***

Source: Powerlink Operating Expenditure Model

[8] Economic Benchmarking Results for the Australian Energy Regulator's 2020 TNSP Annual Benchmarking Report, Economic Insights, October 2020, page 62.

4.4.4 Total rate of change

Figure 4.6 shows the summation of forecast output growth, price change and productivity over the 2023-27 regulatory period, defined as the Total Rate of Change.

Figure 4.6: Forecast annual rate of change (%)

Total Opex Growth Calculation								
	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27
Forecast output growth								
Output measure Energy	52757	50589	51778	53223	56553	54193	53878	54094
Ratcheted maximum demand	12583	12583	12583	12583	12775	12829	12865	12890
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Number of Customers		1.17%	1.24%	1.24%	1.23%	1.23%	1.15%	1.17%
Circuit length		0.00%	0.00%	-0.48%	-0.02%	0.10%	0.00%	0.00%
Weights Energy		14.91%						
Ratcheted maximum demand		24.71%						
Number of Customers		7.59%						
Circuit length		52.79%						
		TRUE						
Output Growth		*-0.54%*	*0.44%*	***0.25%***	***1.36%***	***-0.38%***	***0.07%***	***0.20%***
Forecast price change								
Forecast price chang WPI				0.38%	0.51%	0.85%	1.14%	0.68%
CPI				0.00%	0.00%	0.00%	0.00%	0.00%
Weights WPI				70.40%	70.40%	70.40%	70.40%	70.40%
CPI				29.60%	29.60%	29.60%	29.60%	29.60%
Price Growth				***0.27%***	***0.36%***	***0.60%***	***0.80%***	***0.48%***
Forecast productivity								
				0.50%	0.50%	0.50%	0.50%	0.50%
Productivity Growth				***0.50%***	***0.50%***	***0.50%***	***0.50%***	***0.50%***
Total rate of change				0.02%	1.22%	-0.28%	0.37%	0.18%

Source: Powerlink Operating Expenditure Model

4.5 Define step changes and other operating expenditure

4.5.1 Step Changes

Under the EFA Guideline, the AER's approach is to separately assess the prudency and efficiency of forecast cost increases or decreases associated with new regulatory obligations and capital and operating expenditure trade-offs (step changes). Powerlink has assessed the requirement for step changes and has not proposed any for the 2023-27 regulatory period. For this reason, there is no expenditure identified for step changes in controllable operating expenditure in the *Input|Step & Zero Base Changes* worksheet.

4.5.2 Other Operating Expenditure

For other operating expenditure, we have applied a zero-based forecasting approach. A zero-based approach uses an external or bottom-up cost build to estimate the total cost of a particular activity. Figure 4.7 illustrates the forecast of other operating expenditure as part of the *Input|Step & Zero Base Changes* worksheet in the forecast operating expenditure model.

Chapter 6 Forecast Operating Expenditure of our Revenue Proposal provides further explanation about how these forecasts have been derived.

Figure 4.7: Other operating expenditure forecast (Input|Step & Zero Base Changes)

	2022/23	2023/24	2024/25	2025/26	2026/27
Controllable Operating Expenditure					
Direct Operating and Maintenance Expenditure					
Other Controllable Operating Expenditure					
Total Controllable Operating Expenditure	-	-	-	-	-
Other Operating Expenditure					
AEMC Levy	5.92	5.93	5.95	5.96	5.97
Network Support	-	-	-	-	-
Debt Raising	3.53	3.47	3.41	3.33	3.24
Total Other Operating Expenditure	9.45	9.40	9.36	9.29	9.21
Total Operating Expenditure	**9.45**	**9.40**	**9.36**	**9.29**	**9.21**

Source: Powerlink Operating Expenditure Model

4.6 Total forecast operating expenditure

Total forecast operating expenditure is presented in the *Calc|Forecast* worksheet in Figure 4.8. This worksheet consolidates the following input data to derive the controllable and total operating expenditure forecast for the 2023-27 regulatory period:

- *Input|Inflation* – used to adjust the 2018/19 base year nominal (mid-year) operating expenditure to real 2021/22 (end year);
- *Input|Historic* – provides the 2018/19 base year total operating expenditure and other operating expenditure;
- *Input|Base Year Adjustment* – provides adjustments for controllable operating expenditure in the 2018/19 efficient base year;
- *Calc|Rate of Change* – provides the final year increment and the rate of change factors to be applied to controllable operating expenditure from the 2018/19 efficient base year; and
- *Input|Step & Zero Base Changes* – provides zero-based forecasts for step changes in controllable operating expenditure and other operating expenditure that are added to the underlying trend of controllable operating expenditure.

The following steps are carried out in the *Calc|Forecast* worksheet shown in Figure 4.8:

1. Other operating expenditure and base year adjustments are identified from the total operating expenditure for the 2018/19 base year to ensure an efficient base year controllable operating expenditure (nominal).

2. Nominal (mid-year) expenditure for the efficient base year controllable operating expenditure is converted to real (end-year) 2021/22 using inflation factors derived from the *Input|Inflation* worksheet.
3. A final year value for operating expenditure is estimated by adding the final year increment to the efficient base year.
4. A total rate of change for output growth, price growth and productivity is applied to the estimated final year operating expenditure from 2022/23 to 2026/27.
5. Step changes and other operating expenditure defined in the *Input|Step & Zero Base Changes* worksheet (Figure 4.8) are added to the controllable operating expenditure forecast, resulting in total forecast controllable operating expenditure.

Figure 4.8: Calc|Forecast worksheet for total operating expenditure forecast

Total Opex Growth Calculation	*Nominal*	*Real*						
	2018/19	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**2025/26**	**2026/27**	**Total**
Base Year Actual: Total Opex	199.37	207.31						
Base Year Actual: Controllable Opex and Insurance	193.27	200.98						
Base Year Actual: Other Operating Opex	5.45	5.67						
Base Year Actual: Debt Raising	0.64	0.67						
Base Year Allowance: Total Opex	201.69	209.73						
Base Year Allowance: Controllable Opex and Insurance	193.70	201.43						
Base Year Allowance: Other Operating Opex	4.32	4.49						
Base Year Allowance: Debt Raising	3.67	3.82						
Final Year Allowance: Total Opex		207.85						
Final Year Allowance: Controllable Opex and Insurance		199.68						
Final Year Allowance: Other Operating Opex		4.49						
Final Year Allowance: Debt Raising		3.67						
Change in Opex: Base Year to Final Year Increment		(1.74)						
Base year adjustments	(1.24)	(1.29)						
Efficiency Adjustment	-	-						
Final Year Estimated: Controllable Opex and Insurance		197.94						
Final Year Opex - $m, real 2021/22		**197.94**						
Controllable Opex and Insurance								
Rate of change — Output Growth			*0.25%*	*1.36%*	*-0.38%*	*0.07%*	*0.20%*	0.30%
Change			*0.46*	*3.18*	*2.42*	*2.56*	*2.94*	11.56
			198.40	***201.12***	***200.35***	***200.49***	***200.88***	
Price Growth			*0.27%*	*0.36%*	*0.60%*	*0.80%*	*0.48%*	0.50%
Change			*0.49*	*1.24*	*2.42*	*4.01*	*4.97*	13.13
			198.88	***202.36***	***202.78***	***204.51***	***205.86***	
Productivity			*0.50%*	*0.50%*	*0.50%*	*0.50%*	*0.50%*	0.50%
Change			*(0.90)*	*(1.96)*	*(2.95)*	*(3.94)*	*(4.93)*	(14.68)
Cumulative Change			*0.04*	*2.46*	*1.89*	*2.63*	*2.99*	10.02
Total Rate of change			0.02%	1.22%	-0.28%	0.37%	0.18%	0.30%
Total Forecast Opex, excluding step changes and Other Operating Expenditure			**197.98**	**200.40**	**199.83**	**200.57**	**200.93**	**999.71**
Step Changes			-	-	-	-	-	-
Total Forecast Opex, excluding Other Operating Expenditure			**197.98**	**200.40**	**199.83**	**200.57**	**200.93**	**999.71**
Other Operating Expenditure								
Self Insurance			*Forecast by Rate of Change for Revenue Proposal*					
Insurance Premiums			*Forecast by Rate of Change for Revenue Proposal*					
AEMC Levy			5.92	5.93	5.95	5.96	5.97	29.73
Network Support			-	-	-	-	-	-
Total Forecast Opex excluding Debt Raising			**203.90**	**206.33**	**205.77**	**206.53**	**206.90**	**1,029.44**
Debt Raising			3.53	3.47	3.41	3.33	3.24	16.97
Total Forecast Opex			**207.43**	**209.80**	**209.19**	**209.86**	**210.14**	**1,046.41**

Source: Powerlink Operating Expenditure Model