







# 2018-22

# POWERLINK QUEENSLAND REVENUE PROPOSAL








Powerlink QUEENSLAND | Delivering better value

# Executive Summary

This Revenue Proposal provides details of the Queensland Electricity Transmission Corporation Limited's (Powerlink's) revenue requirements for prescribed transmission services in its next regulatory period from 1 July 2017 to 30 June 2022.

Powerlink is a State Government Owned Corporation which owns, develops, operates and maintains the high voltage electricity transmission network in Queensland, extending 1700kms from the north of Cairns to the New South Wales border.

## Powerlink's approach

Powerlink recognises that access to affordable and reliable electricity is a key enabler of the economy and supports life and our modern lifestyles. Powerlink is focused on doing its part in the overall electricity supply arrangements to deliver better value to its customers and consumers. To help achieve this, Powerlink is focused on the use of alternative practices to maintain safe and reliable electricity supply at a lower cost than in the past.

Powerlink's increased focus on customer and consumer engagement supports this approach with its business-as-usual program of engagement activities having been extended to involve stakeholders in the approach taken to many aspects of the Revenue Proposal. During this process and through research on stakeholder priorities, customers and consumers have reinforced their concern over electricity prices and the expectation that Powerlink should drive change in its business to increase efficiency and deliver cost reductions.

The electricity supply industry in Queensland has a long history of strong growth in electricity demand and there has been network investment to meet this demand. In line with the subdued outlook for economic growth in Queensland, a flat or reducing electricity demand outlook has required a change in mindset across Powerlink's business to minimise investment through alternative practices. As the majority of forecast capital investment is related to asset reinvestment, Powerlink is taking a more holistic view of future network needs, focused on integrated solutions to meet demand.

Powerlink also aims to achieve flexibility in the way in which it operates the transmission network so that renewable generation can deliver electricity supply to loads, including large scale renewables connected to the transmission network, without the need for additional investment in the prescribed network. This could be achieved, for example, through network reconfiguration.

Overall, Powerlink aims to be a more efficient electricity Transmission Network Service Provider (TNSP) that delivers its services within the allowances determined by the Australian Energy Regulator (AER). This Revenue Proposal has been prepared on the basis of proposing efficient and prudent expenditure forecasts and revenue requirements that are capable of acceptance by the AER.

## Changing business and operating environment

Like many organisations in today's business environment, Powerlink is impacted by considerable external factors. In the five years since submitting its last Revenue Proposal, there have been fundamental shifts in economic outlook, electricity consumer behaviour, government policy and regulation and emerging technologies that have reshaped the environment in which Powerlink delivers its transmission services. These factors are discussed briefly below.

### Electricity prices

Electricity prices continue to be a significant issue for Powerlink's customers and consumers, with all parts of the electricity supply chain under pressure to lower prices. The Queensland Productivity Commission (QPC) noted in its Issues Paper: Electricity Pricing in Queensland[1] that after almost a decade of no or Consumer Price Index (CPI) only electricity price increases, retail electricity prices in Queensland have increased sharply since 2007. These increases have set the context in which the Queensland Government has asked the QPC to undertake a public inquiry into electricity prices.

1 *Issues Paper: Electricity Pricing in Queensland*, QPC, October 2015, p. 6.

In early 2015, Powerlink engaged the Australian Centre for Corporate Social Responsibility (ACCSR)[2] to undertake in-depth customer and consumer perception research. The research involved 30 stakeholders who included directly connected customers, consumer advocacy groups, peak industry bodies and government/regulatory representatives.

This research highlighted that high electricity prices were the main concern of Powerlink's customers and consumers and that Powerlink needed to play its part in reducing electricity prices.

Powerlink has taken this into account in the preparation of its Revenue Proposal by ensuring it is delivering better value to customers and consumers by increasing efficiency and reducing costs while seeking to maintain the levels of reliability of supply consumers continue to expect.

## Economic outlook

In its September 2015 Business Outlook, Deloitte Access Economics (DAE) noted that after a decade of growth in China and world prices for Queensland commodities:

> *"China has since slowed and that the years of high prices have unleashed a tsunami of supply on global commodity markets. The upshot has been a sharp slump in the prices of those things Queensland sells on world markets. And, not surprisingly, that sharp slump in prices and related profits means that the chance of new mining and energy construction projects getting the go-ahead any time soon continues to fall."*[3]

While growth in Gross State Product (GSP) is forecast to increase in the period up to 2016/17, this is driven largely by the export of Liquid Natural Gas (LNG), and as noted by DAE, not the strength of domestic demand.[4] GSP forecasts in the early years of the 2018-22 regulatory period reflect a return to positive growth although significantly lower than the 10 year average, reinforcing expectations of more subdued economic growth and resource sector investment.

These factors are taken into account in Powerlink's forecast of flat electricity demand growth and negligible load driven capital expenditure in the forthcoming regulatory period.

## Electricity demand outlook

Powerlink's forecast demand for electricity transmission services reflects the impacts of many external forces. Consumers are making choices regarding their energy supply, responding to higher prices and a desire for a lower carbon future by adopting more distributed forms of generation (such as rooftop solar PV). This changes the use of, and demand for electricity transmission services. Existing and emerging technologies are facilitating these changes by reducing the amount of energy required to operate households and businesses as well as enabling greater use of distributed energy sources to provide energy at source rather than transporting it over the transmission network. Future developments in battery storage technology coupled with solar PV could see further significant changes to electricity usage patterns. In particular, battery storage technology has the potential to flatten electricity usage and reduce the need to develop transmission services to cover short duration peaks.

As illustrated in Figure 1, Powerlink's forecast for electricity demand growth is essentially flat over a 10 year outlook (excluding growth in the shorter term due to the commissioning of upstream LNG facilities in the Surat Basin).

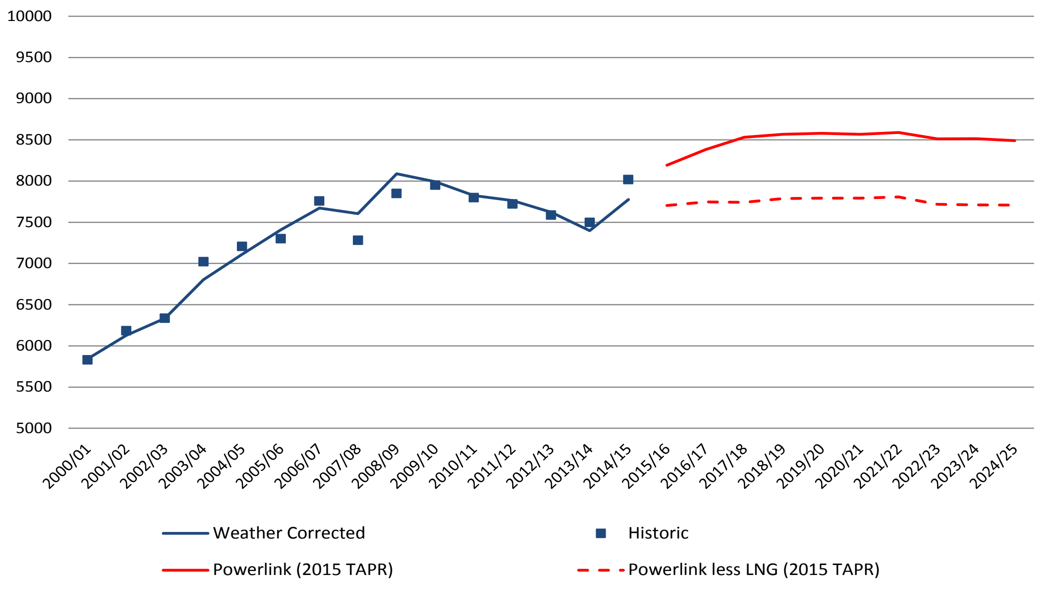
---

2 *Customer and Consumer Perception Research*, ACCSR, April 2015.

3 *Business Outlook*, DAE, September 2015, p. 102

4 *Ibid*, p. ii.

Figure 1: Summer peak electricity demand forecast (MW)




Source: Powerlink data.

## Industry structure and review

In December 2015 the Queensland Government announced the merger of the Queensland electricity distribution businesses, Energex and Ergon Energy under a single company. Powerlink will remain separate and independent from the merged distribution business and will continue to implement its own program of network optimisation and efficiency savings to deliver safe, efficient and reliable transmission services.

Powerlink remains part of the overall energy reform process and will participate in a government strategic alignment review of its future business direction. This review will make recommendations regarding efficiency savings and alignment of work practices for high voltage network assets owned by all three network businesses in Queensland. In parallel, Powerlink will continue to actively participate in the QPC's review of electricity pricing in Queensland and a fair price for solar.

In its Revenue Proposal, Powerlink has forecast prudent and efficient levels of expenditure that will position it well in the energy reform process.

# Responding to change

During the 2013-17 regulatory period, Powerlink has responded to the changes in its business and operating environment and implemented initiatives focused on efficiency and cost reduction. The impact of these initiatives on actual/forecast expenditure and network performance is discussed below.

## Capital expenditure

Powerlink's total actual/forecast capital expenditure by year, relative to the AER's allowance for the current regulatory period is shown in Table 1.

Table 1: Capital expenditure – allowance vs actual/forecast ($m, nominal)

| | 2012/13 | 2013/14 | 2014/15 | 2015/16 (forecast) | 2016/17 (forecast) | Total |
|---|---|---|---|---|---|---|
| Allowance | 679.1 | 575.4 | 420.1 | 478.8 | 555.6 | 2,709.0 |
| Actual/forecast | 445.7 | 316.1 | 158.5 | 159.8 | 211.3 | 1,291.4 |

Total capital expenditure in the 2013-17 regulatory period is forecast to be $1.3b, a reduction of $1.4b (52%) compared to the AER's allowance of $2.7b. This can be attributed to a significant reduction in electricity demand growth which has resulted in Powerlink cancelling or deferring load driven investment and taking a different approach to optimise the timing and scope of its planned reinvestment program. In terms of its capital reinvestments, Powerlink has increased its focus on alternative risk mitigation options (such as network reconfiguration and asset retirement) and lower cost technical solutions that deliver greater flexibility.

## Operating expenditure

Powerlink's total actual/forecast operating expenditure by year, relative to the AER's allowance for the current regulatory period is shown in Table 2.

Table 2: Operating expenditure – allowance vs actual/forecast ($m, nominal)

| | 2012/13 | 2013/14 | 2014/15 | 2015/16 (forecast) | 2016/17 (forecast) | Total |
|---|---|---|---|---|---|---|
| Allowance | 179.4 | 191.3 | 200.4 | 211.7 | 223.1 | 1,005.9 |
| Actual/forecast | 167.4 | 181.0 | 211.3 | 216.5 | 216.1 | 992.3 |

Total operating expenditure within the 2013-17 regulatory period is forecast to be $992.3m, a reduction of $13.6m (-1.4%) compared to the AER's allowance of $1,005.9m. This outcome is a result of lower operating expenditure in the early part of the regulatory period, balanced against increased operating expenditure in the latter part of the regulatory period linked to business restructuring costs, transmission line maintenance and refurbishment needs (including new decommissioning costs) and a new levy related to the Queensland Government's financial contribution to the operation of the Australian Energy Market Commission (AEMC).

## Benchmarking performance

Powerlink notes that the AER is still in the early stages of developing its approach to transmission benchmarking and that it is faced with the significant challenge of developing robust benchmarking techniques that account for the small sample size and heterogeneous operating environments of only five TNSPs in the National Electricity Market (NEM).

In that regard, Powerlink has been working with the AER to encourage greater consistency of data inputs and consequently benchmarking outputs. Powerlink has also made submissions to the AER on the need to take into account relevant operating and environment factors in the analysis of benchmarking results in its reports, to recognise that each TNSP is subject to different conditions that drive differences in expenditure.

Powerlink considers that its benchmarked performance is comparable to its peers when operating environment factors are taken into account. Powerlink also recognises its performance can still be improved. Powerlink's aim is to deliver an increased level of productivity and cost reduction in its forecast capital and operating expenditure that responds to the concerns of its customers and consumers about electricity prices and the challenges posed by the external environment. Powerlink's benchmarking performance is discussed in more detail in Chapter 4 of its Revenue Proposal.

## Network performance

Powerlink has delivered strong performance under the Service Target Performance Incentive Scheme (STPIS)[5] in the current regulatory period by actively responding to incentives and closely managing network performance and availability.

### *Service Component*

The Service Component (SC) of the STPIS scheme consists of seven measures related to transmission circuit availability and loss of supply events.

Powerlink's performance during the current regulatory period for peak circuit and reactive plant availability has consistently exceeded targets, while transformer availability performance was above target for three of the four years. Transmission line performance remained below the AER target for the period.

Powerlink has continued its better than target loss of supply performance in relation to both large and small event thresholds. Powerlink has actively worked to minimise the impact of loss of supply events on its network and these actions have continued to improve performance in recent years.

### *Market Impact Component*

For the majority of the current regulatory period, Powerlink's performance under the Market Impact Component (MIC) has consistently exceeded targets, which reflects the consistent application of established processes to minimise the impact of outage events on market participants in response to the incentive framework.

In 2014, Powerlink undertook extended planned project outages on its network connection between Queensland and New South Wales, which resulted in significant Dispatch Interval (DI) counts. As outages were required to deliver project works, Powerlink scheduled these outages at times of the year that would create least impact. Powerlink also used efficient project staging and resourcing to minimise the duration of these outages.

Powerlink continues to work closely with customers to plan and coordinate network outages at times least likely to result in a market constraint. Powerlink also takes real-time action to reschedule works to reduce the impact of binding constraints on the market.

# Delivering better value

In developing the key building-blocks of its Revenue Proposal, Powerlink has focused on delivering better value through increased efficiency and cost reduction while seeking to maintain the reliability of supply that customers and consumers have come to expect. The following sections describe Powerlink's proposed forecast capital expenditure, operating expenditure and rate of return.

## Forecast capital expenditure

A summary of Powerlink's forecast capital expenditure for the 2018-22 regulatory period is presented in Table 3.

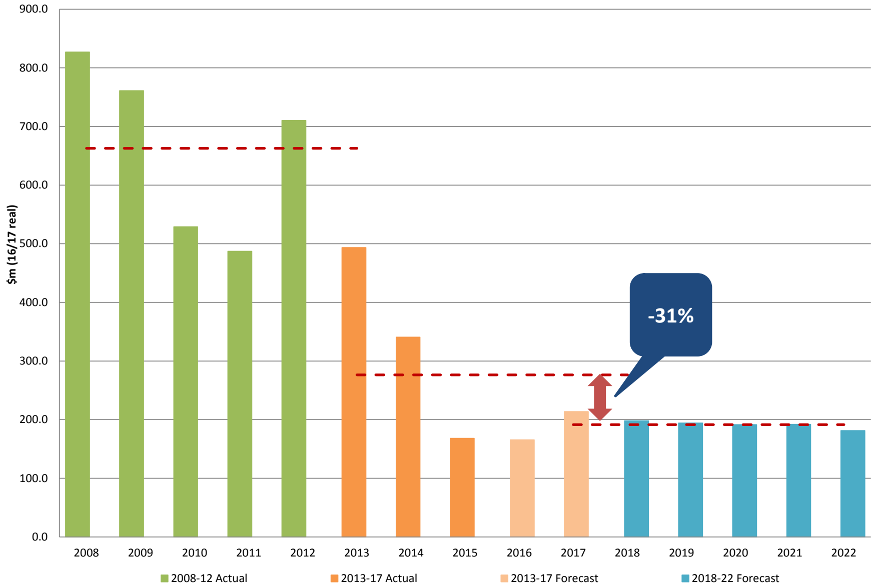
Table 3: Forecast capital expenditure ($m, 2016/17)

| | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Total |
|---|---|---|---|---|---|---|
| Total capital expenditure | 198.2 | 194.2 | 191.4 | 192.1 | 181.3 | 957.1 |

5 Powerlink is subject to Version 3 of the STPIS in the 2013-17 regulatory period, consisting of a Service Component (SC) and Market Impact Component (MIC).

Figure 2 shows Powerlink's total annual capital expenditure profile since 2007/08, including the capital expenditure forecast for the 2018-22 regulatory period.

Figure 2: Actual and forecast total capital expenditure ($m, 2016/17)




Source: Powerlink data.

Powerlink's forecast total capital expenditure for the 2018-22 regulatory period is $957.1m, which is an average annual expenditure of $191.4m. This is a reduction of $84.8m (-31%) and $471.2m (-71%) per year compared to actual expenditure in the 2013-17 and 2008-12 regulatory periods, respectively.

The primary driver of the reduction in capital expenditure over these three regulatory periods has been the reduction in demand growth. The reduction has also had an impact on non-load driven capital expenditure, in that network reinvestment plans are focused on different outcomes such as removing assets without replacement or replacing with assets of different capacity and/or configuration. This has also provided the opportunity for greater use of alternative options, such as network support or network reconfiguration, to manage asset condition and risk at a lower overall cost.

In forecasting its capital expenditure for the 2018-22 regulatory period, Powerlink has adopted a hybrid forecast that makes more use of top-down forecasting tools, including the AER's Replacement Expenditure Model (Repex Model). The use of the AER's Repex Model as the primary tool for forecasting capital expenditure for electricity transmission is new and innovative. Powerlink considers that the use of a hybrid approach is highly suited to categories of expenditure such as reinvestment and is a more efficient approach to developing forecasts for its Revenue Proposal.

## Forecast operating expenditure

In forecasting its operating expenditure Powerlink has applied trend, category and independent benchmarking analysis to confirm the efficiency of its base year and focused on setting targets for productivity growth that result in real annual reductions in total operating expenditure in each year of the 2018-22 regulatory period.

This approach has resulted in forecast total operating expenditure of $976.7m for the 2018-22 regulatory period, which is 7% below Powerlink's actual total operating expenditure in the current regulatory period.

A summary of Powerlink's forecast operating expenditure for the 2018-22 regulatory period is presented in Table 4.

Table 4: Forecast operating expenditure ($m, 2016/17)

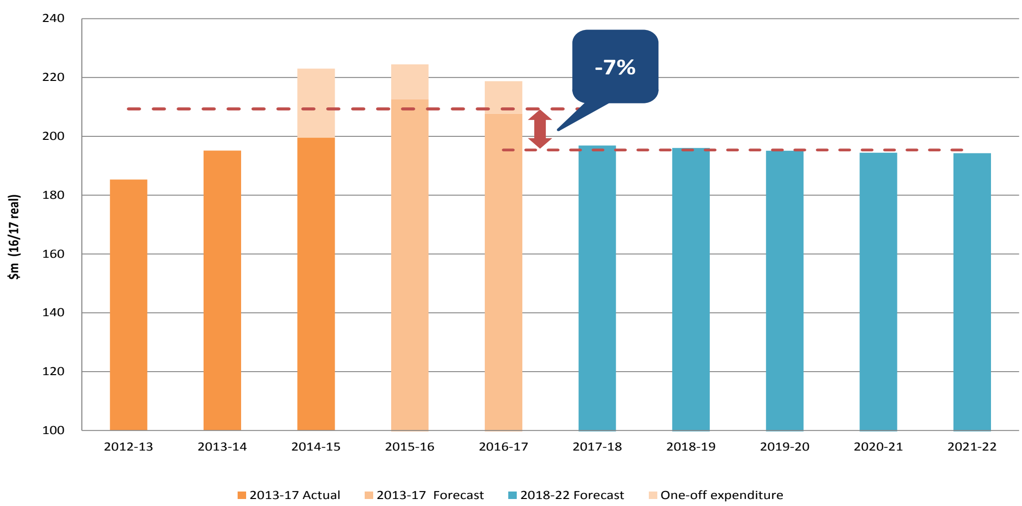
| | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Total |
|---|---|---|---|---|---|---|
| Total controllable operating expenditure | 180.0 | 179.0 | 178.0 | 177.2 | 176.9 | 891.0 |
| Total operating expenditure | 196.9 | 196.0 | 195.1 | 194.4 | 194.3 | 976.7 |

In forecasting its operating expenditure, Powerlink has implemented a range of measures to drive cost reductions:

- Adopted estimates for labour and materials price growth based on independent expert opinion and consistent with the AER's approach in recent decisions;
- Applied very low output growth (reflecting Powerlink's own conservative forecast for demand and energy growth) and taken additional steps to manually reduce output growth caused by increases in the demand and energy consumption of LNG loads in the Surat Basin and to reflect the decommissioning of transmission line assets. These measures have reduced forecast operating expenditure by $17.7m over the 2018-22 regulatory period; and
- Undertaken a line-by-line assessment to determine real productivity growth of -1.2% per annum, which exceeds the long run average productivity for both Powerlink and the industry. This translates to productivity savings of $53m over the 2018-22 regulatory period.

Figure 3 illustrates the change between Powerlink's forecast and actual total operating expenditure in the current regulatory period.

Figure 3: Actual and forecast total operating expenditure ($m, 2016/17)




Source: Powerlink data.

## Rate of return

Powerlink has applied the AER's Rate of Return (RoR) Guideline in developing its estimate of the rate of return for the 2018-22 regulatory period. This has resulted in an estimated indicative rate of return of 6.04% (nominal, vanilla).

In proposing its rate of return Powerlink has had regard to independent expert opinions which recommended that departures from the RoR Guideline would be appropriate to arrive at an estimate of the required rate of return that best meets the requirements of the National Electricity Law (NEL), the Rules and is consistent with the National Electricity Objective (NEO). Powerlink supports the views of its independent experts and notes that many of the matters related to the AER's application of its RoR Guideline are the subject of appeal before the Australian Competition Tribunal (the Tribunal).

However, if the Tribunal finds that the AER has made a material error of fact, has incorrectly exercised its discretion or made an unreasonable decision and that varying or setting aside the decision would be materially preferable under the NEO, Powerlink reserves the right to submit an updated rate of return in a separate submission or in its Revised Revenue Proposal that reflects one or more aspects of the Tribunal's decision.

## Revenue requirement and price path

Powerlink has estimated its total building-block revenue requirement using the AER's Post Tax Revenue Model (PTRM). The smoothed revenue requirement and resulting X-factor is summarised in Table 5.

Table 5: Smoothed revenue requirement and X-factor ($m, nominal)

| | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Total |
|---|---|---|---|---|---|---|
| Smoothed revenue requirement | 767.4 | 785.0 | 803.0 | 821.5 | 840.3 | 4,017.2 |
| X-factor | 27.23% | 0.15% | 0.15% | 0.15% | 0.15% | - |

In real terms, Powerlink's smoothed revenue for 2017/18 is proposed to reduce by 27.2% compared to revenue forecast in the 2016/17 year. In subsequent years of the regulatory period annual revenue is forecast to reduce by 0.15% per annum.

Powerlink's Revenue Proposal results in a nominal 27.7% reduction in the indicative price path[6] compared to the 2016/17 year. Indicative price growth over the balance of the 2018-22 regulatory period is forecast to remain within CPI on average.

Transmission charges comprise approximately 9% of an average residential household's electricity bill each year.[7] The impact of Powerlink's Revenue Proposal on residential electricity consumers each year will depend on a number of factors, which include: the proportion of annual prescribed revenue to be recovered from the DNSPs (Energex and Ergon Energy); the particular tariff arrangements applied by the DNSPs and retailers; and the individual customer's electricity usage.

For a residential electricity consumer, Powerlink's Revenue Proposal is expected to reduce the average electricity bill by about 2.6% in the first year. On the basis of assumed tariffs and consumption, this presents an estimated annual saving of between $22 and $37.

Table 6 provides an estimate of how the transmission component of the typical residential and business electricity bill will be impacted by the Revenue Proposal.

6 The average indicative price path is determined by dividing revenue (MAR) by forecast energy in each year.

7 *2015 AEMC Electricity Price Trends*, AEMC, December 2015, p. 105.

Table 6: Indicative electricity price impacts ($, nominal)

| | | 2013-17 regulatory period | | 2018-22 regulatory period |
|---|---|---|---|---|
| | | 2015/16 | 2016/17 | 2017/18 |
| Average annual residential electricity bill[a] (based on annual usage range of 2,500kWh and 5,173kWh) | Transmission Component | $77 - $129 | $80 - $134 | $58 - $97<br>(-27.7%) |
| Average annual business electricity bill[b] (based on annual usage range of 10,000kWh and 20,000kWh) | Transmission Component | $270 - $470 | $280 - $488 | $203 - $353<br>(-27.7%) |

(a) *2015 AEMC Electricity Price Trends*, AEMC, December 2015, p. 105.

(b) *Energy Made Easy*, AER, https://www.energymadeeasy.gov.au/.

# Contents

# List of Tables

# List of Figures

# 1 Introduction

## 1.1 Purpose of the document

This Revenue Proposal provides details of the Queensland Electricity Transmission Corporation Limited's (Powerlink's) revenue requirements for prescribed transmission services in its next regulatory period from 1 July 2017 to 30 June 2022 (Powerlink's Revenue Proposal). It has been developed in accordance with Chapter 6A of the National Electricity Rules (Rules),[8] the Australian Energy Regulator's (AER) Framework and Approach Paper and the Regulatory Information Notice (RIN) issued by the AER with respect to Powerlink's Revenue Proposal (hereon referred to as the Reset RIN).

Powerlink's Revenue Proposal comprises:

- An overview paper outlining the contents of the Revenue Proposal in plain language to electricity consumers;
- The Revenue Proposal (this document);
- A series of appendices and supporting information for the Revenue Proposal;
- Templates and supporting information required by the Rules and the Reset RIN;
- A proposed Pricing Methodology; and
- A proposed Negotiating Framework.

## 1.2 About Powerlink

Powerlink is a State Government Owned Corporation which owns, develops, operates and maintains the high voltage electricity transmission network in Queensland, extending 1,700kms from the north of Cairns to the New South Wales (NSW) border.

Powerlink's transmission network is a central link in the electricity supply chain, transporting electricity from power stations, where it is generated, to distributors Energex, Ergon Energy and Essential Energy (in northern NSW). Powerlink also transports electricity to directly connected large industrial customers and to NSW via the Queensland/New South Wales Interconnector (QNI).

Powerlink is registered with the Australian Energy Market Operator (AEMO) as a Transmission Network Service Provider (TNSP) and is the holder of a Transmission Authority issued under the *Electricity Act 1994* (Qld). Powerlink has also been appointed by the Queensland government as the entity responsible for transmission network planning in Queensland, the Jurisdictional Planning Body, for the purposes of clause 5.20.5 of the Rules.[9]

## 1.3 Services provided by Powerlink

Powerlink provides prescribed transmission services in accordance with the Rules, the *Electricity Act 1994* (Qld) and its Transmission Authority. These include:

- Shared transmission services provided to directly connected customers and distribution networks (prescribed Transmission Use of System (TUOS) services);
- Connection services for Queensland Distribution Network Service Providers' (DNSP) network connected to the transmission network (prescribed exit services);
- Grandfathered connection services provided to generators and customers directly connected to the transmission network in place on 9 February 2006 (prescribed entry and exit services); and

8 *National Electricity Rules*, AEMC, Chapter 6A.

9 *Ibid*, Chapter 5.

- Services required under the Rules or in accordance with jurisdictional electricity legislation that are necessary to ensure the integrity of the transmission network, including through the maintenance of power system security and quality (prescribed common transmission services).

The quality, reliability and security of supply of prescribed transmission services provided by Powerlink are established in the Rules, Powerlink's Transmission Authority (and other jurisdictional legislation and instruments) and customer connection and access agreements.

## 1.4 Structure of the document

The Revenue Proposal has been developed to provide a complete and self-contained overview of Powerlink's business, operating environment, expenditure forecasts and revenue requirements for the 2018-22 regulatory period.

The remainder of Powerlink's Revenue Proposal is structured as follows:

- Chapter 2 describes the business and operating environment in which Powerlink operates and the key challenges Powerlink is facing now and into the next regulatory period;
- Chapter 3 describes how Powerlink has engaged with its customers and consumers in the development of its Revenue Proposal;
- Chapter 4 outlines Powerlink's historic cost and service performance;
- Chapter 5 describes the capital expenditure forecast;
- Chapter 6 describes the operating expenditure forecast;
- Chapter 7 outlines Powerlink's approach to cost escalation rates and project cost estimation;
- Chapter 8 calculates the regulated asset base for the forthcoming regulatory period;
- Chapter 9 explains Powerlink's cost of capital and taxation;
- Chapter 10 describes Powerlink's depreciation forecast;
- Chapter 11 presents revenue requirements for the forthcoming regulatory period;
- Chapter 12 defines pass through events;
- Chapter 13 outlines Powerlink's assessment of Shared Assets;
- Chapter 14 outlines the expenditure incentive schemes that will apply to Powerlink;
- Chapter 15 presents the proposed Service Target Performance Incentive Scheme (STPIS);
- Chapter 16 describes Powerlink's proposed Pricing Methodology; and
- Chapter 17 describes Powerlink's proposed Negotiating Framework.

## 1.5 Basis of numbers

In Powerlink's Revenue Proposal, the following conventions are applied, unless otherwise specified:

- Historical expenditure is presented in mid-year (December) nominal dollars;
- Forecast expenditure is presented in real end-year (June) 2016/17 dollars; and
- PTRM building-blocks are presented in end-year (June) nominal dollars.

Powerlink notes that numbers presented in tables may not add due to rounding.

## 1.6 Confidential information

Powerlink does not claim confidentiality over any part of this Revenue Proposal document.

Where confidential information has been identified in separate appendices and supporting information, a confidential version has been provided to the AER and registered in accordance with the Confidentiality Guidelines published by the AER.

## 1.7 Governance and compliance

Powerlink's Board has issued two resolutions in relation to the Revenue Proposal, namely to:

- Certify that the key assumptions that underlie the capital and operating expenditure forecasts are reasonable, see Appendix 1.01; and
- Comply with the requirements of the Reset RIN. An extract of this resolution is provided as Appendix 1.02.

To assist the AER in assessing Powerlink's Revenue Proposal's compliance with the Rules, Powerlink has provided a compliance checklist in Appendix 1.03. A separate document contained in Appendix 1.04 provides Powerlink's response to the Reset RIN.

# 2 Business and Operating Environment

## 2.1 Introduction

This chapter provides an outline of the significant changes in Powerlink's business and operating environment, how Powerlink has responded and the implications for its Revenue Proposal.

*Key highlights*

- Powerlink recognises that access to affordable and reliable electricity is a key enabler of the economy and supports life and our modern lifestyles. Powerlink is focused on doing its part in the overall electricity supply arrangements to deliver better value to its customers and consumers.
- Powerlink is focused on maintaining a safe and reliable electricity supply, but at a lower cost than in the past. Powerlink's increased focus on customer and consumer engagement supports this change in approach as alternative practices are adopted.
- Customers and consumers have reinforced their concern about electricity prices and the expectation that Powerlink should drive change in its business to increase efficiency and deliver cost reductions.
- In December 2015, the Queensland Government announced that Powerlink will continue to operate as a stand-alone business and participate in the energy reform process. Powerlink will continue to implement its own program of network optimisation and efficiency savings to deliver safe, efficient and reliable transmission services.
- Powerlink's Revenue Proposal has been prepared on the basis of proposing efficient and prudent expenditure forecasts and revenue requirements that are capable of acceptance by the AER.

## 2.2 Powerlink's approach

Powerlink recognises that access to affordable and reliable electricity is a key enabler of the economy and supports life and our modern lifestyles. Powerlink is focused on doing its part in the overall electricity supply arrangements to deliver better value to its customers and consumers. To help achieve this, Powerlink is focused on the use of alternative practices to maintain safe and reliable electricity supply at a lower cost than in the past.

Powerlink's increased focus on customer and consumer engagement supports this approach with its business-as-usual program of engagement activities having been extended to involve stakeholders in the approach taken to many aspects of the Revenue Proposal. During this process and through research on stakeholder priorities, customers and consumers have reinforced their concern over electricity prices and the expectation that Powerlink should drive change in its business to increase efficiency and deliver cost reductions.

The electricity supply industry in Queensland has a long history of strong growth in electricity demand and there has been network investment to meet this demand. In line with the subdued outlook for economic growth in Queensland, a flat or reducing electricity demand outlook has required a change in mindset across Powerlink's business to minimise investment through alternative practices. As the majority of forecast capital investment is related to asset reinvestment, Powerlink is taking a more holistic view of future network needs, focused on integrated solutions to meet demand.

Powerlink also aims to achieve flexibility in the way in which it operates the transmission network so that renewable generation can deliver electricity supply to loads, including large scale renewables connected to the transmission network, without the need for additional investment in the prescribed network. This could be achieved, for example, through network reconfiguration.

Overall, Powerlink aims to be a more efficient electricity TNSP that delivers its services within the allowances determined by the Australian Energy Regulator (AER). This Revenue Proposal has been prepared on the basis of proposing efficient and prudent expenditure forecasts and revenue requirements that are capable of acceptance by the AER.

## 2.3 External environment

Like many organisations in the current business environment, Powerlink is impacted by a number of external factors including:

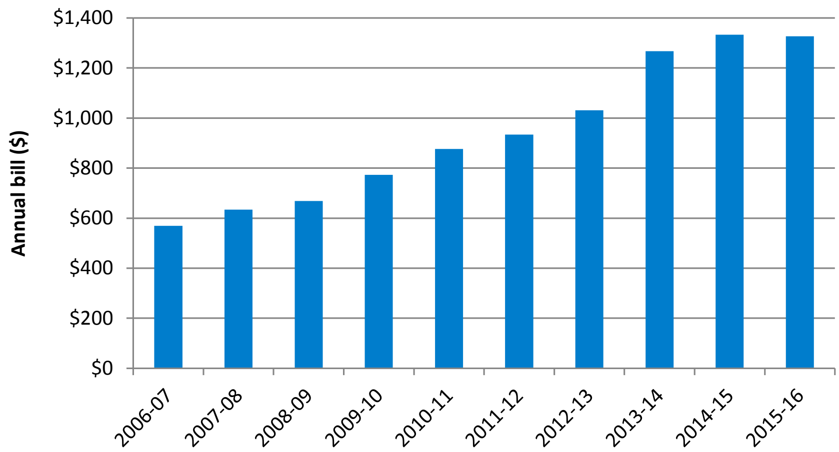
- Consumer concern and response to increasing electricity prices;
- The economic outlook and resource sector;
- Government policy and regulation; and
- Changing electricity demand and emerging technologies.

## 2.4 Electricity prices

Electricity prices continue to be a significant issue for Powerlink's customers and consumers, with all parts of the electricity supply chain under pressure to lower electricity prices.

The Queensland Productivity Commission (QPC) noted in its Issues Paper: Electricity Pricing in Queensland[10] that after almost a decade of no or Consumer Price Index (CPI) only electricity price increases, retail electricity prices in Queensland have increased sharply since 2007. These increases have set the context in which the Queensland Government has asked the QPC to undertake a public inquiry into electricity prices.

Figure 2.1: Average Queensland residential (Tariff 11) annual bills 2006/07 to 2015/16 ($, nominal)




Source: Queensland Government, Department of Energy and Water Supply.

In early 2015, Powerlink engaged the Australian Centre for Corporate Social Responsibility (ACCSR)[11] to undertake in-depth customer and consumer perception research. The research involved 30 stakeholders who included directly connected customers, consumer advocacy groups, peak industry bodies and government/regulatory representatives.

This research highlighted that high electricity prices were the main concern of Powerlink's customers and consumers and that Powerlink needed to play its part in reducing electricity prices.

Powerlink has taken this into account in the preparation of its Revenue Proposal by ensuring it is delivering better value to customers and consumers by increasing efficiency and reducing costs while at the same time seeking to maintain the levels of reliability of supply consumers continue to expect.

10 *Issues Paper, Electricity Pricing in Queensland*, QPC, October 2015.

11 *Customer and Consumer Perception Research Summary of Results*, ACCSR, April 2015.

## 2.5 Economic outlook and the resource sector

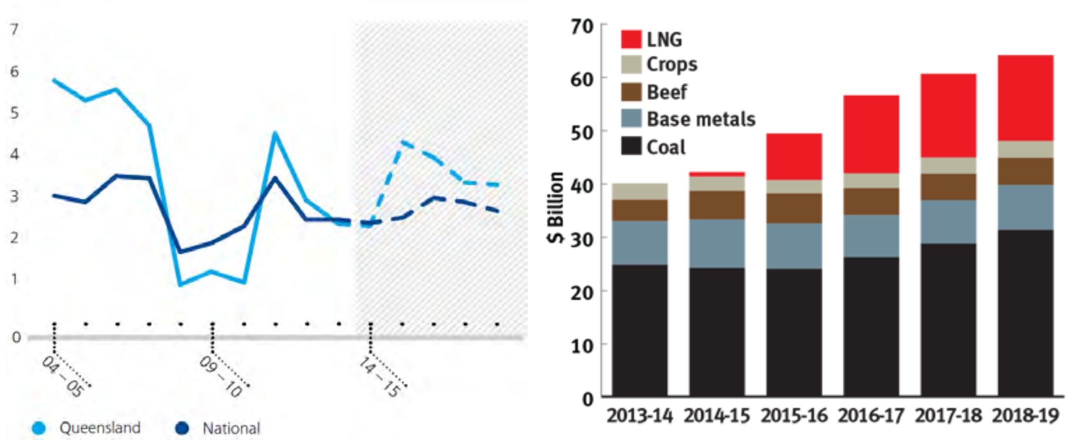
In its September 2015 Business Outlook, Deloitte Access Economics (DAE) noted that after a decade of growth in China and world prices for Queensland commodities:

> *"China has since slowed and that the years of high prices have unleashed a tsunami of supply on global commodity markets. The upshot has been a sharp slump in the prices of those things Queensland sells on world markets. And, not surprisingly, that sharp slump in prices and related profits means that the chance of new mining and energy construction projects getting the go-ahead any time soon continues to fall."*[12]

While growth in Gross State Product (GSP) is forecast to increase substantially in the period up to 2016/17, this is driven largely by the export of Liquid Natural Gas (LNG), and as noted by DAE, not the strength of domestic demand.[13] GSP forecasts in the early years of the 2018-22 regulatory period reflect a return to positive growth although significantly lower than the 10 year average, reinforcing expectations of subdued economic growth and resource sector investment. These factors are taken into account in Powerlink's forecast of flat electricity demand growth and negligible load driven investment in the forthcoming regulatory period.

There remains however the possibility that large resource projects may proceed over the forthcoming regulatory period, illustrated by the growth potential in some resource sectors in Figure 2.2. Powerlink has taken account of this in its Revenue Proposal through the contingent projects framework, which enables Powerlink to define triggers for additional capital expenditure exceeding its forecast and make application to the AER for the additional revenue to provide for this expenditure if and when required. This approach ensures consumers are not exposed to the costs of these potential developments as part of Powerlink's initial Revenue Proposal; however enables Powerlink to facilitate network investment to support increased demand if large resource sector projects eventuate.

Figure 2.2: Queensland GSP (constant price, annual % change) and Queensland Government overseas exports forecast




Source: Deloitte Access Economics, Business Outlook (Confidence for tomorrow), September 2015 and Queensland Government.

12 *Business Outlook*, DAE, September 2015, p. 102.

13 *Ibid*, p. ii.

## 2.6 Government policy and regulation

### 2.6.1 AER's Better Regulation reforms

In 2013, the AER finalised six regulatory Guidelines[14] as part of its Better Regulation program that apply directly to Powerlink's 2018-22 regulatory determination process. These relate to the assessment of expenditure forecasts, the rate of return, incentives, consumer engagement, shared assets and confidentiality.

To implement this program, the AER requires regulated businesses such as Powerlink to report a significant volume of detailed cost and technical information each year, through the issue of RINs. This covers expenditure on switchgear, transformers, and maintenance on towers and conductors, as well as individual asset counts and the number of trees per maintenance span. The AER then uses this information to benchmark the businesses each year and to assess the efficiency of expenditure forecasts as part of the regulatory determination process.

Powerlink has responded to these new requirements in the course of normal business and as part of developing its Revenue Proposal.

### 2.6.2 Queensland Government policies and review

In 2015, the Queensland government requested that the QPC undertake an inquiry into electricity prices in Queensland. The QPC released an Issues Paper in October 2015 to initiate consultation on the matter.[15] One aspect of the QPC's Terms of Reference is to examine factors that drive electricity prices and the impact of energy sector structure, national governance, regulation and market operation on pricing outcomes. The Government has requested that the QPC advance the timing of advice regarding the Government's election commitments, with an interim report expected by end January 2016.

Powerlink is actively participating in this inquiry to assist the QPC to make robust recommendations about how the challenges facing the electricity industry can be met while seeking to deliver better value to consumers.

In 2015, the Queensland Government also made an election commitment to retain ownership of State owned electricity network companies, with consideration to be given to merging the network companies to realise further efficiencies and cost savings. Subsequently, it was announced in December 2015 that the electricity distribution businesses of Energex and Ergon Energy will be merged under a single company, effective from July 2016. Powerlink will remain separate and independent from the merged distribution business and will continue to implement its own program of network optimisation and efficiency savings to deliver safe, efficient and reliable transmission services.

Powerlink remains part of the overall energy reform process and will participate in a government strategic alignment review of its future business direction. This review will make recommendations regarding efficiency savings and alignment of work practices for high voltage network assets owned by all three network businesses in Queensland.

It is possible from this review that Powerlink could acquire additional responsibilities. Should this occur, Powerlink reserves its right to make a further submission to its Revenue Proposal or provide updated information in its Revised Revenue Proposal, when relevant information becomes available.

In its Revenue Proposal, Powerlink has forecast prudent and efficient levels of expenditure that will position it well in the energy reform process.

14 *Better Regulation*, AER, www.aer.gov.au/networks-pipelines/better-regulation.

15 *Issues Paper, Electricity Pricing in Queensland*, QPC, October 2015.

### 2.6.3 Amended reliability standard

In recent years, significant focus has been placed on striking a better balance between the reliability and cost of transmission services. In July 2014, the Queensland Government amended Powerlink's Transmission Authority[16] to formalise a change in the way the transmission network is to be planned and developed. This followed considerable investigation of adjustments to the reliability of supply standard by Powerlink and the Department of Energy and Water Supply.

Powerlink's application of the Regulatory Investment Test for Transmission (RIT-T) for supply into the Northern Bowen Basin during 2013 proactively sought to defer investment due to the uncertain demand outlook. Powerlink sought and received agreement to adopt a lower reliability of supply standard in the Northern Bowen Basin area. This amended standard was then formalised and became part of Powerlink's Transmission Authority and now applies uniformly across the Powerlink network.

The amended standard permits Powerlink to plan and develop the transmission network on the basis that load may be interrupted during a single network contingency event, within defined demand and energy consumption limits. Broadly, the amended planning standard has the effect of deferring or reducing the scope of prescribed network investment required to meet ongoing demand or in response to demand growth and is distinct from how the network is operated on a day-to-day basis. In that regard, Powerlink will continue to maintain and operate its transmission network to maximise reliability to consumers.

With essentially no demand growth forecast over the 2018-22 regulatory period, the amended reliability standard has been applied in Powerlink's Revenue Proposal to the analysis of forecast reinvestment expenditure, particularly to identify instances where there are lower cost options related to network reconfiguration and asset retirement.

### 2.6.4 Growing a renewable energy economy

Growing a renewable energy economy is a key focus for the Queensland Government. As part of its Solar Future program,[17] the Queensland Government has set a number of targets, including:

- One million homes to be fitted with solar panels by 2020 or 3000 MW of solar PV;
- A 50% renewable energy target by 2030. There will be an independent public inquiry about this target to consider a credible pathway to achieving it; and
- Supporting development of up to 60 MW of large-scale solar generation, in conjunction with the Australian Renewable Energy Agency (ARENA).

The recently established QPC is conducting a review into a fair price for solar. In parallel to its pricing inquiry the QPC expects to provide a report in mid-2016 about the public and consumer benefits from exported solar PV generation and recommend a fair price which does not have an unreasonable impact on network costs for non-solar users.

Shifts to renewable energy will change the demand for electricity transmission services. Powerlink has taken these changes into account in forecasting demand for its services and will continue to seek information to proactively improve its forecasts while also seeking ways to defer or delay investments so as to ensure consumers are not paying more than is necessary.

Powerlink also plays a key role in facilitating the connection of sources of large scale renewable energy generation to its transmission network and is focused on enabling such connections through innovative solutions that require little or no investment in the prescribed network.

16 *Transmission Authority No.1*, Queensland Government, July 2014.

17 *A Solar Future: Powering Queensland's Renewable Energy Industries*, Queensland Government, https://www.dews.qld.gov.au/electricity/solar/solar-future.

### 2.6.5 Federal Government policies and review

*Large-scale Renewable Energy Target*

In June 2015, the Australian Parliament passed legislation to implement the Federal Government's reforms to the Renewable Energy Target (RET) scheme. The Large-scale Renewable Energy Target (LRET) component of the scheme includes legislated annual targets which will require significant investment in new renewable energy generation capacity in coming years. The LRET scheme targets increase until 2020 when the target will be 33,000 gigawatt-hours of renewable electricity generation.

The LRET creates a financial incentive for the development of renewable electricity generation sources by creating an obligation for entities such as electricity retailers to source renewable electricity generation in accordance with the LRET schemes annual targets.

With increased investment expected in new renewable energy generation, Powerlink will have a role to facilitate the connection of new sources of large scale renewable energy generation to its transmission network and also to support the efficient operation of the electricity market as the mix of generation operating in Queensland changes over time.

## 2.7 Electricity demand and emerging technologies

Powerlink's forecast demand for electricity transmission services reflects the impacts of many external factors. Consumers are making choices regarding their energy supply, responding to higher prices and a desire for a transition to a lower carbon future by adopting more distributed forms of generation (such as rooftop solar PV). This changes the use of and demand for electricity transmission services. Existing and emerging technologies are facilitating these changes by reducing the amount of energy required to operate households and businesses, as well as enabling greater use of distributed energy sources to provide energy at source rather than transporting it over the transmission network.

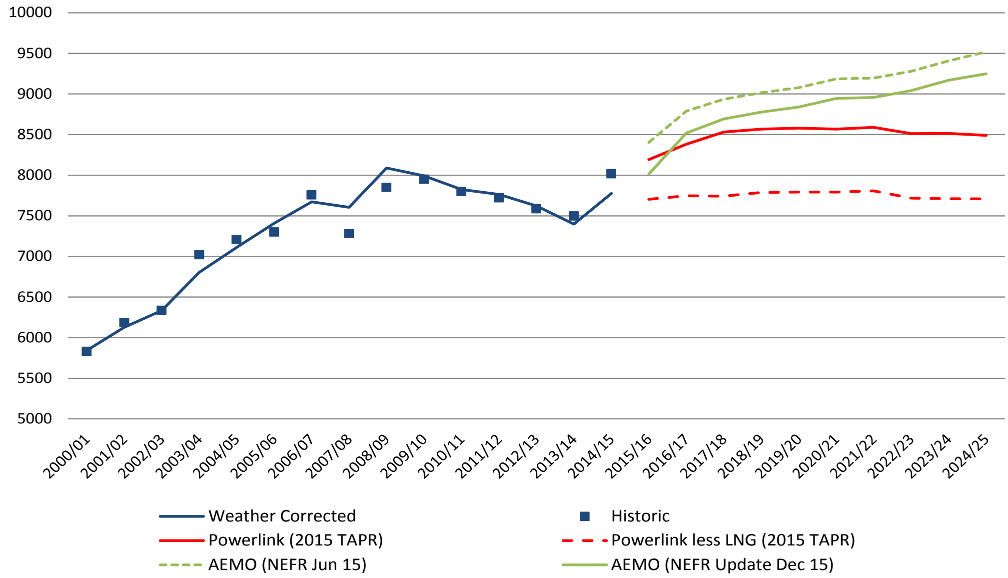
Future developments in battery storage technology coupled with solar PV could see further significant changes in electricity usage patterns. In particular, as battery storage technology further develops it has the potential to flatten electricity usage and reduce the need to develop transmission services to cover short duration peaks.

Powerlink's forecast of demand for electricity transmission services is essentially flat over a 10 year outlook (excluding growth in the shorter term due to the commissioning of upstream LNG facilities in the Surat Basin).

Figure 2.3 illustrates Powerlink's forecast for maximum electricity demand over the 2018-22 regulatory period. The forecast of demand for transmission services from AEMO in its 2015 National Electricity Forecasting Report (NEFR) and NEFR[18] update are higher than Powerlink's forecast. Powerlink has not used this higher forecast in the preparation of its Revenue Proposal.

18 *National Electricity Forecasting Report*, AEMO, December 2015

Figure 2.3: Summer peak electricity demand forecast (MW)




Source: Powerlink and AEMO data.

## 2.8 2013-17 regulatory period

Powerlink has made significant changes to its operations over the current 2013-17 regulatory period. These have included pursuing efficiency savings and network investment optimisation to deliver an efficient, reliable high voltage network. These changes have been made in conjunction with changes in Powerlink's external environment and as part of its focus on delivering better value to customers and consumers.

The most significant outcome of these changes in Powerlink's approach and the external environment has been reduced capital expenditure in the 2013-17 regulatory period compared to the allowance set in the AER's 2012 Transmission Determination. Total capital expenditure in the current regulatory period is forecast to be $1.4b (or 52%) under the 2012 allowance of $2.7b. This can be attributed to a significant reduction in electricity demand growth and, in that context, Powerlink cancelling or deferring load driven investment as well as Powerlink proactively taking a different approach to optimise the timing and scope of its planned reinvestment program to deliver better value to electricity consumers.

Changes proactively made by Powerlink and in response to changes in the external environment are further outlined in Chapter 4.

# 3 Customer and Consumer Engagement

## 3.1 Introduction

This chapter outlines Powerlink's customer and consumer engagement activities and how they influenced and improved its Revenue Proposal.

*Key highlights*

- Powerlink's engagement with customers and consumers directly influenced several aspects of its Revenue Proposal including:
  - Operating expenditure - use of benchmarking, individual line item efficiency analysis and more detailed evaluation of the efficient base year;
  - Demand and energy forecasting – improved approach to demand and energy forecasting with impacts of new technology such as battery storage included for the first time;
  - Network planning – input to Greater Brisbane area plan with outcome to maintain flexibility at lowest costs in the short to medium term; and
  - Engagement approach – engage through face-to-face activities with a focus on areas that have greatest impact on electricity prices.
- Powerlink undertook a dedicated stakeholder identification and mapping process to ensure an appropriate representative sample of customers and consumers participated in engagement activities.
- Powerlink sought to engage at the "Involve" level of the International Association for Public Participation's (IAP2) Public Participation Spectrum by seeking input at an early stage to assist with the development of methodologies and processes, rather than just seeking feedback on draft outputs.
- A long term view was taken to engagement, with a framework created to inform better decision making as part of business-as-usual, not just for Powerlink's Revenue Proposal.

## 3.2 Powerlink's engagement approach

### 3.2.1 Engagement objectives

As part of its commitment to IAP2 values and the AER's Consumer Engagement Guideline,[19] Powerlink set the following engagement objectives for its Revenue Proposal:

- Engage early at the "Involve" level of the IAP2 Spectrum where possible by seeking input on methodologies and processes rather than "Consult" on outputs;
- Find out what is important to our stakeholders and how they want to be engaged by undertaking research to identify key issues and engagement preferences;
- Present information in a clear and accessible manner so that customers and consumers can meaningfully participate in engagement activities and provide informed feedback;
- Work with stakeholders to ensure a clear scope of engagement outlining which elements of Powerlink's operations and decision making they can influence;
- Educate Powerlink staff to improve engagement skills and identify engagement opportunities, building a solid internal culture that values and embraces engagement with customers and consumers;

19 *Consumer Engagement Guideline for Network Service Providers*, AER, November 2013.

- Genuinely consider feedback received and ensure that stakeholder feedback has the appropriate level of influence on decisions; and
- Demonstrate how engagement has improved Powerlink decision making by regularly communicating with stakeholders about how their feedback has been used.

### 3.2.2 Powerlink's engagement approach

Powerlink has taken a long term view to its engagement approach, to create a framework of engagement activities to inform better decision making as part of business-as-usual operations. Engagement about the Revenue Proposal was undertaken through this business-as-usual framework.

Due to its position in the electricity supply chain, Powerlink's engagement approach for its Revenue Proposal was about "depth" rather than "breadth". Stakeholder mapping was used to identify who Powerlink needed to engage, with discussion topics selected through a process that involved input from both external stakeholders and key Powerlink representatives.

Figure 3.1: Powerlink's engagement approach


Source: Powerlink, Stakeholder Engagement Framework.

*Alignment with AER and IAP2 engagement principles*

Powerlink's engagement approach is aligned with engagement principles set by both the AER through its Consumer Engagement Guideline and the IAP2.

Table 3.1 provides examples of how Powerlink followed the engagement principles set by the AER guideline.

Table 3.1: Alignment with AER engagement principles

| AER engagement principles | Powerlink actions (both business-as-usual and Revenue Proposal specific) |
|---|---|
| Clear, accurate and timely communication | • Simple overview sheets of key concepts and methodologies.<br>• Pre-reading provided to participants before every engagement activity.<br>• Summary reports showing actions and influence distributed in a timely manner after engagement activities.<br>• All relevant communication made available through Powerlink website and social media channels. |
| Accessible and inclusive | • Stakeholder mapping identified appropriate stakeholders to be engaged.<br>• Stakeholders proactively contacted by Powerlink to be involved in engagement activities.<br>• Stakeholders specifically asked about engagement preferences.<br>• Formal ToR established for Powerlink Customer and Consumer Panel to ensure all relevant stakeholder groups are represented.<br>• Powerlink pays for travel costs of Customer and Consumer Panel members.<br>• All relevant information sheets, presentations and summary reports available on website.<br>• Dedicated email address created to allow contact with Revenue Proposal team. |
| Transparent | • All relevant information sheets, presentations and summary reports circulated to participants and made available on Powerlink's website.<br>• Early indicative forecasts for operating and capital expenditure and price path made publicly available through website.<br>• Model and inputs of demand and energy forecast made available on website so stakeholders could test the impact of their own input assumptions on the resulting forecasts. |
| Measurable | • Clear engagement Key Performance Indicators (KPI) set.<br>• Regular feedback reports to ensure stakeholders could view how their input has influenced decision making.<br>• Formal surveys of stakeholders used to gain quantitative and qualitative data about effectiveness of engagement. |

Powerlink's engagement program aligns with IAP2's Core Values and Code of Ethics.[20] Powerlink sought to engage at the "Involve" level of the IAP2 Spectrum[21] where possible by involving stakeholders earlier in the decision making process to ensure they had an appropriate level of influence. At each engagement Powerlink ensured that clear and realistic timeframes were established so that stakeholder engagement was both effective and meaningful.

## 3.3 Customer and consumer research

In 2014, Powerlink commissioned engagement consultancy Articulous Communications to analyse engagement approaches undertaken by other energy network businesses. This study involved desktop research of 24 organisations, a review of more than 1,000 pages of engagement strategies and relevant AER papers and submissions, and four in-depth, one-on-one interviews. The purpose of this research was to obtain learnings to inform and improve Powerlink's engagement approach. These key learnings are set out in Table 3.2. A copy of the Articulous Communications research report is included as Appendix 3.01 to the Revenue Proposal.

In February and March 2015, Powerlink also used independent research firm ACCSR to undertake in-depth customer and consumer perception research. The research involved 30 stakeholders who included directly connected customers, consumer advocacy groups, industry peak bodies and government/regulatory representatives. This research enabled Powerlink to better understand key customer and consumer perceptions to focus on in the context of its Revenue Proposal.

20 *Foundations of Public Participation*, IAP2, http://www.iap2.org.au/resources/iap2s-foundations-of-public-participation.

21 *Public Participation Spectrum*, IAP2, https://www.iap2.org.au/documents/item/84.

Table 3.2: Key learnings from customer and consumer perception research

| Key learning | Influence on engagement approach |
|---|---|
| High electricity prices are the main consumer issue/concern | Engagement focused on aspects of Powerlink operations that have greatest impact on electricity prices. |
| Stakeholders want more information about future network investments | Engaged on Powerlink's demand and energy forecasting methodologies, providing increased transparency and understanding. Established and implemented formalised process to involve stakeholders in Area Plan Forums to discuss long term network planning considerations. |
| Preference for face-to-face engagement | Provided multiple opportunities for stakeholders to interact face-to-face with Powerlink and have interactive discussions. |
| Directly engage with consumer advocates about role of transmission in price setting and educate about the trade-off between price and reliability | Identified consumer advocacy groups as key stakeholders and involved them in discussions on price/reliability trade-offs. |

Appendix 3.02 contains further information on the ACCSR Customer and Consumer Perception Research Report.

## 3.4 Key stakeholder groups

Powerlink's engagement focused on the key stakeholder groups outlined in Table 3.3.

Table 3.3: Key stakeholder groups

| | |
|---|---|
| **Consumer advocates** | Council of the Ageing (COTA)<br>Energy Consumers Australia<br>Queensland Council of Social Services (QCOSS)<br>St Vincent de Paul |
| **Directly connected customers** | Energex<br>Ergon Energy<br>Generators<br>Large industrial (smelters, refineries, rail)<br>Resource companies |
| **Regulators and government** | AER<br>Australian Energy Market Operator (AEMO)<br>Australian Energy Market Commission (AEMC)<br>Department of Energy and Water Supply<br>Queensland Treasury<br>Shareholding Ministers |
| **Industry** | Commonwealth Scientific and Industrial Research Organisation (CSIRO)<br>Energy Networks Association (ENA)<br>Energy Retailers Association of Australia (ERAA)<br>Energy Supply Association of Australia (ESAA)<br>Energy Users Association of Australia (EUAA)<br>Industry groups - Chamber of Commerce and Industry Queensland, Queensland Farmers Federation, Queensland Resources Council |

As part of Powerlink's transparent engagement approach, members of the AER's Consumer Challenge Panel, sub-panel 4 (CCP4),[22] were invited and attended many engagement activities as observers.

22 The CCP4 refers to those memebers assigned by the AER to Powerlink's 2018-22 transmission determination process.

## 3.5 Engagement activities

### 3.5.1 Face-to-face engagement

Powerlink focused primarily on face-to-face engagement with stakeholders, consistent with one of the key learnings from Powerlink's customer and consumer research. The engagement activities noted below have been established as business-as-usual opportunities for stakeholders to provide input to Powerlink's operations. All pre-reading, presentations and supporting information generated as part of face-to-face engagement are available on Powerlink's website.[23]

*Powerlink Customer and Consumer Panel*

Powerlink established its Customer and Consumer Panel in May 2015, with a representative membership of directly connected customers, consumer advocates and industry representatives. The panel continues to meet on a quarterly basis to provide a face-to-face forum for stakeholders to provide their input to Powerlink decision making processes and methodologies. With regard to its Revenue Proposal, Powerlink sought input and feedback from the panel on its approach to forecasting operating and capital expenditure, early expenditure forecasts and approaches to transmission pricing and depreciation.

*Demand and Energy Forecasting Forum*

On 30 March 2015, Powerlink hosted a Demand and Energy Forecasting Forum with experts from a wide range of industries to learn more about new technologies and the impacts they may have on future electricity demand and energy. As a result of this forum several enhancements were made to Powerlink's forecasting methodology in the Transmission Annual Planning Report 2015 (TAPR). This included improved monitoring of the impact of solar PV and the addition of transparent modelling assumptions for the impact of battery storage, electric vehicles, energy efficiency improvements and tariff reform for the first time.

In line with Powerlink's commitment to transparency, its demand and energy forecasting model was also made publicly available through its website, also for the first time.

*Transmission Network Forum*

On 24 July 2015, Powerlink held its annual Transmission Network Forum with more than 100 stakeholders present to discuss the future development of Queensland's electricity transmission network. The forum commenced with a presentation on Powerlink's TAPR, followed by concurrent interactive breakout sessions on three topics: Powerlink's Revenue Proposal; how to optimise the long term planning of the transmission network; and the impact of technology on demand and energy forecasts.

*Area Plan Forums*

One of the key findings of Powerlink's research was that stakeholders wanted more information and involvement in future network planning and investment decisions. In response, Powerlink has developed a strategy to host Area Plan Forums to allow stakeholder involvement in network planning decisions.

In 2015, stakeholders were invited to provide input on the Greater Brisbane and Central Queensland to Southern Queensland Area Plans. Both Area Plans were in the early stages of development and focused on investment decisions required in the five to 15 year outlook. The focus of these forums were Powerlink's approach to optimising asset reinvestment decisions in these areas, including options such as network reconfiguration and asset retirement. Stakeholders were invited to contribute views on aspects such as investment strategy, network reliability, market operation, strategic value of land and easements, landowner impacts, reputation and public safety.

23 *Customer and Consumer Panel and Engagement Forums*, Powerlink, https://www.powerlink.com.au/Community_and_Environment/Stakeholder_Engagement/Customer_and_Consumer_Panel_and_Engagement_Forums.aspx.

*Stakeholder briefings and industry presentations*

Powerlink undertook a number of one-on-one briefings with key stakeholders including the Queensland Government, AEMO, Energex, Ergon Energy, Queensland Resources Council (QRC) and the Energy Users Association of Australia (EUAA). Powerlink also provided updates on the Revenue Proposal through presentations at key industry conferences including the EUAA's Queensland Energy Forum and National Conference.

### 3.5.2 Online engagement

Online mediums were also utilised to complement Powerlink's face-to-face engagement. These included:

- *Transmission pricing webinar* - following on from its session with Powerlink's Customer and Consumer Panel on its early thinking in relation to potential changes to its transmission pricing arrangements, a webinar was held on 12 October 2015 which primarily involved Powerlink's customers.

  The webinar was held after Powerlink's directly connected customers indicated they wanted further information on how the potential changes to Powerlink's Pricing Methodology may impact them. Powerlink also prepared and published a Consultation Paper on Transmission Pricing on its website to assist in this discussion; and

- *Powerlink website* - dedicated sections for stakeholder engagement and the Revenue Proposal process were created on Powerlink's website to allow access to information and provide an opportunity for those stakeholders not involved in face-to-face engagement activities to provide input.

## 3.6 How feedback influenced decision making

One of Powerlink's engagement objectives was to genuinely consider feedback received and ensure that stakeholders have the appropriate level of influence on decisions. Table 3.4 summarises the key topics discussed with stakeholders, the feedback received and how Powerlink considered and used this feedback.

More detailed information about how stakeholder feedback was used to inform Powerlink's Revenue Proposal is discussed in the relevant chapters.

Table 3.4: How feedback influenced decision making

| Topic | Themes and focus areas | Summary of feedback received | How Powerlink used the feedback |
|---|---|---|---|
| Capital Expenditure Forecasting Methodology | Use of top-down, bottom-up "hybrid" approach to expenditure forecasting.<br>Criteria to select projects to support and complement top-down forecasts. | Use a more detailed analysis of bottom-up information for reinvestment expenditure where there is less certainty of the ongoing need for the asset. | Asset Management Plan considers the enduring needs for assets and optimisation alternatives potentially involving decommissioning. Detail provided as supporting information. |
| | | Bottom-up information to supplement top-down capital expenditure should not be based on capital expenditure alone. | Criteria was expanded to projects expected to cost more than $10m or where a technically feasible option may include network reconfiguration or a non-network solution. |
| | | Repex modelling needs to be robust to ensure an efficient rate of reinvestment and unit costs. | Introduced geographic zones into the Repex Model to reflect that different environments have a different impact on assets and the need for reinvestment.<br>Excluded assets from model where there may not be an enduring need.<br>Analysed model input data to ensure repex forecast is aligned with flat demand growth outlook.<br>Obtained third party benchmarking of unit costs applied in the replacement expenditure model. |
| Operating Expenditure Forecasting Methodology | Operating expenditure efficiency.<br>Use of benchmarking.<br>Evaluation of efficient base year. | Should undertake a "deep dive" to identify operational efficiencies. | Reviewed opex for efficiencies at an individual line item level. |
| | | Use benchmarking and/or external review to gain a better understanding of efficient base year. | Engaged independent consultant to review Powerlink's opex performance and efficient base year. |
| | | Consider longer term trends in operating expenditure and how they link with variables such as the environment. | Have undertaken long term opex modelling to understand trends at total operating expenditure and category levels. |
| Demand and Energy Forecasting Methodologies | Impact of technology such as battery storage, electric vehicles and energy efficiency on energy and demand forecasting. | Gain a better understanding of new technologies, consumer behaviour, government policies and overseas case studies. | Powerlink developed a new approach to its demand and energy forecasting model to assess the impacts of battery storage and energy efficiency for the first time. |

| Topic | Themes and focus areas | Summary of feedback received | How Powerlink used the feedback |
|---|---|---|---|
| Rate of Return Approach | Factors to consider when formulating Weighted Average Cost of Capital (WACC) | Need to engage early on potential WACC outcome to assist customers in their decision making. | Communicated upfront that AER Rate of Return Guideline approach would be applied in Powerlink's Revenue Proposal.<br>Published overview sheet on rate of return in July 2015.<br>Conveyed early indicative WACC estimate in engagement forums and meetings. |
| | | Investigate the need to remove assets from the existing asset base where the ongoing need for the asset is at risk. | Asset Management Plan actively considers the enduring needs for assets and optimisation alternatives potentially involving decommissioning. Detail provided as supporting information. |
| | | There is an opportunity to manage the potential impact of depreciation costs and other offsets such as an adjustment to the rate of return applied to those assets. | Undertook engagement with stakeholders to understand their views on alternative depreciation models. |
| Transmission Pricing | Options for transmission pricing methodology.<br>Achieving price predictability | Mixed views on option to 'opt-in' to Nominated/Contract Demand only locational Transmission Use of System (TUOS) prices. | Powerlink committed to further consideration on amending Pricing Methodology to allow customers to opt-in. |
| | | Differing views of Powerlink staying with Cost Reflective Network Pricing (CRNP) or moving to Modified CRNP. | Powerlink has decided to continue to use CRNP as it is unclear if a utilisation based signal is appropriate in the current environment. |
| | | Support to stay with a 50/50 locational to non-locational revenue split | Will continue to use 50/50 split. |
| | | Support for further investigation into price predictability. | Commitment to undertake further investigation into price predictability opportunities. |
| | | Investigate potential for kVA based transmission charges. | Commitment to undertake further investigation into moving from kW to kVA based transmission charges. |
| Network Planning | Network resilience<br>Strategic value of land<br>Cost versus reliability trade offs<br>Market impacts and transfer capability | If trading off network resilience with cost savings, need to ensure the savings are material to the consumer. | Involved customers and consumers in Area Plan Forums to discuss cost v reliability trade-offs for the Greater Brisbane and Central Queensland to Southern Queensland areas. |
| | | Take a longer term view with regards to network resilience and strategic value of easements. | Decided to retain assets in Greater Brisbane area to maintain flexibility and lowest costs in the short to medium term. |
| | | Joint planning of network through collaboration with Energex and Ergon. | Powerlink engaged with Ergon and Energex in Area Plan Forums to discuss Greater Brisbane and Central Queensland to Southern Queensland areas. |

| Topic | Themes and focus areas | Summary of feedback received | How Powerlink used the feedback |
|---|---|---|---|
| Engagement Approach | Topics to be discussed<br>Preferred engagement techniques<br>Stakeholder identification | High electricity prices is the main consumer issue. | Engagement focused on aspects of Powerlink operations that have greatest impact on electricity prices. |
| | | Want more information about future network investments to ensure a reliable service and sustainable prices. | Engaged on Powerlink's demand and energy forecasting methodologies and formalised process to involve stakeholders in Area Plan Forums to discuss long term network planning considerations. |
| | | Preference for face-to-face engagement with the majority preferring techniques such as workshops and meetings. | Provided multiple opportunities for stakeholders to interact face-to-face with Powerlink and have interactive discussions. |
| | | Directly engage with consumer advocates about role of transmission in price setting and educate about the trade-off between price and reliability. | Identified consumer advocacy groups as key stakeholders and involved them in discussions on price/reliability trade-offs. |

## 3.7 Engagement evaluation

In line with the evaluation methodology outlined in the IAP2, Powerlink measured the success of its engagement program by focusing on the following components outlined in Table 3.5.

Table 3.5: Evaluation approach

| Evaluation component | Evaluation tool |
|---|---|
| Effectiveness of information provided to participants | • Stakeholder pulse survey<br>• Post activity feedback forms<br>• Informal feedback |
| Satisfaction levels of participants with engagement activities | • Stakeholder pulse survey<br>• Post activity feedback forms<br>• Informal feedback |
| Stakeholders engaged at the appropriate level | • Stakeholder pulse survey<br>• Post activity feedback forms<br>• Informal feedback |
| Impact of engagement on Powerlink decision making | • Formal tracking of how feedback influenced decision making (see Section 3.6)<br>• Internal reviews |
| Consistency with AER Consumer Engagement Guideline | • Stakeholder pulse survey<br>• Post activity feedback forms<br>• Informal feedback |

### 3.7.1 Stakeholder pulse survey

In October 2015, Powerlink used a web based survey to assess stakeholder satisfaction with its engagement approach. The survey was sent to more than 250 stakeholders, with the survey completed by more than 90 respondents. Satisfaction ratings are outlined in Table 3.6.

Table 3.6: Satisfaction ratings

| Engagement activity | Average satisfaction Scale 1 (very unsatisfied) – 5 (very satisfied) |
|---|---|
| Demand and Energy Forecasting Forum (March 2015) | 3.8 |
| First Customer and Consumer Panel meeting (May 2015) | 3.6 |
| Qld Transmission Network Forum (July 2015) | 3.9 |
| Second Customer and Consumer Panel meeting (August 2015) | 3.6 |

Survey results showed the greatest improvement in stakeholder perceptions of Powerlink's was in its social performance. Stakeholders also identified effective engagement as one of the key drivers of Powerlink's reputation and rated Powerlink's engagement approach very positively overall.

Outside of large directly connected customers, stakeholders indicated that value for money was of increasing importance to them, with reliability of supply falling in importance.

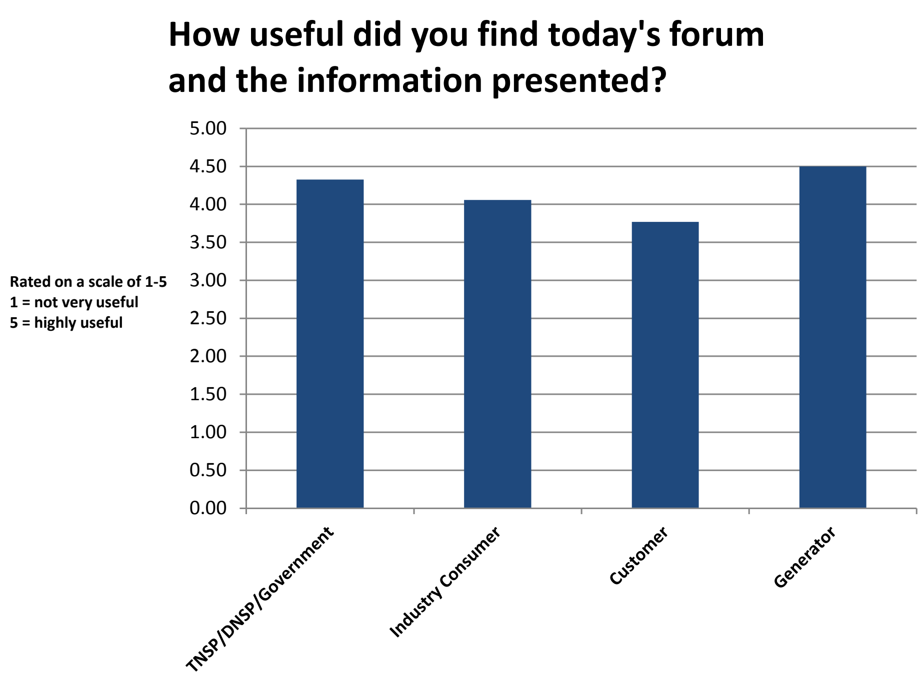
Further information on the stakeholder pulse survey is included as Appendix 3.03 to Powerlink's Revenue Proposal.

### 3.7.2 Post activity feedback forms

To rate the effectiveness of key engagement activities, Powerlink asked participants to complete a feedback form to gain insights into the effectiveness of the activity and the suitability of the information provided.

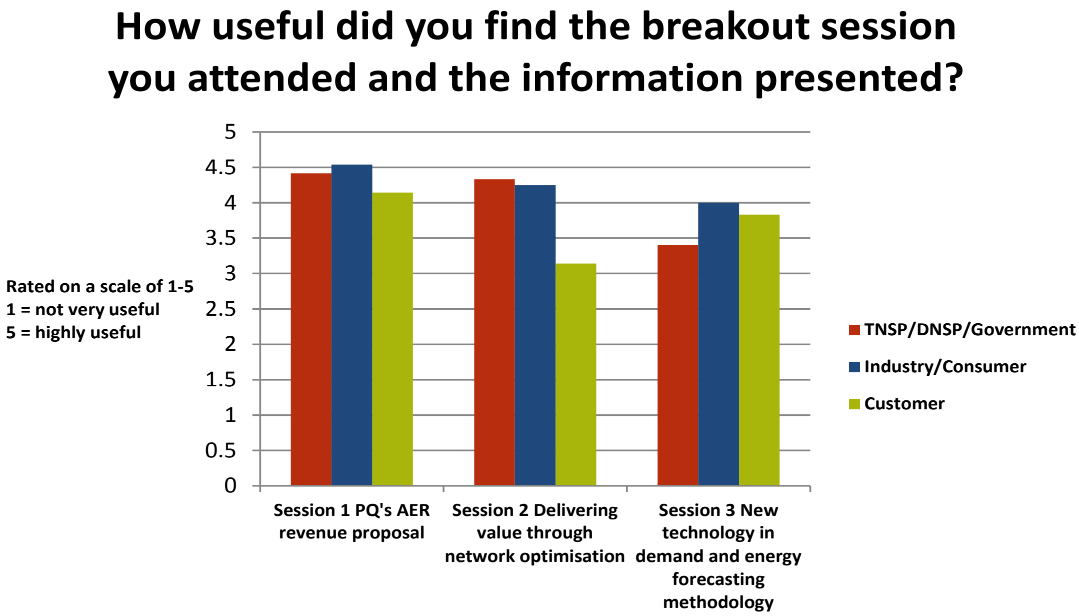
At Powerlink's Transmission Network Forum, participants were asked to rate on a scale of 1 to 5 (1 being not very useful to 5 highly useful) the information presented at the forum and in the individual breakout sessions. A total of 58 participants responded. The results are shown in Figures 3.2 and 3.3. A full copy of the participant feedback report is attached as Appendix 3.04 to the Revenue Proposal.

Figure 3.2: Transmission network forum feedback summary




Source: Powerlink, Transmission Network Forum Survey Results.

Figure 3.3: Transmission network forum breakout sessions feedback




Source: Powerlink, Transmission Network Forum Survey Results.

A similar feedback form was completed by participants of the Central Queensland/Southern Queensland Area Plan Forum and is attached as Appendix 3.05 to Powerlink's Revenue Proposal.

## 3.8 Future direction

Powerlink views effective engagement with its customers and consumers as central to the continued delivery of valued transmission services.

Powerlink's approach to stakeholder engagement will continue to evolve based on feedback received from customers and consumers about recent engagement activities. While gains have been made, Powerlink acknowledges there is more to be done to ensure that engagement is timely, effective and delivers value to all parties involved.

In that regard, Powerlink is committed to learning from recent engagement experiences and responding to key challenges including:

- Ensuring that information is presented in a way that meets the needs of a diverse range of stakeholders (in terms of detail and technical content);
- Achieving a balance between information contained in pre-reading and that conveyed during face-to-face discussions to ensure that stakeholders are adequately prepared to provide input during engagement activities; and
- Effectively facilitating engagement activities to ensure that all stakeholders get a reasonable opportunity to put forward their views and feedback.

To deliver value to customers and consumers, Powerlink must strive to better understand their needs and priorities and will make effective engagement a focus of continued effort and improvement.

# 4 Historic Cost and Service Performance

## 4.1 Introduction

This chapter provides an overview of Powerlink's performance against the AER's allowances for capital and operating expenditure during the current and preceding regulatory periods and provides important context for forecast expenditure in the 2018-22 regulatory period. Powerlink's cost performance under the AER's Annual Benchmarking Report[24] is discussed, with a particular focus on operating expenditure performance in the current regulatory period. Finally, Powerlink provides a review of its performance under the AER's incentive schemes applied to operating expenditure (the Efficiency Benefit Sharing Scheme or EBSS) and network performance (the Service Target Performance Incentive Scheme or STPIS).

*Key highlights*

- During the 2013-17 regulatory period Powerlink has been implementing a range of strategic initiatives focused on efficiency and cost reduction, including changing its approach to capital investments and progressively realigning organisation structure and resource levels consistent with the ongoing demand for transmission services.
- Total capital expenditure in the current regulatory period is forecast to be $1.3b, a reduction of $1.4b (52%) compared to the AER's allowance of $2.7b. This can be attributed to a significant reduction in electricity demand growth which has resulted in Powerlink cancelling or deferring load driven investment and taking a different approach to optimise the timing and scope of its planned reinvestment program to deliver better value to electricity customers and consumers.
- Total operating expenditure within the regulatory period is forecast to be $992.3m, a reduction of $13.6m (-1.4%) compared to the AER's allowance of $1,005.9m. This outcome is a result of lower operating expenditure in the early part of the period, balanced against increased operating expenditure in the latter part of the period. This increase in operating expenditure was due to business restructuring costs, transmission line maintenance and refurbishment needs and a new Australian Energy Market Commission (AEMC) Levy.
- Powerlink has delivered strong performance under the STPIS in the current regulatory period by actively responding to incentives and closely managing network performance, availability, reliability and market impacts.

## 4.2 Regulatory requirements

The Rules[25] require that Powerlink's Revenue Proposal provides information related to its actual and forecast operating and capital expenditure during the current and preceding regulatory periods. The Rules[26] also require that, when considering Powerlink's proposed forecast expenditure, the AER also has regard to such expenditure.

## 4.3 Powerlink's efficiency focus

Driving efficiency and reducing costs has been a key area of focus for Powerlink in this regulatory period. Powerlink has sought to ensure that expenditure within the 2013-17 regulatory period is delivering better value through:

- A review of planned capital expenditure in light of the reduction in forecast demand growth. This resulted in Powerlink significantly reducing the scope of its forecast program of capital works in this regulatory period;

24 *Annual Benchmarking Report, Electricity Transmission Network Service Providers*, AER, November 2015.

25 *National Electricity Rules*, AEMC, schedule 6A.1.1(6) and schedule 6A.1.2(7).

26 *Ibid*, clauses 6A.6.7(e)(5) and 6A.6.6(e)(5).

- Taking a different approach to assessing options for reinvestment needs in a low demand growth environment, with an increased focus on alternative risk mitigation options (such as network reconfiguration and asset retirement) and technical solutions that deliver more flexibility than like-for-like replacement;
- Establishment of an organisation wide risk management framework to drive a robust and commercial approach to risk assessment, extending to strategic asset risk assessment and investment decision making; and
- The implementation of an organisation wide initiative to improve the initiation, scoping and estimation of projects.

Powerlink is also implementing a range of business initiatives focused on efficient performance and delivery that have and will continue to influence Powerlink's cost performance in the 2013-17 regulatory period and form the basis of Powerlink's assessment of forecast expenditure requirements in the 2018-22 regulatory period. These initiatives include:

- Implementation of a new simplified organisational structure to maintain efficiency in process and decision making. In 2013 Powerlink initiated a program to maximise accountability, productivity and performance, which focused on a top-down review of organisational structure, key accountabilities and workforce composition of the organisation. This resulted in the establishment of a simplified executive management and divisional structure, reduced layers within the organisational structure and broadened leadership and technical accountabilities for staff;
- Review and adjustment of resource levels within the business so that Powerlink is well positioned to deliver efficient transmission services. In 2015 Powerlink responded to reductions in forecast workload (related to capital investment) and commenced adjusting resource levels across the business to align with forecast workload needs; and
- Review and implementation of cost effective long term arrangements for maintenance service delivery across Queensland, through comprehensive market scanning for alternative service delivery models and independent advice on the capability of alternative service providers to deliver against Powerlink's requirements for maintenance service delivery.

## 4.4 Historic capital expenditure

With regard to historic capital expenditure, schedule 6A.1.1(6) of the Rules requires that Powerlink provide an annual summary of capital expenditure for the previous and current regulatory period (actual and forecast), categorised in the same way as for the capital expenditure forecast.

### 4.4.1 Actual capital expenditure

Powerlink's actual and forecast capital expenditure for the current regulatory period is set out in Table 4.1. Expenditure for the 2007/08 to 2014/15 financial years is based on actual expenditure net of disposals, while the 2015/16 and 2016/17 financial years are based on Powerlink's current expenditure plans and forecasts.

Table 4.1: Capital expenditure – actual/forecast ($m, nominal)

| Project category | | 2007/08 | 2008/09 | 2009/10 | 2010/11 | 2011/12 | Total | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Network | | | | | | | | | | | | | |
| Load driven | Augmentations | 410.2 | 344.2 | 207.6 | 133.1 | 296.2 | 1,391.3 | 155.7 | 98.8 | (1.3) | 2.5 | 0.0 | 255.7 |
| | Connections | 22.7 | 27.4 | 30.8 | 12.6 | 8.3 | 101.8 | 5.8 | 7.5 | 0.8 | 0.0 | 0.0 | 14.1 |
| | Easements | 23.6 | 20.2 | 17.2 | 17.1 | 12.9 | 91.0 | 12.7 | 10.8 | 6.2 | 11.4 | 5.3 | 46.5 |
| Non-load driven | Reinvestments | 170.7 | 191.6 | 145.7 | 216.4 | 253.6 | 978.0 | 229.0 | 178.5 | 130.0 | 111.5 | 174.9 | 823.9 |
| | Security/compliance | 2.3 | 2.3 | 9.1 | 3.6 | 15.6 | 32.9 | 5.1 | 5.8 | 4.5 | 2.3 | 3.7 | 21.4 |
| | Other | 6.6 | 13.6 | 5.8 | 5.7 | 10.4 | 42.1 | 12.2 | 6.1 | 2.1 | 5.2 | 4.1 | 29.8 |
| | Total network | 636.1 | 599.2 | 416.3 | 388.5 | 597.0 | 2,637.1 | 420.6 | 307.6 | 142.4 | 133.0 | 188.0 | 1,191.6 |
| Non-Network | | | | | | | | | | | | | |
| Business IT | Information Technology | 10.4 | 12.7 | 11.6 | 12.4 | 16.4 | 63.4 | 8.0 | 5.4 | 9.7 | 15.2 | 16.3 | 54.7 |
| Support the business | Commercial buildings | 4.4 | 6.7 | 10.6 | 14.8 | 8.1 | 44.5 | 15.0 | 0.3 | 3.2 | 5.6 | 2.7 | 26.9 |
| | Motor vehicles | 0.8 | 1.3 | 3.3 | 2.9 | 4.3 | 12.5 | 1.3 | 1.8 | 1.9 | 4.7 | 3.1 | 12.9 |
| | Moveable plant/ tools and equipment | 1.3 | 1.2 | 1.4 | 2.1 | 1.6 | 7.7 | 0.8 | 1.0 | 1.2 | 1.2 | 1.2 | 5.3 |
| | Total non-network | 16.9 | 21.9 | 26.9 | 32.2 | 30.3 | 128.2 | 25.1 | 8.5 | 16.1 | 26.8 | 23.3 | 99.8 |
| **Total Capital Expenditure** | | **653.0** | **621.1** | **443.2** | **420.7** | **627.3** | **2,765.3** | **445.7** | **316.1** | **158.5** | **159.8** | **211.3** | **1,291.4** |

Note: Actual and forecast expenditure reported above does not include any margins paid or expected to be paid to related parties.

### 4.4.2 Network capital expenditure

At the time Powerlink developed its Revenue Proposal in 2010/11, electricity industry participants and major electricity consumers expected significant and continued economic growth over a 10 year outlook, underpinned by the growth of the mining and resources sector in Queensland.

By way of example of the growth expectations at that time, in a submission to Powerlink's Revised Revenue Proposal for the 2013-17 regulatory period, the QRC said that:

> *"In value of production terms, Queensland's resources sector could grow by as much as 243 percent to $141 billion over the next 10 years."*[27]

Under this scenario the QRC foreshadowed the potential need for an additional 4,000MW of supply to resource developments stating that:

> *"The QRC anticipates that there will be substantial resource loads connected to both the transmission and distribution networks which will result in the need to augment the transmission network."*[28]

Significant focus was placed on Powerlink's ability to respond to the growing demand for electricity which, at the time, was conservatively forecast to grow by around 4% per annum.[29]

Despite expectations of significant demand growth, the early years of the 2013-17 regulatory period saw a sharp downturn in commodity prices which significantly reduced resource sector investment, underlying economic growth and the associated demand for electricity. Consumer response to high electricity prices, increased focus on energy efficiency and the uptake of distributed solar PV installations saw further reductions in forecast demand growth, which by the middle of the current regulatory period had fallen to 0.2% per annum,[30] excluding the growth in LNG loads in the Surat Basin.

In response to the reductions in forecast demand growth, Powerlink cancelled or deferred a significant amount of load driven capital expenditure originally forecast in the 2013-17 regulatory period. Load driven expenditure is now forecast to total $316.4m in this regulatory period, with negligible expenditure in the final two years. This represents a reduction of $789.9m (71%) against the AER allowance, of $1,106.3m.

The reduction in forecast demand growth also had a significant impact on Powerlink's planned reinvestment program. In this changed environment, Powerlink has adapted its approach to reinvestment decisions, with a particular focus on assessing whether there was an enduring need for the key assets and alternative investment options to manage asset condition and risks at a lower cost (such as network reconfiguration or asset retirement). Also, Powerlink has taken a cautious approach in determining where it is appropriate to refit or replace aging transmission line assets and how to implement these works cost effectively. These changes have been aimed at delivering better value to consumers.

For the reasons outlined above, capital expenditure driven by asset condition, compliance and other non-load related factors has also significantly reduced in the 2013-17 regulatory period compared to the AER allowance. Non-load driven expenditure is now forecast to total $875.2m, a reduction of $594.0m (40%) from the AER's allowance of $1,469.3m.

### 4.4.3 Non-network capital expenditure

Non-network capital expenditure in the current regulatory period is expected to be $99.8m, a reduction of $33.6m (-25%) compared to the AER's allowance of $133.4m. Information Technology (IT) expenditure is a significant portion of this category and is forecast to reach $54.7m against the AER allowance of $83.0m.

27 *Powerlink Revised Revenue Proposal*, QRC, February 2012.

28 *Ibid.*

29 *Electricity Statement of Opportunities*, AEMO, 2011, p.62.

30 *Medium, 50% PoE demand forecast*, Transmission Annual Planning Report 2015, Powerlink, p. 27.

IT capital expenditure in the current regulatory period has been impacted by Powerlink's internal restructure of the business and adjustments to resource levels to align with ongoing demand for its services. Powerlink prudently sought to defer the implementation of new IT initiatives that would have placed an additional change management burden on the business. In 2012/13, Powerlink also initiated a separate program to enhance IT governance, maturity and delivery capability. These factors contributed to periods of reduced IT capital expenditure in this regulatory period and resulted in the deferral of IT investment programs that are required to support ongoing productivity improvements. Forecast IT capital expenditure in the remainder of the 2013-17 regulatory period and in the 2018-22 regulatory period reflects the continued implementation of these important strategic initiatives, which are an enabler of business efficiencies and will assist in achieving the forecasts.

### 4.4.4 Total capital expenditure

Powerlink's total actual/forecast capital expenditure by year relative to the AER's allowance for the current regulatory period is provided in Table 4.2.

Taking into account the significant reduction in forecast demand growth and Powerlink's focus on optimising reinvestment expenditure, total capital expenditure for the 2013-17 regulatory period is expected to be $1.3b, a reduction of $1.4b (52%) compared the AER's allowance of $2.7b.

Table 4.2: Capital expenditure – allowance vs actual/forecast ($m, nominal)

| | 2012/13 | 2013/14 | 2014/15 | 2015/16 (forecast) | 2016/17 (forecast) | Total |
|---|---|---|---|---|---|---|
| Allowance | 679.1 | 575.4 | 420.1 | 478.8 | 555.6 | 2,709.0 |
| Actual/forecast | 445.7 | 316.1 | 158.5 | 159.8 | 211.3 | 1,291.4 |

## 4.5 Historic operating expenditure

With regard to historic operating expenditure, schedule 6A.1.2(7) of the Rules requires that Powerlink provide an annual summary of operating expenditure for the current regulatory period (actual and forecast), categorised in the same way as for the operating expenditure forecast. This information is provided in Table 4.3.

### 4.5.1 Actual operating expenditure

Table 4.3: Operating expenditure – actual/forecast ($m, nominal)

| | 2012/13 | 2013/14 | 2014/15 | 2015/16 (forecast) | 2016/17 (forecast) | Total |
|---|---|---|---|---|---|---|
| Field maintenance | 56.2 | 61.5 | 64.2 | 66.4 | 74.4 | 322.6 |
| Operational refurbishment | 31.2 | 33.0 | 37.5 | 33.6 | 35.5 | 170.8 |
| Maintenance support | 12.5 | 13.4 | 12.7 | 14.7 | 14.5 | 67.8 |
| Network operations | 13.1 | 13.6 | 15.2 | 14.7 | 15.0 | 71.5 |
| Asset management support | 31.7 | 32.5 | 34.2 | 26.0 | 26.4 | 150.7 |
| Corporate support | 14.3 | 18.4 | 32.2 | 44.0 | 34.2 | 143.2 |
| **Controllable operating expenditure** | **159.0** | **172.4** | **196.0** | **199.3** | **199.9** | **926.6** |
| Insurance | 7.8 | 8.2 | 8.4 | 8.6 | 9.2 | 42.1 |
| Network support | 0.0 | 0.0 | 2.6 | 3.5 | 1.8 | 8.0 |
| AEMC Levy | 0.0 | 0.0 | 3.8 | 4.1 | 4.2 | 12.1 |
| Debt management costs | 0.5 | 0.5 | 0.5 | 1.0 | 1.0 | 3.5 |
| **Total operating expenditure** | **167.4** | **181.0** | **211.3** | **216.5** | **216.1** | **992.3** |

Note: IT support costs were reported in Asset Management Support to 2014/15 and in Corporate Support from 2015/16 onwards.

Powerlink's total operating expenditure in the 2013-17 regulatory period is expected to be broadly in line with the AER's allowance.

In the first two years of the period, Powerlink delivered management induced reductions in operational refurbishment and support functions which resulted in actual operating expenditure being 5-6% lower than the allowance. Operating expenditure in the latter part of the 2013-17 regulatory period has, or is expected, to exceed the AER's allowance due to the factors set out below:

- Powerlink is restructuring its business to establish a more simplified structure, drive efficiency in process and decision making and align resource levels with forecast workload levels. This initiative has resulted in increased operating expenditure for restructuring costs and redundancy payments;
- The increasing average age of the transmission line fleet has required increased maintenance and refurbishment expenditure above historic trends, particularly to manage advanced corrosion of structures, insulators and line hardware and line decommissioning costs;
- The write-off of expenditure on early capital project development works no longer required due to reduced electricity demand growth; and
- Additional operating expenditure to address the introduction of a new AEMC Levy, legislated by the Queensland Government in 2014.

Despite operating expenditure increasing in the latter part of the regulatory period, Powerlink has sought to reprioritise operational works where practical and expects its total actual operating expenditure to reach $992.3m a reduction of $13.6m (-1.4%) under the AER's allowance of $1,005.9m.

Table 4.4: Operating expenditure – allowance vs actual/forecast ($m, nominal)

| | 2012/13 | 2013/14 | 2014/15 | 2015/16 (forecast) | 2016/17 (forecast) | Total |
|---|---|---|---|---|---|---|
| Allowance | 179.4 | 191.3 | 200.4 | 211.7 | 223.1 | 1,005.9 |
| Actual/forecast | 167.4 | 181.0 | 211.3 | 216.5 | 216.1 | 992.3 |

## 4.6 Benchmarking performance

The following sections provide an overview of Powerlink's historic performance under the AER's 2015 Annual Benchmarking Report.

Powerlink notes that the AER is still in the early stages of developing its approach to transmission benchmarking and that it is faced with the significant challenge of developing robust benchmarking techniques that account for the small sample size and heterogeneous operating environments of only five TNSPs in the NEM.

In considering its historic performance and an efficient level of forecast operating expenditure, Powerlink sought an independent expert opinion from Huegin Consulting (Huegin). Huegin's independent report is based on RIN data used in the 2015 Annual Benchmarking Report (up to and including the 2013/14 financial year) and is provided as Appendix 4.01.

Powerlink considers that its benchmarked performance is comparable to its peers when operating environment factors are taken into account. Powerlink also recognises its performance can still be improved. Powerlink's aim is to deliver an increased level of productivity and cost reduction in its forecast capital and operating expenditure that responds to the concerns of its customers and consumers about electricity prices and the challenges posed by the external environment.

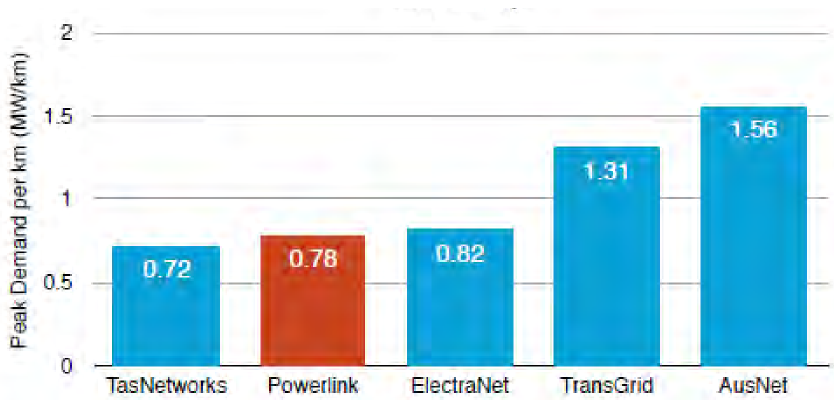
### 4.6.1 Significant cost drivers in Queensland

In its report, Huegin identified relevant operating environment factors that drive a number of differences in Powerlink's operating and capital expenditure benchmarking performance relative to other TNSPs. Powerlink understands that the AER takes operating environment factors into account in its assessment of forecast expenditure. Powerlink considers the following factors are relevant to this assessment.

*Low load and energy density*

As illustrated in Figure 4.1, Powerlink ranks lower on load density factors when compared to most other TNSPs.

Figure 4.1: Load density – peak demand/km




Source: Huegin, Powerlink Operating Expenditure Benchmarking Review, November 2015.

Powerlink's low load density implies that it has a greater number of circuit kilometres of line in service to meet peak demand and energy consumption, compared to most other TNSPs. This reflects the large distances that must be traversed between base load power stations and load centres in Queensland.

These factors mean that Powerlink will invariably make higher capital investments to transport energy over longer distances between generation and load centres compared with most other TNSPs. This will result in incrementally higher costs to maintain and operate those assets as a function of demand and energy output delivered from the network.

### 4.6.2 Differences in capitalisation policy

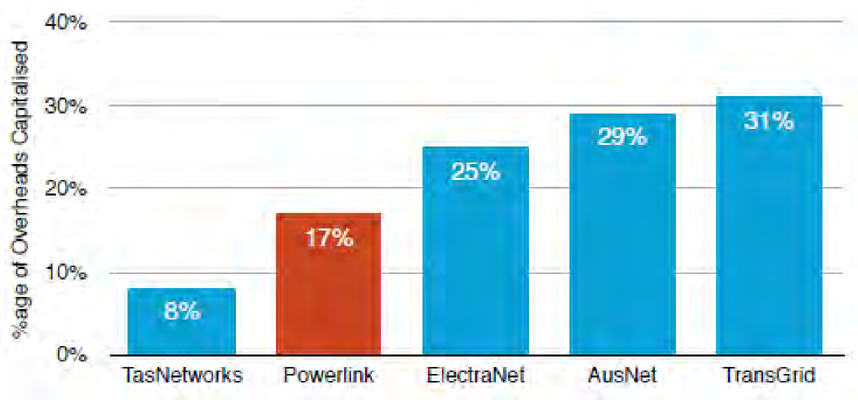
In addition to the inherent physical properties of Powerlink's network service area. Huegin note that:

> *"accounting practices adopted by the various transmission businesses are perhaps the most significant of all factors in the context of the AER benchmarking framework."*[31]

The benchmarking approach adopted by the AER does not explicitly recognise annual capital expenditure (as physical proxies for capital investment are used in total cost and other analysis). As such, businesses that capitalise a greater proportion of their total expenditure will invariably perform better under the AER's total operating expenditure benchmarks and related productivity measures.

Figure 4.2 shows the percentage of overheads capitalised by each TNSP, based on data provided annually to the AER in RIN responses. Such differences in capitalisation policy are likely to distort relative comparisons of operating expenditure efficiency.

Figure 4.2: Capitalisation of overheads




Source: Huegin, Powerlink Operating Expenditure Benchmarking Review, November 2015.

To demonstrate the impact of differences in capitalisation policy, the operating expenditure Partial Factor Productivity (PFP)[32] scores derived by the AER in its 2015 Annual Benchmarking Report were normalised for differences in capitalisation of overheads. This analysis showed that the differences in operating expenditure PFP scores would diminish significantly if each TNSP's approach to the capitalisation of overheads were better aligned. Once adjusted most TNSP's operating expenditure PFP scores (with the exception of Electranet) converge to within 3%.[33]

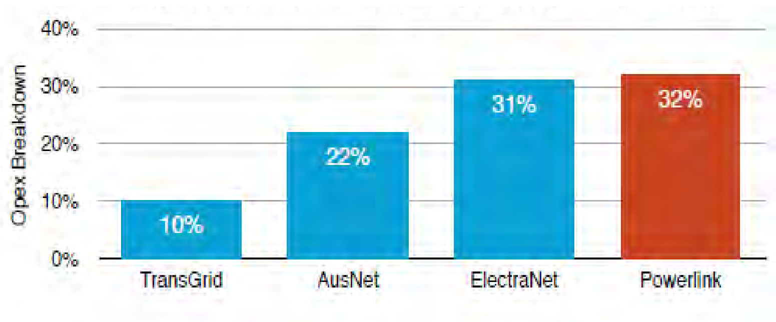
An analysis of historical RIN data also highlights that due to differences in capitalisation policy Powerlink allocates a greater portion of its controllable operating expenditure to refurbishment activities compared to most other TNSPs, illustrated in Figure 4.3. The difference in each TNSP's allocation of costs between capital and operating expenditure is another factor that should be taken into account when making relative comparisons of operating expenditure performance.

31 *Powerlink Operating Expenditure Benchmarking Review*, Huegin, December 2015, p. 11.

32 *Annual Benchmarking Report, Electricity Transmission Network Service Providers*, AER, November 2015, p.17.

33 *Op Cit*, p. 11.

Figure 4.3: Operational refurbishment costs (2013/14)




Source: Huegin, Powerlink Operating Expenditure Benchmarking Review, November 2015.

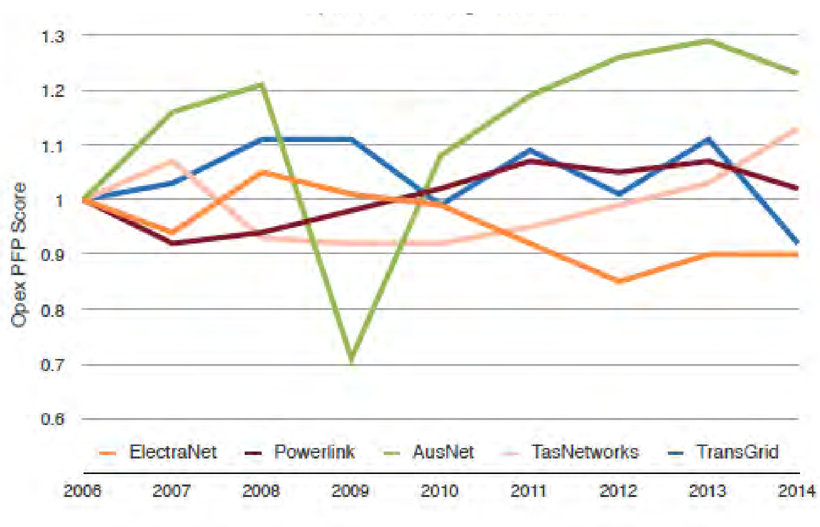
### 4.6.3 Operating expenditure performance

*Operating expenditure productivity*

In its report, Huegin concluded that due to the inherent limitations in making relative comparisons using the Multilateral Total Factor Productivity (MTFP) and Multilateral Partial Factor Productivity (MPFP) specifications, TNSPs are likely to be benchmarked against themselves over time. The AER made similar observations in its 2014 and draft 2015 Annual Benchmarking Reports.[34]

Figure 4.4 illustrates Powerlink's total operating expenditure PFP[35] over time, consistent with the methodology adopted by Economic Insights[36] in its advice to the AER for the 2014 and 2015 Annual Benchmarking Reports.

Figure 4.4: Operating expenditure PFP scores




Source: Huegin, Powerlink Operating Expenditure Benchmarking Review, November 2015.

34 *Draft Annual Benchmarking Report, Electricity Transmission Network Service Providers*, AER, November 2015, p. 16 and Final Annual Benchmarking Report, Electricity Transmission Network Service Providers, AER, November 2014, p. 21.

35 The total operating expenditure PFP compares the total operating expenditure of each TNSP against a standard basket of outputs delivered from the network (including energy throughput, ratcheted non-coincident maximum demand, voltage weighted connection points, circuit kilometres of transmission line and unserved energy).

36 *Economic Benchmarking Assess of Operating Expenditure for NSW and Tasmanian Electricity TNSPs*, Economic Insights, November 2014.

Under the total operating expenditure PFP measure, Powerlink's productivity has on average improved since 2006, with an average annual total operating expenditure productivity growth of +0.24% by 2014 compared to the industry average of -0.03%.

Powerlink notes that this long run average performance has been delivered by Powerlink despite the challenges of operating and maintaining a greater number of transmission assets which serve proportionally lower customer demand and energy consumption, compared to most other TNSPs.

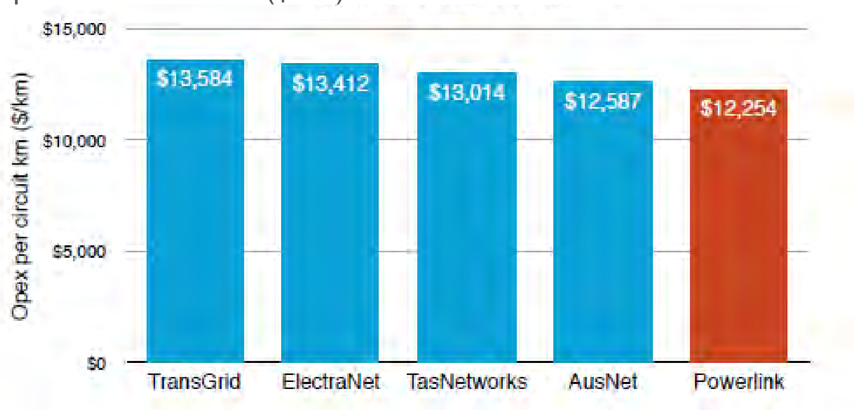
Between 2013 and 2014, Powerlink's total operating expenditure PFP score reduced. The chart shows a similar trend for all TNSPs except TasNetworks. Huegin's analysis reveals that these changes were substantially driven by output growth factors related to energy throughput and unserved energy. These factors are unlikely to result in a proportional change in operating expenditure in a single year.[37] This further illustrates that caution must be exercised when making relative comparisons under this measure or inferring that improvements were driven solely by cost efficiency.

### *Trend and category analysis*

To complement the top-down assessment of total operating expenditure productivity, Powerlink conducted a more detailed trend and category level analysis of its operating expenditure.

Figure 4.5 shows that in the 2013/14 financial year, Powerlink's operating expenditure per circuit kilometre was lower than all other TNSPs. This suggests that as a function of the physical size of its transmission network, Powerlink's total operating expenditure performance in 2013/14 is comparable (and marginally better) than other TNSPs.

Figure 4.5: Operating expenditure/circuit km ($/km)



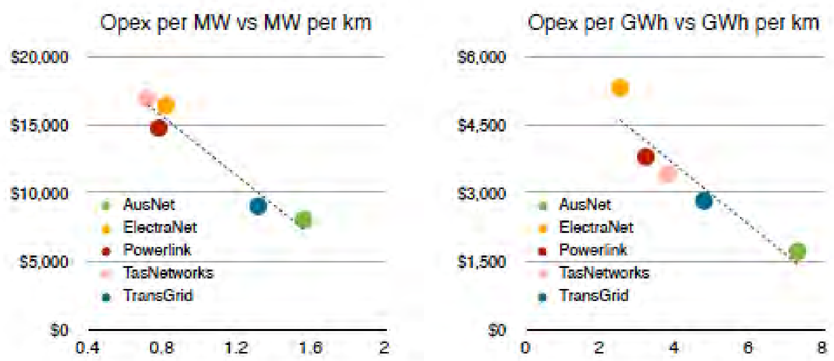

Source: Huegin, Powerlink Operating Expenditure Benchmarking Review, November 2015.

In Figure 4.6, 2013/14 total operating expenditure for each TNSP has been normalised by load and energy density factors. This illustrates that the relative efficiency of each TNSP is comparable, reflected by the close proximity of each TNSP's performance to the regression line.

In each case Powerlink sits below the regression line, which indicates marginally better cost performance than the industry average.

37 For example, TasNetworks' significantly improved performance was due to a strong increase in energy throughput and a decrease in unserved energy (leading to a +11.3% improvement in its output index). In contrast, Powerlink's reduced performance was due to a fall in energy throughput and increase in unserved energy (leading to a -1.9% reduction in its output index).

Figure 4.6: Operating expenditure normalised by load and energy density




Source: Huegin, Powerlink Operating Expenditure Benchmarking Review, November 2015.

Further analysis of Powerlink's historic operating expenditure at the category level (including field maintenance, vegetation management, network operations and support functions) confirmed that there is no evidence to suggest that Powerlink's total operating expenditure is inefficient when compared to other TNSPs. Huegin observed that:

- Powerlink's operating expenditure performance is as efficient as its peers when important environmental factors such as load and energy density, population density and service area are considered; and
- Powerlink's annual operating expenditure productivity has improved since 2006 and consistently remained above the industry average.

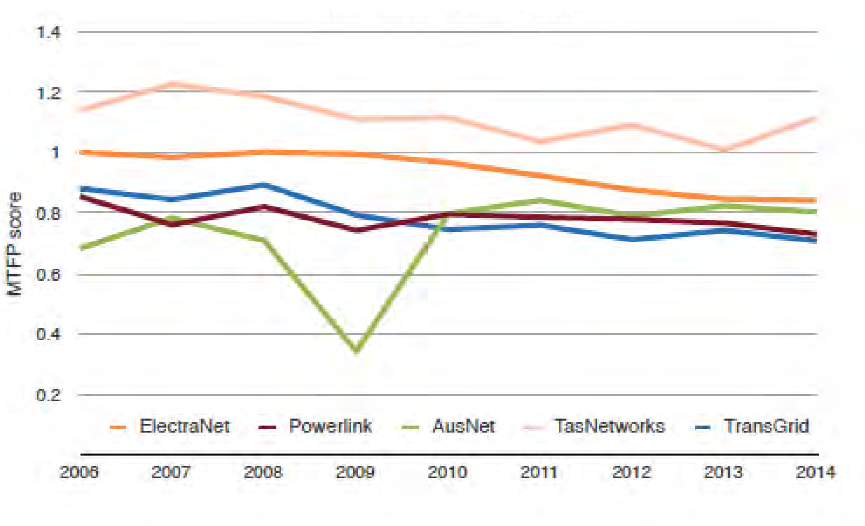
### 4.6.4 Total cost performance

Powerlink's total cost performance reported in the AER's 2015 Annual Benchmarking Report is significantly influenced by its historic capital expenditure and growth in the regulated asset base. In the early years of the benchmarking period, Powerlink made capital investments to maintain reliability of supply in an environment of high forecast demand growth. Outturn demand and energy consumption in more recent years has not increased in line with forecast demand and hence outputs measured by the MTFP have not increased in proportion to capital inputs.

While most other TNSPs also experienced a significant increase in capital inputs over this period, Powerlink's performance was exacerbated by the need to invest higher levels of capital expenditure to traverse longer distances between generation and areas of load growth.

Given these conditions, Powerlink's total cost productivity under the AER's benchmarking approach has diminished, as shown in Figure 4.7. A similar trend can be observed for other TNSPs over the period.

Figure 4.7: Powerlink MTFP scores




Source: Huegin, Powerlink Operating Expenditure Benchmarking Review, November 2015.

Powerlink expects its performance under the MTFP to improve in the next regulatory period with reduced forecast expenditure and forecast increases in demand and energy consumption due to the ramp up of LNG production in the Surat Basin.

## 4.7 Efficiency Benefit Sharing Scheme 2013-17

This section sets out Powerlink's overall performance result for operating expenditure under the AER's Efficiency Benefit Sharing Scheme (EBSS) for the 2013-17 regulatory period.

### 4.7.1 Regulatory requirements

The EBSS provides TNSPs with an incentive to seek sustainable operating expenditure efficiencies. There are currently two versions of the EBSS which are applicable to Powerlink:

- EBSS (2007 EBSS) is applicable to Powerlink for the 2013-17 regulatory period with any net carryover benefits/penalties reflected in revenues for the 2018-22 regulatory period; and
- EBSS (2013 EBSS) applicable to Powerlink for the 2018-22 regulatory period with any net benefits/penalties to be carried over to the 2023-27 regulatory period (refer Chapter 14 for more details).

This section deals with the calculation of the EBSS carryover amounts under the 2007 EBSS.

### 4.7.2 Exclusions and adjustments EBSS 2013-17

*Adjustments*

The 2007 EBSS requires Powerlink to adjust its total operating expenditure allowance to reflect the difference between forecast and actual demand growth. Powerlink has adjusted its total operating expenditure allowance in accordance with the methodology established in its 2012 Transmission Determination.[38] The demand growth adjusted operating expenditure target is shown in Table 4.5.

38 *Final Decision, Powerlink Transmission Determination 2012-13 to 2016-17*, AER, pp. 252-253.

Table 4.5: Demand growth adjusted forecast operating expenditure ($m, 2016/17)

| | 2012/13 | 2013/14 | 2014/15 | 2015/16 (forecast) | 2016/17 (forecast) | Total |
|---|---|---|---|---|---|---|
| Total operating expenditure allowance | 199.7 | 207.3 | 212.7 | 220.6 | 227.1 | 1,067.4 |
| Demand growth adjustment | (0.8) | (2.0) | (3.0) | (4.0) | (5.0) | (14.9) |
| Adjusted operating expenditure target for EBSS | 198.9 | 205.3 | 209.7 | 216.6 | 222.1 | 1,052.5 |

*Exclusions*

The 2007 EBSS allows for certain cost categories to be excluded from the scheme on the basis that they are uncontrollable or would adversely impact the operation of the scheme. In accordance with Powerlink's Transmission Determination, the following cost categories have been identified for exclusion:[39]

- Debt raising costs;
- Insurance premiums;
- Self-insurance allowance; and
- Network support costs.

To determine the net carryover benefit/penalty applicable to Powerlink's 2018-22 regulatory period, the AER requires that the actual expenditure is determined using the same cost categories and methodology as that employed when determining the forecast operating expenditure allowance.

*Additional exclusions*

During the current regulatory period, Powerlink incurred operating expenditure for significant non-recurrent items or new recurrent items, due to exogenous factors not provided for within its allowed operating expenditure.

For the EBSS to operate appropriately, and consistent with the adjustments made in forecasting its operating expenditure for the 2018-22 regulatory period, Powerlink proposes to adjust its actual expenditure to exclude these expenditure items when calculating the EBSS carryover amounts to be included in revenues for the 2018-22 regulatory period. The absence of these adjustments would unduly penalise Powerlink under the scheme. These expenditure items are reflected in the calculation of the carryover amounts in Table 4.6 and are discussed below:

- *AEMC Levy* – In 2014, the Queensland Government enacted changes to the *Electricity Act 1994* (Qld).[40] Under these changes Powerlink, as holder of a Transmission Authority in Queensland, must pay an annual fee that is a portion of the Queensland Government's funding commitments to the AEMC. This fee was not known to Powerlink at the time of developing its last Revenue Proposal. As a result, the AER's Transmission Determination does not account for this change in regulatory obligation;
- *Reduced demand, workforce adjustment* – In response to significant reductions in forecast demand growth, Powerlink reduced its capital expenditure program and took prudent action to align its workforce with its forecast workload requirements. This workforce reduction has resulted in one-off costs related to redundancy payments. Powerlink considers that these one-off costs should be excluded from actual operating expenditure under the EBSS, on the basis that they are non-recurrent and have been incurred by Powerlink to ensure longer term operational efficiencies; and

39 *Final Decision, Powerlink Transmission Determination 2012-13 to 2016-17*, AER, pp. 253-254.

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

- *Reduced demand, 500kV write-off* – The demand forecasts which supported Powerlink's 2013-17 Revenue Proposal indicated the need for the development of a 500kV transmission corridor from South West to South East Queensland. Initial development and design works were undertaken on this project to ensure reliability of supply under the forecast demand growth. However, reductions in forecast demand growth negated the requirement for this investment. As a result, Powerlink incurred a write-off for the costs of the 500kV works in 2014/15 that reflected the capital expenditure on this project prior to its cancellation.

### 4.7.3 EBSS net carryover amount

In deriving its EBSS net carryover amount, Powerlink has included its latest estimate of controllable and non-controllable operating expenditure for the 2015/16 year and, consistent with the scheme, assumed no incremental efficiency gain for 2016/17.

Taking these figures, and the previously noted exclusions and adjustments into account, Powerlink has determined a net carryover amount of -$7.8m. An adjustment for this amount has been accounted for in the PTRM for the 2018-22 regulatory period.

Table 4.6: EBSS carryover calculation ($m, 2016/17)

| | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Total |
|---|---|---|---|---|---|---|
| Carryover amount | (0.8) | (6.8) | (3.0) | 2.8 | - | (7.8) |

## 4.8 Service Target Performance Incentive Scheme Performance 2013-17

The Service Target Performance Incentive Scheme (STPIS) provides an economic incentive for TNSPs to maintain and further improve delivery of transmission services.

This section sets out Powerlink's overall performance result under the AER's STPIS for the current regulatory period (from 1 July 2012 to 30 June 2017). In this period, Powerlink is subject to Version 3 of the scheme.

Under Version 3, network performance is measured against seven parameters under the Service Component (SC) and also against the Market Impact Component (MIC) as identified below:

- Service Component:
  - Peak transmission circuit availability;
  - Transmission line availability;
  - Transformer availability;
  - Reactive plant availability;
  - Frequency of loss of supply events > 0.10 system minutes;
  - Frequency of loss of supply events > 0.75 system minutes; and
  - Average outage duration.
- Market Impact Component:
  - Dispatch Interval (DI) count.

Powerlink's historical STPIS performance since 1 July 2012, which is on a calendar year basis, is summarised in Table 4.7.

It should be noted that the performance shown in Figures 4.8 to 4.15 is for the full calendar year based on Version 3, regardless of the transition to a new regulatory period halfway through 2007 and 2012.

Table 4.7: Historic STPIS performance (2012 2H[a] to 2015)

| Parameter | Measure | Calendar Year | | | |
|---|---|---|---|---|---|
| | | 2012 2H[a] | 2013 | 2014 | 2015[b] |
| Service Component | | | | | |
| Peak transmission circuit availability | % | 98.71 | 99.03 | 98.91 | 99.01 |
| Transmission line availability | % | 98.46 | 98.68 | 98.36 | 98.29 |
| Transformer availability | % | 98.77 | 98.22 | 98.88 | 99.03 |
| Reactive plant availability | % | 98.01 | 98.79 | 97.72 | 97.33 |
| Loss of supply events > 0.10 system minutes | Events | 1 | 0 | 3 | 1 |
| Loss of supply events > 0.75 system minutes | Events | 0 | 0 | 0 | 1 |
| Average outage duration | Minutes | 900 | 645 | 742 | 628 |
| Market Impact Component | Dispatch intervals | 0 | 97 | 3941 | 65 |

(a) Powerlink's 2012 STPIS performance was based on the second half-year period from 1 July 2012 to 31 December 2012, given that its new targets were applicable to the new regulatory period from 1 July 2012 to 30 June 2017.

(b) Powerlink's 2015 STPIS performance will be submitted to the AER for review on 1 February 2016 as part of the AER's annual reporting requirements.

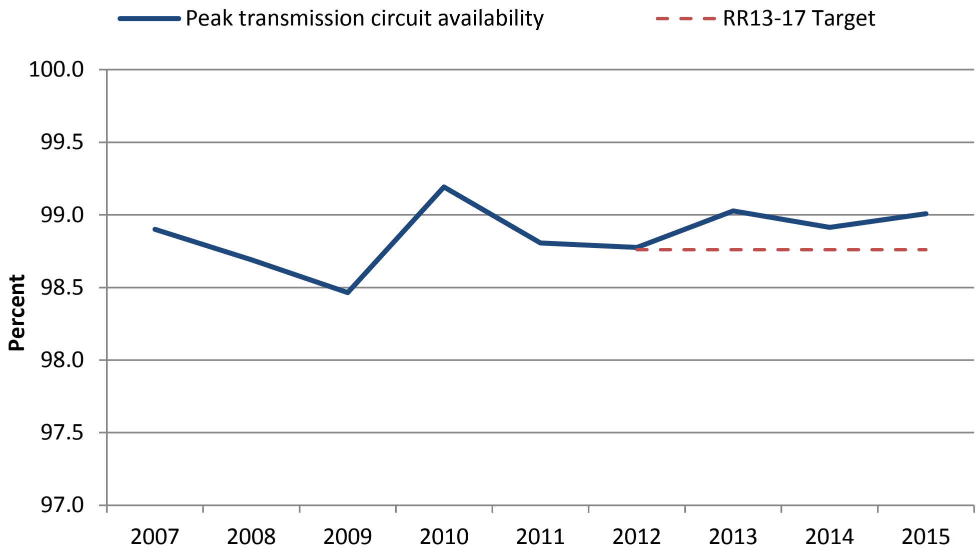
### 4.8.1 Historic transmission circuit availability performance

Powerlink's transmission circuit availability since 2007 for peak, transmission line, transformer and reactive plant is presented in Figures 4.8 to 4.11, respectively. These figures show availability performance for all four measures in relation to performance target, collar and cap values set by the AER for the current regulatory period.

Powerlink's performance during the current regulatory period for the peak circuit and reactive plant availability has consistently exceeded target, while transformer availability performance was above target for three of the four years. Transmission line performance remained below the AER target for the period.

The peak availability measure encourages Powerlink to plan outages at times of the year with least potential impact on the network, which is typically outside the peak summer load times between November and March each year. Reactive plant, and in particular capacitor banks, are most useful during times of high load demand which is also in the summer months. As can be seen from Figure 4.8, Powerlink has achieved positive results from implementing outage planning to avoid peak times where possible, resulting in above target outcomes.

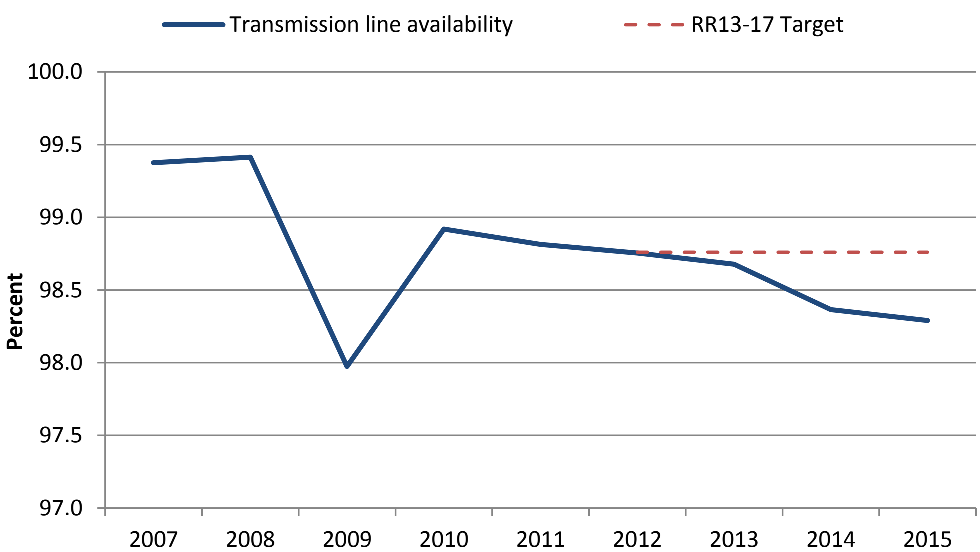
Figure 4.8: Powerlink historic performance - peak transmission circuit availability




Source: Powerlink data.

Transmission line availability (see Figure 4.9) has trended below target during the current regulatory period, primarily as a result of planned project outages for operational refurbishment and capital transmission line works and secondary systems upgrades that required line outages.

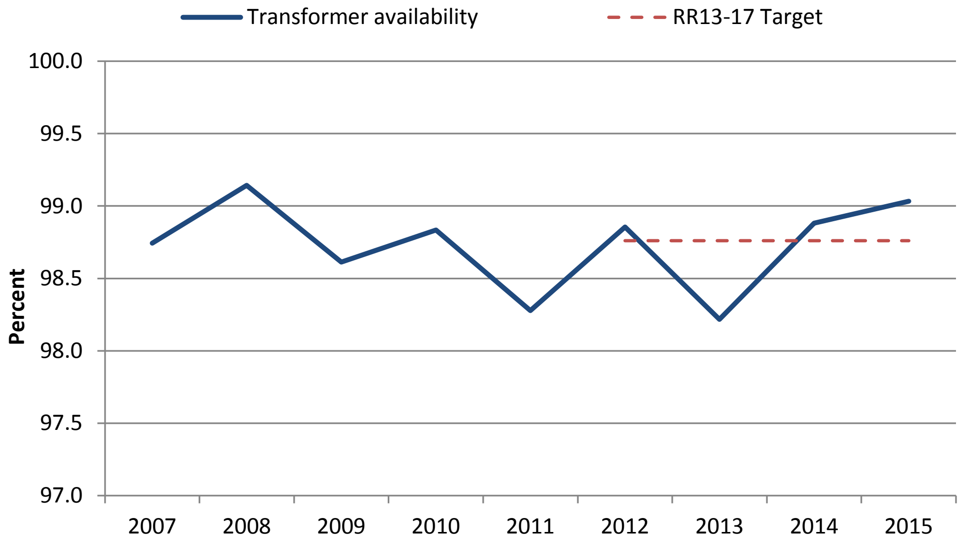
Figure 4.9: Powerlink historic performance - transmission line availability




Source: Powerlink data.

Transformer availability has been reasonably consistent over the past nine years with annual variations reflecting planned outages of transformers (Figure 4.10). During the current regulatory period transformer availability exceeded target for all years except 2013, where a higher than normal volume of planned outages for both maintenance and project works resulted in a lower availability for that year.

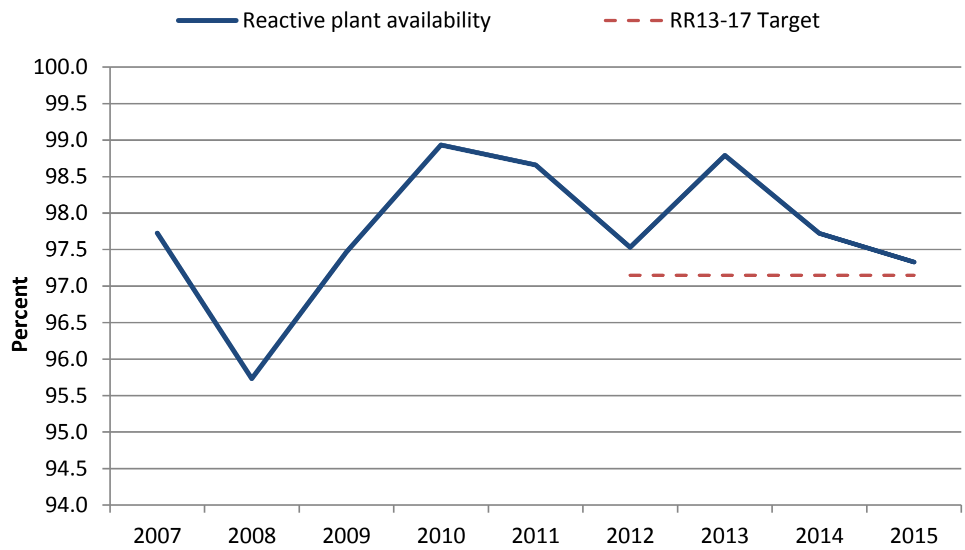
Figure 4.10: Powerlink historic performance - transformer availability




Source: Powerlink data.

Reactive plant availability has trended above target reflecting improved levels of availability for this class of equipment, being Static VAr Compensators (SVC), capacitor banks and reactors (Figure 4.11).

Figure 4.11: Powerlink historic performance - reactive plant availability



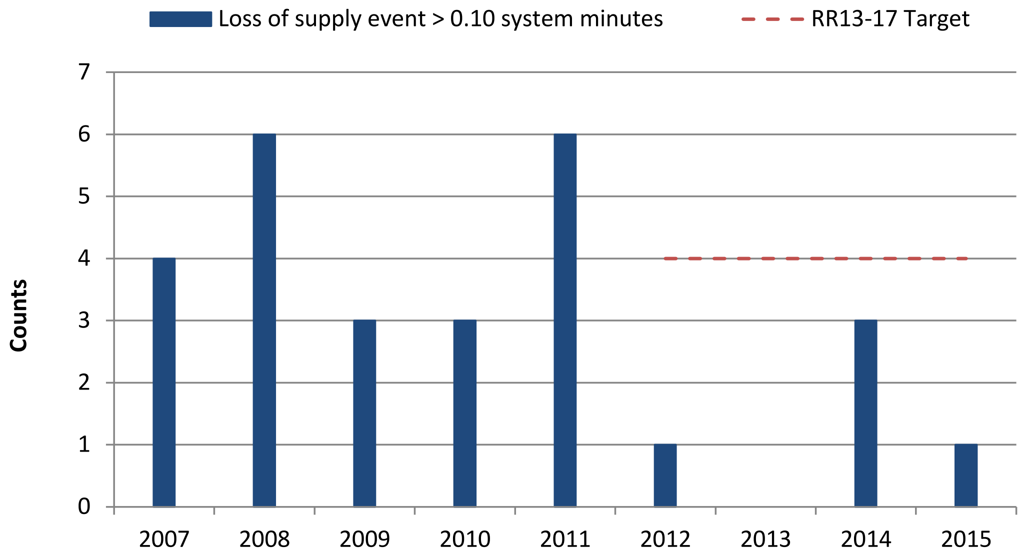

Source: Powerlink data.

## 4.8.2 Historic loss of supply event frequency performance

Powerlink's performance under loss of supply event frequency exceeding 0.10 system minutes (x) and 0.75 system minutes (y) since 2007 is shown in Figures 4.12 and 4.13. The figures indicate that Powerlink has continued its better than the target loss of supply performance in relation to both thresholds.

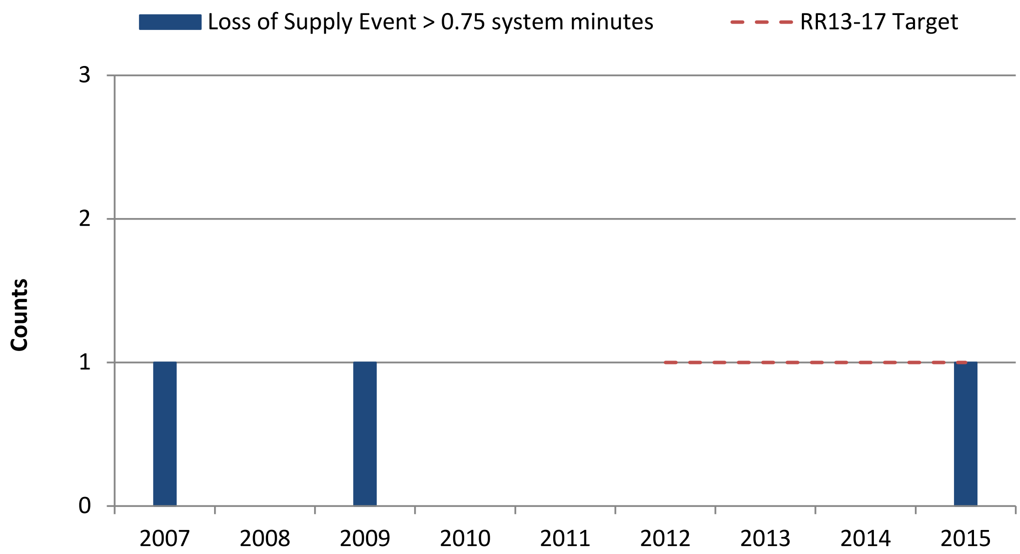
In January 2015, Queensland experienced a significant storm which impacted Powerlink's network supply to Far North Queensland. This resulted in a loss of supply event greater than 0.75 system minutes.

Figure 4.12: Powerlink historic performance - loss of supply event frequency greater than 0.10 system minutes




Source: Powerlink data.

Figure 4.13: Powerlink historic performance - loss of supply event frequency greater than 0.75 system minutes

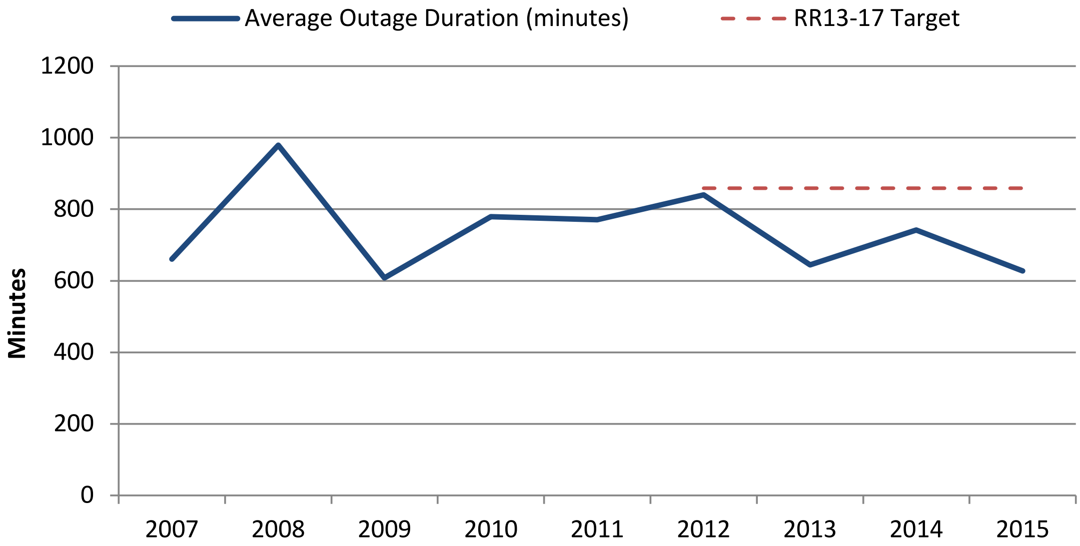



Source: Powerlink data.

### 4.8.3 Historic average outage duration performance

Figure 4.14 illustrates Powerlink's average outage duration performance from 2007 to 2015. This measure relates only to unplanned outage events and shows that Powerlink has consistently maintained an average outage duration performance at levels better than the AER target.

Figure 4.14: Powerlink historic performance - average outage duration




Source: Powerlink data.

### 4.8.4 Historic Market Impact Component performance

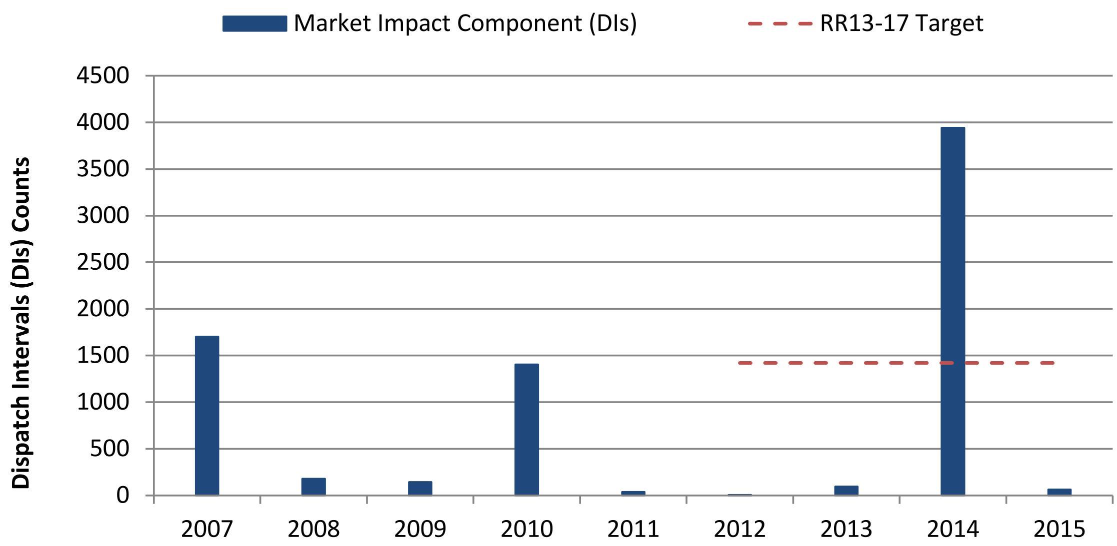
Powerlink's MIC performance since 2007 is shown in Figure 4.15, which reflects the consistent application of established processes to minimise the impact of outage events on market participants.

For clarification, Powerlink was subject to report only arrangements under the MIC between 2007 and 2009. Powerlink commenced the scheme in full on 13 July 2010.

In 2014, Powerlink undertook extended planned outages on its network connection between Queensland and New South Wales, which resulted in significant Dispatch Interval (DI) counts (as seen in Figure 4.15). As outages were required to deliver project works, Powerlink's outage planning process scheduled these outages at the time of the year that would create least impact on the market. Powerlink also used efficient project staging and resourcing to minimise the duration of these outages.

Powerlink continues to work closely with customers to plan and coordinate network outages at times least likely to result in a market constraint. Powerlink also takes real-time action to reschedule works to reduce the impact of binding constraints on the market.

Figure 4.15: Powerlink historic performance - Market Impact Component




Source: Powerlink data.

## 4.9 Summary

The analysis in this chapter demonstrates that Powerlink has responded to changes in its operating environment. Capital expenditure has reduced due to subdued demand growth, Powerlink has taken a different approach to optimising the timing and scope of reinvestment needs and a clear focus on delivering better value to customers and consumers. Total operating expenditure is expected to align with the overall allowance set by the AER for the current regulatory period, despite operating expenditure increases that Powerlink has incurred to restructure its business and other exogenous factors.

Powerlink has performed strongly under the STPIS through minimising the frequency of loss of supply events, maintaining overall transmission circuit availability and a shorter average duration of unplanned network outages. Powerlink has also consistently sought to minimise the impact of outage events that cause constraints to market participants.

# 5 Forecast Capital Expenditure

## 5.1 Introduction

This chapter presents Powerlink's capital expenditure forecasts for each year of the 2018-22 regulatory period. It describes how the capital expenditure forecast meets the requirements of the Rules and has been prepared in line with Powerlink's Expenditure Forecasting Methodology.[41] Any adjustments that have been made to the forecasting methodology as a result of feedback from stakeholders are also set out below.

The key inputs and assumptions underpin the forecasts are set out in this chapter, together with information from, and references to, key supporting documentation.

Powerlink's capability to deliver the necessary capital expenditure in a timely and efficient manner is also discussed, along with an outline of proposed contingent projects relevant to the 2018-22 regulatory period.

*Key highlights*

- Powerlink has forecast total capital expenditure for the 2018-22 regulatory period of $957.1m. This is $423.9m or 31% lower than actual expenditure in the 2013-17 regulatory period. Powerlink considers that this expenditure is reasonably required to achieve the capital expenditure objectives.
- Forecast capital expenditure has been developed taking into account stakeholder views on demand forecasting and asset reinvestment in an environment of low demand growth. Stakeholder input has been broader and deeper than previous Revenue Proposals and has substantially influenced the forecast.
- Powerlink has adopted a hybrid forecasting methodology making use of both top-down and bottom-up forecasting techniques. Powerlink considers this to be a suitable basis for preparing forecasts for a Revenue Proposal and that the methodology has been appropriately applied.
- In an environment of reduced demand growth, Powerlink's forecast is based on only a single scenario of demand growth. Powerlink's proposed contingent projects are essential for managing the investment risk associated with movements away from the single scenario.
- Reinvestment in the existing network comprises more than 80% of the total forecast capital expenditure.

## 5.2 Regulatory requirements

This section sets out Powerlink's consideration of the forecast capital expenditure against the objectives set out in the Rules.

### 5.2.1 Capital expenditure objectives

Powerlink's Revenue Proposal must include the forecast capital expenditure which it considers is required to achieve the capital expenditure objectives set out in clause 6A.6.7(a) of the Rules. The capital expenditure objectives are discussed in turn:

41 *Expenditure Forecasting Methodology*, Powerlink, June 2015.

*1 Meet or manage the expected demand for prescribed transmission services over the period*

Powerlink expects the demand for prescribed transmission services to remain relatively constant over the 2018-22 regulatory period. This expectation is based on the following considerations:

- Demand forecasts show little growth in peak demand over the next 10 years, apart from growth associated with the new coal seam gas industry, and no material decrease in demand;
- The continued application of deterministically expressed planning standards for the provision of prescribed transmission services, but to a lower standard than previously and with the ability to place some customer load at risk of interruption for a first contingency; and
- An assumption of no change to the regulatory framework that defines what constitutes prescribed transmission services.

Powerlink's capital expenditure forecasts for the 2018-22 regulatory period provide predominantly for reinvestment in the transmission network and supporting systems. Where Powerlink has identified existing assets that have no enduring need beyond their technical or economic life, the inputs to the capital expenditure forecasts have been adjusted to reflect that no reinvestment will be required for those assets.

*2 Comply with all applicable regulatory obligations or requirements associated with the provision of prescribed transmission services*

Powerlink is subject to regulatory obligations as the holder of a Transmission Authority under the *Electricity Act 1994* (Qld) and as a registered TNSP in the NEM. As a company, Powerlink is also subject to various other environmental, cultural heritage, planning approval, Workplace Health & Safety, financial and other regulatory requirements.

Powerlink's compliance with these regulatory obligations and requirements is reflected in the capital expenditure forecasts through the application of efficient costs for capital expenditure required to meet the demand for prescribed transmission services.

*3 Maintain the safety of the transmission system through the supply of prescribed transmission services*

Powerlink plans, designs and develops the transmission system to ensure the safety and security of people and equipment. This includes standards of designs as well as maintaining the physical and cyber security of the transmission system.

Powerlink's capital expenditure forecasts include prudent provision for maintaining the safety of the transmission system.

Powerlink recognises that the AER must assess its capital expenditure forecasts against the capital expenditure criteria in the Rules and in doing so, must have regard to the capital expenditure factors also set out in the Rules. Powerlink has undertaken its own assessment of the capital expenditure forecasts against these criteria and factors in Appendix 5.01.

## 5.3 Capital expenditure categories

Powerlink's capital expenditure forecasts are presented with reference to well accepted categories of drivers of capital expenditure as well as the categories of transmission services to which the forecast capital expenditure relates.

To assist the AER and stakeholders to understand the nature of the forecast capital expenditure, and how it relates to capital expenditure undertaken in the 2013-17 regulatory period, Powerlink has retained the same categories of capital expenditure as adopted in the 2013-17 regulatory period. However, Powerlink has renamed the "Replacement" category as "Reinvestment" to better reflect the nature of the activities undertaken under this category. This reflects Powerlink's assessment approach and more detailed investigation to ensure asset reinvestment delivers fit-for-purpose outcomes in the current environment. These categories are set out in Table 5.1.

Table 5.1: Categories of capital expenditure

| Capital expenditure category | Definition | Prescribed transmission service |
|---|---|---|
| Network – load driven | | |
| Augmentations | Relates to augmentations defined under the Rules. Includes projects to which the RIT-T applies. Typically these include projects such as the construction of new lines, substation establishments and reinforcements or extensions of the existing network. | TUOS services and exit services |
| Connections | Works to facilitate additional connection point capability between Powerlink and DNSPs. Associated works are identified through joint planning with the relevant DNSP. | Exit services |
| Easements | The acquisition of transmission line easements to facilitate the projected expansion and reinforcement of the transmission network. This includes land acquisitions associated with the construction of substations or communication sites. | Common services, TUOS services and exit services |
| Network – non-load driven | | |
| Reinvestments (replacements) | Relates to reinvestments to meet the expected demand for prescribed transmission services. Expenditure is primarily undertaken due to end of asset life, asset obsolescence, asset reliability or safety requirements. A range of options is considered as asset reinvestments, including removing assets without replacement, non-network alternatives, line refits to extend technical life or replacing assets with assets of an equivalent/ different type, configuration or capacity. Each option is considered in the context of the future capacity needs accounting for forecast demand. | Common services, TUOS services and entry/exit services |
| Security/compliance | Expenditure undertaken to ensure compliance with amendments to various technical, safety or environmental legislation. In addition, expenditure is required to ensure the physical security (as opposed to network security) of Powerlink's assets, which are regarded as critical infrastructure. | Common services, TUOS services and entry/exit services |
| Other | All other expenditure associated with the network that provide prescribed transmission services, such as communications systems enhancements, improvements to network switching functionality and insurance spares. | Common services |
| Non-network | | |
| Business IT | Expenditure to maintain IT capability and improve business system functionality where appropriate. | Common services |
| Support the business | Expenditure to replace and upgrade business requirements including the areas of commercial buildings, motor vehicles and other tools and equipment. | Common services |

## 5.4 Forecasting methodology

Powerlink provided its proposed forecasting methodology for capital expenditure to the AER on 30 June 2015. A copy of the Expenditure Forecasting Methodology is provided as Appendix 5.02. The methodology sets out Powerlink's intention to adopt a fundamentally different approach to forecasting capital expenditure compared to its previous Revenue Proposals.

As described in the methodology, Powerlink has adopted a mix of both bottom-up and top-down forecasting methods to determine its total forecast capital expenditure – a hybrid approach.[42] Powerlink considers that the hybrid approach provides a number of advantages, while ensuring the resultant forecasts are prudent and efficient. In particular, this affords a more efficient approach to preparing a Revenue Proposal. It should also assist the AER and stakeholders in terms of the time, effort and cost to review and assess Powerlink's Revenue Proposal.

### 5.4.1 Load driven capex

Load driven network projects include augmentations, connections to the distribution networks, and easement and land acquisitions. As triggers for load driven capital expenditure are based on specific local demand growth forecasts and the amount of existing headroom in network capability in those areas, the forecast expenditure profile tends to be quite lumpy. Powerlink considers that bottom-up analysis remains the most practical means for developing forecasts for load driven capital expenditure.

Forecast capital expenditure for these future investment needs has been developed from cost estimates for individual projects using Powerlink's standard project estimating processes.

To derive the forecast capital expenditure in these categories Powerlink has considered only the most likely scenario of forecast demand growth (medium economic outlook), taken from its 2015 TAPR. A copy of the 2015 TAPR is provided as Appendix 5.03.

The use of a single scenario of forecast demand growth differs from the approach taken in Powerlink's past Revenue Proposals. Previously, the high degree of variability in demand growth forecasts between different scenarios of economic growth, and the uncertainty associated with the location and timing of new entrant generation, meant there was potential for significant variability in capital expenditure requirements across a large number of plausible scenarios. The approach taken was to develop a capital expenditure forecast for each scenario and weight that expenditure by the probability of that scenario eventuating.

In the current environment of little or no forecast growth in future underlying demand, Powerlink considers the risk of significant asymmetry in capital expenditure requirements between different scenarios of economic growth is no longer present. Accordingly, detailed analysis of emerging network limitations and the forecast capital expenditure requirement attributable to demand growth has been conducted for only the medium economic growth outlook.

### 5.4.2 Non-load driven capex

Non-load driven network capital expenditure includes reinvestment in network assets, investment in the physical and cyber security of network assets, compliance with mandated asset standards and other minor network assets. As overall expenditure in these categories is not directly linked to demand growth it typically exhibits a smoother profile of expenditure over time than load driven capital expenditure.

To develop the majority of the forecast capital expenditure requirements for these categories Powerlink has applied top-down modelling techniques. For the most significant of these expenditure categories, network reinvestment, Powerlink has used predictive modelling techniques, similar to the AER's own Replacement Expenditure Model (or Repex Model). The quantity of reinvestment that has been forecast reflects any opportunities that Powerlink has identified where alternative practices to meet demand can be adopted. Standardised unit reinvestment costs for each of these network asset types has been applied to these forecast quantities to arrive at the forecast network reinvestment capital expenditure.

Early in the development of its forecasting methodology, Powerlink engaged with the AER, the AER's CCP4, and Powerlink's Customer and Consumer Panel to seek feedback and input regarding Powerlink's methodology. Feedback from stakeholders was varied, with some stakeholders supportive of Powerlink's ideas for an alternative approach, and others wanting to see more detail, similar to a traditional bottom-up approach. The feedback received from stakeholders has influenced the final forecasting methodology as outlined in Table 5.2.

42 A bottom-up method relies on individually specified project scopes whose costs are similarly individually estimated and then summed to arrive at the total forecast expenditure. A top-down method relies on historical information and established trends to forecast future expenditure.

Table 5.2: Stakeholder influence on forecasting methodology

| Stakeholder | Feedback | Influence on forecasting methodology |
|---|---|---|
| AER | Concerned that Repex Model is not suitable for forecasting with small populations of high cost items such as large power transformers. | Replacement of power transformers is now forecast bottom-up using individual project scopes and estimates informed by condition assessments. |
| Customer and Consumer Panel | Concerned that a top-down forecasting methodology would not provide the AER with sufficient detail to critically assess Powerlink's forecast capital expenditure. | Powerlink has provided additional bottom-up estimates for a sample of future network investment needs based on criteria suggested by the Panel. |
| Transmission Network Planning Forum participants | Suggested the inclusion of additional information for reinvestment triggers where the enduring need for assets is uncertain or non-network solutions may be viable. | Powerlink has added this criterion, however Powerlink has identified only one transformer replacement trigger that meets this additional criterion. |

The remaining categories of non-load driven capital expenditure, namely security/compliance and other, have been forecast using a trend analysis technique. In addition, a small proportion of network reinvestment expenditure that is not captured by either the Repex Model or bottom-up estimating has been forecast using this technique.[43] Powerlink has developed a forecasting methodology similar to the AER's base-step-trend approach for forecasting operating expenditure and applied this to these categories of capital expenditure.

Powerlink engaged Nuttall Consulting[44] to review its top-down forecasting models and provide an independent expert opinion on their suitability for providing reasonable forecasts of capital expenditure requirements. Nuttall Consulting:

> *"consider(s) the AER repex model and base step trend approaches to be appropriate methods for preparing the capex forecast for the relevant capex categories, for these regulatory purposes. Further, to a very large extent, I consider that Powerlink has set up and implemented these approaches appropriately"*[45]

However, Nuttall Consulting identified several concerns related to specific aspects of Powerlink's capital expenditure modelling. The two most significant concerns were:

- Powerlink's approach to deriving transmission tower lifespan is resulting in lives for some towers which are not supported by the input data; and
- For secondary systems assets, the age profiles that form an input to the modelling process suggest that the model may not be set up correctly or there is an issue with the age profile.

Powerlink has reviewed these aspects of the modelling and made appropriate changes to address these and the other concerns identified by Nuttall Consulting.

A copy of the Nuttall Consulting report is provided as Appendix 5.04. More detail on Powerlink's top-down forecasting models, including Powerlink's response to issues identified by Nuttall Consulting, is provided as Appendix 5.05.

### 5.4.3 Non-network capex

Non-network capital expenditure includes investment in business information technology as well as other support the business expenditure (commercial buildings, motor vehicles and other tools and equipment).

43 This non-modelled repex accounts for around 2% of forecast capital expenditure.

44 Nuttall Consulting has previously provided advice to the AER in reviewing the capital expenditure forecasts for a number of other Revenue Proposals. Nuttall Consulting also developed the AER's Repex Model.

45 *Forecasting Methodology Review*, Nuttall Consulting, November 2015, p. 4.

Capital expenditure forecasts for information technology requirements have been developed through a planning process that identified future business needs and expenditure required for information technology applications and infrastructure, including reinvestment in existing infrastructure. Forecast expenditure within each strategy area is programmed to ensure future investment is prioritised in accordance with Powerlink's overall corporate and asset management strategies.

Buildings, fleet and other support the business capital expenditure forecasts have been developed with regard to a mix of historic trends and expected future business requirements. Future investment requirements for buildings takes into account specific known projects to renew building assets based on asset condition and forecast business requirements. Capital expenditure forecasts for motor vehicles have been adjusted to reflect the lower forecast for expenditure on network assets. Mobile plant and other support the business capital expenditure has predominantly been forecast with regard to historical capital expenditure trends.

### 5.4.4 Top-down forecasting methods

As described earlier in this section, Powerlink has adopted a number of top-down forecasting techniques to develop the capital expenditure forecasts for the non-load driven categories of expenditure. In a submission to the AER during the development of the AER's Framework and Approach Paper the AER's CCP4 expressed a number of concerns about the use of top-down forecasting.

These concerns were raised in the context of the application of the AER's Expenditure Forecast Assessment (EFA) Guideline to Powerlink's Revenue Proposal. The AER's CCP4 were concerned that the use of top-down forecasting would limit or impede the AER's ability to apply the EFA Guideline to the assessment of Powerlink's Revenue Proposal.

Powerlink has ensured that its top-down forecasting techniques provide sufficient information to properly complete its Reset RIN on a comparable basis to the annual RIN returns. The Repex Model provides a detailed forecast of asset reinvestment quantities such as the number of transmission towers, circuit breakers and substation buildings. As these asset types align with the quantities already reported in the annual RIN returns, the AER and other stakeholders can readily view trends in reinvestment quantities and form their own view of Powerlink's forecasts.

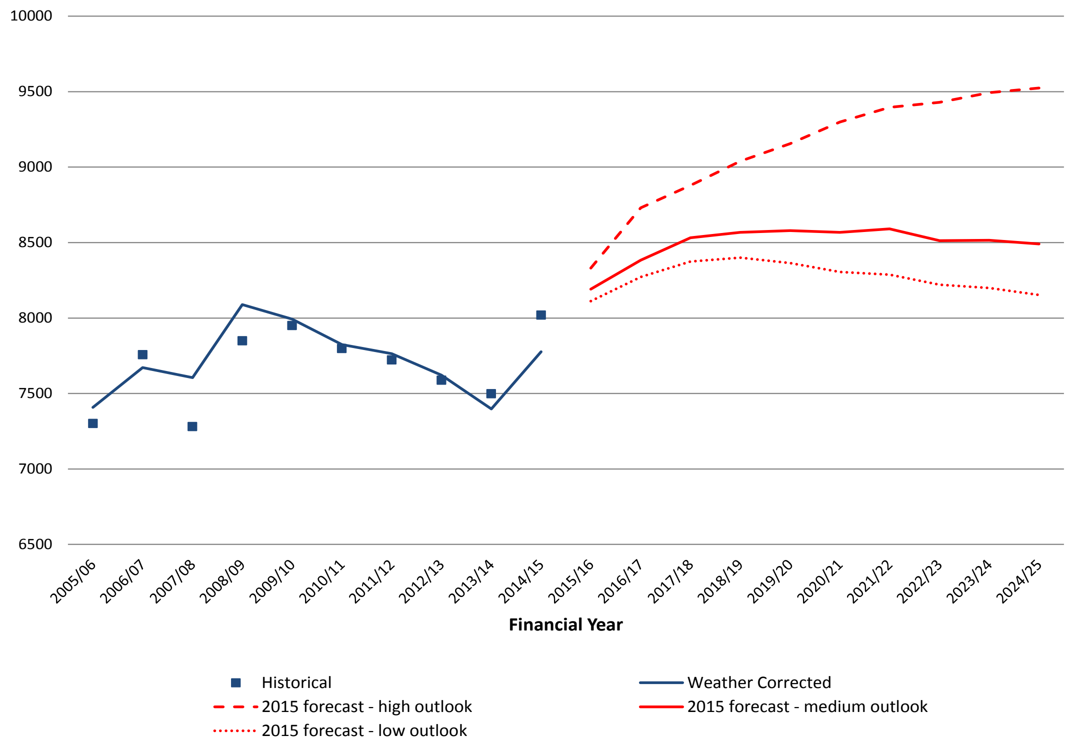
## 5.5 Key inputs and assumptions

Powerlink's capital expenditure forecasts are underpinned by a number of key inputs and assumptions. These include demand forecasts, Powerlink's asset management and asset reinvestment frameworks, network analysis models and network planning criteria. The following sections explain each of these in turn. Other key inputs and assumptions relating to cost estimates and cost escalators are set out in Section 7.3 and Section 7.5.

### 5.5.1 Demand forecast

Powerlink's most recent demand forecast was published in its 2015 TAPR. This demand forecast is shown in Figure 5.1.

Figure 5.1: Summer peak electricity demand forecast (MW) - Powerlink




Source: Powerlink, Transmission Annual Planning Report 2015.

In March 2015 Powerlink hosted a Demand and Energy Forecasting Forum with experts from a wide range of industries to learn more about new technologies and the impacts they may have on future electrical demand and energy in Queensland.

In response to feedback received from stakeholders at this forum Powerlink has moved to further increase the transparency around its demand forecasting processes. More detail on the demand forecasting methodology and the assumptions that are input to the forecasting models was provided in the 2015 TAPR (Appendix B). This included details of the assumed impact of new and emerging technologies and trends such as solar PV, battery storage, energy efficiency initiatives and electric vehicles as well as initiatives in tariff reform and demand side management. Appendix B of the 2015 TAPR has been included with this Revenue Proposal as Appendix 5.06.

In addition, Powerlink has made the actual demand and energy forecasting model available on its website, including all of the input data. This allows interested stakeholders to test the impact of their own input assumptions on the resulting forecasts.

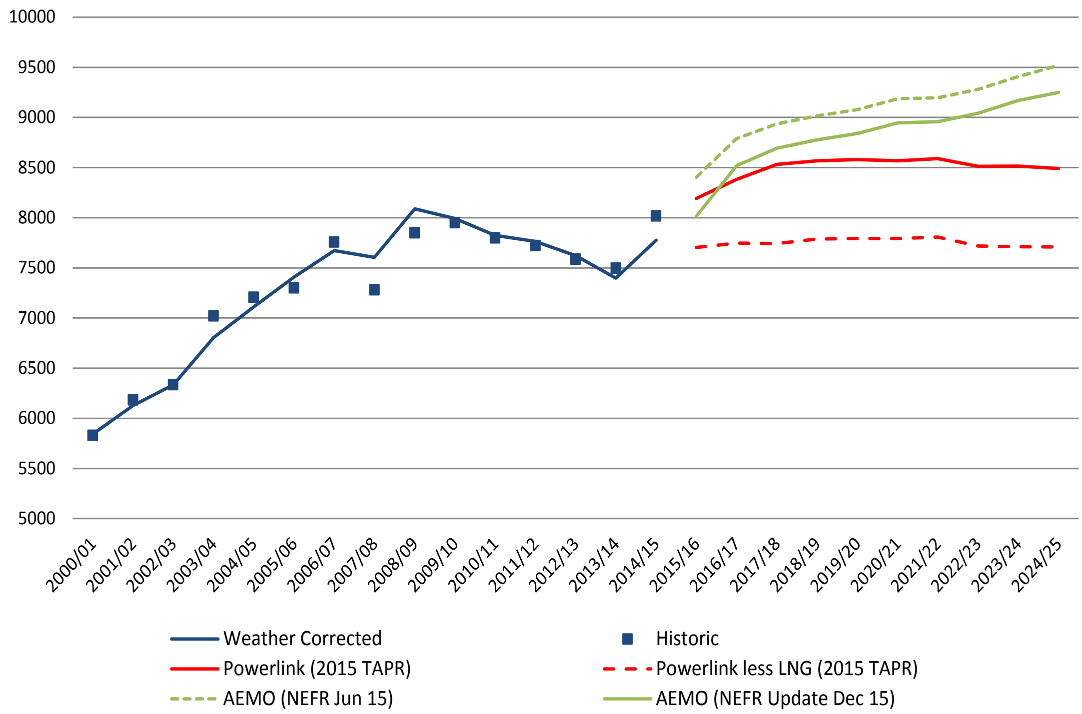
Powerlink engaged KPMG to provide an expert opinion on the methodologies, processes and key inputs and assumptions to the demand and energy forecasts. KPMG concluded that Powerlink's demand and energy forecasting models meet the AER's criteria for best practice forecasting with the following caveats:

- While a detailed description is provided in the TAPR of the weather correction process there is insufficient data provided for a third party to replicate the results of the process;
- The R-squared for the winter maximum demand of 0.46 suggests that further improvement in the model may be possible; and
- While some details are provided on in-sample model performance, no details are provided regarding in-sample or out-of-sample forecast performance.

Powerlink notes the caveats put forward by KPMG and considers they represent opportunities for potential further improvements in transparency around the forecasting process. Nevertheless, Powerlink does not consider these caveats challenge the validity of the overall forecasting process or the resultant forecasts. In particular, KPMG's caveat on weather correction concerned making the source data available for a third party to reproduce Powerlink's analysis.[46] KPMG assessed Powerlink's actual analysis as comprehensive and without bias. A copy of the KPMG report is provided as Appendix 5.07.

AEMO also published the 2015 National Electricity Forecasting Report (NEFR) in June 2015 which provides AEMO's energy and demand forecasts for Queensland. AEMO subsequently updated its forecast in December 2015 using new information on electricity usage by Queensland LNG projects that was not available when the 2015 NEFR was developed. Powerlink notes that AEMO is forecasting a higher rate of demand growth than Powerlink has forecast. This is shown in Figure 5.2.

Figure 5.2: Summer peak electricity demand forecast (MW) - Powerlink and AEMO




Source: Powerlink and AEMO data.

Powerlink has worked with AEMO to identify and understand the drivers of the differences between the forecasts. Powerlink has concluded that the underlying forecasts for DNSP supplied demand and energy are similar. The AEMO differences arise due to assumptions regarding the impact of new technologies and forecasts associated with the LNG industry.

Table 5.3 provides a breakdown of the contributions of various factors to the difference in the forecast coincident maximum demand at the end of the forecast period in 2024/25.

Table 5.3: Contribution to differences in demand forecast (MW) in 2024/25

| | LNG | Energy efficiency | Battery storage | DSM/tariff reform | Total |
|---|---|---|---|---|---|
| Powerlink forecast | 780 | (315) | (185) | (100) | |
| AEMO forecast | 973 | (100) | 0 | 0 | |
| Variance | 193 | 215 | 185 | 100 | 693 |

46 *Review of Demand and Energy Forecasting Methodologies*, KPMG, October 2015, pp. 4-5.

### 5.5.2 Asset management planning

Powerlink has applied its Asset Management Strategy in preparing its Revenue Proposal. A critical element of the Asset Management Strategy involves the adoption of processes to manage the life cycle of assets, from planning and investment to operation, maintenance and refurbishment to end-of-life. The result of these processes is brought together in Powerlink's Asset Management (AM) Plan.

The purpose of the Asset Management Plan is to:

- Apply the principles set out in Powerlink's Asset Management Policy, Asset Management Framework, Asset Management Strategy and related processes to guide the development of investment and reinvestment plans for the network;
- Provide an overview and analysis of factors that impact network development, including energy and demand forecasts, generation developments, network performance and the condition and performance of the existing asset base;
- Provide an overview of asset condition and health, life cycle plans and emerging risks related to factors such as safety, network reliability and obsolescence; and
- Outline optimised plans for network investment and reinvestment.

In particular, Powerlink's area planning processes have identified opportunities where existing assets approaching their end-of-life may be retired from service in the future without replacement or reinvestment. Where these opportunities could result in material reconfiguration of the network, and consequent impact on network users, Powerlink has commenced consultation with its customers and other stakeholders to seek input to better inform its decision making processes.

Powerlink engaged AMCL Pty Ltd (AMCL) to review its methodology and supporting processes for assessing asset risk levels and the framework for prioritising investments. AMCL found that:

> *Powerlink has demonstrated significant progress in the development of the Risk and Prioritisation methodology that aligns with industry leading best practice risk management. The development of the risk assessment process has been based on sound Asset Management fundamentals. Although it is recognised that the approach has yet to be fully embedded into the organisation, the concept and methodology used in the Risk Assessment and Prioritisation process is considered to align with good industry practice.*

A copy of the AMCL report is provided as Appendix 5.08.

A copy of Volume 1 (Overview) and Volume 2 (Asset Investment Outlook) from Powerlink's Asset Management Plan are provided as Appendix 5.09 and Appendix 5.10, respectively.

### 5.5.3 Asset reinvestment

In addition to meeting the forecast demand, Powerlink must maintain its current network so that the risks associated with the condition and performance of existing assets is appropriately managed. Powerlink routinely assesses the condition of assets and identifies potential emerging risks related to such factors as reliability, safety and obsolescence.

The approach to planning the network adopted by Powerlink optimises the network topology as assets reach the end of their technical life so that the network is configured to meet current and future capacity needs. Individual asset investment decisions are not determined in isolation. Powerlink's integrated asset planning process takes account of both future changes in demand and the condition based risks of related assets in the network. The integration of condition and demand based limitations delivers cost effective solutions that manage both reliability of supply obligations and the risks associated with assets that remain in service.

In response to these risks, a range of options are considered as part of asset reinvestment planning, which includes the removal of assets without replacement, non-network alternatives, line refits to extend technical life or replacing assets with assets of an equivalent/different type, configuration or capacity. Each of these options is considered in the context of the future capacity needs accounting for forecast demand.

### 5.5.4 Network modelling

The network analysis models used to inform the development of Powerlink's capital expenditure forecasts are the same as those developed and shared amongst AEMO, DNSPs and TNSPs for operational and planning purposes. These models are therefore subject to regular scrutiny by external, independent power industry experts.

Powerlink considers that its modelling and transmission network analysis is robust, and consistent with good electricity industry practice. In particular:

- The network models have been established, developed and further refined by Powerlink to reflect the Queensland operating environment and conditions over many years;
- The software and tools used to undertake the analysis are consistent with those employed by other network businesses and by specialist consultants;
- The key outputs of the modelling are provided to, and discussed with, AEMO and other Network Service Providers (NSPs), where appropriate, on a regular basis; and
- The integrity and validity of Powerlink's network modelling has been subject to review by the AER and its consultants as part of previous regulatory determination processes.

### 5.5.5 Network planning criteria

Consistent with most other jurisdictions in the NEM, Powerlink is required to plan and develop its transmission network to meet a deterministically expressed reliability of supply standard. Powerlink's Transmission Authority requires Powerlink to plan and develop the network so that only a limited amount of customer demand and energy is at risk of not being supplied during the most critical single contingency event. These demand and energy limits are 50MW and 600MWh.

The Transmission Authority also includes a requirement to apply good electricity industry practice which, in turn, necessitates the use of a range of supporting technical standards. The reliability of supply, along with the supporting technical standards, comprises Powerlink's Asset Planning Criteria Framework. A copy of the Asset Planning Criteria Framework is provided as Appendix 5.11.

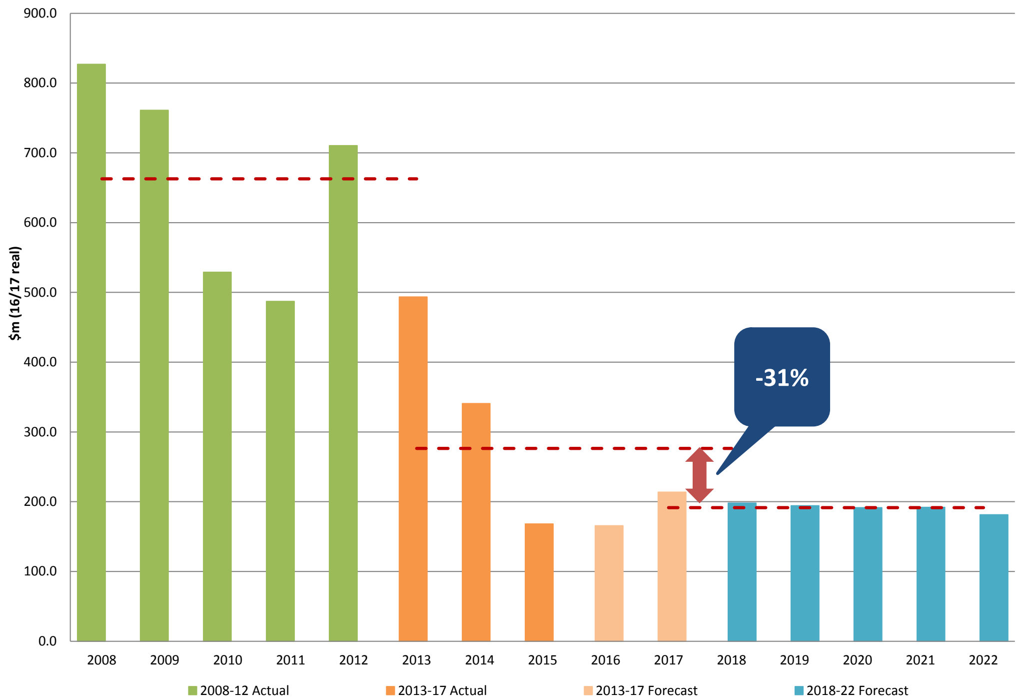
## 5.6 Forecast capital expenditure

A summary of Powerlink's capital expenditure forecasts and the alignment with AEMO's National Transmission Network Development Plan (NTNDP) is contained in the following sections.

### 5.6.1 Total capital expenditure

Figure 5.3 shows Powerlink's total annual capital expenditure profile since 2008, including the capital expenditure forecast for the 2018-22 regulatory period.

Figure 5.3: Actual and forecast total capital expenditure comparison ($m, 2016/17)




Source: Powerlink data.

Powerlink's forecast total capital expenditure for the 2018-22 regulatory period is $957.1m, which is an average annual expenditure of $191.4m. This is a reduction of $84.8m (-31%) and $471.2m (-71%) per year compared to actual expenditure in the 2013-17 and 2008-12 regulatory periods, respectively. As a result, the value of Powerlink's Regulated Asset Base (RAB) is forecast to reduce in real terms during the 2018-22 regulatory period. This is discussed further in Appendix 5.01 in the context of benchmarking capital expenditure.

The primary driver of the reduction in capital expenditure over these three regulatory periods has been the reduction in demand growth. The reduction has also had an impact on non-load driven capital expenditure, in that network reinvestment plans are focused on different outcomes such as removing assets without replacement or replacing with assets of different capacity and/or configuration. This has also provided the opportunity for greater use of alternative options, such as network support or network reconfiguration, to manage asset condition and risk at a lower overall cost.

### 5.6.2 Capital expenditure by category

This section provides a summary of Powerlink's capital expenditure forecast by category of expenditure driver for the 2018-22 regulatory period. The forecast expenditure is set out in Table 5.4.

Table 5.4: Capital expenditure forecast by category ($m, 2016/17)

| Project category | | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Total |
|---|---|---|---|---|---|---|---|
| Network | | | | | | | |
| Load driven | Augmentations | 0.3 | 2.6 | 0.3 | 0.0 | 0.0 | 3.1 |
| | Connections | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Easements | 2.6 | 1.5 | 3.2 | 0.3 | 0.0 | 7.7 |
| Non-load driven | Reinvestments | 161.6 | 161.2 | 155.8 | 159.6 | 156.0 | 794.3 |
| | Security/compliance | 3.7 | 3.7 | 3.8 | 3.8 | 3.8 | 18.8 |
| | Other | 12.0 | 6.1 | 4.0 | 4.0 | 4.0 | 30.1 |
| | **Total network** | **180.2** | **175.1** | **167.0** | **167.7** | **163.8** | **854.0** |
| Non-network | | | | | | | |
| Business IT | Information Technology | 12.4 | 11.3 | 12.5 | 12.5 | 11.8 | 60.5 |
| Support the business | Commercial buildings | 2.2 | 4.3 | 8.0 | 8.0 | 2.0 | 24.5 |
| | Motor vehicles | 2.3 | 2.4 | 2.8 | 2.7 | 2.7 | 12.9 |
| | Moveable plant/tools and equipment | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 | 5.3 |
| | **Total non-network** | **17.9** | **19.1** | **24.4** | **24.3** | **17.5** | **103.1** |
| **Total capital expenditure** | | **198.2** | **194.2** | **191.4** | **192.1** | **181.3** | **957.1** |

*This table is net of disposals.

With reductions in forecast demand growth the load driven categories of capital expenditure make up a very small proportion of the total capital expenditure forecast, $10.8m (or 1%). Powerlink will publish a new demand forecast in June 2016, in its 2016 TAPR. Any changes to the load driven capital expenditure forecasts will be included in Powerlink's Revised Revenue Proposal.

Reinvestments now comprise the largest single category of capital expenditure, accounting for $794.3m, or over 80% of the total capital expenditure forecast.

In each of the expenditure categories, except for commercial buildings, the capital expenditure forecasts for the 2018-22 regulatory period are less than the AER's Transmission Determination for the 2013-17 regulatory period for the same category. For commercial buildings, Powerlink's capital expenditure forecast for the 2018-22 regulatory period is greater than the expenditure provided for in the 2013-17 regulatory period due to the need to undertake a refit of internal office spaces.

### 5.6.3 Supplementary bottom-up information

In its Expenditure Forecasting Methodology, Powerlink acknowledged that the use of more top-down forecasting techniques for capital expenditure forecasts would mean that project specific estimates to meet future investment needs would not ordinarily be available.[47] To improve visibility of future investment needs Powerlink proposed to develop estimates of a sample of future investment needs.

Powerlink consulted with and sought feedback from its Customer and Consumer Panel in May 2015 about the criteria that could be applied to identify possible future investment needs for which additional estimated cost information should be provided in support of its Revenue Proposal.

Powerlink then took this feedback to a group of industry stakeholders at its Transmission Network Planning Forum in July 2015 to test whether any additional criteria should be considered. Based on the feedback received from stakeholders Powerlink has adopted the following selection criteria:

- The estimated cost of the possible future investment need is greater than $10m; or
- There is a potential non-network solution to the possible future investment need.

47 Expenditure Forecasting Methodology, Powerlink, June 2015, p. 23.

Using these selection criteria, a summary of the sample unapproved future investment needs is provided in Table 5.5.

It is important to note that most of these estimates are not a direct input to Powerlink's capital expenditure forecast. Powerlink's forecasts developed using top-down techniques are not based on projects. The projects listed here provide an indication of the type and scale of work Powerlink expects to undertake in the next regulatory period but should not be interpreted as a firm program of work.

Table 5.5: Sample unapproved capital expenditure projects

| Project description | Category | Total project costs ($m, nominal) | Description |
|---|---|---|---|
| Greenbank to Mudgeeraba 275kV transmission line refit | Reinvestment | $69.7 | Tower painting, member and hardware replacement, and OHEW replacement of both existing 275kV single circuit transmission lines. |
| Clare South to Strathmore to Collinsville transmission line refit | Reinvestment | $55.1 | Tower painting, member and hardware replacement existing 132kV double circuit transmission line. |
| Biloela to Moura 132kV transmission line replacement | Reinvestment | $44.9 | Replacement of existing 132kV single circuit line. |
| PDH Mux replacement | Reinvestment | $37.8 | Replacement of PDH telecommunications equipment. |
| Bergins Hill to Goodna to Belmont 275kV transmission line refit | Reinvestment | $36.4 | Tower painting, member and hardware replacement, and OHEW replacement of existing 275kV double circuit transmission line. |
| DWDM replacement | Reinvestment | $34.0 | Replacement of the DWDM telecommunications network platform. |
| Gin Gin substation plant replacement | Reinvestment | $26.7 | Replacement of selected 275kV and 132kV primary plant at Gin Gin Substation. |
| Bouldercombe primary plant replacement | Reinvestment | $25.9 | Replacement of selected 275kV and 132kV primary plant at Bouldercombe Substation. |
| Kamerunga substation replacement | Reinvestment | $24.3 | Replacement of 132kV primary plant and secondary systems at Kamerunga Substation. |
| Callide A to Biloela 132kV transmission line replacement | Reinvestment | $23.5 | Replacement of existing 132kV double circuit line. |
| EMS Replacement | Reinvestment | $19.4 | Replace the existing Energy Management System |
| Karana Downs to South Pine 275kV transmission line refit | Reinvestment | $18.6 | Tower painting, member and hardware replacement of existing 275kV double circuit transmission line. |
| Ashgrove West substation rebuild | Reinvestment | $12.9 | Replacement of selected 110kV primary plant and secondary systems at Ashgrove West Substation |
| Dysart substation replacement | Reinvestment | $11.7 | Replacement of selected 132kV primary plant and secondary systems at Dysart Substation. |
| Wide area network deployment Stage 2 | Other | $10.4 | Installation of MPLS WAN at additional sites. |
| Garbutt transformer replacement* | Reinvestment | $6.7 | Replacement of both 132/66kV transformers at Garbutt Substation. |

*Potential non-network solution

These 16 sample projects have a total estimated cost of $457.8m (nominal), of which $445.4m (nominal) is forecast within the 2018-22 regulatory period. This is approximately 44% of the total capital expenditure forecast for the 2018-22 regulatory period. Other transformer replacement projects with expenditure forecast on a bottom-up basis are an additional $45m. Approved projects with expenditure in the 2018-22 regulatory period comprise a further $73m. Overall, 56% of Powerlink's total capital expenditure forecast is supported by some degree of bottom-up estimate of cost.

## 5.7 Customer and consumer feedback and input

During the course of developing the capital expenditure forecast for the 2018-22 regulatory period Powerlink consulted with and sought input from a range of stakeholders. An overview of Powerlink's approach to engaging with customers and consumers is described in Chapter 3.

In relation to forecasting future capital expenditure Powerlink's engagement activities with stakeholders are outlined in Table 5.6.

Table 5.6: Summary of engagement activities and their influence on capital expenditure forecasts

| Date | Activity | Outcome/influence on Revenue Proposal | Revenue Proposal reference |
|---|---|---|---|
| March 2015 | Demand and energy forecasting forum | Demand and energy forecasts in the TAPR, which Powerlink's Revenue Proposal is based on, included modelling the impacts of emerging and disruptive technologies. | Section 5.5.1 |
| May 2015 | Powerlink Customer and Consumer Panel (capex forecasting methodology) | While some stakeholders expressed concern at the use of a hybrid forecasting methodology (mix of top-down and bottom-up) all stakeholders wanted Powerlink to provide additional information on specific projects to supplement the top-down forecasts. This additional information is summarised in Table 5.5. | Section 5.6.3 |
| July 2015 | Transmission Network Forum (Revenue Proposal) | This engagement built on the input gathered from the Customer and Consumer Panel in May 2015 to refine the criteria for identifying supplementary project material. In addition to expected project cost the criteria also include reinvestment triggers where the enduring need for the assets is uncertain or where non-network solutions may be a viable alternative. | Section 1.6.3 |
| July 2015 | Transmission Network Forum (Brisbane area plans) | Given the uncertainty around future levels of electricity demand, stakeholders recognised the risks of losing access to strategic easements and encouraged Powerlink to look for low cost ways to maintain the infrastructure without capital reinvestment.<br>Powerlink has decided to manage these assets under maintenance and has ensured that capital expenditure associated with reinvestment in these transmission lines has been removed from the forecast. | Appendix 5.05, Section 2.2.9 |
| October 2015 | Area Plan Forum (Central Queensland to Southern Queensland coastal circuits) | Stakeholders were keen to see Powerlink adopt an incremental approach to investment such that future alternative options were not eliminated. They were uncomfortable to endorse a strategy that may offer additional future benefits at a higher cost.<br>As a result Powerlink has adjusted the inputs to the capital expenditure forecasts to reflect a refit of selected single circuit lines. | Appendix 5.05, Section 2.2.9 |

### *AER Repex Model*

The AER's Repex Model is a predictive modelling tool that forecasts quantities of assets and equipment to be replaced over time based on a mean replacement life and a profile of the quantities of assets and the years they were installed. The forecast is based on a probability distribution for each type of asset that describes the probability of when those assets can be expected to be replaced, given they have already survived to their current age.

The use of the AER's Repex Model as a primary tool for forecasting capital expenditure for electricity transmission is new and innovative. Many stakeholders have sought reassurance that this method of forecasting is suitable to support the requirements of a Revenue Proposal. This aspect was particularly highlighted in the AER's CCP4 submission in response to the AER's draft Framework and Approach Paper for Powerlink.[48]

As part of the review of Powerlink's top-down forecasting methodologies, Nuttall Consulting expressed an independent expert opinion that there was:

> *"no fundamental reason why the AER repex model (or similar method) is not an appropriate basis for a large part of an NSP's repex forecast in its regulatory proposal to the AER."*

In coming to this opinion Nuttall Consulting articulated the following views:

- Nuttall Consulting expressed an opinion that it does not believe that Detailed Engineering Analysis (DEA) is clearly a better method for forecasting replacement capex;
- The AER Repex Model (or similar) with suitable application can address some of the accuracy shortcomings of the DEA method;
- Forecasting through the AER Repex Model should reduce the effort associated with conducting the revenue reset process; and
- There is no clear reason why the adoption of this method over DEA would hinder the AER's review.

Stakeholders were also concerned to ensure that the repex modelling is robust and not simply an age based replacement program. To address this concern Powerlink has taken the following steps in preparing the input data for the Repex Model:

- Assets whose condition based reinvestment is heavily influenced by climatic conditions have been segmented into geographical zones to model the differing rates of asset degradation across these zones – this applies to transmission tower structures and ensures the appropriate condition based drivers for reinvestment are modelled;
- Assets replaced during the calibration period for reasons other than their condition (such as fault level uprating) have been removed from the modelling calibration – this ensures that only condition based drivers for reinvestment are used to establish calibrated asset lives; and
- Assets that Powerlink's asset management planning has identified can be removed from service at their end-of-life without replacement, have been removed from the forecasting process – this ensures the capital expenditure forecasts only include reinvestment in assets with an enduring need to provide transmission services.

Powerlink has incorporated feedback from stakeholders in the development of its capital expenditure forecasts. This feedback has led to a total capital expenditure forecast that is substantially lower than if the modifications described above had not been made. The standard modelling approach described in the AER Repex Model handbook[49] does not envisage such adjustments.

## 5.8 Proposed contingent projects

As discussed in Section 5.5.1 Powerlink has forecast load-driven capital expenditure using a single scenario of demand growth. To manage the risk that significant network investments may be triggered as a result of material changes in demand or generation mix away from this single scenario within period (and without consumers being subject to additional costs), Powerlink has proposed seven contingent project triggers at an indicative total cost of $590.0m (nominal).

Powerlink engaged Ernst & Young (EY) to identify events that may trigger a material shift in either demand or generation and require additional prescribed network investment to occur prior to the end of the 2018-22 regulatory period. A copy of the EY report is provided as Appendix 5.12.

48 *Final Framework and Approach for Powerlink*, AER, June 2015, p. 34.

49 *Electricity Network Service Providers – Replacement Model Handbook*, AER, December 2011.

In considering the EY report Powerlink has identified those projects that EY has rated as being Probable[50] or Plausible[51] to occur by 2022 as being potential contingent project triggers. Powerlink then analysed the impact of those plausible projects on power transfers and network capability, and the expected network developments that could be required to meet those needs. Where the estimated cost of the expected network development exceeds the contingent project cost threshold the project is proposed as a contingent project trigger.

The Rules[52] specify that the proposed contingent project capital expenditure must exceed either $30m or 5% of the value of the Maximum Allowed Revenue (MAR) for the first year of the regulatory period, whichever is the larger amount. Powerlink's proposed MAR for 2017/18 is $767.4m (nominal) (see Table11.8). As 5% of $767.4m is approximately $38.4m, this is the threshold for Powerlink's contingent projects.

The proposed contingent projects, and their indicative costs, are summarised in Table 5.7. These costs are not otherwise provided for in the forecast capital expenditure set out in Table 5.4. Appendix 5.13 provides further detail on the individual contingent projects and their triggers. Should any of these triggers occur, Powerlink will undertake the required regulatory processes, including engagement with the AER within its 2018-22 regulatory period.

Table 5.7: Proposed contingent projects

| Project name | Indicative capital cost ($m, nominal) |
|---|---|
| North West Surat Basin Area | 147.2 |
| Central to North Queensland Reinforcement | 55.1 |
| Southern Galilee Basin connection shared network works | 116.9 |
| Northern Bowen Basin area | 55.7 |
| Bowen Industrial Estate | 42.9 |
| QNI upgrade (Queensland component) | 66.7 |
| Gladstone area reinforcement | 105.5 |
| Total indicative cost | 590.0 |

## 5.9 Network support

Network support is used by Powerlink as an alternative to network investment when it is economic to do so. Powerlink has established processes for engaging with stakeholders for the provision of non-network services in accordance with the requirements of the Rules. The current engagement processes centre on publishing relevant information on the need and scope of viable non-network solutions to emerging network limitations. For a given network limitation, the viability and specification of non-network solutions are first introduced in the TAPR. Further opportunities are then explored in the consultation and stakeholder engagement processes undertaken as part of any subsequent RIT-T.

In the past these processes have been successful in delivering non-network solutions to emerging network limitations. As early as 2002, Powerlink contracted with generating units in North Queensland to maintain reliability of supply and defer transmission projects between central and northern Queensland. Most recently Powerlink has entered into network support services as part of the solution to address emerging limitations in the Bowen Basin area.

50 The project has received required state/federal approvals (where applicable). It has the resources in place to proceed but is not publicly considered a committed project. There may be some speculation around the date of commencement.

51 The project may not have received final state and/or federal approvals but it has completed preliminary investigations and reports. There is likely some media attention surrounding the progress of the project. If the project gains momentum it is within reason that it could be operating before 2022.

52 National Electricity Rules, AEMC, clause 6A.8.1(b)(2)(iii).

Powerlink is continuing to develop its non-network engagement process and, where possible and economic, expand the use of non-network solutions to address future limitations within the transmission network. In 2014/15, Powerlink initiated consultation for the purposes of enhancing engagement with non-network providers and to further enhance the processes for consideration of non-network solutions. Powerlink will also continue to request non-network solutions from market participants as part of the RIT-T process.

An example of this approach is Powerlink's recent involvement in the Network Opportunity Mapping project being undertaken by the Institute for Sustainable Futures.[53] This project aims to provide enhanced and earlier information to market participants on network constraints and the opportunities for demand side solutions. This project expands on the information typically provided in the TAPR, and responds to feedback Powerlink has received from a number of stakeholders about the need to provide earlier information on the potential value and timing of non-network solutions.

Powerlink has forecast $0 for network support in its Revenue Proposal. This is discussed further in Section 6.7.3 of Chapter 6.

## 5.10 Deliverability of future expenditure

Powerlink has a proven track record for delivery of capital projects to meet the needs of Queensland customers for a reliable electricity supply. In physical terms, the forecast capital and operating expenditure workloads are somewhat lower than in the 2013-17 regulatory period. Powerlink's well established business practices have continued to adapt to changing circumstances to deliver better value for electricity consumers. These include:

- *Design standardisation* - Designs for transmission lines and substations adopt a high degree of standardisation. During the 2013-17 regulatory period Powerlink has developed new design standards based on the IEC61850 standard for substation automation. The standard achieves a high degree of integration and inter-operability between the various protection and control functions and between systems from different vendors. As the new standards are implemented through future capital investments, this will provide for lower overall total cost of ownership and improved capability for remote fault diagnostics and restoration with consequent benefits to electricity consumers.
- *Program management* - Powerlink has continued to apply a program management approach to achieve synergies in project delivery. In the 2013-17 regulatory period the transmission line refit works have been consolidated under a single program team to ensure Powerlink can efficiently achieve the scale of activity required to meet the needs of an ageing fleet of transmission lines.
- *Panel arrangements* - Powerlink has a well-established and proven model for contracting the delivery of new substations and transmission lines. This includes a panel of approved suppliers with whom Powerlink has pre-agreed terms and conditions. Powerlink has extended the panel supplier arrangements to cover transmission line refits and has adopted an output focused delivery model. This provides contractors with sufficient flexibility to assess the scope of required refit works to deliver specified performance outcomes.
- *Portfolio management* - In addition to program management, which focuses on achieving efficiencies in project delivery through identifying and exploiting synergies, Powerlink is working to enhance its portfolio management practices. Portfolio management is directed to prioritising and optimising the portfolio of projects to meet the required levels of reliability while effectively managing asset related risks within a resource constrained environment.

53 *Network Opportunity Mapping, UTS: Institute for Sustainable Futures*, http://www.uts.edu.au/research-and-teaching/our-research/institute-sustainable-futures/our-research/energy-and-climate-1.

## 5.11 Summary

Powerlink's forecast capital expenditure for the 2018-22 regulatory period, the forecasting methodology adopted and the key inputs and assumptions used to derive it, are set out in this chapter. Powerlink considers that its capital expenditure forecasts:

- Are required to achieve the capital expenditure objectives;
- Reasonably reflect the efficient costs that a prudent operator would require to achieve the capital expenditure objectives; and
- Reflect a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.

# 6 Forecast Operating Expenditure

## 6.1 Introduction

Powerlink's operating expenditure enables the operation and maintenance of its network, as well as the supporting business activities to deliver prescribed transmission services.

This chapter outlines Powerlink's operating expenditure forecasts for each year of the 2018-22 regulatory period. It describes how the operating expenditure forecast meets the requirements of the Rules and has been prepared in line with Powerlink's Expenditure Forecasting Methodology.[54] Powerlink's forecasting methodology is closely aligned with the AER's base-step-trend methodology.

In developing operating expenditure forecasts for the 2018-22 regulatory period, Powerlink has sought and received input from stakeholders to understand their expectations regarding its approach to forecasting an efficient level of expenditure.

The key inputs and assumptions underlying the operating expenditure forecasts are explained in Section 6.6 and 6.7 with references to supporting documentation.

*Key highlights*

- Powerlink is working to be a more efficient TNSP and is implementing initiatives to enhance the efficiency of operating expenditure, reform business processes that are aligned with driving efficiency and cost reduction and review resource levels to align with evolving requirements. These measures are reflected in Powerlink's forecast operating expenditure.
- Powerlink's total operating expenditure forecast for the 2018-22 regulatory period is $976.7m which is:
  - On average $195.3m per year and falling in real terms; and
  - 8% less than the AER's allowance and 7% less than Powerlink's actual/forecast total operating expenditure compared to the 2013-17 regulatory period.
- The independent expert opinion of Huegin Consulting has confirmed that:
  - Powerlink's historic total operating expenditure benchmarking performance is comparable to its NEM peers when important environmental factors such as load and energy density, population density and capitalisation policy are considered; and
  - Powerlink's proposed base year is at the lower end of an efficient range based on a range of benchmarking techniques.
- Forecasts for controllable operating expenditure are based on the AER's base-step-trend methodology. A zero-based approach has been applied for a small number of other operating expenditure items that Powerlink considers are better suited to a bottom-up estimation approach.

## 6.2 Regulatory requirements

This section sets out Powerlink's consideration of the forecast operating expenditure against the objectives set out in the Rules.

54 Expenditure Forecasting Methodology, Powerlink, June 2015.

### 6.2.1 Operating expenditure objectives

Powerlink's Revenue Proposal must include the forecast operating expenditure which Powerlink considers is required to achieve the operating expenditure objectives set out in clause 6A.6.6(a) of the Rules. The operating expenditure objectives are to:

*1 Meet or manage the expected demand for prescribed transmission services over the period*

Powerlink expects the demand for prescribed transmission services to remain approximately constant over the 2018-22 regulatory period. This expectation is based on the following considerations:

- Demand forecasts show little growth in peak demand to be transported over the transmission network over the next 10 years, apart from growth associated with the new coal seam gas industry, and no material decrease in demand;
- A continued application of deterministically expressed planning standards for the provision of prescribed transmission services, but with the ability to place some customer load at risk of interruption for a first contingency; and
- An assumption of no change to the regulatory framework that defines what constitutes prescribed transmission services.

Powerlink's forecast operating expenditure for the 2018-22 regulatory period reflects the efficient costs for operating and maintaining the transmission network assets and supporting functions. The forecast operating expenditure is derived in accordance with the forecast output growth of the network and is required to meet the stable demand for prescribed transmission services over the period.

*2 Comply with all applicable regulatory obligations or requirements associated with the provision of prescribed transmission services.*

Powerlink is subject to regulatory obligations as the holder of a Transmission Authority under the *Electricity Act 1994* (Qld) and as a registered TNSP in the NEM. As a company Powerlink is also subject to various other environmental, cultural heritage, planning approval, Workplace Health & Safety, financial and other regulatory requirements.

Powerlink's compliance with these regulatory obligations and requirements is encompassed in its Asset Management Framework and supporting policies and procedures, which provides the foundation for the efficient forecast of operating expenditure. New regulatory obligations or requirements have also been assessed to determine the potential effect on forecast operating expenditure in the 2018-22 regulatory period.

*3 Maintain the safety of the transmission system through the supply of prescribed transmission services*

Powerlink's operating expenditure forecasts include prudent provision for maintaining the safety of the transmission system while delivering reliable services to its customers and consumers.

Powerlink recognises the AER must assess its operating expenditure forecasts against the operating expenditure criteria in the Rules and in doing so must have regard to the operating expenditure factors also set out in the Rules. Powerlink has undertaken its own assessment of the operating expenditure forecasts against these criteria and factors in Appendix 5.01.

## 6.3 Operating expenditure categories

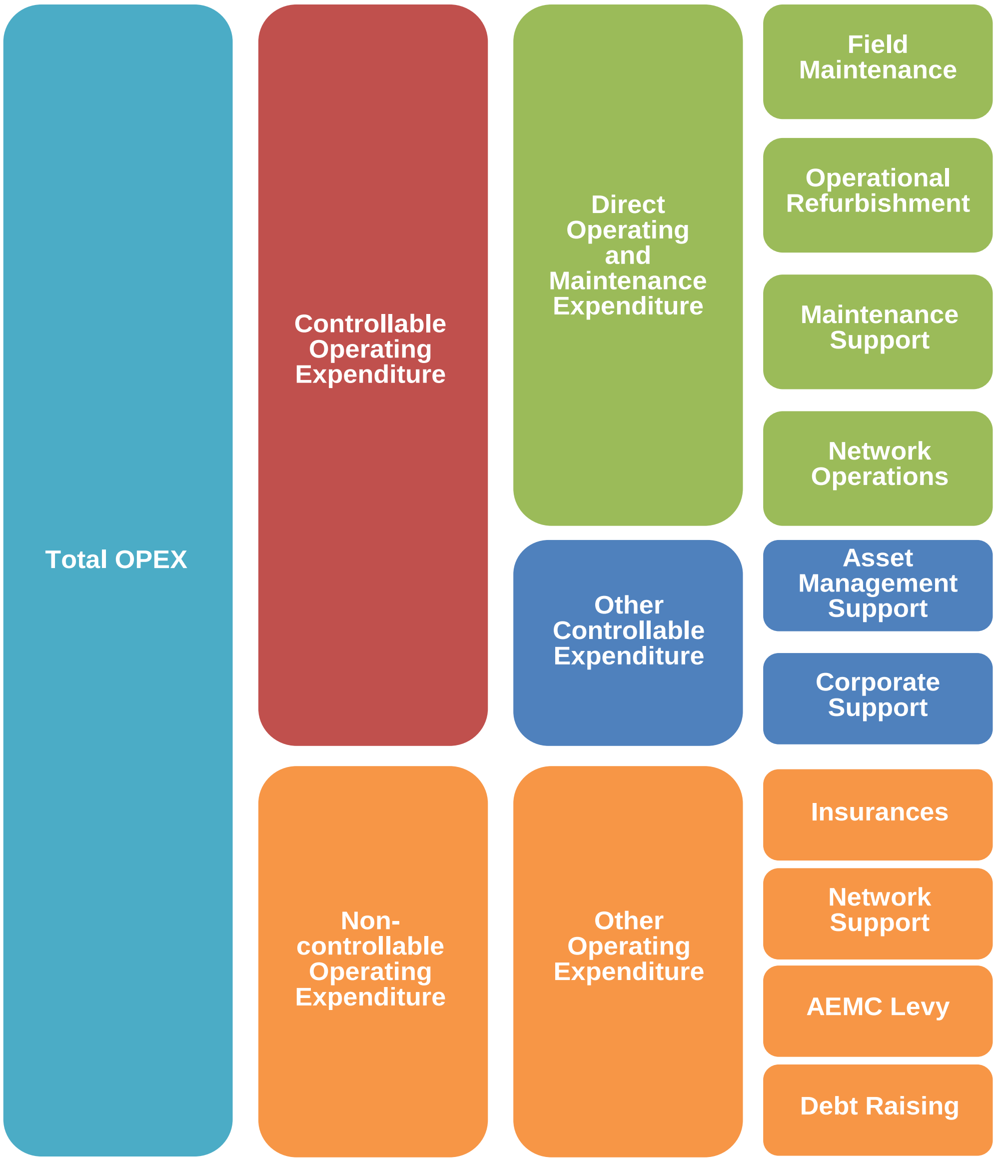
Powerlink's forecast operating expenditure is presented with reference to well accepted categories of operating expenditure as well as the categories of prescribed transmission services to which the forecast operating expenditure relates.

Powerlink has retained the same broad categories of operating expenditure as adopted for the current regulatory period. This should assist the AER and stakeholders in understanding the nature of the forecast operating expenditure for the 2018-22 regulatory period.

Powerlink notes the addition of the AEMC Levy as an element of other operating expenditure.

Figure 6.1 shows how Powerlink's operating expenditure categories fit within the total operating expenditure framework. Definitions of each category are presented in Table 6.1.

Figure 6.1: Powerlink's operating expenditure categories




Source: Powerlink, Operational and Capital Expenditure Forecasting Methodology.

Table 6.1: Categories of operating expenditure

| Operating expenditure category | | Definition | Prescribed transmission service |
|---|---|---|---|
| **Controllable operating expenditure** | | | |
| Direct operating and maintenance | Field maintenance | Includes all field activities to ensure plant can perform its required functions. There are four types of field maintenance; *routine, condition based, emergency and deferred [emergency] maintenance.* Field maintenance costs include all labour and materials needed to perform the required maintenance tasks. Each field maintenance type is further separated into five major asset type categories; substations, transmission lines, secondary systems, communications and land. | Exit, entry, TUOS and common services |
| | Operational refurbishment | Involves activities that return an asset to its pre-existing condition or function, or activities undertaken on specific parts of an asset to return these parts to their pre-existing condition or function. These refurbishment activities do not involve increasing the capacity or capability of the plant, or extending its life beyond original design. | Exit, entry, TUOS and common services |
| | Maintenance support | Includes activities where maintenance service providers represent asset support functions in the field as well as non-field functions supporting maintenance activities for the operate/maintain phase of the asset life cycle such as maintenance strategy development, performance management and maintenance auditing. This category also includes local government rates charges, water charges, electricity charges and charges for permits for Powerlink. | Exit, entry, TUOS and common services |
| | 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. | Exit, entry, TUOS and common services |
| Other controllable expenditure | AM support | Activities required to support the strategic development and ongoing asset management of the network. AM Support has four major sub-elements: network planning, asset management, regulatory management and operations. | Exit, entry, TUOS and common services |
| | Corporate support | Corporate Support encompasses the support activities required by Powerlink to ensure adequate and effective corporate governance. This includes corporate and direct corporate support charges and also revenue reset costs. | Common services |
| **Non-controllable operating expenditure** | | | |
| Other operating expenditure | Insurances | This covers both insurance premiums for Powerlink's network and non-network assets and also a self-insurance allowance to provide cover for Powerlink's losses that are not insured. | Common services |
| | Network support | Network support includes costs associated with non-network solutions used by Powerlink as a cost effective alternative to network investment. | TUOS services |
| | AEMC Levy | From the start of the 2014/15 financial year the *Electricity Act 1994* (Qld) requires gas and electricity transmission networks in Queensland to pay shares of the State's cost to fund the Australian Energy Market Commission. | Common services |
| | Debt raising | Debt raising costs relate to costs incurred by an entity over and above the debt margin. | Debt raising costs relate to costs incurred by an entity over and above the debt margin. |

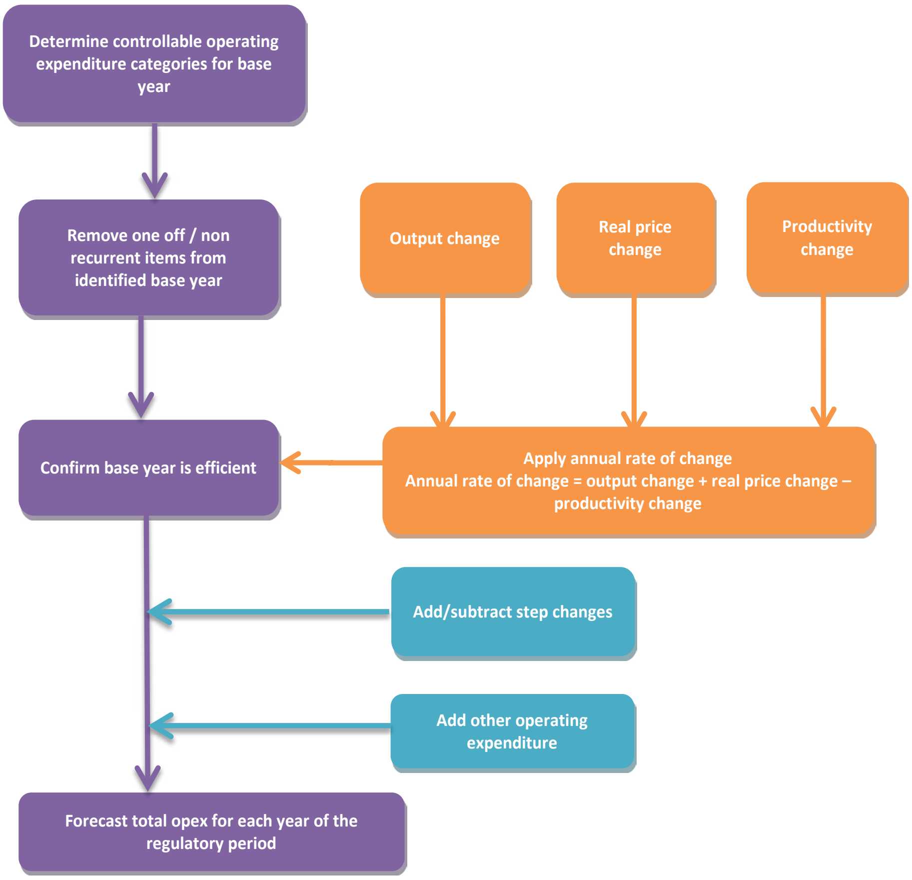
## 6.4 Operating expenditure forecasting methodology

Powerlink provided its proposed operating expenditure forecasting methodology to the AER on 30 June 2015. A copy of the Expenditure Forecasting Methodology is provided as Appendix 5.02.

Powerlink has largely used the approach set out in the AER's EFA Guideline to forecast its operating expenditure requirements in the 2018-22 regulatory period.[55] A base-step-trend approach has been applied to the controllable operating expenditure categories and a zero-based approach applied to other operating expenditure items.

The methodology used to prepare Powerlink's operating expenditure forecast is summarised in Figure 6.2 and explained in the following sections.

Figure 6.2: Powerlink's operating expenditure forecasting methodology




Source: Powerlink, Operational and Capital Expenditure Forecasting Methodology.

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

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

An annual real rate of change factor was 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.

55 Expenditure Forecast Assessment Guideline for Electricity Transmission, AER, November 2013.

An assessment of new requirements and other factors that may require a step change in controllable operating expenditure was conducted and zero-based estimates established for items in the other operating expenditure category. While Powerlink's operating expenditure forecasting methodology provides for the assessment of step changes, Powerlink has not proposed any for the 2018-22 regulatory period.

The zero-based forecast of other operating expenditure was 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 2018-22 regulatory period.

Further information on Powerlink's approach to forecasting operating expenditure is provided as Appendix 6.01.

## 6.5 Customer and consumer feedback and input

Early in the development of its operating expenditure forecasting methodology, Powerlink engaged with the AER, the AER's CCP4, Powerlink's Customer and Consumer Panel and stakeholders at Powerlink's Transmission Network Forum to seek feedback and input regarding Powerlink's methodology. Table 6.2 summarises the forums in which Powerlink received stakeholder feedback and how this has influenced Powerlink's final operating expenditure forecasting methodology.

Table 6.2: Stakeholder influence on forecasting methodology

| Stakeholder | Feedback | Influence on forecasting methodology |
|---|---|---|
| Customer and Consumer Panel | Stakeholder feedback focused on the approach to establishing an efficient base year and the significance of the AER's Annual Benchmarking Report results. Stakeholders requested that Powerlink undertake a broad assessment of the efficient base year and provide analysis considering scenarios for different base years and long term trends. | Powerlink has undertaken a broad range of analysis to demonstrate the proposed base year is efficient. The analysis of the efficient base year is explained in Section 6.6. |
| Transmission Network Forum Participants (Revenue Proposal) | This engagement built on the input gathered from the Customer and Consumer Panel in May 2015 to understand more about additional steps that Powerlink could take to demonstrate that the base year is efficient. Powerlink took away two key themes from this engagement: Powerlink should consider applying benchmarking in the analysis of its efficient base year, and Powerlink should undertake a "deep dive" into its operating expenditure to determine line item productivity gains. | Powerlink engaged an independent expert and its advice on benchmarking is discussed in Section 6.6.1 and the outcomes of its detailed line item review of productivity growth are discussed in Section 6.6.3. |

## 6.6 Forecast controllable operating expenditure

The following sections outline the application of the base-step-trend approach in accordance with Powerlink's Operating Expenditure Forecasting Methodology. The base-step-trend approach consists of three key phases:

- Determine an efficient base year from which to forecast controllable operating expenditure (Section 6.6.1);
- Establish an annual rate of change to trend forecast operating expenditure (Section 6.6.2); and
- Assess step changes in controllable operating expenditure (Section 6.6.4).

### 6.6.1 Efficient base year

Consistent with its operating expenditure forecasting methodology, Powerlink selected the 2014/15 financial year as the efficient base year. This year is the most recent full year of reported operating expenditure that has been independently audited.

Powerlink has reviewed actual expenditure in the base year and removed items 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). Table 6.3 identifies the controllable operating expenditure items removed from the 2014/15 base year.

Table 6.3: Adjusted expenditure items in 2014/15 base year

| Controllable operating expenditure category | $m, 2014/15 nominal | Basis for adjustment |
|---|---|---|
| 2014/15 unadjusted controllable operating expenditure | 196.0 | |
| Base year adjustments | | |
| Field maintenance | (1.4)<br>(0.3)<br>(0.2) | Work program efficiency: vegetation management<br>Work program efficiency: vegetation management<br>Non-recurrent: G20 preparation works |
| Operational refurbishment | (2.9) | Work program efficiency: refurbishment |
| Maintenance support | (0.1)<br>(0.3) | Non-recurrent: G20 preparation works<br>Work program efficiency: vegetation management |
| Asset management support | (0.5) | Non-recurrent: cancelled project for substation equipment integration and automation |
| Corporate support | (4.7)<br>(12.1)<br>0.3 | Workforce efficiency review*<br>Non-recurrent: cancelled project for 500kV development<br>Movement in provision adjustment |
| Total base year adjustments | (22.2) | |
| 2014/15 controllable operating expenditure - efficient base year | 173.8 | |

*The workforce efficiency review includes redundancy costs resulting from changes in Powerlink's external operating environment that were outside Powerlink's control. By removing this expenditure from the base year, Powerlink's forecast operating expenditure does not provide for redundancy costs which may be incurred due to similar exogenous factors (such as a change in industry structure or further reductions in the demand for transmission services).

After the removal of non-recurrent and efficiency implementation driven expenditure items shown in Table 6.3, Powerlink's controllable operating expenditure for the 2014/15 base year is $173.8m (in $2014/15). This is $11.8m (6.4%) below the AER's allowance for controllable operating expenditure for the 2014/15 year.

In response to feedback received from stakeholders at its Customer and Consumer Panel meeting and Transmission Network Forum, Powerlink further tested the veracity of 2014/15 as its efficient base year through a variety of techniques, which included economic benchmarking analysis. Stakeholders indicated that Powerlink should conduct a detailed analysis of operating expenditure efficiency at a category level, consider long term operating expenditure trends and demonstrate the application of benchmarking techniques.

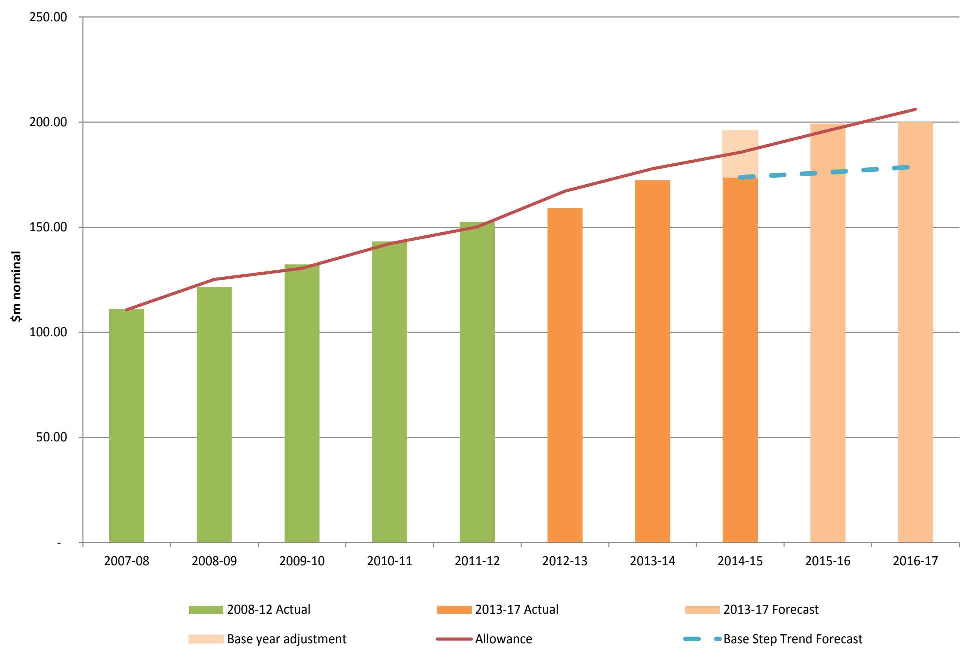
### *Actual total controllable expenditure performance relative to forecast allowances*

Figure 6.3 indicates that since 2007/08, Powerlink's actual controllable operating expenditure has consistently been within the AER's allowances. The only material exception to this trend was in 2014/15, which was due to a number of one-off factors and external operating circumstances that have been removed from the base year.

Powerlink's proposed adjustments for these factors results in an efficient base year from which to forecast controllable operating expenditure going forward, and is 6.4% below the AER's allowance.

Figure 6.3 also shows that Powerlink's forecast operating expenditure departs from the trend of the controllable operating expenditure allowance in the current regulatory period, reflecting the extent of cost efficiency incorporated into the forecast. This is discussed in Section 6.6.2.

Figure 6.3: Controllable operating expenditure 2007/08 to 2016/17 ($m, nominal)



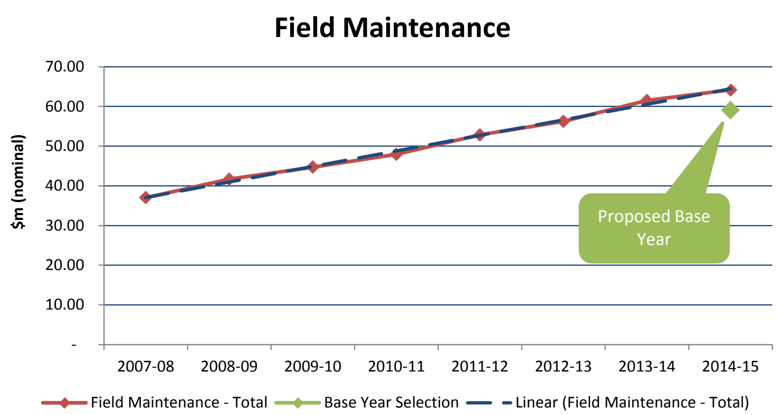

Source: Powerlink data.

### *Category analysis of controllable operating expenditure*

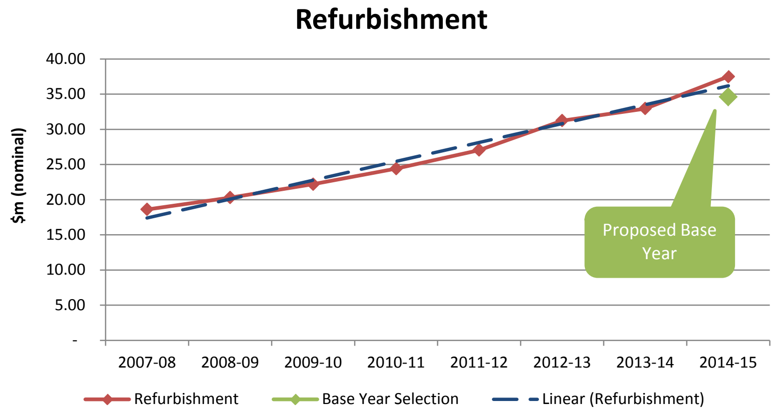
In considering an appropriate base year, Powerlink also assessed the relative performance of each major category of controllable operating expenditure against the long term trend from 2007/08. This analysis provides an indication of the effect of Powerlink's proposed adjustments to establish the efficient base year and the relative position of the base year adjustment in each category compared to the long term trend.

The results are shown in Figure 6.4. The analysis demonstrates that the proposed 2014/15 base year is, at a category level, on or below the long term trend. Further commentary specific to each controllable operating expenditure category is provided below.

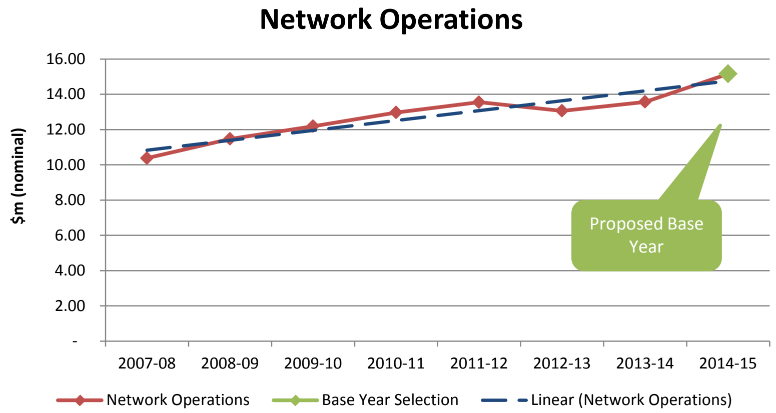
Figure 6.4: Category analysis of controllable operating expenditure



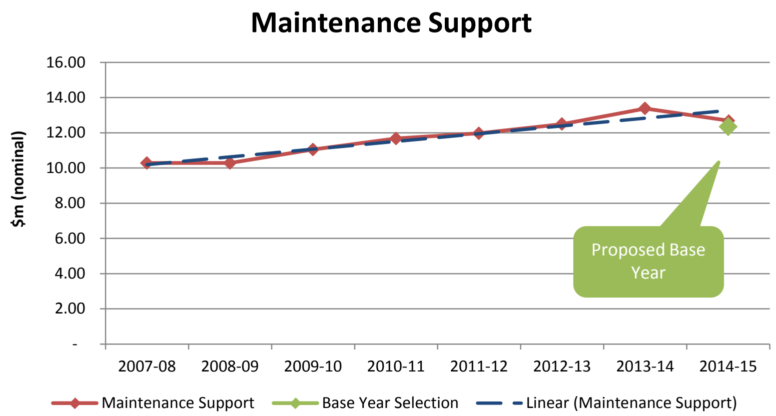

Field maintenance includes routine, condition based and corrective maintenance. Since 2003 Powerlink's field maintenance program has been structured in accordance with Reliability Centred Maintenance. The proposed base year, having been adjusted as part of a focus on reducing vegetation management costs, is incrementally below the longer term trend.



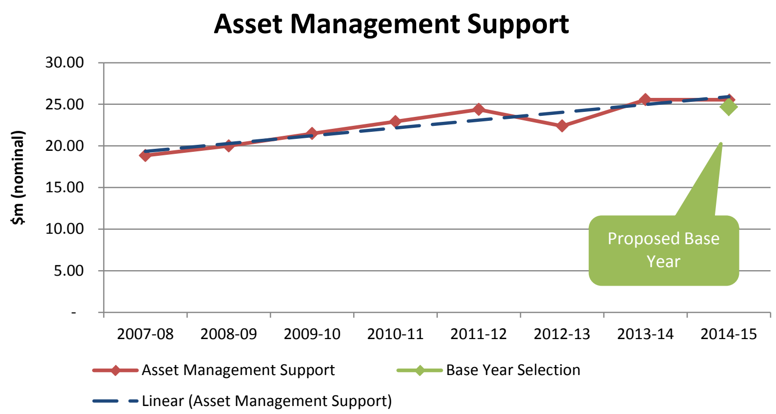

Refurbishment involves activities that return an asset to its pre-existing condition or function. Transmission line refurbishment expenditure has on average increased at a rate slightly higher than historical trends since 2012/13 whereas the expenditure on other asset classes has been stable since 2007/08. The main reason for this increase is the general ageing and deterioration in condition of the transmission line fleet requiring additional structure repairs and insulator replacement. Powerlink has included an efficiency program in the base year adjustment and forecast productivity growth.




Network operations include control centre functions as well as additional operations support activities. In 2012/13 and 2013/14 expenditure in this category reduced due to significant resource commitments from Network Operations allocated directly to major capital and non-regulated projects. In 2014/15, the adjusted base year is consistent with the long term trend. Powerlink has applied productivity growth in its forecast reflecting additional efficiency gains anticipated in this area.

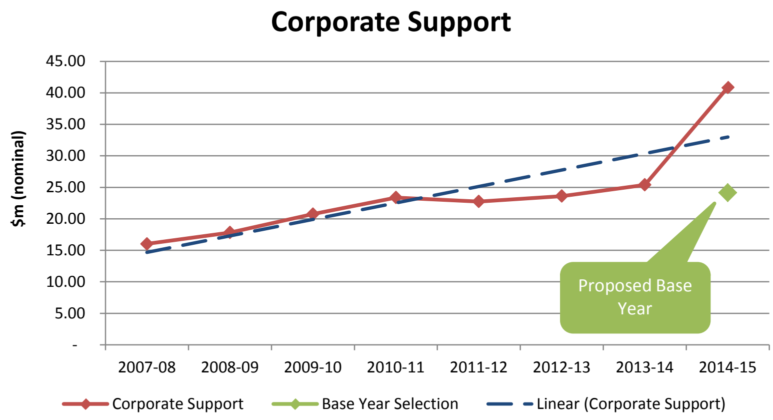



Maintenance support includes activities required to develop and maintain the systems to support field maintenance. In 2014/15 maintenance support expenditure reduced compared to longer term trends as result of efficiencies delivered in engineering support activities and helicopter contractor maintenance support.




Asset management support includes activities required to support the strategic development and ongoing asset management of the network.

In 2012/13, asset management technical investigations were cancelled or temporarily placed on hold as part of cost reductions targeted in operating expenditure in that year. In subsequent years (including the proposed base year), the trend returned to a level consistent with the longer term average. The rate of cost increases over recent years has also reduced.




Corporate support includes the support activities required by Powerlink to ensure adequate and effective corporate governance. Since 2010/11, the growth in corporate support expenditure has been significantly curtailed, increasing in 2014/15 due to significant non-recurrent expenditure (redundancy costs and the major write-off of project expenditure due to a sharp reduction in forecast demand growth). These items have been excluded from the proposed base year, which in real terms is consistent with the trend observed since 2010/11.

Source: Powerlink data.

### *Benchmarking of base year*

Powerlink engaged Huegin to independently assess the efficiency of Powerlink's historical operating expenditure, having regard to its TNSP peers, for the purposes of forecasting operating expenditure for the 2018-22 regulatory period. Huegin's report is provided as Appendix 4.01 and is discussed in more detail in Chapter 4.

Huegin's key findings in relation to Powerlink's absolute and relative efficiency were as follows:

- Powerlink's operating expenditure PFP performance has improved since 2006, indicating that Powerlink has been able to deliver increased aggregate output over the period with less labour and materials inputs;
- Powerlink's operating expenditure performance is similar to its NEM peers when important environmental factors such as load and energy density, population density and capitalisation policy are considered; and
- At the category analysis level Powerlink's operating expenditure performance is comparable to its peers.

Huegin concluded that Powerlink's large service area, highly radial network, low load density and sparsely located customer base will materially influence its ongoing required total operating expenditure. Given these environmental factors and broad indications of relative efficiency at the total and disaggregated levels of operating expenditure, Huegin's benchmarking analysis suggests Powerlink's historical revealed operating expenditure is comparable to the efficiency of other TNSPs.

In light of these findings, and feedback from the Customer and Consumer Panel, Powerlink sought Huegin's independent expert opinion on what would represent an appropriate efficient base year level of operating expenditure to compare against Powerlink's revealed costs in the current regulatory period. Huegin considered the following three approaches to identify a reasonable range for base year operating expenditure:

- Set a target by applying the network growth rates from the benchmarking model used in the AER's assessment of TransGrid's Revenue Proposal, assuming a 2013/14 starting point;
- Set a target by deducing the operating expenditure required in 2014/15 to match the average productivity score over the current regulatory period; and
- Use the historical trend of Powerlink's operating expenditure from 2006/07 to 2013/14 and extending this trend line to 2014/15 by forecast.

Having applied these three approaches, Huegin estimated efficient total operating expenditure for the 2014/15 base year between $177.9m and $184.1m (in $2013/14), excluding non-recurrent items and step changes.

For the purposes of comparison, Powerlink adjusted Huegin's estimate to $2014/15 and removed other operating expenditure items and step changes[56] incurred in 2014/15. This resulted in an estimate of efficient controllable operating expenditure between $172.9m and $179.2m.

Powerlink's base year controllable operating expenditure is $173.8m ($2014/15) and is at the lower end of the efficient range estimated by Huegin. Powerlink's application of a negative rate of change to this base year during the 2015/16 and 2016/17 years results in controllable operating expenditure of $166.5m ($2014/15) in the first year of the 2018-22 regulatory period.

Having regard to the trend, category and independent benchmarking analysis, Powerlink considers $173.8m to be an appropriate efficient base from which to forecast controllable operating expenditure for the 2018-22 regulatory period.

For the purposes of applying rate of change factors in the base-step-trend model and developing its forecast of controllable operating expenditure, Powerlink escalated its 2014/15 base year expenditure of $173.8m (nominal, $2014/15) to real $2016/17, resulting in a figure of $183.4m. Forecast operating expenditure in subsequent sections of this chapter is described in real $2016/17.

### 6.6.2 Rate of change

Powerlink trended its base year expenditure forward by the application of the real rate of change which is a function of:

**Output growth + Real Price Growth – Productivity Growth**

Powerlink has applied the trend function from the 2014/15 base year, resulting in the application of the rate of change to forecast controllable operating expenditure for both the 2015/16 and 2016/17 financial years and each year of the 2018-22 regulatory period.

This approach results in an additional efficiency gain between the base year (2014/15) and the commencement of the 2018-22 regulatory period compared to the approach adopted by the AER. As described in the AER's EFA Guideline, the productivity factor is applied from the first year of the 2018-22 regulatory period.

Each rate of change factor applied to the base year controllable operating expenditure is discussed in turn below.

### 6.6.3 Output growth

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

- Energy;
- Ratcheted non-coincident maximum demand;
- Weighted entry and exit points; and
- Transmission line circuit length.

The weightings applied to each measure of network output are the same as those used by the AER in its MTFP analysis, and are depicted in Table 6.4.[57]

56 Powerlink identified step increases in its 2014/15 revealed costs that are recurrent and need to be provided for in forecast operating expenditure. These cost increases relate to the commencement of a program of line decommissioning works (as a lower cost option than capital reinvestment).

57 The output specification for MTFP includes unserved energy which is measured on an annual basis for historical analysis but which cannot be reasonably forecast.

Table 6.4: Weightings for each output measure

| | Weighting |
|---|---|
| Energy | 21.4% |
| Ratcheted max demand | 22.1% |
| Weighted entry and exit points | 27.8% |
| Circuit line length | 28.7% |

### *Energy throughput*

Powerlink's energy forecasts are based on its Transmission Annual Planning Report 2015 (TAPR) supplemented by the Australian Energy Market Operator (AEMO) electricity flow forecasts across the Queensland/New South Wales border via the Queensland/New South Wales Interconnector (QNI) and Teranorra interconnectors taken from AEMC's 2015 National Transmission Network Development Plan (NTNDP).

Powerlink reviewed the impact of energy growth on its forecast controllable operating expenditure and recognised that the forecast annual growth in energy throughput between 2015/16 and 2017/18 was due to the significant forecast growth of LNG load concentrated in the Surat Basin. This energy is being delivered via the prescribed network and LNG proponent funded non-regulated assets.

Taking this into account, Powerlink reduced the additional Surat Basin LNG load in its energy throughput data between 2015/16 and 2017/18 for the purposes of forecasting its operating expenditure. Powerlink pro-rated this energy throughput data in line with the proportions of regulated and non-regulated capital expenditure associated with developing the assets to serve the LNG load.

Without this adjustment, the significant forecast growth of the LNG load (from a single point of supply in the prescribed network) would have caused a material increase in output growth and in turn the controllable operating expenditure forecast. Powerlink's approach represents a departure from the standard model for output growth applied in the AER's base-step-trend model and has the effect of reducing total forecast controllable operating expenditure by $13.1m in the 2018-22 regulatory period compared to the AER's application of the model.

### *Ratcheted maximum demand*

Powerlink's ratcheted maximum demand forecasts are based on the same sources as its energy throughput forecasts noted above.

### *Entry and exit points*

Powerlink is forecasting no new entry and exit points in the 2018-22 regulatory period and has therefore maintained in its forecast, the voltage weighted entry and exit points recorded in the 2017/18 year over the 2018-22 regulatory period.

### *Circuit length*

Powerlink has forecast no increase in circuit length over the 2018-22 regulatory period and has adjusted the forecast of circuit kilometre length to reflect planned line decommissioning over the 2018-22 regulatory period.

This adjustment reflects Powerlink's focus on reducing both forecast capital and operating expenditure on assets at the end of technical and economic life, for which there may be no enduring need. The adjustment to reflect planned line decommissioning has incrementally reduced output growth and in turn forecast controllable operating expenditure by $4.6m in the 2018-22 regulatory period.

### *Summary of output change forecasts*

Table 6.5 presents Powerlink's output change forecasts for the 2018-22 regulatory period.

Table 6.5: Output growth (%)

| | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Average |
|---|---|---|---|---|---|---|---|---|
| Energy | 0.5 | 0.8 | 0.8 | 0.0 | 0.2 | -0.5 | 0.7 | 0.2 |
| Ratcheted maximum demand | 0.0 | 0.0 | 0.6 | 0.5 | 0.0 | 0.0 | 0.0 | 0.2 |
| Weighted entry and exit points | 0.7 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Circuit line length | 0.0 | -1.4 | 0.0 | -0.1 | -0.5 | 0.0 | 0.0 | -0.1 |
| **Total output growth** | **0.3** | **0.0** | **0.3** | **0.1** | **-0.1** | **-0.1** | **0.2** | **0.1** |

## 6.6.4 Real price growth

### *Labour input price changes*

Powerlink's forecast of labour input price changes are based on the independent expert opinion of BIS Shrapnel, complemented by publicly available labour cost forecasts published by Deloitte Access Economics (DAE).[58] Section 7.5 of the Revenue Proposal outlines the approach Powerlink has adopted to develop its forecast of labour input price changes, which is summarised in Table 6.6.

For the purpose of incorporating real labour cost changes in the base-step-trend operating expenditure model, Powerlink conservatively used only the internal labour enterprise agreement plus simple average of BIS Shrapnel and DAE forecast series. This provides a lower real labour cost forecast than if a weighted estimate of internal and external labour cost forecasts were used.

Powerlink considers that its labour input price changes represent a realistic forecast of labour price increases over the 2018-22 regulatory period.

Table 6.6: Real labour cost forecasts (%)

| Labour series | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2021/21 | 2021/22 | Average |
|---|---|---|---|---|---|---|---|---|
| Internal Labour | | | | | | | | |
| Enterprise Agreement + ((BIS + DAE)/2) | 0.7 | 0.6 | 0.6 | 0.9 | 1.2 | 1.4 | 1.5 | 1.1 |

### *Materials input price changes*

Powerlink has used the CPI as a conservative proxy to forecast price increases in the materials component of controllable operating expenditure for the 2018-22 regulatory period. Further details of Powerlink's approach to material input price changes are provided in Section 7.5 of its Revenue Proposal.

### *Aggregate real input price changes*

In determining aggregate real input escalation forecasts, Powerlink notes that the AER has in its recent regulatory determinations used a weighting of 62% for labour and 38% for materials. Powerlink has investigated the appropriateness of this weighting and found that it is consistent with the split of labour and materials costs in Powerlink's historical controllable operating expenditure. Accordingly, Powerlink has applied these weightings to develop its real input escalation forecasts for the 2018-22 regulatory period. Table 6.7 depicts the forecast real input growth for the 2018-22 regulatory period.

58 The DAE forecasts have been taken from a February 2015 paper developed for the AER to assess Energex and Ergon Energy's labour cost forecasts up to 2019/20.

Table 6.7: Forecast real input growth (%)

| | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Average |
|---|---|---|---|---|---|---|---|---|
| Labour | 0.7 | 0.6 | 0.6 | 0.9 | 1.2 | 1.4 | 1.5 | 1.1 |
| Materials | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total real input growth | 0.4 | 0.3 | 0.4 | 0.6 | 0.7 | 0.8 | 0.9 | 0.7 |

## 6.6.5 Productivity growth

For the 2018-22 regulatory period, Powerlink's forecast productivity gains are based on a detailed "line-by-line" assessment of the potential efficiencies across its whole controllable operating expenditure program. This approach is consistent with feedback from customers and consumers that Powerlink should undertake a "deep dive" to identify operational efficiencies and reflects the impact of Powerlink's ongoing focus on achieving efficiencies and cost reduction.

The forecast productivity change for the 2018-22 regulatory period using Powerlink's approach is -1.2% per annum as shown in Table 6.8. Powerlink's approach has resulted in a much stronger level of productivity improvement each year compared to the level applied by the AER in its transmission determinations for TransGrid and TasNetworks (-0.86% per annum) and that recently proposed by AusNet Services (-0.28% per annum).

Table 6.8: Forecast real productivity change (%)

| | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Average |
|---|---|---|---|---|---|---|---|---|
| Productivity change | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 |

## 6.6.6 Total rate of change

Table 6.9 shows the summation of output, real input and productivity forecast changes over the 2018-22 regulatory period. In aggregate, the impact of Powerlink's forecast strong productivity performance will be to reduce controllable operating expenditure in real terms over the next regulatory period.

Table 6.9: Forecast real annual rate of change (%)

| | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Average |
|---|---|---|---|---|---|---|
| Output change | 0.3 | 0.1 | -0.1 | -0.1 | 0.2 | 0.1 |
| Input price change | 0.4 | 0.6 | 0.7 | 0.8 | 0.9 | 0.7 |
| Productivity change | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 | -1.2 |
| Rate of change | -0.5 | -0.6 | -0.6 | -0.5 | -0.2 | -0.5 |

Table 6.10 shows the annual increase or decrease in forecast controllable operating expenditure due to the rate of change being applied in each year of the regulatory period.

Table 6.10: Equivalent forecast annual operating expenditure ($m, 2016/17)

| | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Total |
|---|---|---|---|---|---|---|
| Output change | 1.0 | 1.2 | 1.0 | 0.8 | 1.0 | 5.0 |
| Input price change | 2.1 | 3.0 | 4.3 | 5.8 | 7.3 | 22.4 |
| Productivity change | (6.5) | (8.6) | (10.7) | (12.8) | (14.9) | (53.5) |
| Rate of change | (3.4) | (4.4) | (5.5) | (6.3) | (6.6) | (26.2) |

These rates of change indicate that over the next regulatory period. Powerlink's total operating expenditure is forecast to fall by over $26m in real terms.

### 6.6.7 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 capex/opex trade-offs (step changes). Powerlink has assessed the requirement for step changes and has not proposed any for the 2018-22 regulatory period.

Powerlink also identified a range of actual and prospective legislative changes that could potentially impact its controllable operating expenditure over the next regulatory period. These include:

- *Environmental Protection Act 1994* (Qld) in relation to contaminated land and biosecurity;
- *Nature Conservation Act 1992* (Qld);
- *Electricity Safety Act 2002* (Qld) (and Regulation); and
- AS 5577:2013 Electricity Network Safety Management Systems.

Powerlink has assessed each of these new requirements and considers that the associated additional costs can be managed within the forecast controllable operating expenditure over the 2018-22 regulatory period.

## 6.7 Forecast other operating expenditure

For other operating expenditure, Powerlink has 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. For these expenditure items, Powerlink does not consider that adopting a trend of base year expenditure will reasonably reflect future operating expenditure requirements.

### 6.7.1 Insurances

Powerlink proposes to adopt a combination of insurance policies, self-insurance and pass through arrangements to efficiently manage the exogenous risks associated with operating its network.

Powerlink's forecast insurance requirements are defined in more detail in the following sections.

*External insurance*

Powerlink takes an integrated approach to risk management and adopts a combination of insurance policies, self-insurance and pass through arrangements to efficiently manage the risks associated with loss events. A key component of Powerlink's risk management strategy is the establishment and maintenance of a prudent and efficient insurance program which provides coverage for the majority of Powerlink's major risk exposures. In establishing its insurance program, Powerlink sought advice from its insurance brokers, for domestic insurance and international cover, to ensure that its insurance coverage is effective and is delivered at a competitive cost.

Powerlink engaged independent external actuaries Finity Consulting (Finity) to provide a forecast of its insurance premiums and self-insurance for the 2018-22 regulatory period (refer Appendix 6.02 and 6.03). Table 6.11 presents the expected insurance premiums over the period.

Table 6.11: Forecast insurance premiums ($m, 2016/17)

| | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Total |
|---|---|---|---|---|---|---|
| Insurance Premiums | 7.6 | 7.8 | 7.9 | 8.1 | 8.3 | 39.7 |

In considering its potential risk exposure over the 2018-22 regulatory period Powerlink has largely retained its current level of insurance coverage.

Powerlink's insurance brokers' and Finity's analysis of Powerlink's existing policy coverage identified a potential gap related to the increasing threat from cyber security. Finity (supported by Powerlink's brokers) recommended that Powerlink insure against this risk and provided an estimate of the costs of additional policy coverage for the 2018-22 regulatory period. Powerlink has reviewed this recommendation and in the interests of maintaining insurance costs at a reasonable level, decided not to include the additional cost of cyber security insurance coverage (estimated at $1.8m over the regulatory period) in its forecast operating expenditure. However, it should be noted that Powerlink is progressing market interactions to establish a policy for this risk.

More generally, Finity identified that the current insurance market is considered to be in a "soft" part of the pricing cycle represented by strong competition and low premium prices. Finity predict "hardening" market conditions, represented by reduced competition and increasing prices over the 2018-22 regulatory period, which will result in an increase in insurance premiums. Finity highlight in its Insurance Premiums Projections report (refer Appendix 6.02) that the insurance market is:

> *"… currently undergoing a competitive phase in terms of premiums, characterised by premium rate reductions over the last two years across most classes of business. We expect the insurance market to remain in the "soft" phase of the cycle for the next two years (in the absence of any significant catastrophe events) before gradually moving towards a "harder" market with modest premium rate increases expected over the regulatory period 2017/18 to 2021/22."*

Given the real expectation of a hardening insurance market coupled with the additional cyber security coverage, Powerlink has classified insurance as other operating expenditure and included the forecast insurance premiums identified in Table 6.11 as a zero-based estimate in its forecast operating expenditure.

#### *Self-insurance*

Self-insurance costs relate to below deductible losses contained in Powerlink's insurance portfolio.

Powerlink engaged Finity to review historic levels of these losses and to develop a forecast of prudent self-insurance amounts for the 2018-22 regulatory period. These forecasts are presented in Table 6.12.

Table 6.12: Self-insurance ($m, 2016/17)

| | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Total |
|---|---|---|---|---|---|---|
| Self-insured amounts | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 7.4 |

Powerlink has classified self-insurance as other operating expenditure and for the 2018-22 regulatory period incorporated it as a zero-based estimate in its total operating expenditure forecast.

#### *Pass through events*

Powerlink has proposed that residual risk events for which Powerlink cannot commercially insure or self-insure be managed through the cost pass through mechanism in the Rules. Powerlink's nominated pass through events, including an insurance cap event, are discussed in Chapter 12 of the Revenue Proposal.

### 6.7.2 AEMC Levy

In 2014, the Queensland Government enacted changes to the *Electricity Act 1994* (Qld).[59] Under these changes Powerlink, as holder of a Transmission Authority in Queensland, must pay an annual fee that is a portion of the Queensland Government's funding commitments to the AEMC. The levy was first applied to Powerlink in 2014/15 and resulted in an increase in other operating expenditure within the current regulatory period that is required on a recurrent basis. Powerlink's proportion of the levy in 2014/15 was $3.8m.

The Queensland Government confirmed that the levy is expected to increase in line with CPI over the 2018-22 regulatory period. Table 6.13 presents the AEMC Levy forecasts for the period.

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

Table 6.13: AEMC Levy ($m, 2016/17)

| | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Total |
|---|---|---|---|---|---|---|
| AEMC Levy | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 | 21.0 |

### 6.7.3 Network support

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

Powerlink is not forecasting any requirement for network support over the 2018-22 regulatory period. Consequently, a $0 allowance is proposed. To the extent that a network support event occurs during the 2018-22 regulatory period Powerlink will make a cost pass through application under clause 6A.7.2 of the Rules.

### 6.7.4 Debt raising costs

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.

To provide an independent expert opinion in relation to this matter, Powerlink engaged KPMG to estimate the total debt raising transaction costs that a benchmark efficient electricity network service provider could be expected to incur over the 2018-22 regulatory period. KPMG's report is provided as Appendix 6.04.

KMPG has considered the AER's current preferred estimation methodology and alternative methodologies proposed by NSPs. KPMG's estimate is based on the AER's benchmark gearing assumption of 60% and Powerlink's forecast opening RAB value for the 2018-22 regulatory period. Using these assumptions, KPMG determined total levelised debt raising transaction costs to be 8.29 basis points per annum. Applying this basis point assumption results in forecast debt raising costs in the 2018-22 regulatory period presented in Table 6.14.

Table 6.14: Debt raising costs ($m, 2016/17)

| | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Total |
|---|---|---|---|---|---|---|
| Debt raising costs | 3.6 | 3.6 | 3.5 | 3.5 | 3.4 | 17.6 |

## 6.8 Interaction between forecast capital and operating expenditure

Schedule 6A.1.3(1) of the Rules requires that a Revenue Proposal identify and explain any significant interactions between forecast capital and operating expenditure.

Powerlink has a legislative responsibility to provide safe and reliable transmission services to customers and other NEM participants. To meet this legal obligation, Powerlink undertakes planning to ensure network assets deliver the required reliability, availability and quality of supply at the lowest long run cost. This in turn requires that operating expenditure and capital expenditure across regulatory periods is optimised having regard to the age profile of Powerlink's geographically dispersed network and expected future demand for prescribed transmission services.

Powerlink uses operating expenditure such as maintenance and operational refurbishment projects to maintain assets in a condition that ensures ongoing safe and reliable supply to its customers. When this is no longer considered to be technically and economically feasible, Powerlink considers a range of options for the asset (depending on its function in the transmission network) including network reconfiguration, asset retirement and capital reinvestment. In this context, Powerlink considers the appropriate balance between operating and capital expenditure through life cycle cost analysis.

With forecast demand growth expected to be essentially flat over the 2018-22 regulatory period reducing the need for augmentation capital expenditure, the ratio of Powerlink's operating to capital expenditure will shift when compared to the current and preceding regulatory periods. Operating expenditure is now expected to represent approximately half of Powerlink's total forecast expenditure.

The interaction between Powerlink's operating and capital expenditure will be particularly evident in the 2018-22 regulatory period as many of Powerlink's transmission line assets were constructed in a large wave of expenditure during the 1960s and 1970s. During the current regulatory period, maintenance and refurbishment of these assets has increased as the condition of this vintage of assets has degraded. Powerlink has sought to manage emerging condition issues and where possible, prudently defer the timing of capital reinvestment. Powerlink is proposing to continue to adopt methods to defer reinvestments in some transmission line assets through early tower painting, as well as to retire and dispose of a number of transmission lines for which there is no enduring need. Such an approach will be managed through forecast operating expenditure.

## 6.9 Forecast total operating expenditure

Powerlink's forecast total operating expenditure is shown in Table 6.15. The table provides the forecast values for each category for the 2018-22 regulatory period. The forecast is the outcome of applying Powerlink's operating forecast methodology outlined in Section 6.4 and the forecast parameters outlined in Sections 6.6 and 6.7.

Table 6.15: Forecast operating expenditure by category ($m, 2016/17)

| | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | TOTAL |
|---|---|---|---|---|---|---|
| Field maintenance | 62.7 | 62.0 | 61.3 | 60.7 | 60.2 | 306.9 |
| Operational refurbishment | 35.9 | 35.7 | 35.4 | 35.1 | 35.0 | 177.1 |
| Maintenance support | 14.1 | 14.1 | 14.1 | 14.1 | 14.1 | 70.4 |
| Network operations | 14.9 | 14.9 | 14.9 | 14.9 | 14.9 | 74.4 |
| Asset management support | 26.4 | 26.4 | 26.3 | 26.3 | 26.4 | 131.8 |
| Corporate support | 25.9 | 26.0 | 26.0 | 26.1 | 26.3 | 130.4 |
| **Total controllable operating expenditure** | **180.0** | **179.0** | **178.0** | **177.2** | **176.9** | **891.0** |
| Insurance premiums | 7.6 | 7.8 | 7.9 | 8.1 | 8.3 | 39.7 |
| Self-insurance | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 7.4 |
| Network support | 0 | 0 | 0 | 0 | 0 | 0 |
| AEMC Levy | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 | 21.0 |
| Debt management costs | 3.6 | 3.6 | 3.5 | 3.5 | 3.4 | 17.6 |
| **Total other operating expenditure** | **16.9** | **17.0** | **17.1** | **17.2** | **17.4** | **85.7** |
| **Total operating expenditure** | **196.9** | **196.0** | **195.1** | **194.4** | **194.3** | **976.7** |

As described in Section 6.4, Powerlink has forecast controllable operating expenditure using the AER's base-step-trend approach. The selection of an efficient base year has been the subject of detailed analysis of non-recurrent expenditure and an efficiency assessment informed by trend analysis, category analysis and independent expert advice on benchmarking. Powerlink's independent advice indicated that its proposed base year controllable operating expenditure is at the lower end of the efficient range.

Powerlink has also ensured that the rate of change factors applied to forecast controllable operating expenditure over the 2018-22 regulatory period are realistic and efficient. Powerlink has:

- Adopted estimates for labour and materials price growth based on independent expert opinion and consistent with the AER's approach in recent decisions;
- Applied very low output growth (reflecting its own conservative forecast for demand and energy growth) and taken additional steps to manually reduce output growth caused by increases in the demand and energy consumption of LNG loads in the Surat Basin and to reflect the decommissioning of transmission line assets. These measures have reduced forecast operating expenditure by $17.7m over the 2018-22 regulatory period; and
- Undertaken a line-by-line assessment to determine real productivity growth of -1.2% per annum, which exceeds the long run average productivity for both Powerlink and the industry. This translates to forecast productivity savings of $53m over the 2018-22 regulatory period.

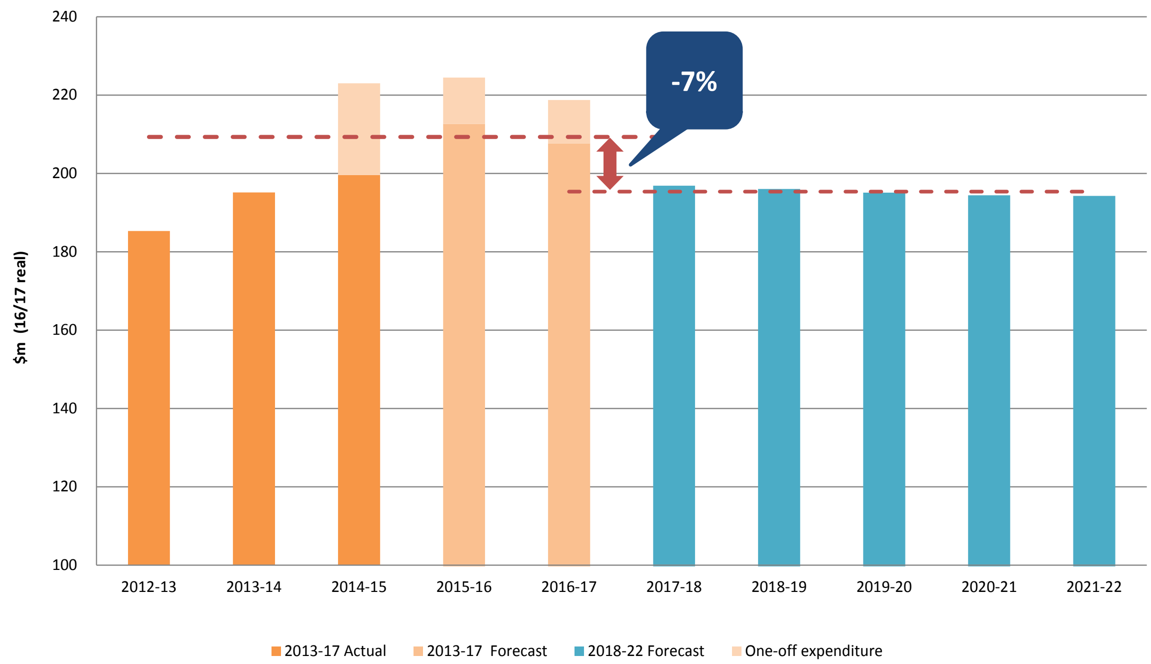
All of these factors combined result in real annual reductions in total operating expenditure of approximately -0.5% per annum or more than $26m over the 2018-22 regulatory period.

Powerlink has provided zero-based estimates of other operating expenditure, including insurances, debt management costs and the AEMC Levy.

Taking all of these factors into account, Powerlink considers that it has proposed a prudent and efficient level of forecast operating expenditure that will enable it to meet the operating expenditure objectives of the Rules while engendering a strong focus within its business on ongoing efficiency and cost reduction.

Figure 6.5 illustrates that this approach has resulted in forecast total operating expenditure of $976.7m for the 2018-22 regulatory period, which is 7% below Powerlink's actual total operating expenditure in the current regulatory period. Powerlink's underlying total forecast operating expenditure, excluding the AEMC Levy, is $955.7m. This reflects the efficient level of expenditure Powerlink requires to operate and maintain its network and business support functions.

Figure 6.5: Actual and forecast total operating expenditure ($m, 2016/17)




Source: Powerlink data.

## 6.10 Summary

This chapter explains Powerlink's methodology as well as key inputs and assumptions used to forecast its required operating expenditure for the 2018-22 regulatory period. Powerlink considers that its operating expenditure forecasts:

- Meet the requirements of the Rules and the AER's EFA Guideline;
- Deliver valued outcomes for Powerlink's customers through the application of a number of efficiencies in the operating and maintenance program and absorbing the costs associated with a number of new operating expenditure and regulatory requirements; and
- Achieve a balance between reliability and cost by maintaining current levels of reliability and delivering real annual reductions in forecast operating expenditure.

# 7 Escalation Rates and Project Cost Estimation

## 7.1 Introduction

Powerlink applies a range of methodologies to estimate the cost of projects and input cost escalation for labour and materials. This chapter explains how these methodologies have been used in the development of Powerlink's capital and operating expenditure forecasts for the 2018-22 regulatory period.

The key assumptions that underpin these inputs are discussed in more detail in relevant supporting documents referenced in the relevant sections below.

*Key highlights*

- Powerlink's expenditure forecasts and cost estimates have drawn upon its delivered project cost data collected and applied under Queensland conditions over the past decade. This data has been subjected to internal and external review.
- Powerlink's forecast labour cost escalation for the 2018-22 regulatory period is based on its current Enterprise Agreement until February 2018 and a simple average of BIS Shrapnel's and DAE's Wage Price Index (WPI) forecasts thereafter.
- Powerlink's forecast materials cost escalation for the 2018-22 regulatory period is based on CPI, when results in zero real (or inflation adjusted) increase.
- Powerlink has developed unit rates for input to the Repex Model to forecast reinvestment expenditure. Powerlink compared its unit rates with independently developed rates from Jacobs and is satisfied that they meet the requirements of the Rules.

## 7.2 Regulatory requirements

The Rules[60] require capital and operating expenditure forecasts to reasonably reflect prudent and efficient costs and a realistic expectation of demand and cost inputs required to achieve the capital expenditure objectives.

## 7.3 Cost estimates

The Revenue Proposal expenditure forecasts are supported by various types of project cost estimates, unit rates and cost escalators. These are summarised in Table 7.1, and are discussed in more detail in the associated supporting documents. Namely, the Cost Estimating Methodology (refer Appendix 7.01), Non-Load Driven Network Capital Expenditure Forecasting Methodology (refer Appendix 5.05), BIS Shrapnel Report on Real Labour Cost Escalation Forecasts to 2021/22 (refer Appendix 7.02) and Jacobs Report on Cost Escalation Factors (Materials) for Powerlink – 2016 to 2022 (Appendix 7.03).

60 *National Electricity Rules*, AEMC, clauses 6A.6.6 and 6A.6.7.

Table 7.1: Capital projects – cost estimates and escalators

| Phase of investment development | Description | Basis of cost estimate |
|---|---|---|
| Assets under construction | Already received full financial approval consistent with corporate governance framework. | Business-as-usual (BAU) estimates, typically detailed bottom-up (Project Proposal). |
| Confirmed investment need | Projects not yet approved but the need for investment has been confirmed and options are being assessed in preparation for seeking investment approval. | Combination of:<br>• Concept/Base Planning Objects (BPO) type estimates that adopt real labour cost escalators (independently sourced) and CPI for materials cost escalation;<br>• 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<br>• Historic trends in expenditure. |
| Future investment need | Based on normal business practices there is an expected future need however specific project details are not yet finalised or ready to seek project approval. | Combination of:<br>• Concept/BPO-type estimates that adopt real labour cost escalators (independently sourced) and CPI for materials cost escalation;<br>• 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<br>• Historic trends in expenditure. |

Powerlink's operating expenditure forecast adopted the same independently sourced real labour cost escalators identified above and applies CPI to materials cost inputs.

## 7.4 Powerlink's cost estimating governance structure and processes

In the normal course of business, Powerlink develops different types of capital and operating project cost estimates to assess options and for input to internal governance documentation upon which project approval is sought. The type and level of accuracy of the estimate will vary depending on the stage in the project life cycle it may be at. Typically, the more developed the need, justification and scope of works, the more detailed (or bottom-up) and accurate the cost estimate.

Powerlink's estimating cost database is underpinned by Base Planning Objects (BPOs). These are effectively standardised units of cost that apply to different types of assets, such as lines, substations, primary plant and secondary systems. The BPOs vary with inputs to construction (e.g. steel, aluminium, equipment and labour) and allowances for location or site specific conditions (e.g. above average wet weather) based on Powerlink's experience with implementing similar projects under Queensland conditions. The BPOs are also adjusted from time to time on the basis of actual competitive tender costs for similar projects and estimates obtained from contractors or manufacturers. Therefore, BPOs provide an expected average cost to deliver an assumed unit of work.

In preparation for full investment approval, a detailed bottom-up estimate (or Project Proposal) is generally developed, which is based on a more defined scope of work, with design and subject matter expert input.

## 7.5 Cost escalation

Powerlink has adopted forecast real input cost changes for labour and materials to develop project cost estimates that underpin its capital and operating expenditure forecasts for the 2018-22 regulatory period. These are presented in Table 7.2. The same set of real cost escalators were applied to forecast unapproved capital and operating expenditure projects and as an input to the Repex Model. The basis of these escalation forecasts is discussed, in turn, below.

Table 7.2: Real input price growth (%)

| | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 |
|---|---|---|---|---|---|
| Labour | | | | | |
| Internal | 0.6 | 0.9 | 1.2 | 1.4 | 1.5 |
| External | 0.7 | 0.8 | 1.2 | 1.7 | 1.7 |
| Materials | - | - | - | - | - |

### 7.5.1 Real labour price growth

Powerlink engaged BIS Shrapnel to provide an independent expert opinion on Wage Price Index (WPI) forecasts for the Electricity, Gas, Water and Waste Services (EGWWS) and Construction sectors in Queensland over the seven year period from 2014/15 to 2021/22. Separate forecasts were prepared for internal and external labour, to reflect Powerlink's use of its own workforce and external contractors to deliver its capital and operational works.

Following a relatively flat short term outlook, BIS Shrapnel expects EGWWS wages growth to pick up pace from 2017/18. This is due to a forecast increase in the demand for labour from energy, gas and water utilities related engineering construction activity. Overall, it forecasts Queensland utilities WPI growth to average 4% per annum (nominal) over the 2018-22 regulatory period.

Similarly, BIS Shrapnel forecasts flat non-dwelling and dwellings building activity in Queensland in the short term with an increase in activity in the medium term. Given this construction outlook, BIS Shrapnel expects the Queensland construction industry WPI growth to average 3.9% per annum (nominal) over Powerlink's 2018-22 regulatory period.[61]

BIS Shrapnel's report is provided as Appendix 7.02 of the Revenue Proposal. The report contains further details on the basis of these forecasts, including Queensland's future growth prospects and implications for labour market conditions.

In light of BIS Shrapnel's advice, Powerlink has developed internal labour cost forecasts from 2015/16 out to the end of its 2018-22 regulatory period based on:

- Powerlink's existing enterprise agreement until its nominal expiry date of February 2018; and
- A simple average of BIS Shrapnel and DAE forecasts thereafter.[62]

This simple average approach recognises that the average of two wages forecasts is likely to be more accurate than reliance on an individual forecast. It also aligns with the AER's approach in recent determinations for other NSPs, including TransGrid and TasNetworks.

Powerlink has also developed external real labour cost forecasts based on a simple average of BIS Shrapnel and DAE forecasts for all years of the 2018-22 regulatory period.[63]

61 *Real Labour Cost Escalation Forecast to 2021/22*, BIS Shrapnel, p. 35.

62 The DAE forecasts have been sourced from a February 2015 paper developed for the AER to assess Energex and Ergon Energy's labour cost forecasts up to 2019/20. The 2020/21 to 2021/22 forecasts were developed using DAE 2019/20 rates, extrapolated using the rate of change in labour price observed in the BIS Shrapnel forecasts for the corresponding period.

63 *Ibid.*

Powerlink considers that this approach has delivered an efficient and realistic forecast of input labour cost increases required to meet expected demand for prescribed transmission services.

Table 7.3 presents Powerlink's real labour cost forecasts for the 2018-22 regulatory period. In the interests of transparency, Powerlink has also included its current forecasts for the remaining two years of the current regulatory period.

Table 7.3: Real labour cost forecasts (%)

| Labour series | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2021/21 | 2021/22 |
|---|---|---|---|---|---|---|---|
| **Internal labour** | | | | | | | |
| BIS EGWWS WPI Qld | - | - | 1.1 | 1.3 | 1.6 | 1.8 | 1.9 |
| DAE EGWWS WPI Qld | - | - | 0.5 | 0.5 | 0.7 | 0.9 | 1.0 |
| Enterprise agreement + ((BIS Shrapnel + DAE)/2) | 0.7 | 0.6 | 0.6 | 0.9 | 1.2 | 1.4 | 1. 5 |
| **External labour** | | | | | | | |
| BIS construction WPI Qld | -0.2 | 0.2 | 0.7 | 0.8 | 1.5 | 2.0 | 2.0 |
| DAE construction WPI Qld | -0.4 | 0.0 | 0.8 | 0.8 | 0.8 | 1.3 | 1.3 |
| (BIS + DAE)/2 | -0.3 | 0.1 | 0.8 | 0.8 | 1.2 | 1.7 | 1.7 |

### 7.5.2 Real material price growth

Powerlink has used the CPI as a proxy to forecast increases in the materials component of capital and operating expenditure for the 2018-22 regulatory period. This approach is consistent with the materials escalation approach applied by the AER in recent regulatory determinations. As a result, Powerlink has assumed zero increase in materials costs from 2014/15 to 2021/22.

Under certain economic conditions, Powerlink considers that there may be cause to apply materials cost escalators above CPI. Powerlink engaged Jacobs to provide independent expert advice on this matter, which is provided as Appendix 7.03.

However, in the context of the overall capital and operating expenditure forecasts put forward in its Revenue Proposal, Powerlink has chosen not to adopt Jacobs' forecasts. Powerlink may revisit this issue in its Revised Revenue Proposal, pending the overall outcome of the AER's Draft Determination expenditure allowances.

## 7.6 Repex Model unit rates

Powerlink applied the AER's Repex Model to forecast much of its capital reinvestment expenditure requirements for the 2018-22 regulatory period. Powerlink's Repex Model and Non-Load Driven Network Capital Expenditure Forecasting Methodology are provided as supporting information to the Revenue Proposal.

The unit rates used in the Repex Model are based on Powerlink's standard project cost estimate rates (or BPOs). The unit rates reflect Powerlink's reasonably available historical and contemporary costing data and have been subject to independent benchmarking and external review. The forecast labour and materials cost escalators discussed in the preceding section of this chapter have also been applied to these unit rates.

However, there are some important differences in the unit rates Powerlink has used in the Repex Model, those derived from its Category Analysis RIN data and the Reset RIN data submitted as part of the Revenue Proposal. This is discussed further below.

### 7.6.1 Reconciliation between Category Analysis and Repex Model unit rates

The unit rates adopted in Powerlink's application of the Repex Model differ from those reported in Powerlink's annual Category Analysis RIN responses and Reset RIN due to three factors:

- The Repex Model unit rates include a corporate overhead (indirect cost) allocation, given they are developed from Powerlink's BPOs. However, the AER requires historical Category Analysis RIN and Reset RIN unit rates to be estimated on an "unburdened" basis. In other words, for businesses to exclude any allocation for corporate overheads;
- Unit rates for new assets derived from the Category Analysis RIN information do not include costs to modify or enhance an existing asset or costs incurred after the asset has been capitalised.[64] For example, when a new replacement substation asset is commissioned, the cost of any necessary complementary refurbishment of existing associated substation assets is capitalised into the existing asset's value not the new asset's value; and
- Repex Model unit rates have been developed using Powerlink's BPOs (bottom-up) as opposed to Category Analysis RIN unit rates that are developed by disaggregating projects costs to an asset level (top-down). The assumptions applied in the disaggregation of the Category Analysis RIN unit rates do not align with requirements for forecast unit rates applied in the Repex Model.

The impact of these differences is that the unit rates reported in the Category Analysis and Reset RIN responses will tend to be lower than Powerlink's observed project costs and also vary due to the differing methodologies used to allocate the costs to unit rates.

For the purpose of forecasting reinvestment capital expenditure in the 2018-22 regulatory period using the Repex Model, Powerlink considers that it is appropriate to capture the costs identified above in the unit cost input module of the model. In particular, Powerlink considers that this is required to provide transparency in the total costs that are expected to be incurred in the 2018-22 regulatory period.

### 7.6.2 Powerlink review of Repex Model unit rates

To internally validate the unit rates applied in the Repex Model, Powerlink undertook various cross-checks. These included comparisons with actual historical costs for completed projects, BPO estimates and historical RIN data. Aside from the differences identified above in relation to RIN data, Powerlink's unit rates used in the Repex Model when applied across a population of sample projects results in total estimated expenditure within ±5%.

However, to provide an independent comparison, Powerlink sought external advice from Jacobs, discussed below.

### 7.6.3 Independent benchmarking

Powerlink engaged Jacobs to provide its own independent set of estimates for 52 nominated asset building-blocks across a number of different categories and voltages, namely: conductors; tower replacement and refit/refurbishment; substation switch bays, including selected power transformers; Supervisory Control and Data Acquisition (SCADA), network control and protection systems; and reactive plant including Static VAr Compensators (SVCs), capacitors and shunt reactors. Jacobs' report is provided as Appendix 7.04.

64 Powerlink has explained its approach in the Basis of Preparation documents supplied to the AER as part of its annual Category Analysis RIN response. See AER website: http://www.aer.gov.au/system/files/Powerlink%202013-14%20-%20Category%20Analysis%20RIN%20-%20Basis%20of%20Preparation%20D14%20149022.pdf.

Jacobs' estimates were based on market data drawn from multiple sources, which included:

- Recent expenditure reviews for electricity transmission and distribution utilities to support regulatory proposals to the AER;
- Procurement studies of transmission and distribution asset costs;
- Jacobs market price surveys of materials costs and construction and maintenance activities;
- Contract and procurement costs incurred by utilities on recent projects;
- Recent asset valuations and comparative Jacobs estimates; and
- Jacobs' valuation database.

Powerlink then used Jacobs' estimates to compare against the unit rates derived from Powerlink's own estimating systems and actual delivered projects used as input to the Repex Model. Powerlink found that while some of its individual unit rates differed from those developed by Jacobs, the application of the Jacobs unit rates in the Repex Model resulted in a replacement expenditure forecast marginally higher than that derived using Powerlink's unit rates (by 2%). The reason for the variation in some individual unit rates could be attributed to the different approach that Powerlink and Jacobs has taken to apportion common costs to each unit rate. Overall, Powerlink is satisfied that the unit rates used as input to the Repex Model generate a reasonable estimate of forecast costs.

## 7.7 Summary

Powerlink's expenditure forecasts and cost estimates have drawn upon its delivered project cost data collected and applied under Queensland conditions over the past decade. This data has been subjected to internal and external review. Powerlink has sought external independent opinion on realistic labour and material cost escalation factors over the forthcoming regulatory period and applied these factors consistent with the approach applied by the AER in recent transmission determinations. Finally, Powerlink has developed efficient unit rates for input to the Repex Model that have been the subject of independent benchmarking.

# 8 Regulatory Asset Base

## 8.1 Introduction

This chapter outlines the approach taken to calculate the Regulatory Asset Base (RAB) as at 1 July 2017 and the forecast annual regulatory asset base to 30 June 2022.

*Key highlights*

- Powerlink's opening RAB as at 1 July 2017 is estimated to be $7,237.9m.
- Based on the regulatory depreciation methodology the RAB is forecast to grow by $424.6m (5.9%) during the regulatory period, resulting in a closing RAB balance of $7,662.5m as at 30 June 2022.

## 8.2 Regulatory requirements

Under schedule 6A.1.3(5) of the Rules, Powerlink must provide the calculation of the RAB for each year of the 2013-17 regulatory period. In doing so, Powerlink has applied Version 3 of the AER's Roll Forward Model (RFM) published in October 2015 in accordance with clause 6A.6.1 and schedule 6A.2 of the Rules.

## 8.3 Roll forward value of regulatory asset base

Powerlink's opening RAB as at 1 July 2012 has been adjusted for:

- Actual capital expenditure incurred during 2012/13, 2013/14 and 2014/15;
- Forecast capital expenditure for 2015/16 and 2016/17;
- Proceeds of assets disposed of during 2012/13, 2013/14 and 2014/15;
- Depreciation rates determined by the AER's RFM;
- Capitalised movements in provisions; and
- The difference between estimated and actual capital expenditure during the last year of the previous regulatory period (2011/12), and the return on the difference for that year.

Powerlink is currently investigating a number of matters that may result in a requirement to make some adjustments to the RAB, for example, as part of the Queensland Government's strategic review. Powerlink reserves its right to provide further information to the AER as it becomes available.

## 8.4 Disposal of assets

As in previous Revenue Proposals, due to the regulatory models being based on cash flows, Powerlink has adopted the proceeds value for disposals within the RFM. Therefore, capital expenditure is reported net of disposals.

### 8.5 Regulatory asset base as at 1 July 2017

Utilising the AER's RFM, Powerlink has calculated its opening RAB as at 1 July 2017 as $7,237.9m. This is illustrated in Table 8.1.

Table 8.1: Regulatory asset base ($m, nominal)

| | 2012/13 | 2013/14 | 2014/15 | 2015/16 (forecast) | 2016/17 (forecast) |
|---|---|---|---|---|---|
| Opening RAB | 6,428.8 | 6,847.9 | 7,149.0 | 7,152.5 | 7,217.5 |
| Capex expenditure as incurred* | 464.3 | 329.1 | 163.8 | 167.5 | 220.6 |
| Regulatory depreciation | (45.2) | (28.1) | (160.3) | (102.6) | (102.6) |
| Closing RAB | 6,847.9 | 7,149.0 | 7,152.5 | 7,217.5 | 7,335.4 |
| Difference in forecast and actual capex | - | - | - | - | (65.5) |
| Return on difference | - | - | - | - | (32.1) |
| **Opening RAB at 1 July 2017** | **-** | **-** | **-** | **-** | **7,237.9** |

*Adjusted for Consumer Price Index (CPI) and ½ Weighted Average Cost of Capital (WACC) allowance.

## 8.6 Forecast regulatory asset base

To calculate the RAB for the 2018-22 regulatory period, Powerlink has applied the opening RAB as at 1 July 2017 calculated above in the AER's PTRM and adjusted for:

- Forecast capital expenditure for 2017/18 to 2021/22;
- Forecast proceeds of assets disposed for 2017/18 to 2021/22;
- Depreciation rates determined by the AER's PTRM (refer to Chapter 10);
- Forecast capitalised movements in provisions; and
- Forecast inflation (refer to Chapter 9).

Table 8.2: Forecast regulatory asset base ($m, nominal)

| | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 |
|---|---|---|---|---|---|
| Opening RAB | 7,237.9 | 7,350.3 | 7,447.4 | 7,528.1 | 7,602.3 |
| Capital expenditure as incurred* | 206.8 | 207.6 | 209.6 | 215.5 | 208.4 |
| Regulatory depreciation | (94.3) | (110.4) | (128.9) | (141.3) | (148.2) |
| **Closing RAB** | **7,350.3** | **7,447.4** | **7,528.1** | **7,602.3** | **7,662.5** |

*Adjusted for Consumer Price Index (CPI) and ½ Weighted Average Cost of Capital (WACC) allowance.

## 8.7 Summary

In accordance with the Rules, this chapter explains the derivation of Powerlink's opening RAB at 1 July 2017 and its roll forward over the 2018-22 regulatory period. A complete RFM and PTRM accompanies Powerlink's Revenue Proposal.

# 9 Cost of Capital and Taxation

## 9.1 Introduction

This chapter outlines Powerlink's approach to the calculation of the rate of return and treatment of taxation for the 2018-22 regulatory period. The chapter also summarises the independent expert advice Powerlink obtained regarding its proposed rate of return and treatment of taxation for the 2018-22 regulatory period.

*Key highlights*

- In its Revenue Proposal, Powerlink:
  - Applied the AER's Rate of Return (RoR) Guideline to estimate an indicative rate of return for the 2018-22 regulatory period of 6.04%, based on:
    - A Return on Equity of 7.3%
    - A Return on Debt of 5.20%
  - Adopted a rate of 0.4 for gamma consistent with recent AER regulatory determinations.
  - Proposed an allowance for taxation of $111.5m which has been determined using the AER's PTRM.
- Powerlink sought independent expert advice on its proposed rate of return which concluded that some departures from the RoR Guideline are appropriate to estimate the required rate of return in a manner that best meets the requirements of the National Electricity Law (NEL), the Rules and supports the National Electricity Objective (NEO). While Powerlink supports these views, it has nonetheless adopted the AER's RoR Guideline approach in its Revenue Proposal.
- Powerlink notes that many of the matters related to the AER's application of its RoR Guideline are currently the subject of appeals before the Australian Competition Tribunal (Tribunal) and may be the subject of judicial review before the Federal Court of Australia (Federal Court). Powerlink reserves its rights on the cost of capital and gamma estimates and may submit an updated rate of return in a separate submission, or in its Revised Revenue Proposal, that reflects one or more aspects of the Tribunal Decision (or if relevant, the decision of the Federal Court).

## 9.2 Regulatory requirements

The NEO is as follows:

> *… to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to:*
>
> *(a) Price, quality, safety, reliability and security of supply of electricity; and*
>
> *(b) The reliability, safety and security of the national electricity system.*[65]

Consistent with the NEO, clause 6A.6.2 of the Rules requires that:

> *(b) The allowed rate of return is to be determined such that it achieves the allowed rate of return objective.*
>
> *(c) The allowed rate of return objective is that the rate of return for a Transmission Network Service Provider is to be commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the Transmission Network Service Provider in respect of the provision of prescribed transmission services (the allowed rate of return objective).*[66]

65 *National Electricity (South Australia) Act 1996*, 30.1.2015, Schedule, National Electricity Law, Part 1, Section 7.

66 *National Electricity Rules*, AEMC, clauses 6A.6.2(b) and 6A.6.2(c).

The AER published its current RoR Guideline in November 2013 under its Better Regulation reform program. This followed some material changes to the Rules that were finalised in 2012, and resulted in the AER having a less prescriptive and more flexible approach to assess the rate of return.[67] As a consequence of these changes, the Rules require the AER to have consideration to:

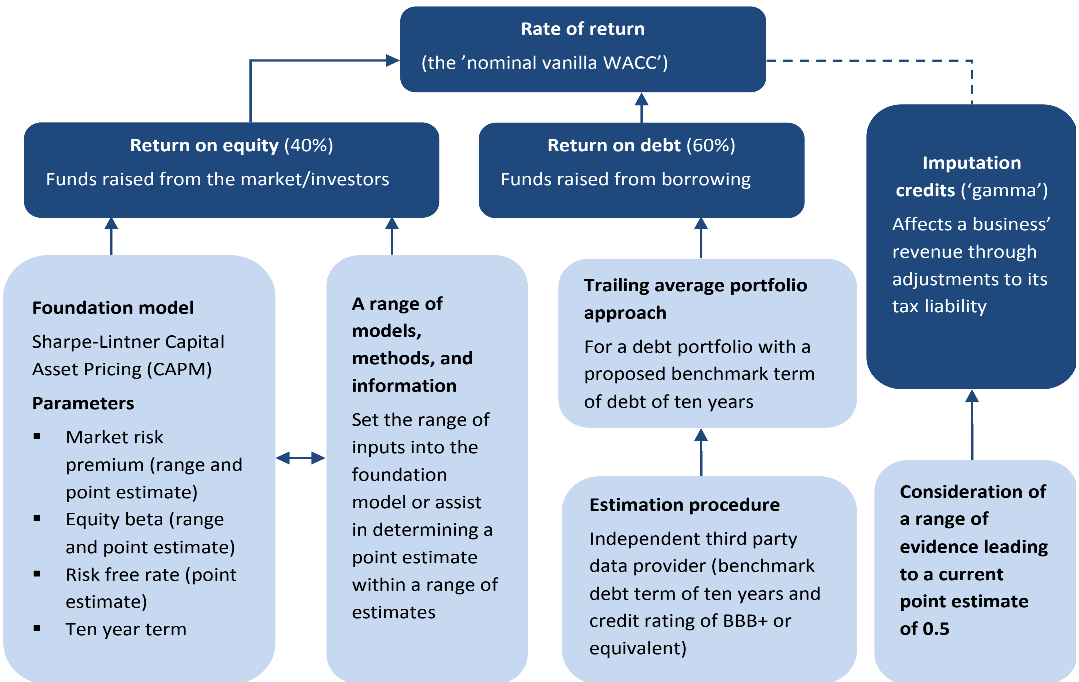
> *(a) relevant estimation methods, financial models, market data and other evidence;*
>
> *(b) the desirability of using an approach that leads to the consistent application of any estimates of financial parameters that are relevant to the estimates of, and that are common to, the return on equity and the return on debt; and*
>
> *(c) any interrelationships between estimates of financial parameters that are relevant to the estimates of the return on equity and the return on debt.*[68]

The Rules also require that the rate of return is to be a weighted average of the following:

- The return on equity for the regulatory period in which that regulatory year occurs; and
- The return on debt for that regulatory year.[69]

The AER's approach is summarised in Figure 9.1.

Figure 9.1: Overview of the AER's Rate of Return Guideline




Source: AER, Rate of Return Guideline.

67 *Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, National Gas Amendment (Price and Revenue Regulation of Gas Services) Rule 2012*, AEMC, 29 November 2012.

68 *National Electricity Rules*, AEMC, clause 6A.6.2(e).

69 *Ibid*, clause 6A.6.2(d)(1).

## 9.3 Powerlink's proposed rate of return

Powerlink has adopted and applied the AER's RoR Guideline for the purpose of establishing its indicative rate of return in the Revenue Proposal. This has resulted in an indicative rate of return of 6.04%. The sections below outline the approach adopted for each parameter.

### 9.3.1 Return on equity

Based on the application of the AER's RoR Guideline, Powerlink's estimate for the return on equity is 7.3%. The return on equity parameters are identified in Table 9.1, and are discussed in turn below.

Table 9.1: Return on equity parameters

| | Proposed value |
|---|---|
| Nominal risk free rate | 2.72% |
| Equity beta | 0.7 |
| Market risk premium | 6.50% |
| **Cost of equity** | **7.3%** |

*Risk free rate*

The AER's RoR Guideline approach for estimating the risk free rate is to use the yield on 10 year Commonwealth Government Securities (CGS) averaged over a 20 day period.

Powerlink has applied the AER's approach. As there are no observable CGS bonds with a term to maturity of precisely 10 years in the 20 day period up to 15 September 2015, Powerlink interpolated between the two closest bonds with remaining terms to maturity that are slightly shorter and longer than 10 years. The estimated rate from this approach is 2.72%.

*Equity beta*

The RoR Guideline approach involves estimating a range for the equity beta based on empirical analysis of Australian energy utility firms that the AER considers to be comparable to the benchmark efficient entity. In its RoR Guideline, the AER determined that this approach leads to a range for the equity beta from 0.4 to 0.7. The AER then uses other information sources to inform the selection of a point estimate from within that range, which include empirical estimates of overseas energy networks and theoretical principles which underpin the Black CAPM.

The AER's approach results in a point estimate for the equity beta of 0.7, which Powerlink has adopted in its Revenue Proposal.

*Market Risk Premium*

To estimate the Market Risk Premium (MRP) the AER estimates the range for the MRP with regard to theoretical and empirical evidence, including historical excess returns, Dividend Growth Model (DGM) estimates, survey evidence and conditioning variables. The AER also typically has regard to recent decisions among Australian regulators. Having established a range for the MRP the AER determines a point estimate by applying regulatory judgment, taking into account estimates from each of these sources of evidence and considering their strengths and limitations.

In its Explanatory Statement to the RoR Guideline[70] the AER determined that based on the market evidence as at December 2013, its methodology would return a range for the MRP of 5.0% to 7.5%, from which it selected a point estimate of 6.5%. In more recent AER regulatory determinations, examination of the same evidence produced an updated range for the MRP between 5.1% and 8.6%. However, the AER has consistently maintained its point estimate at 6.5%.

Powerlink has adopted a rate of 6.5% in its Revenue Proposal.

### 9.3.2 Return on debt

The AER estimates the allowed return on debt using a trailing average portfolio approach with the following key characteristics:

- A trailing average length of 10 years;
- Equal weights applied to all the elements of the trailing average; and
- The trailing average to be automatically updated every regulatory year within the regulatory period.

The trailing average approach proposed by the AER differs from its previous approach of an "on-the-day" methodology. As such the AER has proposed a transitional arrangement under which:

- The yield on each fixed rate loan will initially equal the average 10 year benchmark debt yield during a service provider's regulatory period;
- In each subsequent year the maturing fixed rate loan (which funds 10 per cent of the benchmark debt balance) is refinanced with a new 10 year fixed rate loan at the prevailing 10 year benchmark debt yield; and
- The trailing average is gradually phased in over a 10 year period.

To estimate the prevailing return on debt the AER's approach is to adopt the simple average of the observed yields published by independent third party data service providers with an observation period between 10 consecutive business days up to a maximum of 12 months.

The AER has not specified any preferred independent third party data source/s in its RoR Guideline. However, Powerlink observes that in recent AER determinations, including its Final Determinations for Energex, Ergon Energy and SA Power Networks published in October 2015, it has used a simple average of Bloomberg's BVAL[71] and the Reserve Bank of Australia's (RBA's) estimates.

Powerlink has applied this approach to derive its indicative return on debt estimate. For the purpose of its Revenue Proposal, Powerlink's estimate of 5.2% is based on a 40 day simple average of the estimates from Bloomberg's BVAL and the RBA's series, ending 15 September 2015.

Powerlink proposed to adopt a 40 business day observation period for its Final Transmission Determination and each year thereafter. Powerlink has set out its nominated periods on a confidential basis as Appendix 9.01.

### 9.3.3 Process

In the event that the AER proposes within a reasonable timeframe to adopt a fast-track determination process and Powerlink agrees, Powerlink reserves the right to propose alternative averaging periods for the risk free rate and observation periods for the cost of debt.

### 9.3.4 Customer and consumer feedback

In considering its approach to the rate of return, Powerlink engaged with its stakeholders. This included the AER's CCP4 and with stakeholders more broadly at its 2015 Transmission Network Forum. Broad themes from the feedback received and how Powerlink has applied this feedback have been summarised in Table 9.2.

70 *Explanatory Statement, Rate of Return Guideline*, AER, pp. 89-97.

71 *Bloomberg Valuation Service*, Bloomberg, http://www.bloomberg.com/enterprise/content-data/pricing-data/.

Table 9.2: Summary of feedback received on rate of return

| Feedback received | Influence on approach |
|---|---|
| Powerlink needs to engage early on potential WACC outcomes to assist customers in their decision making. | Powerlink communicated upfront that the approach in the AER's RoR Guideline would be applied in its Revenue Proposal.<br>Powerlink published an overview sheet on its proposed approach to the rate of return in July 2015 and ensured that this was made available to key stakeholders at the 2015 Transmission Network Forum in July 2015 and via Powerlink's website. This included the AER.<br>Powerlink conveyed its early indicative rate of return estimate in engagement forums and meetings with stakeholders, including to its Customer and Consumer Panel, and at AER, government and large energy user briefings. |
| There is an opportunity to manage the potential impact of depreciation costs and other offsets through an adjustment to the rate of return applied to those assets. | Powerlink engaged with stakeholders at its Customer and Consumer Panel meeting in November 2015 to seek preliminary feedback to set the future direction for investigations on different approaches to depreciation, which is discussed further in Chapter 10. |

### 9.3.5 Powerlink's indicative rate of return estimate

For the purpose of its Revenue Proposal, Powerlink's indicative rate of return is summarised in Table 9.3.

Table 9.3: Powerlink's indicative rate of return[72]

| | Proposed value |
|---|---:|
| Nominal risk free rate | 2.72% |
| Market risk premium | 6.50% |
| Equity beta | 0.7 |
| Return on equity | 7.3% |
| Return on debt | 5.20% |
| WACC (nominal, vanilla) | 6.04% |

## 9.4 Powerlink's independent expert advice

While Powerlink has elected to adopt the AER's RoR Guideline approach for its Revenue Proposal, Powerlink puts on record that this is not an (explicit or implicit) endorsement of the AER's approach.

In developing its Revenue Proposal, Powerlink sought independent expert opinion from:

- Frontier Economics Pty Ltd (Frontier) in relation to the return on equity and gamma; and
- Queensland Treasury Corporation (QTC) in relation to the return on debt.

These experts concluded that departures from the RoR Guideline are appropriate to arrive at an estimate of the required rate of return that best meets the requirements of the NEL and the Rules and supports the NEO. A summary of the experts views are provided below and the full reports are provided as Appendix 9.02.

Powerlink notes that similar departures to the RoR Guideline proposed by other NSPs have not been accepted by the AER. It further notes that the AER's decision to reject these departures is currently subject to appeal before the Tribunal and the Federal Court. At a very high level, the decisions that are subject to appeal include, but are not limited to:

- The AER's reliance on the Sharpe-Lintner Capital Asset Pricing Model (the SL-CAPM) as its sole foundation model used to estimate the return on equity, along with its relegation or rejection of other models;

72 The WACC reflects a pre-tax cost of debt and post-tax cost of equity.

- In the AER's application of the SL-CAPM:
  - Its conclusion that the appropriate value of the equity beta is 0.7;
  - The approach it has used to estimate the MRP;
- The AER's approach to the calculation of gamma; and
- The AER's approach to phasing in the 10 year trailing average approach used to estimate the return on debt.

If as a consequence of the current appeals the Tribunal finds that:

- The AER has made a material error (or multiple errors) of fact, has incorrectly exercised its discretion, or has made an unreasonable decision, having regard to all of the circumstances; and
- Varying the decision, or setting it aside and requiring the AER to make a new decision, would, or would be likely to, result in a materially preferable NEO decision,

Powerlink reserves its rights and may submit an updated rate of return in its Revised Revenue Proposal or otherwise address these issues in a submission concerning how the AER should make its determination.

Similarly, should the Court make a decision that there is a flaw in the AER's approach, Powerlink reserves its rights to make an amendment to its Revenue Proposal or otherwise to make a submission on how the AER should address the Federal Court's ruling in making its determination on Powerlink's proposal.

### 9.4.1 Return on equity

The AER's preferred approach set out in its RoR Guideline is to retain the SL-CAPM as its sole foundation model for determining the return on equity, with other models having subsidiary roles in the estimation process. Independent expert opinion from Frontier identifies a number of issues with the approach including the extent to which the reliance on a sole foundation model provides the best estimate of the required return. Frontier considers that other relevant models should also have a primary role, along with the SL-CAPM, referred to as the "multi-model" approach.[73]

#### *Equity beta*

Independent expert opinion from Frontier identifies a number of issues with the approach and evidence applied by the AER, including the:

- Extent to which the AER relies on a small sample of domestic comparators and the reliability of those comparators along with the interpretation and application of international evidence; and
- AER's use of the theory of the Black CAPM (which adjusts for low beta bias) to influence its selection of its point estimate from within the range.[74]

Frontier's independent expert opinion is that the appropriate equity beta is 0.91.[75]

#### *Market risk premium*

Independent expert opinion from Frontier identifies a number of issues with the approach and evidence applied by the AER, including the material weight that it has applied to historical excess returns versus DDGM estimates (noting that the weights actually applied are not transparent). Frontier also considers that the Wright approach and independent valuation reports should be included in the evidence informing the MRP.

Frontier's independent expert opinion is that the appropriate MRP is 7.9%.[76]

---

73 *The Required Return on Equity under the AER's Rate of Return Guideline*, Frontier Economics, p. 19.

74 *Ibid*, Frontier Economics, p. 24.

75 *Ibid*, Frontier Economics, p. 45.

76 *Ibid*, Frontier Economics, p. 56.

### 9.4.2 Return on debt

The independent expert opinion of QTC questions the AER's decision to impose a transition arrangement under the RoR Guideline, which is not required under the Rules, in the calculation of the return on debt.[77]

In the independent expert opinion of QTC, a benchmark efficient entity may already enter its next regulatory period with a Debt Risk Premium (DRP) equivalent to the average DRP over the last 10 years. In addition to this, it is the independent expert opinion of QTC that a simple trailing average approach will incorrectly compensate increases in the PTRM debt balance. Further in opinion, the trailing average should be weighted by the approved forecast change in the PTRM debt balance (the PTRM weighted trailing average).[78]

## 9.5 Taxation

Powerlink has proposed a gamma of 0.4, consistent with the AER's RoR Guideline and its assessment of gamma in recent regulatory determinations.

As part of the post-tax nominal approach, the AER must provide a separate taxation allowance in the revenue allowance for corporate income tax, net of the value ascribed to imputation credits. The PTRM determines a notional taxable income and tax payable, taking into account deductions for tax depreciation calculated from the tax asset base.

The Rules[79] require that details relating to the calculation and estimated cost of corporate income tax be provided in a Revenue Proposal. The taxation allowance was calculated using the following formula:

$$ETCt = (ETIt \times rt)\ (1 - y);$$

where:

ETIt = an estimate of the taxable income a prudent and efficient TNSP would earn in a particular year (t) as a result of providing the same prescribed transmission services as the TNSP under review;

rt = the expected statutory income tax rate for that regulatory year as determined by the AER, currently 30%; and

y = is the assumed use of imputation credits, deemed to be 0.40.

Powerlink has used the AER's PTRM to calculate the taxation allowance, as summarised in Table 9.4.

Powerlink notes the AER's decision to apply a gamma of 0.4, which is driven by its conceptual interpretation of theta. As a consequence of that interpretation, the reliance placed on the equity ownership approach is currently the subject of an appeal before the Tribunal. Powerlink reserves the right to submit an updated estimate for gamma in its Revised Revenue Proposal or otherwise that reflects the Tribunal's (or if relevant, the Federal Court's) decision.

Table 9.4: Tax allowance ($m, nominal)

| | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Total |
|---|---|---|---|---|---|---|
| Corporate tax | 31.4 | 32.8 | 38.7 | 41.2 | 41.6 | 185.8 |
| Less value of imputation credits | (12.6) | (13.1) | (15.5) | (16.5) | (16.6) | (74.3) |
| **Tax allowance** | **18.9** | **19.7** | **23.2** | **24.7** | **25.0** | **111.5** |

77 *Return on debt transition analysis for Powerlink*, QTC, December 2015.

78 *PTRM –weighted trailing average approach*, QTC, December 2015.

79 *National Electricity Rules*, AEMC, clause 6A.6.4.

## 9.6 Forecast CPI

The AER's approach to estimating inflation is not prescribed. Powerlink applied the approach used in recent regulatory decisions of TransGrid, Energex and Ergon Energy. This involves calculating a 10 year forward looking (geometric) average, using the RBA's inflation forecasts for the next two years and the mid-point of the RBA's target band for inflation for the remaining eight years. This approach has resulted in a forecast rate of 2.45%.

## 9.7 Summary

Powerlink has applied the AER's RoR Guideline to establish its indicative estimate of the rate of return for the 2018-22 regulatory period. While Powerlink has adopted the AER's RoR Guideline approach, it should not be construed as support (either implicit or explicit) for the AER's approach.

In proposing its rate of return Powerlink has had regard to independent expert opinions. Powerlink supports the views of its independent experts and notes that many of the matters related to the AER's application of its RoR Guideline are the subject of appeal before the Tribunal and may be subject to judicial review before the Federal Court.

Powerlink reserves the right to submit an updated rate of return in a separate submission or in its Revised Revenue Proposal that reflects one or more aspects of the Tribunal's (or if relevant, the Federal Court's) decision.

Table 9.5 provides a summary of the relevant parameters used to calculate the indicative rate of return and taxation allowance.

Table 9.5: Summary of WACC and taxation allowance calculation

| | Proposed value |
|---|---:|
| Nominal risk free rate | 2.72% |
| Market risk premium | 6.50% |
| Equity beta | 0.7 |
| Proportion of equity funding | 40% |
| Cost of debt | 5.20% |
| Proportion of debt funding | 60% |
| **WACC** | **6.04%** |
| Inflation | 2.45% |
| Gamma | 0.4 |
| Taxation rate | 30.0% |

# 10 Depreciation

## 10.1 Introduction

This chapter presents Powerlink's assessment of allowable depreciation on prescribed assets during the regulatory period. The annual allowance for regulatory depreciation is referred to as the "return of capital" in the revenue building-block model.

*Key highlights*

- Regulatory depreciation for the 2018-22 regulatory period totals $623.2m.
- Powerlink has applied regulatory depreciation in accordance with the Rules.

## 10.2 Regulatory requirements

Clause 6A.6.3 of the Rules describes how depreciation should be calculated for each regulatory year. Depreciation schedules must use a profile that reflects the nature of the category of assets over the economic life of that category of assets. Powerlink categorises assets into asset classes as described in this chapter. Each asset class in the RAB has been depreciated on a straight-line basis over the economic life of the asset and an adjustment then made for the annual inflation of the opening RAB (referred to in this chapter as regulatory depreciation). The depreciation methodology and resulting depreciation forecast are set out in the following sections.

## 10.3 Depreciation methodology

Depreciation is defined in Accounting Standard AASB 116 (property, plant and equipment) as the systematic allocation of the depreciable amount of an asset over its useful life. The accounting standard requires depreciation to be charged on a systematic basis over the life of the asset. Powerlink's depreciation methodology is consistent with AASB 116, and accords with the requirements of the Rules.

## 10.4 Asset classes and standard asset lives

In accordance with clause 6A.6.3 of the Rules, Powerlink has established a regulatory depreciation profile with an asset life for each asset class that reflects the expected economic or technical life. The standard asset lives are sourced from those used in Powerlink's audited financial accounts and are consistent with Powerlink's Transmission Determination for the 2013-17 regulatory period. The standard asset lives are presented in Table 10.1.

Table 10.1: Asset class and standard lives

| Asset class | Asset life (years)* |
|---|---|
| Overhead lines | 50 |
| Underground lines | 45 |
| Lines (refit) | 30 |
| Substations primary plant | 40 |
| Substations secondary systems | 15 |
| Comms (civil works) | 40 |
| Communications other assets | 15 |
| Network switching centres | 12 |
| Land | n/a |
| Easements | n/a |
| Commercial buildings | 40 |
| Computer equipment | 5 |
| Office furniture and miscellaneous | 7 |
| Office machines | 7 |
| Vehicles | 7 |
| Moveable plant | 7 |
| Insurance spares | n/a |

*Asset classes marked 'n/a' do not depreciate

## 10.5 Remaining asset lives

Clause 6A.6.3(b) of the Rules requires that a TNSP depreciate its assets using a profile that reflects the nature of its category of assets over the economic life of the category of assets.

Powerlink has used Version 3 of the AER's RFM to establish the remaining lives of assets in existence as at 30 June 2017 as part of determining the closing RAB value for the 2013-17 regulatory period. This model uses the weighted average of capex to calculate a remaining asset life for each class of asset. These values are then applied in the PTRM to forecast depreciation over the 2018-22 regulatory period.

Table 10.2 sets out the remaining lives of each asset class as at 30 June 2017.

Table 10.2: Asset class and remaining lives at 30 June 2017

| Asset class | Asset life (years)* |
|---|---|
| Overhead lines | 30.2 |
| Underground lines | 19.8 |
| Lines (refit) | 28.0 |
| Substations primary plant | 27.1 |
| Substations secondary systems | 10.2 |
| Comms (civil works) | 16.9 |
| Communications other assets | 11.4 |
| Network switching centres | 7.5 |
| Commercial buildings | 29.6 |
| Computer equipment | 3.8 |
| Office furniture and miscellaneous | 4.0 |
| Office machines | 4.8 |
| Vehicles | 5.0 |
| Moveable plant | 4.5 |

## 10.6 Depreciation forecast

The forecast depreciation for the 2018-22 regulatory period has been calculated by the AER's PTRM and is presented in Table 10.3. The forecast RAB values and remaining asset lives are calculated by the RFM and used as an input in the PTRM. In addition to this, Powerlink has adjusted for forecast capex and asset disposals for each year in the regulatory period. Regulatory depreciation is calculated on the adjusted RAB values. Adjusted RAB values are calculated by dividing the opening RAB by the weighted average remaining life of forecast capex by the assigned useful life. The resulting straight-line depreciation is then adjusted by the annual inflation of the opening RAB.

Table 10.3: Forecast regulatory depreciation ($, nominal)

| | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Total |
|---|---|---|---|---|---|---|
| Straight-line depreciation | 271.7 | 290.5 | 311.4 | 325.7 | 334.4 | 1,533.7 |
| Less inflation adj. on opening RAB | (177.3) | (180.1) | (182.5) | (184.4) | (186.3) | (910.6) |
| **Regulatory depreciation** | **94.4** | **110.4** | **128.9** | **141.3** | **148.2** | **623.2** |

## 10.7 Customer and consumer feedback and input

In formulating its depreciation allowance Powerlink engaged with its Customer and Consumer Panel and the AER's CCP4 to seek feedback regarding Powerlink's approach to depreciation. This included seeking views about alternative depreciation approaches which may result in different impacts in the longer term, including lower RAB.

To support this discussion, Powerlink published a briefing note[80] that:

- Provided information about the AER's current approach to regulatory depreciation;
- Described at a high level the differences between regulatory depreciation and pure straight-line depreciation; and
- Summarised and provided references to consultation papers issued since early 2014 on alternative depreciation models.

The purpose of the engagement was to seek input and feedback from stakeholders regarding the use of regulatory depreciation and the feasibility of alternative depreciation models. This input was to assist Powerlink in determining focus areas for future consideration.

In its pre-reading material and as part of the Customer and Consumer Panel meeting, Powerlink clarified its intention to continue to apply regulatory depreciation in accordance with the AER's current approach for its Revenue Proposal. Powerlink indicated that the complexity of the issue requires broader consultation with industry, consumers and regulators to inform any changes to the regulatory framework.

Given engagement with stakeholders was at a very early stage, feedback remained at a high level and did not provide any basis for Powerlink to alter its current position. Stakeholders reinforced their expectation that Powerlink should focus on ensuring cost reflective and efficient levels of network pricing in the short term, which may assist in preserving or improving current and future levels of network utilisation.

For the 2018-22 regulatory period, Powerlink has applied regulatory depreciation in accordance with the Rules and will seek further input from stakeholders to inform its approach to depreciation as part of business-as-usual engagement activities.

## 10.8 Summary

Powerlink has prepared its forecast depreciation at an asset class level using straight-line regulatory depreciation in accordance with the Rules. Powerlink has also applied the AER's RFM to establish weighted average remaining lives for each asset class. Depreciation has been calculated using the AER's PTRM model.

80 *2017/18-2021/22 Revenue Proposal Depreciation Approach, Pre-reading*, Powerlink, November 2015, https://www.powerlink.com.au/Community_and_Environment/Stakeholder_Engagement/Customer_and_Consumer_Panel_and_Engagement_Forums.aspx.

# 11 Maximum Allowed Revenue

## 11.1 Introduction

This chapter outlines Powerlink's MAR for the 2018-22 regulatory period, based on the building-block approach in the Rules and PTRM.

*Key highlights*

- Powerlink's proposed MAR for the 2018-22 regulatory period is $4,017.2m in total.
- In the transition to the 2018-22 regulatory period, smoothed revenue for 2017/18 is 27.2% lower than revenue forecast for the 2016/17 year.
- This reduction in revenue results in a nominal 27.7% reduction in indicative transmission price in 2017/18.
- For an average Queensland residential electricity consumer, Powerlink's Revenue Proposal is expected to reduce the average electricity bill by about 2.6% in 2017/18. On the basis of assumed tariffs and consumption, this represents an estimated initial saving of between $22 and $37 in the first year.
- Transmission prices over the balance of the 2018-22 regulatory period are expected to grow in line with CPI.

## 11.2 Regulatory requirements

Powerlink has determined its MAR by use of the building-block approach outlined in clause 6A.5.4 of the Rules. To calculate this value, Powerlink has utilised the PTRM and RFM. The PTRM calculates, for each year of the regulatory period, the MAR based on the components below.

The building-block formula to be applied in each year of the regulatory period is:

$$\begin{aligned} MAR &= \text{Return on Capital} + \text{Return of Capital} + \text{Opex} + \text{Tax} \\ &= (WACC * RAB) + D + \text{Opex} + \text{Tax} \end{aligned}$$

where:

MAR = Maximum Allowed Revenue

WACC = post-tax nominal weighted average cost of capital ("vanilla" WACC)

RAB = Regulatory Asset Base

D = Regulatory Depreciation

Opex = operating expenditure

Tax = regulated business income tax allowance

The MAR is then smoothed with an X-factor in accordance with the requirements of the Rules.

## 11.3 Building-block components

### 11.3.1 Regulatory asset base

The estimated 1 July 2017 opening RAB of $7,237.9m was established in Chapter 8.

To establish the return on capital, asset values have been rolled forward and adjusted for inflation, the forecast capital expenditure in Chapter 5 and forecast regulatory depreciation in Chapter 10.

The forecast RAB for the next regulatory period is summarised in Table 11.1.

Table 11.1: Forecast regulatory asset base ($m, nominal)

| | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 |
|---|---|---|---|---|---|
| Opening RAB | 7,237.9 | 7,350.3 | 7,447.4 | 7,528.1 | 7,602.3 |
| Capital expenditure as incurred* | 206.8 | 207.6 | 209.6 | 215.5 | 208.4 |
| Regulatory depreciation | (94.3) | (110.4) | (128.9) | (141.3) | (148.2) |
| **Closing RAB** | **7,350.3** | **7,447.4** | **7,528.1** | **7,602.3** | **7,662.5** |

*Adjusted for ½ Weighted Average Cost of Capital (WACC) Allowance and movement in provisions.

### 11.3.2 Return on capital

The return on capital has been calculated by applying the nominal vanilla WACC to the opening RAB balance for each year of the 2018-22 regulatory period.

The indicative WACC of 6.04% was established using the methodology in Chapter 9 and will be updated in each year of the regulatory period to adjust for the trailing average return on debt also discussed in Chapter 9. Powerlink has calculated the return on capital in line with the PTRM, which is summarised in Table 11.2.

Table 11.2: Summary of return on capital ($m, nominal)

| | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 |
|---|---|---|---|---|---|
| Opening RAB | 7,237.9 | 7,350.3 | 7,447.4 | 7,528.1 | 7,602.3 |
| **Return on capital** | **437.2** | **444.0** | **449.8** | **454.7** | **459.2** |

## 11.4 Return of capital

The return of capital provided by regulatory depreciation has been outlined in Chapter 10 of Powerlink's Revenue Proposal. Regulatory depreciation is the net of straight-line depreciation adjusted for inflation on the opening RAB. A summary of the annual regulatory depreciation allowance is provided in Table 11.3.

Table 11.3: Summary of return of capital ($m, nominal)

| | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Total |
|---|---|---|---|---|---|---|
| Regulatory depreciation | 94.3 | 110.4 | 128.9 | 141.3 | 148.2 | 623.2 |

## 11.5 Operating expenditure

Powerlink's total operating expenditure forecast has been derived using the approach in Chapter 6 of the Revenue Proposal and is summarised in Table 11.4.

Table 11.4: Summary of forecast operating expenditure ($m, nominal)

| | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Total |
|---|---|---|---|---|---|---|
| Controllable operating expenditure | 184.4 | 187.9 | 191.4 | 195.2 | 199.6 | 958.5 |
| AEMC Levy | 4.3 | 4.4 | 4.5 | 4.6 | 4.7 | 22.6 |
| Insurances and self-insurance | 9.3 | 9.7 | 10.1 | 10.5 | 11.0 | 50.7 |
| Debt raising costs | 3.7 | 3.7 | 3.8 | 3.8 | 3.9 | 18.9 |
| Total opex | 201.7 | 205.7 | 209.8 | 214.1 | 219.3 | 1,050.7 |

## 11.6 Tax allowance

The tax allowance proposed for the 2018-22 regulatory period is discussed in Chapter 9 and is set out in Table 11.5.

Table 11.5: Summary of tax allowance ($m, nominal)

| | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Total |
|---|---|---|---|---|---|---|
| Corporate tax | 31.4 | 32.8 | 38.7 | 41.2 | 41.6 | 185.8 |
| Less value of imputation credits | (12.6) | (13.1) | (15.5) | (16.5) | (16.6) | (74.3) |
| **Tax allowance** | **18.9** | **19.7** | **23.2** | **24.7** | **25.0** | **111.5** |

## 11.7 Efficiency Benefit Sharing Scheme

Revenue increments and decrements arising from the EBSS in the 2013-17 regulatory period are carried over as an adjustment to the MAR in the 2018-22 regulatory period. The net carryover for the EBSS is set out in Chapter 4 and is summarised in Table 11.6.

Table 11.6: Summary of the EBSS carryover ($m, nominal)

| | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Total |
|---|---|---|---|---|---|---|
| EBSS carryover | (0.8) | (7.1) | (3.2) | 3.1 | - | (8.1) |

## 11.8 Maximum Allowed Revenue

Table 11.7 outlines the MAR for each year of the forthcoming regulatory period. Powerlink's proposed unsmoothed revenue requirement for the 2018-22 regulatory period is based on the building-blocks outlined in the previous sections.

Table 11.7: Summary of unsmoothed revenue requirement ($m, nominal)

| | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Total |
|---|---|---|---|---|---|---|
| Return on capital | 437.2 | 444.0 | 449.8 | 454.7 | 459.2 | 2,244.8 |
| Return of capital | 94.3 | 110.4 | 128.9 | 141.3 | 148.2 | 623.2 |
| Total operating expenditure | 201.7 | 205.8 | 209.8 | 214.2 | 219.3 | 1,050.7 |
| Tax allowance | 18.9 | 19.7 | 23.2 | 24.7 | 25.0 | 111.5 |
| EBSS carryover | (0.9) | (7.1) | (3.2) | 3.1 | - | (8.1) |
| **Unsmoothed revenue requirement** | **751.3** | **772.7** | **808.6** | **837.9** | **851.6** | **4,022.1** |

## 11.9 X-factor smoothed revenue

Clause 6A.6.8 of the Rules requires that the regulatory determination includes the X-factor for each regulatory year. The Rules require that the smoothed revenue is equal to the Net Present Value (NPV) of the annual building-block requirement and should also be as close as reasonably possible to the expected MAR in the last year of the previous regulatory period.

The X-factor for each regulatory year, and the smoothed revenue is presented in Table 11.8.

Table 11.8: Smoothed revenue requirement and X-factor ($m, nominal)

| | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Total |
|---|---|---|---|---|---|---|
| Unsmoothed revenue requirement | 751.3 | 772.7 | 808.6 | 837.9 | 851.6 | 4,022.1 |
| Smoothed revenue requirement | 767.4 | 785.0 | 803.0 | 821.5 | 840.3 | 4,017.2 |
| X-factor | 27.23% | 0.15% | 0.15% | 0.15% | 0.15% | - |

In real terms, Powerlink's smoothed revenue for 2017/18 is proposed to reduce by 27.2% compared to revenue forecast in the 2016/17 year. In subsequent years of the regulatory period annual revenue is forecast to reduce by 0.15% per annum.

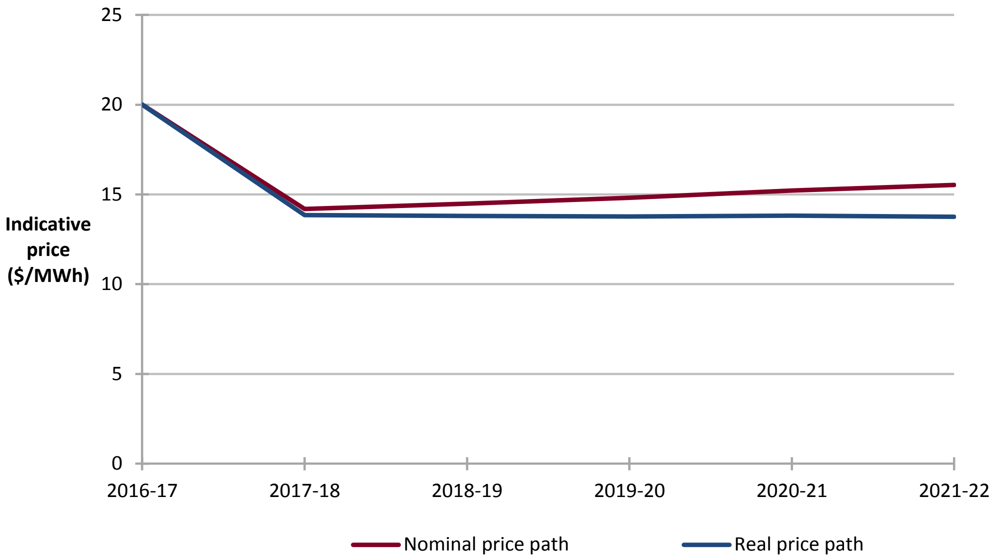
Overall, the total MAR for the 2018-22 regulatory period is forecast to be 14% less than the allowed MAR for the 2013-2017 regulatory period.

## 11.10 Average price path

Powerlink calculates its annual prescribed transmission charges in accordance with the framework set out in the Rules and its approved Pricing Methodology. However, the indicative effect of Powerlink's Revenue Proposal on average transmission prices can be estimated by taking the MAR and dividing it by the forecast energy delivered in Queensland.[81]

Powerlink's Revenue Proposal results in a nominal 27.7% reduction in the average indicative price path[82] compared to the 2016/17 year. Indicative price growth over the balance of the 2018-22 regulatory period is forecast to remain within CPI on average.

Figure 11.1: Indicative price path from 2016/17 to 2021/22 ($/MWh)




Source: Powerlink data.

81 *Transmission Annual Planning Report 2015*, Powerlink, 2015, p. 29.

82 The average indicative price path is calculated by dividing revenue (MAR) by forecast energy in each year.

Transmission charges comprise approximately 9% of an average residential household's electricity bill each year. The impact of Powerlink's Revenue Proposal on residential electricity consumers each year will depend on a number of factors, which include: the proportion of annual prescribed revenue to be recovered from the DNSPs (Energex and Ergon Energy); the particular tariff arrangements applied by the DNSPs and retailers; and the individual customer's electricity usage.

For a residential electricity consumer, Powerlink's Revenue Proposal is expected to reduce the average electricity bill by about 2.6% in the first year. On the basis of assumed tariffs and consumption, this presents an estimated annual saving of between $22 and $37.

Table 11.9 provides an estimate of how the transmission component of a typical residential and business electricity bill will be impacted by the Revenue Proposal.

Table 11.9: Indicative electricity bill impacts ($, nominal)

| | | 2013-17 regulatory period | | 2018-22 regulatory period |
|---|---|---|---|---|
| | | 2015/16 | 2016/17 | 2017/18 |
| Average annual residential electricity bill[a] (based on annual usage range of 2,500kWh and 5173kWh) | Transmission Component | $77 - $129 | $80 - $134 | $58 - $97<br>(-27.7%) |
| Average annual business electricity bill[b] (based on annual usage range of 10,000kWh and 20,000kWh) | Transmission Component | $270 - $470 | $280 - $488 | $203 - $353<br>(-27.7%) |

(a) *2015 AEMC Electricity Price Trends*, AEMC, December 2015, p. 105.

(b) *Energy Made Easy*, AER, https://www.energymadeeasy.gov.au/.

## 11.11 Summary

This chapter sets out the calculation of Powerlink's MAR and provides a forecast for each year and the total forecast MAR for the 2018-22 regulatory period. The average indicative transmission price over the 2018-22 regulatory period is forecast to remain within CPI on average.

# 12 Pass Through Events

## 12.1 Introduction

This chapter sets out the nominated pass through events proposed by Powerlink for the 2018-22 regulatory period.

The pass through event mechanism in the Rules is intended to provide an efficient means for a network service provider to recover at least the efficient costs of uncontrollable, material events that either cannot be insured for or where the establishment of self-insurance is not economically viable.

*Key highlights*

- Powerlink has proposed three nominated pass through events to apply for the 2018-22 regulatory period:
  - Insurance cap event - an event that results in losses which exceed the limit of cover in insurances;
  - Terrorism event - where an act of terrorism occurs and results in losses that are not insured; and
  - Insurer credit risk - where the insolvency of a nominated insurer of Powerlink generates a loss that significantly impacts Powerlink's ability to provide prescribed transmission services.
- Powerlink also notes that under the Rules, a TNSP may seek a determination by the AER to pass through any differences between forecast and actual efficient costs associated with network support events. Powerlink has proposed a forecast allowance for network support payments of $0 for the 2018-22 regulatory period.

## 12.2 Regulatory requirements

Clause 6A.7.3(a1) of the Rules provide for the following pass through events for a transmission determination:

(1) a regulatory change event;

(2) a service standard event;

(3) a tax change event;

(4) an insurance event; and

(5) any other event specified in a transmission determination as a pass through event for the determination.

The Rules also allow for a TNSP to propose events as part of a Revenue Proposal having regard to the nominated pass through event considerations set out in Chapter 10 of the Rules.

The nominated pass through event considerations are:

(a) whether the event proposed is an event covered by a category of pass through event specified in clause 6A.6.1(a1)(1) to (4) inclusive (in the case of a distribution determination) or clause 6A.7.3(a1)(1) to (4) inclusive (in the case of a transmission determination);

(b) whether the nature or type of event can be clearly identified at the time the determination is made for the service provider;

(c) whether a prudent service provider could reasonably prevent an event of that nature or type from occurring or substantially mitigate the cost impact of such an event;

(d) whether the relevant service provider could insure against the event, having regard to:

(1) the availability (including the extent of availability in terms of liability limits) of insurance against the event on reasonable commercial terms; or

(2) whether the event can be self-insured on the basis that:

(i) it is possible to calculate the self-insurance premium; and

(ii) the potential cost to the relevant service provider would not have a significant impact on the service provider's ability to provide network services.

(e) any other matter the AER considers relevant and which the AER has notified Network Service Providers is a nominated pass through event consideration.

## 12.3 Nominated pass through events

Powerlink takes an integrated approach to risk management and employs a range of preventative, detective and mitigating controls including preparedness plans that align to best practice principles as described by Emergency Management Australia. Complementary to, and a key component of, Powerlink's risk management strategy is the establishment and maintenance of an insurance program which provides cover for the majority of Powerlink's major risk exposures. A notable aspect of the insurance program is that it provides cover for all of Powerlink's assets for natural disaster such as flood and cyclone. In establishing its insurance program Powerlink sought professional guidance from its brokers to ensure that the program is effective in its coverage and delivered at a competitive cost.

Despite its risk management strategies and program of insurance, Powerlink is still faced with exposure to potential risks for which it is not efficient to mitigate through commercial insurance measures. Instead, Powerlink considers that these risks are more appropriately addressed through the nominated pass through event provisions of the Rules during the 2018-22 regulatory period.

Powerlink notes that it can only seek pass through of relevant costs where the risk does eventuate and the associated costs are greater than 1% of its MAR in that regulatory year.

Powerlink proposes three nominated pass through events to apply over its 2018-22 regulatory period. Each of these events are discussed, below.

Powerlink engaged Finity Consulting Pty Limited (Finity) to provide support in the development of its proposed nominated pass through events (refer Appendix 12.01).

### 12.3.1 Insurance cap event

Powerlink proposes that an insurance cap event is an event that results in losses which exceed the limit of cover in insurances.

In proposing the event, Powerlink has had regard to the nominated pass through event considerations in the Rules as follows:

- An Insurance Cap Event is not a pass through event for a transmission determination specified in clause 6A.7.3(a1)(1) to (4) of the Rules;
- Powerlink considers that the nature and type of event can be clearly identified at the time the AER makes its determination on the nominated pass through events by reference to the definition provided in Figure 12.1;
- A number of events (such as floods, earthquakes, windstorms, cyclones, tsunami or natural disaster) could result in losses which exceed the limit of cover in existing insurances. Powerlink considers that while it invests, operates and maintains its network to a standard/level of resilience to withstand such events, to do so beyond what is prudent would not be reasonable as a preventative measure; and
- Powerlink has taken out insurance on reasonable commercial terms (that notably provides cover for natural disasters) and considers that it would not be efficient to procure additional insurance which extends the limit of cover. The level of insurance cover held by Powerlink is discussed in Appendix 6.02.

In addition, Powerlink does not consider that it would be efficient to self-insure for an insurance cap event, given that the scale of such a high impact low probability event would require a significant allowance to be placed in reserve over time. Powerlink also considers that the potential costs of such an event would have a significant impact on its ability to provide prescribed transmission services.

Figure 12.1: Proposed definition for insurance cap event

| An insurance cap event occurs if: |
|---|
| 1. Powerlink makes a claim or claims and receives the benefit of a payment or payments under a relevant insurance policy;<br>2. Powerlink incurs costs beyond the relevant policy limit; and<br>3. The costs beyond the relevant policy limit materially increase the costs to Powerlink of providing prescribed transmission services.<br>For this Insurance Cap Event:<br>4. The relevant policy limit is the greater of:<br>a) Powerlink's actual policy limit at the time of the event that gives, or would have given rise to a claim; and<br>b) the policy limit that is explicitly or implicitly commensurate with the allowance for insurance premiums that is included in the forecast operating expenditure allowance approved in the AER's final decision for the regulatory period in which the insurance policy is issued.<br>5. A relevant insurance policy is an insurance policy held during the 2017/18 to 2021/22 regulatory period or a previous regulatory period in which Powerlink was regulated.<br>Note: For the avoidance of doubt, in assessing an insurance cap event cost pass through application under rule 6A.7.3, the AER will have regard to:<br>i. the insurance policy for the event;<br>ii. the level of insurance that an efficient and prudent NSP would obtain in respect of the event; and<br>iii. the extent to which a prudent provider could reasonably mitigate the impact of the event. |

Source: Finity Consulting Pty Limited, Nominated Pass Through Events 2017/18 to 2021/22.

## 12.3.2 Terrorism event

Powerlink proposes that a terrorism event is where an act of terrorism occurs and results in losses that are not insured.

In proposing the event, Powerlink has had regard to the nominated pass through event considerations in the Rules, as follows:

- A Terrorism Event is not a pass through event for a transmission determination specified in clause 6A.7.3(a1)(1) to (4) of the Rules;
- Powerlink considers that the nature and type of event can be clearly identified at the time the AER makes its determination on the nominated pass through events by reference to the definition provided in Figure 12.2;
- While Powerlink takes a prudent approach to the management of terrorism risks (through the implementation of business processes and accountabilities for monitoring terrorism threats and related physical and cyber security measures), unforeseen acts of terrorism could potentially result in significant losses which Powerlink could not reasonably avoid or mitigate; and

- While Powerlink has a prudent insurance program in place, it does not extend to providing cover for a terrorism event. Given the relative infrequency and potentially very high costs of terrorism events, insurance is not available on reasonable commercial terms. Powerlink also considers that it is not reasonable to calculate an efficient forecast of self-insurance for such events. However, if such an event occurred, the potential losses would have a significant impact on its ability to provide prescribed transmission services.

Figure 12.2: Proposed definition for a terrorism event

| A terrorism event is: |
|---|
| An act (including, but not limited to, the use of force or violence or the threat of force or violence) of any person or group of persons (whether acting alone or on behalf of or in connection with any organisation or government), which from its nature or context is done for, or in connection with, political, religious, ideological, ethnic or similar purposes or reasons (including the intention to influence or intimidate any government and/or put the public, or any section of the public, in fear) and which materially increases the costs to Powerlink in providing prescribed transmission services.<br>Note: In assessing a terrorism event pass through application, the AER will have regard to, amongst other things:<br>a) Whether Powerlink has insurance against the event;<br>b) The level of insurance that an efficient and prudent NSP would obtain in respect of the event;<br>c) Whether a declaration has been made by a relevant government authority that a terrorism event has occurred; and<br>d) The extent to which a prudent provider could reasonably mitigate the impact of the event. |

Source: Finity Consulting Pty Limited, Nominated Pass Through Events 2017/18 to 2021/22.

### 12.3.3 Insurer credit risk

Powerlink defines an insurer credit risk event as an event that involves the insolvency of a nominated insurer of Powerlink which generates a loss that significantly impacts Powerlink's ability to provide prescribed transmission services.

In proposing the event, Powerlink has had regard to the nominated pass through event considerations in the Rules, as follows:

- An Insurer Credit Risk is not a pass through event for a transmission determination specified in clause 6A.7.3(a1)(1) to (4) of the Rules. For clarification, it is not an Insurance Event under the Rules, as the definition of an Insurance Event does not extend to managing the risk of insolvency of a nominated insurer of Powerlink;
- Powerlink considers that the nature and type of event can be clearly identified at the time the AER makes its determination on the nominated pass through events by reference to the definition provided in Figure 12.3;
- In establishing its insurance program, Powerlink retains the services of its domestic and international brokers to ensure that its insurance program is effective and that nominated insurers are of sound financial standing. Powerlink has set minimum requirements for the credit ratings of participating underwriters and diversifies its insurance across domestic and international providers. This combination of practices is considered to provide a level of risk mitigation against a potential Insurer Credit Risk event. Notwithstanding this, the insolvency of one or more insurers remains an event that is not within Powerlink's control, and if coincident with a claim, would materially impact Powerlink's ability to provide prescribed transmission services; and

- By the very nature of an Insurance Credit Risk Event, Powerlink is not able to obtain insurance on reasonable commercial terms. Given an Insurance Credit Risk Event would coincide with a claim for a risk that was insured by the insolvent insurer, Powerlink is not able to reasonably calculate a self-insurance premium and considers that such an event would have a significant impact on its ability to provide prescribed transmission services.

Figure 12.3: Proposed definition for an insurer credit risk event

| An insurer credit risk event is: |
| --- |
| An insurer's credit risk event occurs if a nominated insurer of Powerlink becomes insolvent, and as a result, in respect of an existing, or potential, claim for a risk that was insured by the insolvent insurer, Powerlink:<br>i. Is subject to a materially higher or lower claim limit or a materially higher or lower deductible than would have otherwise applied under the insolvent insurer's policy; or<br>ii. Incurs additional costs associated with self-funding an insurance claim, which would otherwise have been covered by the insolvent insurer.<br>Note: In assessing an insurer's credit risk event pass through application, the AER will have regard to, amongst other things:<br>a) Powerlink's attempts to mitigate and prevent the event from occurring by reviewing and considering the insurer's track record, size, credit rating and reputation, and<br>b) In the event that a claim would have been made after the insurance provider became insolvent, whether Powerlink had reasonable opportunity to insure the risk with a different provider. |

Source: Finity Consulting Pty Limited, Nominated Pass Through Events 2017/18 to 2021/22.

Powerlink notes that the nominated pass through events proposed are consistent with the AER's transmission determination for Transend (TasNetworks) in April 2015.

## 12.4 Network support pass through costs

A TNSP may seek a determination by the AER to pass through any differences between forecast and actual efficient costs associated with network support events. The AER assesses any network support pass through applications in accordance with clause 6A.7.2 of the Rules.

In Chapter 6 of this Revenue Proposal, Powerlink has proposed a forecast allowance for network support payments of $0 for the 2018-22 regulatory period.

## 12.5 Summary

Powerlink proposes to address the risk exposures identified above by means of a cost pass through arrangement with a materiality threshold of greater than 1% of MAR, consistent with the current cost pass through threshold in the Rules.

Powerlink also proposes to address any network support requirements which may occur during the 2018-22 regulatory period by way of the pass through provisions in the Rules.

# 13 Shared Assets

## 13.1 Introduction

Shared assets are assets used to provide both prescribed and either non-regulated transmission services or services that are not transmission services.[83] By definition, assets used to provide both prescribed and negotiated transmission services or market network services are excluded from the shared assets mechanism. The assets may be fixed (e.g. poles), mobile (e.g. vehicles) or non-physical (e.g. radio frequency spectrum).

This chapter sets out the regulatory requirements in relation to shared assets, including the AER's proposed cost reduction approach. The chapter also identifies Powerlink services relevant to the shared assets mechanism and an assessment of whether a cost adjustment is necessary.

*Key highlights*

- Powerlink has assessed that its forecast shared asset unregulated revenues for the 2018-22 regulatory period are not material, based on the AER's Shared Asset Guideline (SA Guideline) approach. Therefore, no revenue adjustment has been applied in the Revenue Proposal.

## 13.2 Regulatory requirements

Clause 6A.6.5 of the Rules provide a high level framework for the AER to reduce a service provider's annual revenue requirement, where appropriate, to reflect the costs attributable to services which generate unregulated revenues. The AER's proposed approach to how this would occur is set out in its SA Guideline.[84]

The SA Guideline sets out the following process to establish the shared asset cost reduction for each year of the regulatory period:

- Determine the Shared Asset Unregulated Revenues (SAUR);
- Determine whether the SAUR are material (i.e. exceed 1% of the proposed Annual Revenue Requirement (ARR));
- Where the SAUR is material, calculate the shared asset cost reduction (equal to 10% of the SAUR), subject to:
  - Application of the control step (i.e. a cap); and/or
  - Adjustments for contributed assets, if any.

Where SAUR are not material, no further action is required. Materiality and the unregulated revenue relevant to cost reductions are determined by averaging the forecast SAUR over the 2018-22 regulatory period.

The SA Guideline allows for service providers to propose an alternative method to calculate a cost reduction. However, the service provider must demonstrate that customers would be no worse off compared to the SA Guideline approach. Powerlink has not proposed an alternative method.

In addition, the SA Guideline states that where assets provide prescribed transmission services and unregulated services consistent with a service provider's Cost Allocation Methodology, the shared asset mechanism does not apply.

Powerlink's Reset RIN requires historic and forecast SAUR data to be provided to the AER.

83 *National Electricity Rules*, AEMC, clause 6A.5.5(a).

84 *Shared Asset Guideline*, AER, 29 November 2013.

## 13.3 Powerlink's proposed approach

Powerlink has applied the AER's steps to determine whether a cost reduction should be applied.

### 13.3.1 Shared assets unregulated revenues

Powerlink has identified three categories of non-regulated services that are provided using shared assets and are applicable to the shared assets mechanism in the 2018-22 regulatory period. These are:

- *Oil testing services* – specialist oil and insulation testing and diagnostic services. This includes a comprehensive transformer, reactor and high voltage oil-filled plant monitoring and condition assessment service;
- *Property rentals* – rental income may be generated from property (land or buildings) acquired by Powerlink either directly or incidentally to the purchase of property required for the future development of its prescribed transmission network; and
- *Tower access* – where space on transmission and communications towers is provided to co-locate mobile phone carriers' equipment.

Table 13.1 set outs Powerlink's forecast of unregulated revenues for these services provided by means of shared assets.

Table 13.1: Forecast SAUR ($m, 2016/17)

| | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Total |
|---|---|---|---|---|---|---|
| Oil testing | 0.5 | 0.5 | 0.6 | 0.6 | 0.6 | 2.9 |
| Property rentals | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 1.7 |
| Tower access | 2.1 | 2.0 | 2.0 | 2.0 | 1.9 | 10.0 |
| **Total** | **2.9** | **2.9** | **2.9** | **2.9** | **2.9** | **14.6** |

### 13.3.2 Materiality

The SA Guideline states that SAUR will be considered material when the average for the period is greater than 1% of the total smoothed revenue requirement for that regulatory year.

Table 13.2 compares Powerlink's proposed smoothed ARR against its forecast SAUR.

Table 13.2: Materiality of Forecast SAUR

| | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Total |
|---|---|---|---|---|---|---|
| Proposed smoothed ARR ($m, nominal) | 767.4 | 785.0 | 803.0 | 821.5 | 840.3 | 4,017.2 |
| Average annual SAUR ($m, nominal) | 3.1 | 3.1 | 3.1 | 3.1 | 3.1 | 15.5 |
| SAUR as % of ARR | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% | 0.4% |
| Material? | N | N | N | N | N | N |

The assessment provided above indicates that Powerlink's SAUR are not forecast to be material in any year of its 2018-22 regulatory period. As a result, Powerlink has not adjusted its annual revenue requirements for shared asset revenues in its Revenue Proposal.

## 13.4 Summary

Powerlink has assessed that its forecast shared asset unregulated revenues for the 2018-22 regulatory period are not material. Therefore, no revenue adjustment has been applied in its Revenue Proposal for the 2018-22 regulatory period.

Powerlink has provided the required shared asset information in the Reset RIN template.

# 14 Expenditure Incentive Schemes

## 14.1 Introduction

This chapter outlines the expenditure incentive schemes that will apply to Powerlink in the forthcoming regulatory period, namely the EBSS and the Capital Expenditure Sharing Scheme (CESS).

Section 14.3 sets out Powerlink's proposed adjustments to, and forecast operating expenditure for the calculation of the EBSS net carryover for the 2018-22 regulatory period. Similarly, Section 14.4 provides Powerlink's proposed capital expenditure forecast for calculation of the CESS.

*Key highlights*

- In its Framework and Approach Paper for Powerlink, the AER confirmed its intention to apply Version 2 of the EBSS and Version 1 of the CESS to Powerlink in the 2018-22 regulatory period.
- For the EBSS, Powerlink has proposed adjustments to actual operating expenditure not forecast using a single year revealed cost approach, consistent with Version 2 of the EBSS. Forecast controllable operating expenditure totalling $891.0m will be subject to the EBSS in the 2018-22 regulatory period.
- Forecast capital expenditure totalling $957.1m will be subject to the CESS in the 2018-22 regulatory period.

## 14.2 Regulatory requirements

In its Framework and Approach paper[85] for Powerlink, the AER has proposed to apply Version 2 of the EBSS (the 2013 EBSS) and Version 1 of the CESS to Powerlink in the 2018-22 regulatory period.

Powerlink notes that Version 1 of the EBSS (2007 EBSS) applies to Powerlink for the 2013-17 regulatory period and is discussed further in Chapter 4.

## 14.3 Proposed EBSS for the forthcoming regulatory period

*Adjustments*

In its Framework and Approach paper, the AER has proposed to apply Version 2 of the EBSS (2013 EBSS) to Powerlink in its 2018-22 regulatory period. Under the 2013 EBSS the AER proposes to exclude actual operating expenditure related to:

- Forecast operating expenditure for approved increases/decreases to revenues for items such as pass through events and contingent projects;
- Actual operating expenditure for capitalised operating expenditure excluded from the RAB;
- Forecast and actual operating expenditure for inflation; and
- Categories of operating expenditure not forecast using a single year revealed cost approach.

85 Final Framework and Approach for Powerlink, AER, June 2015

For the 2018-22 regulatory period, Powerlink has explained in the operating expenditure chapter that the categories noted below are not forecast using a single year revealed cost approach and hence propose that they be excluded from actual operating expenditure under the EBSS:

- Insurance and self-Insurance;
- AEMC Levy;
- Network Support;
- Debt Raising Costs; and
- Redundancy Costs.

Further, for clarification, Powerlink's proposed Network Capability Component (NCC) operating expenditure projects do not form part of its total operating expenditure forecast under the EBSS as these projects are subject to the STPIS arrangements.

For the purposes of establishing the controllable operating expenditure forecast applicable to the EBSS calculation for the 2018-22 regulatory period, Powerlink proposes the following values as outlined in Table 14.1.

Table 14.1: Forecast EBSS targets ($m, 2016/17)

| | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Total |
|---|---|---|---|---|---|---|
| Opex forecast | 196.9 | 196.0 | 195.1 | 194.4 | 194.3 | 976.7 |
| Adjustments | | | | | | |
| Insurance premiums | 7.6 | 7.8 | 7.9 | 8.1 | 8.3 | 39.7 |
| Self-insurance | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 7.4 |
| AEMC Levy | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 | 21.0 |
| Network support | - | - | - | - | - | - |
| Debt raising | 3.6 | 3.6 | 3.5 | 3.5 | 3.4 | 17.6 |
| Redundancy related costs | - | - | - | - | - | - |
| **EBSS targets 2018-22** | **180.0** | **179.0** | **178.0** | **177.2** | **176.9** | **891.0** |

## 14.4 Capital Expenditure Sharing Scheme

The overarching objective of the Capital Expenditure Sharing Scheme (CESS) is to provide NSPs with an incentive to undertake efficient capital expenditure during a regulatory period.

In its Framework and Approach paper, the AER proposed to apply Version 1 of the CESS to Powerlink in its 2018-22 regulatory period with any benefits/penalties accrued over the 2018-22 regulatory period reflected in Powerlink's regulated revenue as a separate building-block in the 2023-27 regulatory period.

To establish the capital expenditure applicable to the CESS calculation for the 2018-22 regulatory period, Powerlink proposes the values outlined in Table 14.2.

Table 14.2: Capital Expenditure Sharing Scheme ($m, 2016/17)

| | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Total |
|---|---|---|---|---|---|---|
| Capex for the CESS | 198.2 | 194.2 | 191.4 | 192.1 | 181.3 | 957.1 |

## 14.5 Summary

Powerlink has proposed expenditure incentive schemes for the 2018-22 regulatory period in accordance with the AER's Framework and Approach paper for Powerlink

# 15 Service Target Performance Incentive Scheme

## 15.1 Introduction

The Service Target Performance Incentive Scheme (STPIS) is designed to incentivise electricity TNSPs to maintain a high level of service performance for the benefit of NEM participants and electricity end users.[86]

This chapter sets out the regulatory requirements which apply to the STPIS as well as Powerlink's proposed STPIS values and other relevant information for each of the three components under the scheme.

*Key highlights*

- STPIS Version 5 consists of three components: Service Component (SC), Market Impact Component (MIC) and Network Capability Component (NCC). As determined by the AER, Version 5 provides materially stronger incentives to improve and maintain service performance.
- In the 2018-22 regulatory period, Powerlink will adopt more challenging loss of supply frequency thresholds and targets under the SC and MIC.
- Powerlink has proposed three Network Capability Incentive Parameter Action Plan (NCIPAP) priority projects under the NCC which total $3.2m. These projects have been agreed by AEMO to be classified as priority projects.
- Powerlink's proposed STPIS arrangements will provide further incentive for Powerlink to seek and deliver improvements in its network performance.

## 15.2 Regulatory requirements

Powerlink's STPIS proposal must meet the requirements and principles set out in the Rules,[87] the AER's Framework and Approach Paper, Version 5 of the STPIS and Powerlink's Reset RIN.

## 15.3 Powerlink's proposed STPIS

Powerlink commenced its participation in the scheme in 2007 and the scheme has progressively expanded and developed since then. Powerlink is currently subject to Version 3 of the STPIS and will transition directly to Version 5 of the STPIS (hereafter referred to as Version 5) from the start of its next regulatory period, 1 July 2017. Version 5 introduced a number of significant changes, which included new and restructured performance measures and targets. The targets are more challenging and will provide further incentive for Powerlink to seek and deliver improvements in its network performance.

The following sections contain Powerlink's proposed:

- Performance targets, caps and floors for the SC as required by Section 3.2 of the STPIS;
- Performance targets, unplanned outage event limit and dollars per dispatch interval for the MIC as required by Section 4.2 of the STPIS; and
- Network Capability Incentive Parameter Action Plan (NCIPAP) for the NCC as specified by Section 5.2 of the STPIS.

Each component of the scheme will be addressed in turn.

86 *Final Electricity Transmission Network Service Provider, STPIS Version 5 (corrected)*, AER, October 2015.

87 *National Electricity Rules*, AEMC, clause 6A.7.4.

## 15.3.1 Service Component

The SC has historically measured network availability and reliability via three parameters – circuit availability, loss of supply event frequency and average outage duration. Under Version 5, the SC now provides TNSPs with an incentive to improve network reliability by focusing on unplanned outages only. There are now four parameters under this component of the scheme, namely: unplanned circuit outage event rate, loss of supply event frequency, average outage duration and the proper operation of equipment.

Consistent with Section 3.2 of Version 5, Powerlink has proposed values for the targets, caps and floors, with performance targets equal to the average performance history over the most recent five years. The caps and floors were calculated using a best fit statistical distribution to the previous five years' performance data for each of the parameters and sub-parameters. In addition, the caps and floors reflect the 5th and 95th percentiles of each of the chosen statistical distributions.

The methodology Powerlink applied to determine the statistical distributions for each parameter and sub-parameter is provided as Appendix 15.01, Setting STPIS Values.

Powerlink engaged WSP/Parsons Brinckerhoff (WSP/PB) to review the soundness of Powerlink's methodology for setting floors and caps. WSP/PB confirmed that Powerlink has used a sound methodology to determine the best fit statistical distributions. They also verified the actual statistical output from Powerlink's statistical modelling and confirmed that the dataset meets the Version 5 requirements. WSP/PB's report is provided as Appendix 15.02.

Powerlink's proposed targets, caps and floors are summarised in Table 15.1.

Table 15.1: Powerlink's proposed Service Component targets, caps and floors

| Parameter | Floor | Target | Cap | Weighting % of MAR |
|---|---|---|---|---|
| **Service Component** | | | | **±1.25** |
| Unplanned outage circuit event rate | | | | |
| Lines event rate – fault | 27.17 | 20.88 | 15.86 | ±0.20 |
| Transformer event rate – fault | 20.84 | 18.91 | 17.09 | ±0.20 |
| Reactive plant event rate – fault | 43.42 | 29.85 | 19.49 | ±0.10 |
| Lines event rate – forced | 24.09 | 20.39 | 15.90 | ±0.10 |
| Transformer event rate – forced | 23.49 | 19.17 | 13.96 | ±0.10 |
| Reactive plant event rate – forced | 34.25 | 24.23 | 15.95 | ±0.05 |
| Loss of supply event frequency | | | | |
| Greater than 0.05 system minutes | 7 | 3 | 1 | ±0.15 |
| Greater than 0.40 system minutes | 3 | 1 | 0 | ±0.15 |
| Average outage duration | 282.00 | 94.14 | 4.83 | ±0.20 |
| Proper operation of equipment | | | | |
| Failure of protection system | N/A | N/A | N/A | 0.00 |
| Material failure of SCADA system | N/A | N/A | N/A | 0.00 |
| Incorrect operational isolation of equipment | N/A | N/A | N/A | 0.00 |

Powerlink's historic performance for each of the parameters and sub-parameters under Version 5 is described in the sections below. This information forms the basis for setting Powerlink's proposed target, cap and floor values.

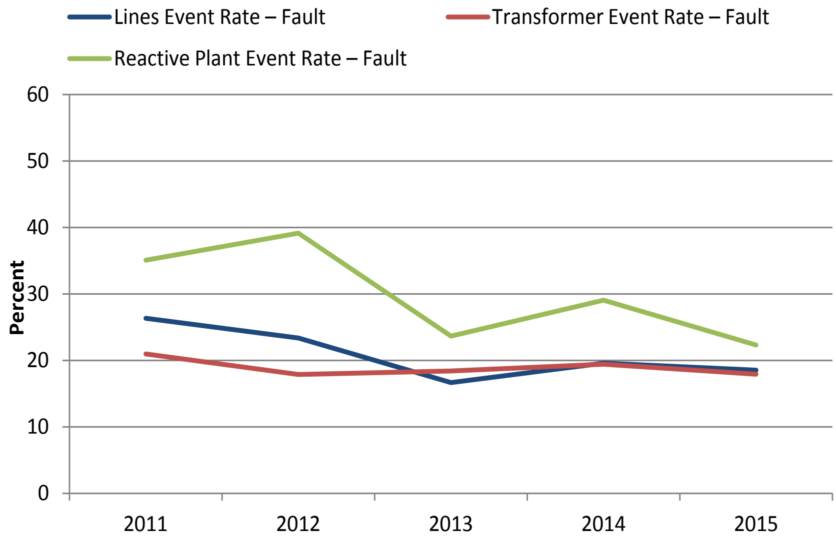
*Unplanned outage circuit event rate – fault*

A fault outage is any element outage that occurred as a result of unexpected automatic operation of switching devices (such as circuit breakers). That is, the element outage did not occur as a result of intentional manual operation of switching devices.

The fault outage circuit event rate parameter measures network reliability by using an aggregate number of fault outages per annum for each of the element transmission types, namely, lines, transformers and reactive plant.

Powerlink's historic performance of fault outage circuit rates is shown in Figure 15.1.

Figure 15.1: Powerlink historic performance – unplanned outage circuit event rate – fault




Source: Powerlink data.

To minimise the impact on its customers and the market, Powerlink rapidly responds to and restores fault outages on its network.

Powerlink has actively implemented improvements to its remote interrogation and plant monitoring capabilities, and undertakes regular operational event reviews. Powerlink's fault outage rates have shown steady improvement. Reactive plant, namely Static VAr Compensators (SVC), reactors and capacitor banks, exhibit a higher level of fault outage rates due to the inherent complexity of these devices.

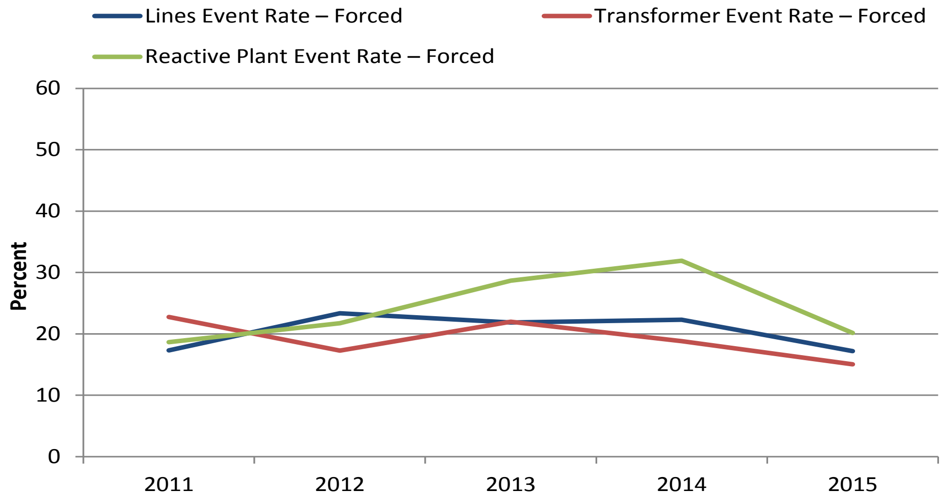
### *Unplanned outage circuit event rate – forced*

A forced outage is any element outage that occurred as a result of intentional manual operation of switching devices based on the requirement to undertake urgent and unplanned corrective activity, where less than 24 hours' notice was given to the affected customer(s) and/or AEMO.

Similar to the fault outage rate, the forced outage circuit event rate parameter measures network reliability by using an aggregate number of forced outages per annum for each of the element transmission types. As identified above, these are lines, transformers and reactive plant.

Powerlink's historic performance of forced outage circuit rates is shown in Figure 15.2.

Figure 15.2: Powerlink historic performance – unplanned outage circuit event rate – forced




Source: Powerlink data.

Lines and transformers have shown reasonably consistent performance over the past few years, while reactive plant outages have increased in recent years. Similar to the fault outage performance, SVCs again exhibit higher numbers of failures and require an urgent operational response.

### *Loss of supply event frequency*

The aim of the loss of supply event frequency parameter is to minimise the number and impact of loss of supply events by including and counting both small (x) and large (y) loss of supply events. The parameter is measured in system minutes, which is calculated using energy not supplied for each supply interruption divided by Powerlink's peak network demand value. The number of events where system minutes exceed x and y thresholds are summed each year.

Powerlink has actively sought to minimise the impact of loss of supply events on its network. This has resulted in improved network performance against previous x and y system minute thresholds.

While the AER did not propose any adjustment to Powerlink's loss of supply thresholds under draft Version 5, Powerlink reviewed its recent network performance and proposed that the AER apply incrementally lower thresholds to Powerlink in the 2018-22 regulatory period. In its Final Decision on Version 5,[88] the AER established even more challenging loss of supply thresholds.

### *Frequency of small loss of supply events*

Under Version 3, Powerlink's x system minute threshold is 0.10 system minutes. Powerlink reviewed its network performance and proposed a lower threshold of 0.05 system minutes, to ensure that it remains consistent with the principles of the scheme.

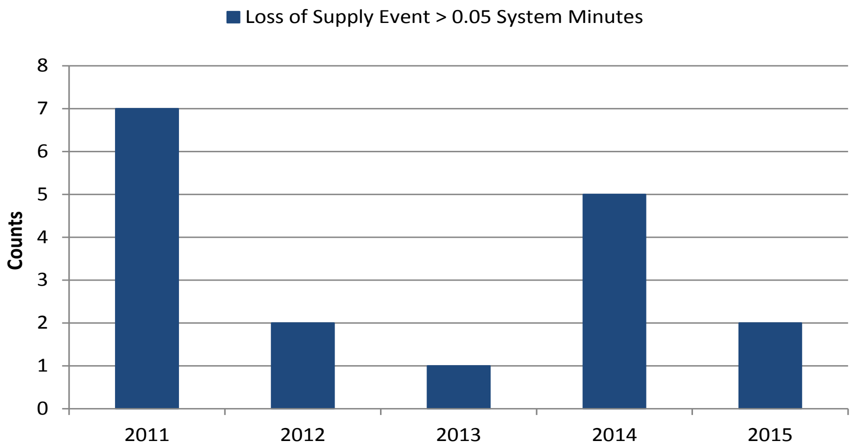
The AER undertook its own analysis of Powerlink's historic performance data and agreed with Powerlink's proposal to apply an x threshold of 0.05 system minutes in the 2018-22 regulatory period.[89]

Powerlink's historic performance of the loss of supply event frequency greater than 0.05 system minutes is shown in Figure 15.3.

88 *Final Decision, Electricity Transmission Network Service Providers STPIS*, AER, September 2015.

89 *Ibid*, pp. 13-20.

Figure 15.3: Powerlink historic performance – loss of supply event frequency greater than 0.05 system minutes




Source: Powerlink data.

Powerlink's performance under the frequency of small loss of supply events parameter has been stronger in recent years.

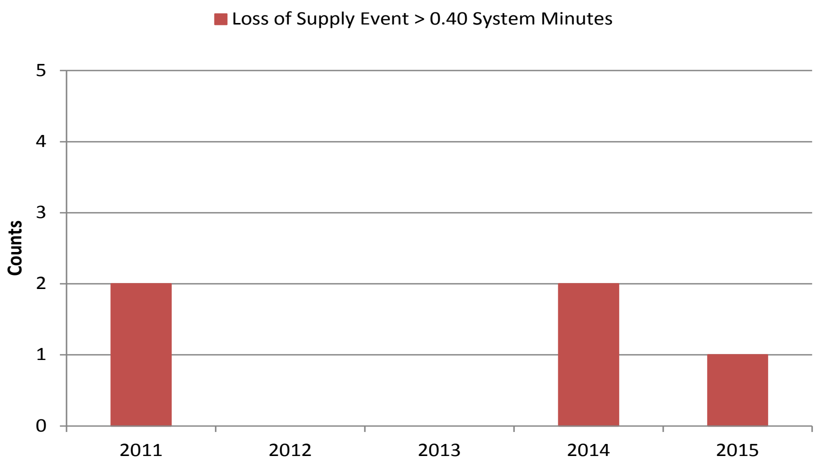
*Frequency of large loss of supply events*

Under Version 3, Powerlink's y system minute threshold is 0.75 system minutes. Powerlink reviewed its network performance during the consultation for the STPIS review and proposed a lower threshold for the 2018-22 regulatory period of 0.65 system minutes.

The AER undertook its own analysis of Powerlink's historic performance data and determined that a further reduction of the threshold to 0.40 system minutes would provide an appropriate target. While Powerlink does not agree with the basis on which the AER determined this target (in terms of statistical validity and consistency with other recent target determinations), Powerlink is mindful of the importance of delivering reliable transmission services and will work to further improve its performance.

Powerlink's historic performance of the loss of supply event frequency greater than 0.40 system minutes is shown in Figure 15.4.

Figure 15.4: Powerlink historic performance – loss of supply event frequency greater than 0.40 system minutes




Source: Powerlink data.

Powerlink's network experienced very few loss of supply events > 0.40 system minutes in recent years and did not experience any such events in 2012 and 2013. Powerlink will continue to look for ways to avoid and minimise outages and loss of supply.

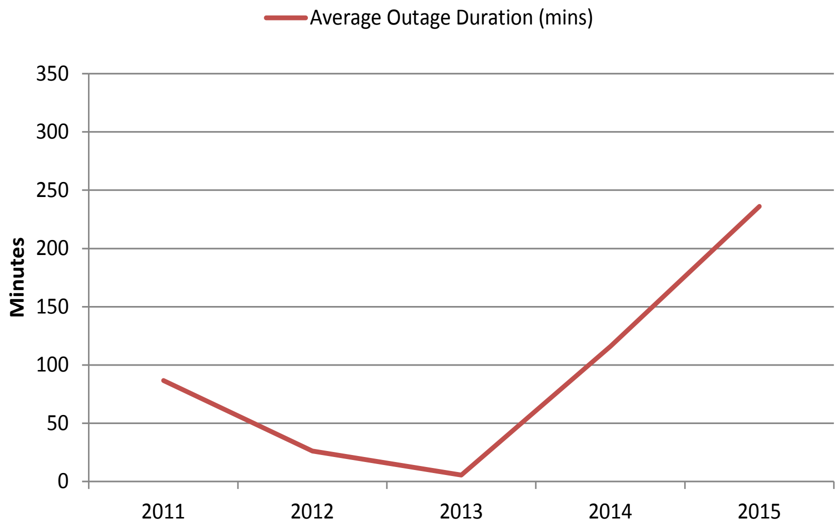
### *Average outage duration*

The average outage duration parameter measures the average time to restore loss of supply events and is calculated by dividing the annual summation of the loss of supply event duration time by the number of loss of supply events.

As the scope for this parameter has narrowed from all unplanned outage events (under Version 3) to only those unplanned outage events with a loss of supply (under Version 5), the number of events measured by this parameter is considerably fewer. This means that performance against the parameter is likely to have a high level of volatility. The two year rolling average is intended to somewhat address the issues associated with volatility.

Powerlink's historic performance of the average outage duration is shown in Figure 15.5.

Figure 15.5: Powerlink historic performance – average outage duration




Source: Powerlink data.

Powerlink has maintained performance within a reasonable range of the average outage duration given the potential for volatility of this measure. Powerlink places importance on minimising the duration of those unplanned outage events that impact supply to its customers.

### *Proper operation of equipment*

The proper operation of equipment parameter was first introduced in Version 4 of the STPIS on a report-only basis. Powerlink has and will continue to report the following three sub-parameters as part of its annual Benchmarking RIN returns:

- Failure of protection system;
- Material failure of the SCADA system; and
- Incorrect operational isolation of primary or secondary equipment.

Version 5 clarified the specific inclusion of control equipment to be captured under the definition of failure of protection system sub-parameter. As a result, this information has been reflected in Powerlink's historic performance data for the sub-parameter.

As this parameter remains report only under Version 5, Powerlink is not required to propose values for the parameter for the 2018-22 regulatory period.

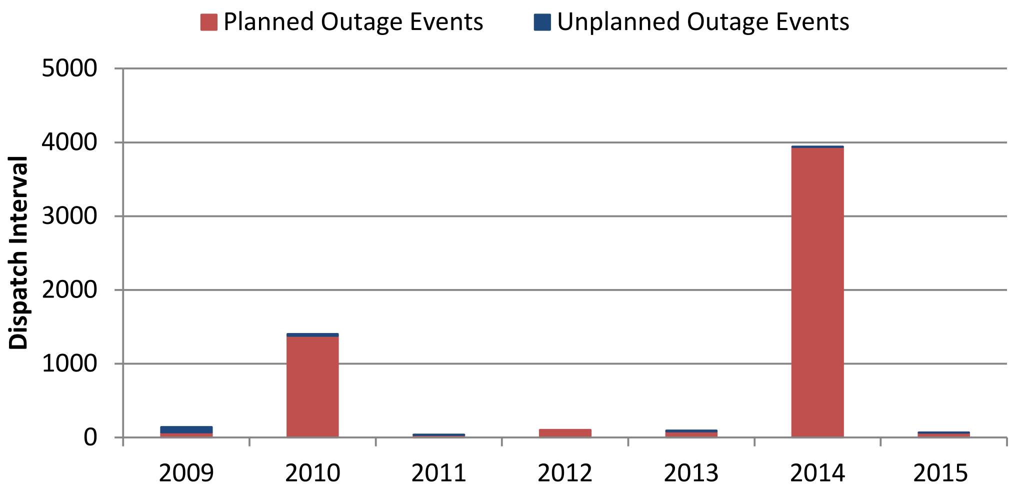
## 15.3.2 Market Impact Component

The MIC is intended to incentivise TNSPs to minimise the impact of transmission network outages on wholesale electricity prices and to improve network availability at times and on parts of the network that are most important to influencing the dispatch of generation in the NEM.

Version 5 redesigned the MIC to be a symmetrical (bonus and penalty) scheme with a 1% MAR incentive. Under the scheme a performance measure of zero DIs will deliver a bonus equal to 1% MAR and a performance measure of twice the performance target will deliver a penalty equal to 1% MAR.

The performance target is calculated as the mean of five of the last seven calendar years performance history with the largest and smallest DI counts removed. Powerlink's historic data for the past seven calendar years (2009 to 2015) is shown in Figure 15.6.

Figure 15.6: Powerlink historic performance – MIC




Source: Powerlink data.

Powerlink has implemented a range of processes to minimise the impact of outage events on market participants, including working closely with customers to plan and coordinate network outages at times least likely to result in a market constraint. This also includes timely real-time action to reschedule works to reduce the impact of binding constraints on the market.

In 2014, Powerlink undertook extended planned project outages on its network connection between Queensland and New South Wales, which resulted in significant DI counts. While these outages were necessary to deliver project works, Powerlink scheduled these outages at times in the year that caused the least impact and used efficient project staging and resourcing to minimise the duration of these outages.

Powerlink's proposed performance target, unplanned outage event limit and dollar per DI incentive for the MIC (as required by Section 4.2 of Version 5) are described in the following sections. Detailed information in relation to the calculations for this parameter is provided in Appendix 15.01, Setting STPIS Values.

*Proposal of MIC performance target*

Powerlink proposes a performance target of 361 DIs.[90] The proposed performance target has been calculated in accordance with Version 5, Appendix F Market Impact Component application. Powerlink's proposed historic performance is provided in Table 15.2.

Table 15.2: Powerlink's historic performance – MIC

| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|
| Planned outage events | 70 | 1,378 | 36 | 105 | 81 | 3,936 | 65 |
| Unplanned outage events | 73 | 27 | 1 | 0 | 16 | 5 | 1 |
| Total DIs for the year | 143 | 1,405 | 37 | 105 | 97 | 3,941 | 66 |

*Unplanned outage event limit*

Powerlink proposes an unplanned outage event limit of 61 DIs.[91] Version 5 requires that the unplanned outage event limit be calculated as 17% of the final performance target to mitigate the impact on volatility of the unplanned outage count in any single year.

*Dollar per dispatch interval incentive*

Powerlink proposes a dollar per dispatch interval incentive of $21,257/DI.[92] The amount was calculated by dividing 1% of the MAR for the first year of the regulatory period ($767.4m for 2017/18 from Section 11.9 of Chapter 11) by the proposed performance target of 361 dispatch intervals.

## 15.3.3 Network Capability Component

The NCC is designed to incentivise TNSPs to deliver benefits of improved network capability from existing network assets to benefit customers and wholesale market outcomes when most needed. The NCC facilitates improvements in the capability of transmission assets through operational expenditure and minor capital expenditure on a TNSP's network which is intended to result in:

- Improved capability of those elements of the transmission system most important to determining spot prices; or
- Improved capability of the transmission system at times when transmission network users place greatest value on the reliability of the transmission system.

The NCC has further incentivised Powerlink to examine its network to identify suitable low cost one-off operational and capital expenditure projects that are expected to improve the capability of its transmission network.[93] Changes to the NCC under Version 5 have included specific new requirements to consider payback periods and material benefits for justification of NCIPAP projects and also clarified the information to be provided to AEMO to perform its review of proposed priority projects.

Powerlink carried out a rigorous process to identify, review, validate and rank a broad range of potential candidate priority projects against the NCC criteria and objectives of Version 5. Powerlink initially identified 20 credible candidate priority projects. Through a process of internal review and validation, including significant consultation with AEMO, the number of proposed priority projects has been refined and reduced to three. Notably, the process of review and refinement was also significantly informed by the parallel development and finalisation of the AER's Version 5. The project identification and validation process is more comprehensively explained in Appendix 15.03, Network Capability Incentive Parameter Action Plan (NCIPAP).

90 As required by section 4.2 of Version 5.

91 *Ibid.*

92 *Ibid.*

93 *Final Decision, Electricity Transmission Network Service Providers STPIS*, AER, September 2015, p. 7.

*Stakeholder engagement*

The AER's CCP4 indicated that NCIPAP projects needed to have material benefits for customers. This feedback has further informed Powerlink's approach to propose NCIPAP projects for which there is a high confidence of being able to achieve market or consumer benefits. These factors, combined with Powerlink's historic focus on delivering network capability improvements through business-as-usual initiatives resulted in a small number of proposed NCIPAP projects.

Section 5.2 of Version 5 requires Powerlink to submit a NCIPAP and to consult with AEMO in developing the plan. The plan includes a list of projects designed to improve network limitations and provide future benefits. The projects are ranked in priority on the basis of the likely benefit for customers and wholesale market outcomes.

Powerlink consulted extensively with AEMO during the development of its NCIPAP.

*Proposal of NCIPAP Priority Projects*

A summary of Powerlink's proposed NCIPAP priority projects is shown in Table 15.3. AEMO has agreed with Powerlink that the three proposed projects should be classified as priority projects.

AEMO's letter of agreement for Powerlink's proposed priority projects is provided as Appendix 15.04.

For details of Powerlink's NCIPAP, refer to Appendix 15.03, NCIPAP.

Table 15.3: Powerlink's proposed NCIPAP priority projects ($m, real 2016/17)

| Category | Project title | Estimated cost (opex) | Net market benefit (pa) | Market benefit (pa) | Pay back period (years) | Rank |
|---|---|---|---|---|---|---|
| Limitations involving minor primary plant or secondary equipment | Increase design temperature of Bouldercombe to Raglan and Larcom Creek to Calliope River 275kV transmission lines | 0.51 | 0.06 | 0.15 | 3.5 | 1 |
| Outage management/ non-credible contingencies | Greenbank System Integrity Protection Scheme (SIPS) | 1.82 | 0.16 | 0.43 | 4.2 | 2 |
| Operational issues and operational flexibility | Load model enhancement and validation | 0.88 | - | - | - | 3 |
| **Estimated total project cost** | | **3.20** | | | | |

## 15.4 Summary

Table 15.4 provides a summary of Powerlink's proposed targets, floors, caps and weightings for the service component of the STPIS, as well as summary information for the market impact and network capability components of the scheme.

Powerlink's STPIS proposal meets all relevant requirements of the Rules, Framework and Approach paper, Version 5 STPIS and the Reset RIN.

Table 15.4: Powerlink's proposed STPIS values

| Parameter | Floor | Target | Cap | Weighting % of MAR |
|---|---|---|---|---|
| **Service Component** | | | | **±1.25** |
| Unplanned outage circuit event rate | | | | |
| Lines event rate – fault | 27.17 | 20.88 | 15.86 | ±0.20 |
| Transformer event rate – fault | 20.84 | 18.91 | 17.09 | ±0.20 |
| Reactive plant event rate – fault | 43.42 | 29.85 | 19.49 | ±0.10 |
| Lines event rate – forced | 24.09 | 20.39 | 15.90 | ±0.10 |
| Transformer event rate – forced | 23.49 | 19.17 | 13.96 | ±0.10 |
| Reactive plant event rate – forced | 34.25 | 24.23 | 15.95 | ±0.05 |
| Loss of supply event frequency | | | | |
| Greater than 0.05 system minutes | 7 | 3 | 1 | ±0.15 |
| Greater than 0.40 system minutes | 3 | 1 | 0 | ±0.15 |
| Average outage duration | 282.00 | 94.14 | 4.83 | ±0.20 |
| Proper operation of equipment | | | | |
| Failure of protection system | N/A | N/A | N/A | 0.00 |
| Material failure of SCADA system | N/A | N/A | N/A | 0.00 |
| Incorrect operational isolation of equipment | N/A | N/A | N/A | 0.00 |
| **Market Impact Component** | | | | **±1.00** |
| Performance target | 722 | 361 | 0 | ±1.00 |
| Dollar per DI incentive | - | $21,257 | - | 0.00- |
| Unplanned outage event limit | - | 61 | - | 0.00- |
| **Network Capability Component** | | | | **3 priority projects, totalling $3.2m** |

# 16 Pricing Methodology

## 16.1 Introduction

Powerlink's Pricing Methodology sets out the approach to how Powerlink allocates its annual prescribed revenue to the various categories of prescribed services and transmission network connection points and determines the structure of its transmission charges.

This chapter sets out the regulatory requirements applicable to a TNSP's pricing methodology and presents Powerlink's proposed amendments to its current methodology. The chapter also provides an overview of Powerlink's pricing related stakeholder engagement activities, which include the potential changes put forward, engagement channels and overall response.

*Key highlights*

- Powerlink undertook a range of stakeholder consultation which was used to inform its proposed Pricing Methodology.
- Powerlink has proposed only minor changes to its current Pricing Methodology.

## 16.2 Regulatory requirements

The Rules[94] require a Proposed Pricing Methodology to be submitted with Powerlink's Revenue Proposal. The Rules[95] also set out various principles and criteria to which the methodology must comply, which include the pricing principles for prescribed transmission services, the AER's Pricing Methodology Guidelines[96] and any relevant Regulatory Information Instrument (RII).

## 16.3 Powerlink's proposed pricing methodology

Powerlink's Pricing Methodology was originally approved by the AER at the time of its 2012 Transmission Determination for the 2013-17 regulatory period. The methodology was amended to reflect the introduction of inter-regional transmission charging arrangements from 1 July 2015. These changes were approved by the AER in May 2015.

For application in its 2018-22 regulatory period, Powerlink has proposed only minor changes to its current methodology. Broadly speaking, these changes are intended to improve clarity, reflect recent developments in transmission pricing and remove superfluous information. These include the following items.

### 16.3.1 Multiple transmission NSPs

Powerlink is currently the sole provider of prescribed transmission services within Queensland and is responsible for the allocation of the annual aggregate revenue requirement within Queensland. These arrangements are reflected in Powerlink's current methodology and include reference to relevant sections of the Rules in the event prescribed transmission services are provided by more than one TNSP in Queensland.

To improve clarity in the situation where there would be more than one Queensland TNSP and Powerlink is appointed as the coordinating TNSP, Powerlink has proposed inclusion of the relevant additional clauses of the Rules directly within Section 6.2 and Appendix D of its Proposed Pricing Methodology.

94 *National Electricity Rules*, AEMC, clause 6A.10.1.

95 *Ibid*, clause 6A.25.

96 *Electricity TNSP, Pricing Methodology Guidelines*, AER, July 2014

### 16.3.2 Description of differences

The AER's Pricing Methodology Guidelines require a description of the differences between pricing methodologies applied during the 2013-17 regulatory period and proposed for the next regulatory period. Powerlink has addressed this requirement in Section 13 of its Proposed Pricing Methodology.

### 16.3.3 Priority ordering – examples

Priority ordering relates to the process by which assets are allocated to more than one category of prescribed transmission service. Appendix E of Powerlink's current methodology provides a number of examples to describe the priority ordering process. Having undertaken a review of these examples, Powerlink has proposed amendments to reflect allocations that would apply to most network configurations.

Powerlink's proposed Pricing Methodology is provided as Appendix 16.01.

## 16.4 Potential changes to pricing arrangements

In the context of recent debate about tariff reform for DNSPs and in an effort to provide better value to customers, Powerlink sought feedback from customers and consumers on whether there was an appetite for its transmission pricing arrangements to go further. To this end, Powerlink proposed a number of potential changes to its existing pricing arrangements as a possible means to provide stronger pricing signals that may better reflect the costs of providing transmission services.

Powerlink's consultation focused on possible changes to locational and non-locational TUOS arrangements given the large cost reflective element inherent in locational TUOS and that together, locational and non-locational TUOS typically comprised the most significant portion of overall prescribed revenues each year, approximately 70%. The changes Powerlink sought input from customers and consumers included whether:

- Customers wanted the flexibility to opt-in to nominated/contract demand only locational TUOS charges or considered that such an approach should apply to all customers in the next regulatory period;
- Powerlink should propose to adopt a modified CRNP methodology to calculate locational TUOS revenue allocations in its Pricing Methodology;
- Powerlink should propose an increase to the locational component of TUOS revenue allocations away from the current 50/50 locational/non-locational proportion;
- To seek a change from the current CRNP (backward looking) approach to establish asset values to a Long Run Marginal Cost (LRMC or forward looking) approach. Powerlink acknowledged that this was not permitted under the current Rules and hence could not be proposed in its Pricing Methodology. However, it may be considered as a potential Rule change proposal; and
- What, if any, other transmission pricing changes may be warranted.

In addition, Powerlink sought feedback from direct connect customers about whether it should investigate options to provide more price predictability. This was a matter that could be addressed through business-as-usual processes rather than the Pricing Methodology.

The details of the possible changes above are discussed in Powerlink's Consultation Paper on Transmission Pricing.[97]

97 Published on Powerlink's website: https://www.powerlink.com.au/Network/Connection_and_pricing/Pricing.aspx.

### 16.4.1 Customer and consumer engagement

Powerlink's engagement on pricing matters for input to its Revenue Proposal occurred through the following channels:

- Powerlink's Customer and Consumer Panel – held 21 August 2015;
- Consultation Paper on Transmission Pricing – published 6 October 2015;
- Transmission Pricing Webinar – held 12 October 2015; and
- Direct customer/stakeholder interactions – during October and November 2015.

### 16.4.2 Powerlink's Customer and Consumer Panel

Powerlink initially put the potential changes to its Customer and Consumer Panel for input and feedback on 21 August 2015. On the day, the Panel was joined by two of the three AER CCP4 members as observers assigned to Powerlink's 2018-22 transmission determination process.

At that time, Powerlink presented its early thinking on the potential changes at a high level, given that it had not undertaken detailed analysis. Part of the reason for this was to enable the Panel to provide feedback on the merits of the potential changes in principle, and to provide guidance on which of these matters Powerlink should focus more detailed attention. The session involved a Powerlink presentation on the potential changes followed by breakout table sessions to allow panellists to raise and discuss issues within a smaller group environment.

While mindful not to overly simplify or generalise the feedback on the day, Powerlink considered that the Panel members' response to the proposals was mixed. Many members appeared to have understood the fundamental basis of distribution tariff reform and supported, at least in principle, the driver for Powerlink's potential changes within the current Rules framework. However, members also sought further information about:

- The Rules and methodologies themselves;
- How these changes would impact customers and consumers in terms of overall charges; and
- The scope to implement more flexible arrangements. For example, to progressively transition to any new arrangements and/or allow individual directly connected customers to opt-in where the Rules allowed for such discretion.

### 16.4.3 Consultation paper on transmission pricing

In response to the feedback provided at Powerlink's Panel meeting of 21 August 2015, Powerlink prepared and published a Consultation Paper on Transmission Pricing.[98] The paper was intended to provide further information to assist customers and consumers to provide further input on the potential changes. In particular, the paper presented the aggregated results of having modelled the impact of some of the potential changes on directly connected customers and further analysis which Powerlink had not taken at the time of the 21 August 2015 panel meeting.

Powerlink received seven written submissions on its Consultation Paper. These are discussed in Section 16.4.7.

### 16.4.5 Pricing webinar

Powerlink held a Pricing Webinar on 12 October 2015. The purpose of the webinar was to provide other stakeholders with an opportunity to receive an overview of the potential changes in the Consultation Paper from Powerlink and to seek clarification on any of the pricing changes prior to the close of submissions.

98 *Ibid.*

While Powerlink had initially intended to open the webinar to only its directly connected customers (given many are not members of its Panel), in response to feedback at its August Panel meeting, it opened the webinar to a wider range of stakeholders. Specifically, Powerlink sought and received the assistance of Energex and Ergon Energy to forward the webinar notification onto their large sub-transmission customers and embedded generators. Powerlink's Panel members and the AER's CCP4 members were also invited to participate in the webinar.

Approximately 20 external stakeholders participated in the webinar, many of which were not members of Powerlink's Panel. While Powerlink received positive feedback from a number of participants for providing the opportunity for them to hear information first hand and provide comment, it also received negative feedback from one participant about the limited two way interaction that such a forum provided and Powerlink's greater level of interest in the views of its own customers, rather than discussions in relation to pricing in NSW.

As a number of the questions at the webinar were customer specific and potentially confidential in nature, customers were encouraged to contact and/or meet with Powerlink separately.

### 16.4.6 Customer/stakeholder interactions

Subsequent to the webinar, Powerlink teleconferenced or met with a number of customers (including sub-transmission customers) to further discuss pricing related matters and to talk through the results of its modelling contained in the Consultation Paper, in particular, the potential impact of the modelled changes on individual customers.

### 16.4.7 Stakeholder submissions

In response to its Transmission Pricing Consultation Paper, Powerlink received seven submissions from stakeholders, namely, Aurizon, BMA, ElectraNet, Energex, Ergon Energy, EUAA and Sun Metals. Table 16.1 provides a high level summary of the submissions. These are also attached to the Revenue Proposal as Appendix 16.02.

Overall, the feedback in submissions was mixed. Notably, the only matter that received comment in all submissions and for which amendments could be proposed in the Revenue Proposal timeframe was in relation to nominated/contract demand only locational TUOS prices. This is discussed further below.

*Nominated/contract demand only locational TUOS prices*

The Rules currently provide for locational TUOS charges to be recovered on the basis of demand at times of greatest utilisation of the network. To meet this requirement, Powerlink currently calculates its locational TUOS charges based on nominated/contract demand and average demand. This arrangement applies to all Powerlink customers.

With a view to potentially providing more cost reflective pricing signals, Powerlink sought feedback from customers and consumers on whether it should seek to adopt nominated/contract demand only locational TUOS prices. In addition, Powerlink asked whether customers wanted the flexibility to opt-in to these arrangements, or be applied to all customers. The feedback from customers and consumers on this matter was mixed (see Table 16.2 at the end of the chapter and Appendix 16.02).

On one hand, two Queensland stakeholders supported the adoption of nominated/contract demand only locational TUOS charges for all customers. While both considered it would improve cost reflectivity, support from one stakeholder was conditional on being subject to transitional arrangements. The other stakeholder also made a general comment in its submission that, no matter what changes are made in the pricing methodology, the 2% side constraint means it would be a long time before there is true economically efficient cost reflective network pricing. Another customer provided limited support for application to large sub-transmission users and recognised the impacts would only be seen by relatively few customers. One other customer supported opt-in. One other TNSP supported use of contract demand as the relevant demand measure.

On the other hand, two customers opposed such a change. One customer argued that it would reduce the opportunity for users to look for ways to manage their load and reduce costs. The other considered that optionality would appear to penalise those customers who do not have the flexibility to influence electricity demand, increase the complexity of Powerlink's pricing framework and result in less transparency and more instability in its regulated pricing arrangements.

As indicated above, there was a wide range of views from stakeholders on the issue of either an opt-in or all-in arrangement to nominated/contract demand only locational TUOS prices. While Powerlink appreciates that these stakeholders lodged a submission on the Consultation Paper, it also recognises that the number of respondents is small relative to those who may be more directly impacted by the change – namely, customers directly connected to the transmission network, large sub-transmission customers and embedded generators (through avoided TUOS payments). Powerlink also considered the potential implications[99] of a move to nominated/contract demand only locational TUOS prices. In particular, the ability (or limited ability) of customers to adapt to these arrangements, the potential level of volatility in locational and non-locational revenue collections across connection points that may occur as a result and the time it would take to transition to a 'pure' nominated/contract demand only based locational price, particularly given that connection point prices are constrained.

The mixed response in submissions on this matter and small number of submissions suggests there does not appear to be a strong case from customers for a definite change. Therefore, on balance, Powerlink has decided not to propose a move to nominated/contract demand only locational TUOS prices in its proposed Pricing Methodology for the next regulatory period.

Powerlink also had regard to the submissions in reaching its position on the other pricing matters. In light of this limited feedback, Powerlink has taken the positions set out in Table 16.1.

Table 16.1: Powerlink response to feedback

| Overall feedback | How Powerlink used the feedback? |
|---|---|
| Nominated/contract demand only locational TUOS prices<br>• Mixed views | Continue to apply current nominated/contract demand and average demand locational TUOS prices. |
| CRNP or modified CRNP<br>• No strong support from customers | Continue to apply current CRNP methodology. |
| 50/50 locational/non-locational revenue split<br>• Mixed views | Continue to apply current 50/50 split. |
| Price predictability<br>• Some interest | Commit to further investigate and engage with interested customers as part of business-as-usual. |
| CRNP to LRMC<br>• Mixed views | Commit to further investigate as part of business-as-usual. |
| Other changes<br>• Investigate kVA based transmission charges<br>• Common services/entry/exit services | Commit to further investigate as part of business-as-usual. |

## 16.5 Summary

Powerlink considers that its proposed Pricing Methodology meets all compliance requirements given that it includes all relevant information prescribed under the Rules, AER Pricing Methodology Guidelines and Reset RIN.

99 These potential implications were discussed in more detail in the Transmission Pricing Consultation Paper.

Table 16.2: Summary of submissions to Transmission Pricing Consultation Paper

| Consultation matter | Aurizon | BMA | Energex | Ergon Energy | EUAA | Sun Metals | ElectraNet |
|---|---|---|---|---|---|---|---|
| Nominated/contract demand only locational TUOS prices (opt-in or all-in) | No | Opt-in | All in | Loose support for major customers only<br>Avoided TUOS impact to be considered. | All in | No | Supports |
| CRNP to modified CRNP | No | - | Loose support | - | Cannot express view | - | Support – proportionate way to improve LRMC. |
| 50/50 to other proportion | No | - | Loose support | - | Support | No | M-CRNP adjusts for this. |
| CRNP to LRMC | No | Cannot comment | Supports | Supports | Need more information. | - | See above, further work required. |
| Price predictability | - | Interested | - | Supports | Supports | - | Supports |
| Other changes | - | - | kVA charges | kVA charges | Locational components of common and entry/exit services. | New rate for flexibility | - |
| Other key comments | - | Use revenue from changes for augmentation in those locations. | Impact may not flow through until 2020 Tariff Structure Statement. | Supports changes that better reflect efficient cost of network services. | Not enough information in Consultation Paper. | - | Supports alignment of transmission pricing across NEM. |

# 17 Negotiating Framework

## 17.1 Introduction

Powerlink's Negotiating Framework sets out the procedure to be followed during negotiations between Powerlink and any person who makes an application to receive a negotiated transmission service under the Rules. These negotiations relate to the terms and conditions of access for the service.

This chapter sets out the relevant regulatory requirements for, and Powerlink's proposed amendments to, its current Negotiating Framework.

> *Key highlights*
>
> - Powerlink's proposed Negotiating Framework for the 2018-22 regulatory period is fundamentally the same as its current AER approved Negotiating Framework.

## 17.2 Regulatory requirements

The Rules[100] set out various principles and criteria which relate to a TNSP's Negotiating Framework. This includes a requirement to comply with any relevant Regulatory Information Instrument (RII), such as a Reset RIN.

## 17.3 Powerlink's proposed Negotiating Framework

Powerlink's proposed Negotiating Framework for the 2018-22 regulatory period is largely consistent with its current AER approved Negotiating Framework.

Powerlink has proposed an amendment to one phrase in the document. Specifically, in relation to the termination of negotiations (Section 11 of Powerlink's proposed Negotiating Framework), the phrase "believes on reasonable grounds" has been replaced with the phrase "is of the reasonable opinion." Powerlink considers that this phrase more appropriately reflects that in these circumstances, it would be providing an opinion.

In addition, Powerlink has proposed a very small number of changes which are typographical in nature.

For ease of review, Powerlink has provided its proposed Negotiating Framework inclusive of tracked changes from its current approved version in Appendix 17.01.

## 17.4 Summary

Powerlink considers that its Negotiating Framework meets all regulatory requirements, given that it includes all relevant information prescribed under the Rules and Reset RIN.

100 *National Electricity Rules*, AEMC, clause 6A.9.5.

# 18 Glossary

| | |
|---|---|
| AEMC | Australian Energy Market Commission |
| AEMO | Australian Energy Market Operator |
| AER | Australian Energy Regulator |
| ARR | Annual Revenue Requirement |
| BAU | Business-as-Usual |
| BPO | Base Planning Objects |
| CAPM | Capital Asset Pricing Model |
| CESS | Capital Expenditure Sharing Scheme |
| CPI | Consumer Price Index |
| CRNP | Cost Reflective Network Pricing |
| DAE | Deloitte Access Economics |
| DEA | Detailed Engineering Analysis |
| DNSP | Distribution Network Service Provider |
| DRP | Debt Risk Premium |
| EBSS | Efficiency Benefit Sharing Scheme |
| EGWWS | Electricity, Gas, Water and Waste Services |
| GSP | Gross State Product |
| IAP2 | International Association for Public Participation |
| IT | Information Technology |
| ISR | Industrial Special Risks |
| KPI | Key Performance Indicators |
| kV | Kilovolt |
| LNG | Liquefied Natural Gas |
| LRMC | Long Run Marginal Cost |
| MAR | Maximum Allowed Revenue |
| MIC | Market Impact Component |
| MPFP | Multilateral Partial Factor Productivity |
| MRP | Market Risk Premium |
| MTFP | Multilateral Total Factor Productivity |
| MW | Megawatts |
| MWh | Megawatt hours |
| NCC | Network Capability Component |
| NCIPAP | Network Capability Incentive Parameter Action Plan |
| NEFR | National Electricity Forecasting Report |
| NEM | National Electricity Market |
| NEL | National Electricity Law |
| NEO | National Electricity Objective |
| NSP | Network Service Provider |

| | |
|---|---|
| NTNDP | National Transmission Network Development Plan |
| PFP | Partial Factor Productivity |
| PTRM | Post-tax Revenue Model |
| PV | Photovoltaic |
| QNI | Queensland/New South Wales Interconnector |
| RAB | Regulatory Asset Base |
| RFM | Roll Forward Model |
| RII | Regulatory Information Instrument |
| RIT-T | Regulatory Investment Test for Transmission |
| SAUR | Shared Asset Unregulated Revenues |
| SC | Service Component |
| STPIS | Service Target Performance Incentive Scheme |
| TAPR | Transmission Annual Planning Report 2015 |
| TNSP | Transmission Network Service Provider |
| TUOS | Transmission Use of System |
| WACC | Weighted Average Cost of Capital |
| WPI | Wage Price Index |

# 19 Appendices

| | |
|---|---|
| Appendix 1.01 | Powerlink – Board Memorandum (Powerlink 2018-22 Revenue Proposal – Certification of Key Assumptions) |
| Appendix 1.02 | Powerlink – Board Memorandum (Reset Regulatory Information Notice) |
| Appendix 1.03 | Powerlink – NER Compliance Checklist |
| Appendix 1.04 | Powerlink – RIN Compliance Checklist |
| Appendix 3.01 | Articulous Communications – Powerlink AER Consumer Engagement Research |
| Appendix 3.02 | ACCSR – Customer and Consumer Perception Research Summary of Results |
| Appendix 3.03 | ACCSR – Stakeholder Perception Pulse Survey |
| Appendix 3.04 | Powerlink – Transmission Network Forum Participant Feedback Report |
| Appendix 3.05 | Powerlink - Central Queensland/Southern Queensland Area Plan Forum Participant Feedback Report |
| Appendix 4.01 | Huegin – Powerlink Operating Expenditure Benchmarking Review |
| Appendix 5.01 | Powerlink – Operating and Capital Expenditure Criteria and Factors |
| Appendix 5.02 | Powerlink – Expenditure Forecasting Methodology |
| Appendix 5.03 | Powerlink – Transmission Annual Planning Report 2015 (TAPR) |
| Appendix 5.04 | Nuttall Consulting – Forecasting Methodology Review |
| Appendix 5.05 | Powerlink – Non-Load Driven Network Capital Expenditure Forecasting Methodology |
| Appendix 5.06 | Powerlink – TAPR 2015 (Appendix B) |
| Appendix 5.07 | KPMG – Review of Demand and Energy Forecasting Methodologies |
| Appendix 5.08 | AMCL – Review of Powerlink's Risk and Prioritisation Approach |
| Appendix 5.09 | Powerlink – Asset Management Plan (Volume 1) |
| Appendix 5.10 | Powerlink – Asset Management Plan (Volume 2) |
| Appendix 5.11 | Powerlink – Asset Planning Criteria Framework |
| Appendix 5.12 | Ernst & Young – Contingent Project Scenarios and Triggers |
| Appendix 5.13 | Powerlink – Contingent Projects |
| Appendix 6.01 | Powerlink – Forecast Operating Expenditure Methodology and Model |
| Appendix 6.02 | Finity – Insurance Premium Projections 2017/18 to 2021/22 |
| Appendix 6.03 | Finity – Self-Insurance Cost Projection 2017/18 to 2021/22 |
| Appendix 6.04 | KPMG – Debt and Equity Raising Transaction Costs |
| Appendix 7.01 | Powerlink – Cost Estimating Methodology |
| Appendix 7.02 | BIS Shrapnel – Real Labour Cost Escalation Forecasts to 2021/22 |
| Appendix 7.03 | Jacobs – Cost Escalation Factors (materials) for Powerlink – 2016 to 2022 |
| Appendix 7.04 | Jacobs – Cost Data Review to Support REPEX Modelling |
| Appendix 9.01 | Powerlink – Nominated Averaging Periods |
| Appendix 9.02 | Powerlink – Rate of Return and Gamma Independent Expert Advice Summary |
| Appendix 12.01 | Finity – Nominated Pass Through Events 2017/18 to 2021/22 |
| Appendix 15.01 | Powerlink – Setting STPIS Values |
| Appendix 15.02 | WSP/Parsons Brinckerhoff – Powerlink's Statistical Methodology for STPIS Service Component - Verification Report |

| | |
|---|---|
| Appendix 15.03 | Powerlink – Network Capability Incentive Parameter Action Plan (NCIPAP) |
| Appendix 15.04 | AEMO – Confirmation of Powerlink's Network Incentive Parameter Action Plan (NCIPAP) for Regulatory Period 2017-18 to 2021-22 |
| Appendix 16.01 | Powerlink – Proposed Pricing Methodology 1 July 2017 to 30 June 2022 (tracked changes) |
| Appendix 16.02 | Various – Submissions to Powerlink's Transmission Pricing Consultation Paper |
| Appendix 17.01 | Powerlink – Negotiating Framework for Negotiated Transmission Services – Version 2 (tracked changes) |

## Contact us


| | |
|---|---|
| Email | revenueresetteam@powerlink.com.au |
| Website | www.powerlink.com.au |
| Call | 1800 635 369 (free call) |


## Further information

Full details of Powerlink's Revenue Proposal are available on the Determinations and Access Arrangements section of the AER's website: www.aer.gov.au

Delivering better value