2013–2017
Powerlink Queensland
REVENUE PROPOSAL

Powerlink Queensland

Reliably supporting Queensland's economic growth and a lower emissions NEM

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1 Executive Summary

1.1 Introduction

This Revenue Proposal presents the Queensland Electricity Transmission Corporation Limited (Powerlink) revenue requirements for prescribed transmission services for the regulatory period from 1 July 2012 to 30 June 2017.

This proposal comes at a time of record levels of capital investment in the resources sector in Queensland and in related sectors such as rail and ports. This activity is driving increased demand for electricity, including in areas not currently serviced by the transmission network.

During the next regulatory period Powerlink faces a numbers of challenges in developing and operating its transmission network. In particular:

- meeting rising electricity demand, Queensland has the highest demand growth in the National Electricity Market (NEM);
- extending the transmission network to service new areas to facilitate the expansion of Queensland's energy resources and mining industries;
- changes in the mix of power generation supporting a lower emissions NEM; and
- maintaining reliability to customers by replacing ageing infrastructure which has now reached the end of its life.

These challenges are made all the more difficult with the forecast competition for skilled labour, rising prices of materials and stricter government requirements for ensuring the sustainable development of new assets.

Despite the challenges of meeting major growth in a period of rising input costs, Powerlink's Revenue Proposal is expected to increase the typical household electricity bill by only 0.6%, or about $2.34 per quarterly bill.

This Revenue Proposal demonstrates how Powerlink will address these challenges. It also provides comprehensive evidence of the revenue needs for the next regulatory period to meet Queensland's economic growth and support a lower emission NEM.

1.2 Customer engagement

Powerlink engages with its direct connect customers, and prospective customers, on a regular basis to discuss their electricity supply needs including: high reliability; security and quality of supply; and timely development of the network to meet their growing electricity demand. It is clear that the Powerlink transmission network plays a pivotal role in reliably supporting Queensland's economic growth. The following themes are prominent in the feedback received from customers:

- The central importance of transmission infrastructure to the Queensland economy. Significant sections of the Queensland transmission network are part of the "export infrastructure chain", supporting mines, Liquefied Natural Gas (LNG) production, rail and ports.
- The importance of timely augmentation of the transmission network to meet increasing electricity demand. In particular, the compressed timelines required by resource developments to meet their tight development timeframes and export contract obligations.

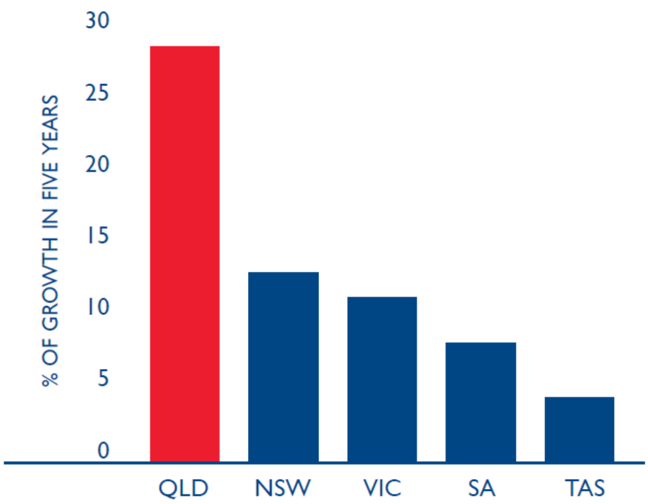
- The importance of reliability and security of supply. The desire for high levels of reliability, reinforced by the Somerville report[1], is still paramount. This requires transmission infrastructure to be replaced in a timely manner to ensure continued reliability of supply.
- It is abundantly clear from customer feedback that a highly reliable supply of electricity from the transmission network is paramount to their successful operations and that customers are willing to pay a reasonable price for reliable transmission services.
- Very significant developments in coal and gas mining will occur in Powerlink's next regulatory period. These developments will require a substantial amount of electricity in locations that are beyond the extent of the existing transmission network, requiring substantial network augmentations.

1.3 Meeting customer demand

The combination of high peak demand growth, more remote power generation developments and mandated reliability obligations continue to drive a major capital investment program of network augmentations. Whilst the global financial crisis provided a temporary slowing of electricity peak demand growth, economic forecasters[2] predict the return to long term economic growth trends and this is already becoming reality with the recent commitments made by large energy intensive coal and gas mining proponents. Powerlink currently has active enquiries from direct connect customers for over 3,000MW[3] of new load, which involves step increases in demand in a number of locations.

As a comparison, Figure 1.1 shows the forecast increase in peak demand for all the NEM States over the next five years.

Figure 1.1: Projected growth rate of peak demand over the next 5 years



Source: Electricity Statement of Opportunities, AEMO, 2010.

Figure 1.1 clearly shows that Queensland has by far the highest forecast growth in peak demand over the next five years. Queensland's five year demand growth is similar to Western Australia's and reflects the additional growth from increasing population and rapidly expanding coal and gas mining sectors. This higher demand growth, together with Queensland's long distances, drives

[1] Electricity Distribution and Service Delivery for the 21st Century, Queensland Government, July 2004.
[2] Long run economic and electricity load forecasts to 2024-25, NIEIR, April 2010.
[3] Only approximately 10% of these customer enquiries are included in the demand forecast.

the need for much greater investment to extend and augment the Queensland transmission network compared to other States.

1.4 Supporting a lower emissions NEM

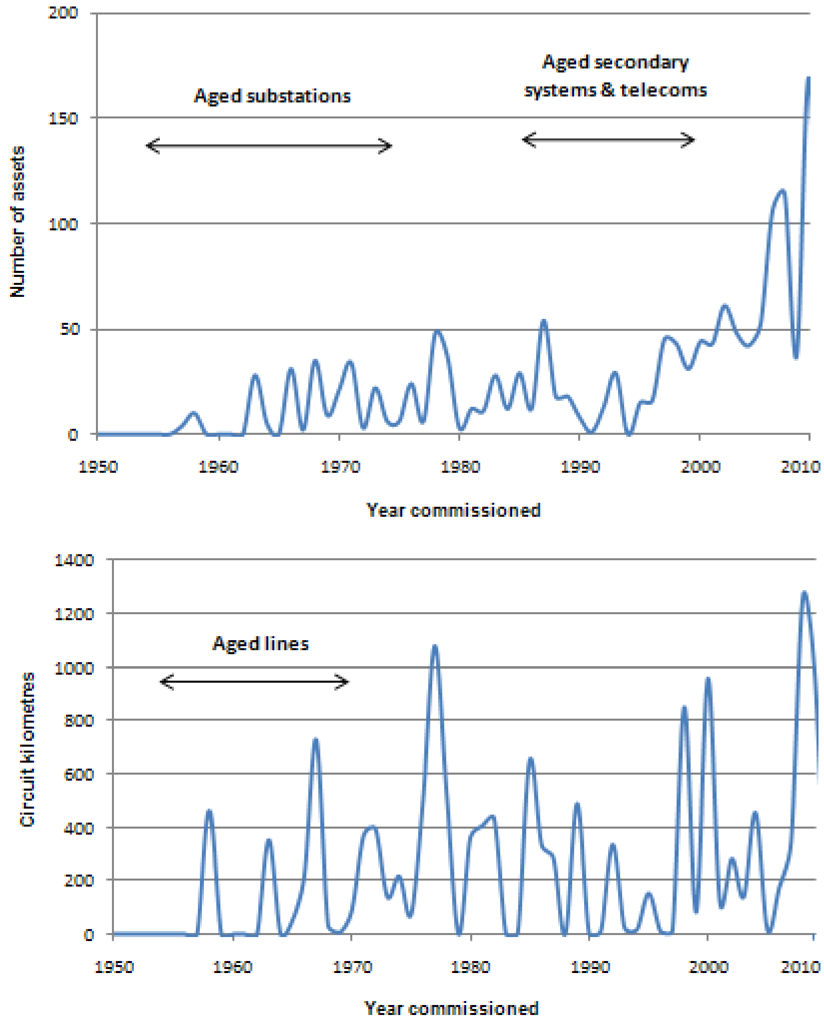
The LNG industry is also underpinning change in Queensland's electricity generation operation and location. The location of generation is equally as important as the location of load for a transmission network business. With the progressive development of coal seam methane gas fields, the large volume of competitively priced ramp up gas is driving the establishment and operation of new gas-fired power stations in the Surat Basin. This has already seen the development of five gas-fired power stations in South West Queensland in recent years. In addition, more than 2,000MW of Powerlink's active enquiries for future new generation are in South West Queensland.

The mix of generation has also changed significantly in the last five years, and this change is expected to continue, with all of Powerlink's active generation enquiries being gas or renewables based. Whilst helping to reduce Australia's emissions, this changing generation mix has been, and will continue to be, changing the power flow patterns on the Queensland transmission network. These potential generation changes must be addressed in planning the network, and have been modelled in the network market development scenarios considered as part of this Revenue Proposal.

1.5 A growing and mature asset base

Powerlink's transmission network has been constructed over a long period of time. Assets built more than 40 years ago are now at, or reaching, the end of their lives. Whilst age itself is not a driver for replacing assets, it does provide an indicator of the assets nearing end of life. Figure 1.2 demonstrates the replacement capital expenditure "wave" which started in the last regulatory period and will continue into the next and future regulatory periods.

Figure 1.2: Age profile of Powerlink's network assets



Source: Powerlink data.

This Revenue Proposal includes the capital expenditure needed to replace these ageing assets in a prudent and timely manner as they reach their end of life. Timely replacement is critical to maintaining reliability standards and optimising whole of life costs, risks and benefits.

1.6 External factors increasing input costs

Whilst Powerlink proactively manages costs, there are a number of external drivers that are expected to increase input costs in the next regulatory period.

1.6.1 Resources boom and Queensland reconstruction program

The Queensland LNG boom is well underway with three projects worth approximately $66 billion[4] being well advanced. Two have reached financial closure, and have entered the construction phase, and financial closure for the third is expected in 2011. These LNG projects will require very large construction workforces and materials which will be in competition with Powerlink and its contractors. As an example, Energy Skills Queensland anticipates that these

[4] Queensland's Coal Seam Gas Booms, Australian Associated Press Newswire, 13 January 2011.

LNG projects may require more than 18,000 new workers for the construction phase[5]. Queensland is also experiencing a significant expansion and development of coal mines. Australia's exports of coking coal are forecast to grow 55% from 135Mt in 2009 to 209Mt in 2016 with over 80% of the increase in coking coal exports sourced from Queensland[6].

This is driving increases in the need for workers in the expanding mines, but also in the rail and ports infrastructure, where capacity is also being expanded.

These, coupled with the requirement to rebuild Queensland infrastructure damaged by the recent floods and cyclone Yasi, will see significant upwards pressure on labour and material costs over the next regulatory period. This is recognised by the Reserve Bank of Australia Board who have identified that growth in wages has returned to rates seen prior to the downturn[7].

1.6.2 New legislation

New environmental legislation is also adding to Powerlink's construction costs, e.g. koala conservation legislation[8] and other biodiversity offset requirements. These new environmental legislative requirements are having a significant impact on the costs of clearing vegetation to construct new transmission lines and substations.

New legislation also makes the acquisition of easements more complex, and costly given the plethora of planning and environment based legislation and consultation that must now be met. By way of example, from 1992 until 2009, the Queensland Government had developed seven State Planning Instruments. However, an additional seven State Planning Instruments have been introduced in the last 12 months, with more proposed.

1.6.3 Borrowing costs

Borrowing costs have also increased for all businesses following the global financial crisis. For example, debt margins have risen significantly since Powerlink's last revenue reset due to financial conditions both overseas and in Australia.

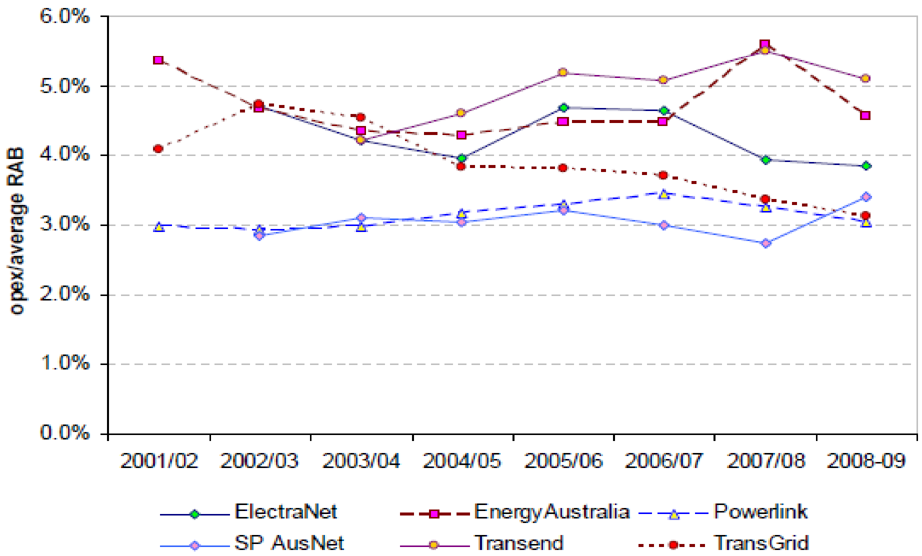
1.7 Recognised nationally and internationally for cost efficiency

A benchmark measure that is used widely by the Australian Energy Regulator (AER) to measure the efficiency of a network company is operating expenditure over Regulatory Asset Base (RAB). Figure 1.3 shows the opex/RAB ratio trended over time which is sourced from the AER's Annual Transmission Network Service Providers Electricity Performance Report[9].

The operating expenditure/RAB ratio is a particularly relevant indicator, as it inherently incorporates the effects of geography and distance.

[5] Workforce Planning for the Queensland Coal Seam Gas/Liquefied Natural Gas Industry, Energy Skills Queensland, 2011.
[6] Commodities: Coking and Thermal Coal, Commonwealth Bank of Australia, November 2010.
[7] Reserve Bank of Australia meeting Statement, 1 March 2011.
[8] State Planning Policy 2/10: Koala Conservation in South East Queensland.
[9] Transmission Network Service Providers Electricity Performance Report for 2008-09, AER, February 2011.

Figure 1.3: Operating expenditure as proportion of average RAB 2001/02 to 2008/09

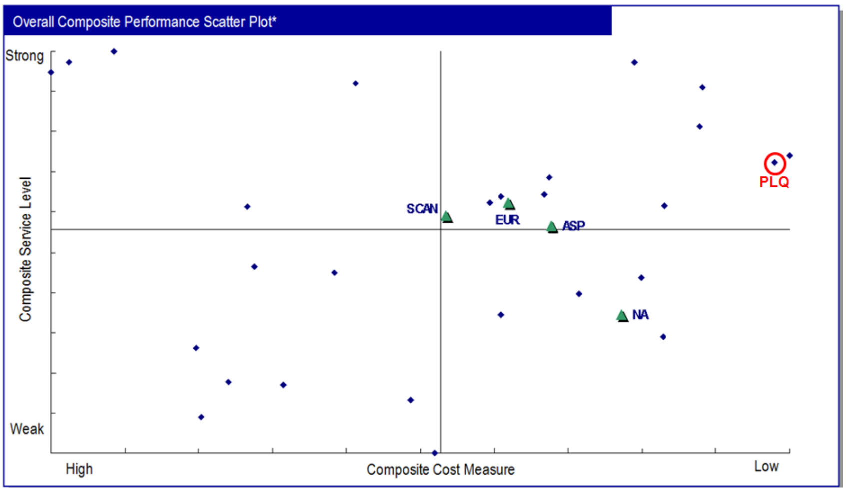


Source: Transmission Network Service Providers Electricity Performance Report for 2008-09, p.51, AER, February 2011.

Figure 1.3 shows Powerlink's operating expenditure over RAB ratio has consistently benchmarked well compared to other NEM Transmission Network Service Providers (TNSPs). Based on this Revenue Proposal, Powerlink forecasts that its operating expenditure over RAB ratio will reduce further to approximately 2.5% in 2017.

Powerlink also participates in international operating expenditure benchmarking studies to assess its performance against similar transmission businesses worldwide. The overall composite result from the most recent International Transmission Operations and Maintenance Study (ITOMS) benchmarking exercise is shown in Figure 1.4.

Figure 1.4: Overall composite performance scatter plot



Source: ITOMS 2009.

As can be seen in Figure 1.4 for the overall composite performance benchmark, Powerlink is well positioned in the "best performer" quartile of lower than average cost and above average reliability, being very close to the low cost frontier.

1.8 Historic cost and service performance (2008-12)

This Revenue Proposal describes Powerlink's actual performance for the current regulatory period. This includes: capital expenditure; operating expenditure; and performance under the various performance incentive schemes.

1.8.1 Capital expenditure

Powerlink's total actual/estimated capital expenditure by year relative to the AER allowance for the current regulatory period is provided in Table 1.1.

Table 1.1: Capital expenditure – allowance vs actual ($m, nominal)

	2007/08	2008/09	2009/10	2010/11 (estimate)	2011/12 (estimate)	Total
Allowance	718.7	680.0	463.7	528.9	462.0	2,853.3
Actual/estimated	652.6	617.3	442.5	410.3	781.2	2,903.8

On a portfolio basis for the current five-year regulatory period, Powerlink estimates that there will be no material difference in the total capital expenditure compared to the AER allowance. This is an excellent result given the high input costs seen at the beginning of the regulatory period, and the need to address the extension of the transmission network in South West Queensland, which was not envisaged five years ago.

1.8.2 Operating expenditure

Powerlink's total actual/estimated controllable operating expenditure by year relative to the AER allowance for the current regulatory period is presented in Table 1.2.

Table 1.2: Controllable operating expenditure – allowance vs actual ($m, nominal)

	2007/08	2008/09	2009/10	2010/11 (estimate)	2011/12 (estimate)	Total
Controllable operating expenditure allowance	111.6	121.6	130.7	142.6	151.2	657.7
Actual/estimated controllable operating expenditure	111.2	121.6	132.4	143.3	152.9	661.4

*Numbers may not add due to rounding.

There are no material, year on year variations between Powerlink's actual/estimated controllable operating expenditure and the AER allowance. Over the current regulatory period, this results in a variation of less than 1% of total controllable operating expenditure. As such, only a small Efficiency Benefit Sharing Scheme (EBSS) carryover has been realised.

1.8.3 Performance incentive schemes

Powerlink also improved its network performance, exceeding the targets set by the AER under the Service Target Performance Incentive Scheme (STPIS) over the last three years. This result was achieved at the same time as delivering a large capital expenditure program, whilst remaining very close to the operating expenditure allowance.

1.9 Forecast expenditure (2013-17)

This Revenue Proposal also presents the capital and operating expenditure requirements for the next regulatory period and demonstrates their need, prudency and efficiency. Detailed explanations are given in the Revenue Proposal and the supporting documentation provided to the AER.

1.9.1 Capital expenditure

A summary of the required capital expenditure for the next regulatory period is provided in Table 1.3.

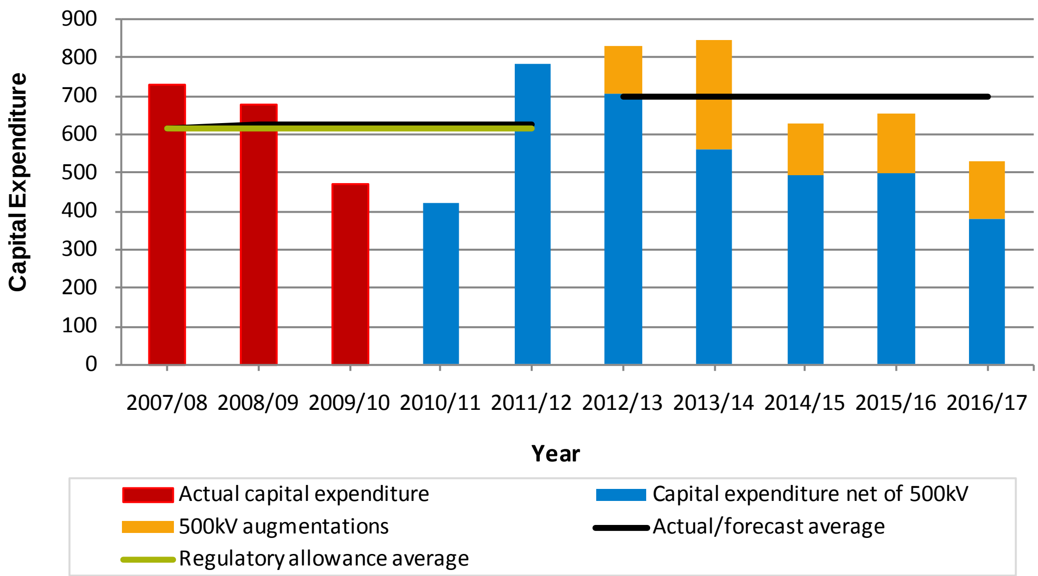
Table 1.3: Capital expenditure forecasts ($m, 2011/12)

	2012/13	2013/14	2014/15	2015/16	2016/17	Total
Total capital expenditure	830.3	846.9	629.2	652.7	529.2	3,488.3

*The value of asset disposals has not been deducted from this table.

Augmentations to meet the demand growth are the primary driver for capital expenditure and in the next regulatory period includes the establishment of the first 500kV transmission lines to supply the growing South East Queensland load. Figure 1.5 depicts Powerlink's current and forecast capital expenditure, showing the average expenditure in the regulatory periods against the AER allowance.

Figure 1.5: Current and forecast capital expenditure comparison ($m, 2011/12)



Source: Powerlink data.

In comparison to the current regulatory period, the next regulatory period:

- continues to have high demand growth, growing from an even higher base;
- has a similar ongoing need to replace assets;
- includes extending the transmission network into the Surat Basin; and
- establishes a 500kV transmission network into South East Queensland.

Notwithstanding these additional requirements the forecast capital expenditure for the next regulatory period is only marginally higher than the current regulatory period, and very similar when the significant future capacity of the 500kV development is taken into account.

1.9.2 Operating expenditure

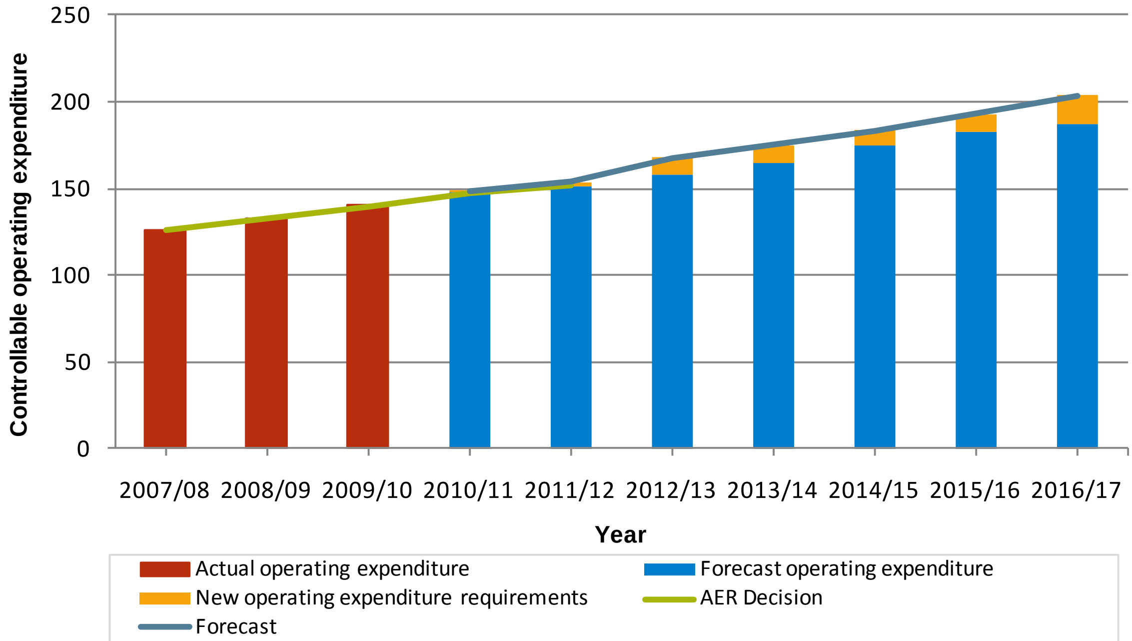
Powerlink's forecast operating expenditure is illustrated in Table 1.4. The forecast is the result of applying Powerlink's comprehensive and robust operating expenditure forecasting methodology.

Table 1.4: Forecast operating expenditure ($m, 2011/12)

	2012/13	2013/14	2014/15	2015/16	2016/17	Total
Total controllable operating expenditure	167.8	174.9	183.3	193.2	203.6	922.7
Total operating expenditure	181.3	188.9	198.7	211.1	221.7	1,001.8

Operating expenditure growth is driven mainly by labour cost increases and network expansion. Figure 1.6 shows Powerlink's current and forecast controllable operating expenditure compared to the AER allowance.

Figure 1.6: Current and forecast operating expenditure comparison ($m, 2011/12)



Source: Powerlink data.

Figure 1.6 shows Powerlink's forecast controllable operating expenditure follows the trend of actual operating expenditure in the current regulatory period which has a similar capital expenditure program.

1.10 Revenue requirement and price path

Powerlink has estimated its total building block revenue using the AER's Post Tax Revenue Model (PTRM). The smoothed revenue requirement and resulting X factor is summarised in Table 1.5.

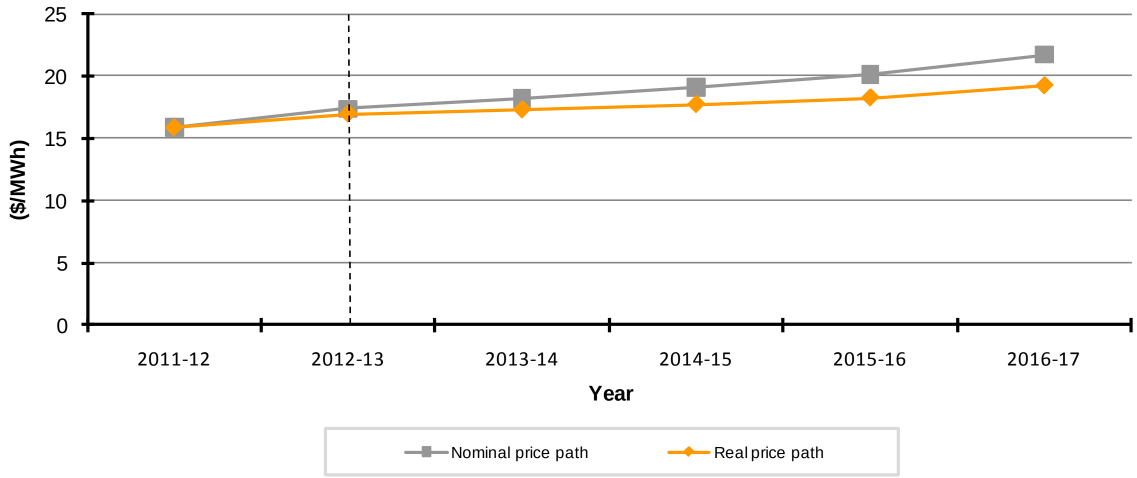
Table 1.5: Smoothed revenue requirement and X factor ($m, nominal)

	2012/13	2013/14	2014/15	2015/16	2016/17	Total
Smoothed revenue requirement	960.6	1,064.0	1,178.5	1,305.3	1,445.7	5,954.0
X factor		**-8.06%**	**-8.06%**	**-8.06%**	**-8.06%**	

The price impact of Powerlink's proposal on the typical household electricity bill will be minimal – about 0.6% per annum.

The average transmission price path resulting from Powerlink's Revenue Proposal during the next regulatory period, is shown in Figure 1.7. Average transmission charges are estimated to increase in nominal terms from around $15.83 per MWh in 2011/12 to $21.72 per MWh in 2016/17.

Figure 1.7: Average transmission price path from 2011/12 to 2016/17 ($/MWh)



Source: Powerlink data.

Transmission charges represent approximately 8% of residential electricity charges in Queensland[10] [11]. Powerlink estimates that the increase in transmission charges under this Revenue Proposal will add approximately $2.34 to the typical quarterly residential electricity bill of $393[12], representing a nominal electricity price increase of only some 0.6% per annum.

[10] Energy User News - Edition 11, Energy Users Association of Australia, March 2011.
[11] The Boomerang Paradox, Part I, Paul Simshauser (AGL) *et. al*, February 2011.
[12] Department of Employment, Economic Development and Innovation, Queensland Government, March 2011.

2 Introduction

2.1 Purpose of the document

This Revenue Proposal provides details of the Queensland Electricity Transmission Corporation Limited (Powerlink) revenue requirements for prescribed transmission services for its next regulatory period from 1 July 2012 to 30 June 2017.

This Revenue Proposal has been developed in accordance with Chapter 6A of the National Electricity Rules[13] (Rules) and the AER's Electricity Transmission Network Service Providers Submission Guidelines[14] (Submission Guidelines).

During the next regulatory period, Queensland's transmission network will require continued investment to reliably meet the State's economic growth and to support a lower emissions National Electricity Market (NEM).

2.2 Length of regulatory control period

As required by Section 4.3.13 of the Submission Guidelines, Powerlink's Revenue Proposal is for a five-year regulatory period commencing 1 July 2012 to 30 June 2017.

2.3 Services provided by Powerlink

As the sole Queensland Transmission Network Service Provider (TNSP), Powerlink's electricity transmission network is the backbone of the Queensland electricity supply system, connecting generation, Distribution Networks Service Providers (DNSPs) and large directly connected mining and industrial loads. The Queensland transmission network is interconnected to the New South Wales transmission network allowing Queensland customers to fully participate in the NEM.

As required by Section 4.3.22 of the Submission Guidelines, this Revenue Proposal covers Powerlink's revenue requirements for providing prescribed transmission services. These include:

- Shared transmission services provided to directly connected customers and distribution networks (prescribed Transmission Use of System (TUOS) services).
- Connection services for Queensland DNSPs' networks connected to the transmission network (prescribed exit services).
- Grandfathered connection services provided to generators and customers directly connected to the transmission network that were in place on 9 February 2006 (prescribed entry and exit services).
- 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[15] (and other jurisdictional legislation and instruments) and customer connection agreements.

[13] National Electricity Rules, Chapter 6A, AEMC.
[14] Electricity Transmission Network Service Providers Submission Guidelines, AER, September 2007.
[15] Transmission Authority No. T01/98, Queensland Government, December 2010.

The required reliability, safety and security of the transmission network are set out in the Rules, Powerlink's Transmission Authority, and other jurisdictional electricity legislation and instruments.

For the avoidance of doubt, the costs and revenues associated with negotiated and non-regulated transmission services are excluded from this Revenue Proposal.

2.4 Forecast map of the transmission network

As required by Section 4.3.23 of the Submission Guidelines, transmission network maps identifying transmission lines and the location of new major network assets proposed to be constructed over the next regulatory period have also been provided to the AER on a confidential basis to safeguard the security of this critical infrastructure.

2.5 Structure of the document

The remainder of this Revenue Proposal is structured as follows:

- Chapter 3 describes the business environment in which Powerlink operates and the key challenges anticipated in the forthcoming regulatory period.
- Chapter 4 describes how the broad compliance requirements are addressed.
- Chapter 5 explains the historic costs and service performance.
- Chapter 6 calculates the regulated asset base for the forthcoming regulatory period.
- Chapter 7 explains Powerlink's capital financing costs and taxation.
- Chapter 8 describes the capital expenditure forecast.
- Chapter 9 describes the operating expenditure forecast.
- Chapter 10 describes Powerlink's depreciation allowance.
- Chapter 11 presents the revenue needs for the forthcoming regulatory period.
- Chapter 12 describes the proposed Efficiency Benefit Sharing Scheme.
- Chapter 13 presents the proposed Service Target Performance Incentive Scheme.
- Chapter 14 describes Powerlink's Pricing Methodology and Negotiating Framework.

To assist the AER in assessing this Revenue Proposal's compliance with the Rules and Submission Guidelines, Powerlink has provided a compliance checklist, which is contained in Appendix A. The checklist provides guidance as to the relevant sections of the Revenue Proposal that address each of the Submission Guidelines requirements.

Any reference material cited in the Revenue Proposal, or supporting documentation, will be available to the AER upon request.

3 Business Environment and Key Challenges

3.1 Introduction

This Revenue Proposal demonstrates that Powerlink expects to remain one of the most cost effective electricity transmission entities in the National Electricity Market (NEM) whilst meeting the reliability needs of its customers.

Powerlink agrees with the AER that, during the next regulatory period, network service providers face a number of key challenges that will require investment in energy infrastructure to maintain a secure, safe and reliable power system[16]. These include:

- rising demand for power - new dwellings and energy-intensive appliances like air conditioners;
- replacing ageing infrastructure from the 1950s to 1970s to maintain reliability standards;
- stricter government requirements for secure, safe and reliable energy networks; and
- rising borrowing costs for power businesses due to the global financial crisis.

In addition, Powerlink's capital and operating costs are fundamentally shaped by the specific business environment in which it operates. Key elements of the Queensland environment include:

- long distances and decentralised regional load centres;
- mandated reliability obligations;
- the highest maximum demand growth in the NEM, driven by a record level of investment in the resources sector;
- expansion of the transmission network into more remote areas to support the development of hitherto unmined coal and gas reserves;
- competition for skilled labour and materials from resources projects and Queensland's post flood and cyclone reconstruction program; and
- Queensland legislation such as the State Planning Policy and regulatory provisions associated with biodiversity and koala conservation.

The following sections detail Powerlink's business environment, feedback from customers and key challenges that must be taken into account when establishing the required revenue for the next regulatory period.

3.2 Powerlink's role and reliability obligations

Powerlink is the sole holder of a Transmission Authority[17] in Queensland, which authorises it, under the Queensland Electricity Act 1994[18], to operate a high voltage transmission network in the eastern part of Queensland. Powerlink is also a registered Transmission Network Service Provider (TNSP) in the NEM, and must comply with the Rules.

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[16] State of the Energy Market Report, AER, December 2010.
[17] Transmission Authority – No. T01/98, Queensland Government, December 2010.
[18] The Queensland Electricity Act 1994, Queensland Government, 1994.

A salient feature of arrangements in Queensland is that Powerlink has mandated reliability obligations. Section 34 of The Queensland Electricity Act, provides that a Transmission Authority holder has a responsibility to:

> ...ensure, as far as technically and economically practicable, that the transmission network is operated with enough capacity (and, if necessary, augmented or extended to provide enough capacity) to provide network services to persons authorised to connect to the network or take electricity from the network….

The Queensland Government issued Transmission Authority – No. T01/98 to Powerlink. Under clause 6.2 of its Transmission Authority, Powerlink has responsibilities to:

> … plan and develop its transmission network in accordance with good electricity industry practice such that:
>
> (a) … power quality standards will be met …;
>
> (b) … even during the most critical single network element outage; and
>
> (c) the power transfer available through the power system will be adequate to supply the forecast peak demand during the most critical single network element outage.

These mandated reliability obligations must be applied in the planning analysis which underpins this Revenue Proposal.

3.3 Customer engagement

Powerlink's customers comprise generators, distributors and directly connected large energy users (e.g. smelters, refineries, coal and gas mines, and electrified railways) as shown in Table 3.1.

Table 3.1: Customers as at March 2011

Customer Type	No. of customers	No. of connection locations
Generators	14	24
Distributors	3	78
Direct connect loads	6	23
Total	**23**	**125**

The two Queensland Distribution Network Service Providers (DNSPs) provide electricity supply to more than 2.1 million customers. Whilst most customers are supplied via the distribution network, both distribution customers and the large direct connect customers rely on the transmission network for a secure and reliable supply of electricity.

Powerlink engages with its direct connect customers, and prospective customers on a regular basis, to discuss their electricity supply needs including high reliability, security and quality of supply, and their growing electricity demand. It is clear that the Powerlink transmission network plays an essential part in reliably supporting Queensland's economic growth. The following themes are prominent in the feedback received from customers:

- The importance of transmission infrastructure to the Queensland economy. Significant sections of the Queensland network are part of the "export infrastructure chain", supporting mines, Liquefied Natural Gas (LNG) production, rail and ports.

- The importance of timely augmentation of the transmission network to meet increasing electricity demand. In particular, the compressed timelines required by resource developments to meet their tight development timeframes and export contract obligations.
- The importance of reliability and security of supply. The desire for high levels of reliability, reinforced by the Somerville report[19], is still paramount. Hence the requirement for transmission infrastructure to be replaced in a timely manner to ensure continued reliability of supply.
- It is abundantly clear from customer feedback that a highly reliable supply of electricity from the transmission network is paramount to their successful operations and that they are willing to pay a reasonable price for reliable transmission services.
- Very significant developments in coal and gas mining will occur in Powerlink's next regulatory period. These developments will require a substantial amount of electricity in locations that are remote from the existing transmission network requiring substantial augmentation to the existing network.

In particular specific feedback from current, committed and prospective customers is provided below.

QR National, the largest transporter of coal in Australia, said:

> "QR National, as the current and prospective provider of high capacity electric rail networks that underpin Queensland's coal export industry, expects to have increasing power requirements across Central Queensland. QR National supports the forward looking planning and grid development approach that Powerlink is undertaking to ensure timely and efficient reinforcement of the transmission grid between the Bowen Basin coal-fields and the coal ports at Mackay and Gladstone."

QGC is developing the Queensland Curtis Island LNG project which requires electrification of the upstream compression process with a maximum demand for electricity of up to 450MW, commented:

> "QGC has plans to continue investment in Queensland that will require significant electrical energy. It is critical that reliable transmission network services are developed in a timely manner to meet the growing electricity demand."

Origin Energy a gas and oil explorer and producer, power generator and energy retailer, quoted:

> "Origin Energy owns and operates significant generating capacity in North Queensland and South West Queensland along with major retail interests. We plan to grow our investments and operations in Queensland. It is critical that the transmission network is expanded and that aged assets are replaced in a timely manner to ensure a reliable and cost effective transmission service with minimal transmission constraints adversely impacting the wholesale electricity market."

APLNG, the largest producer of coal seam gas in Australia, supplying residential and commercial customers expects to significantly increase its domestic gas production to supply gas-fired power generation plants and major industrial customers, stated:

> "APLNG has plans for very substantial investments in the Queensland LNG coal seam gas mining and export industry that will require significant electrical energy. It is critical that reliable transmission network services are developed in a timely manner to meet APLNG's growing electricity demand."

[19] Electricity Distribution and Service Delivery for the 21st Century, Queensland Government, July 2004.

Western Downs Regional Council, recognising the importance of electricity infrastructure to its region, stated:

> "Western Downs is experiencing unprecedented growth driven by the energy resources sector which includes multiple approved and proposed LNG and coal mining developments which are proceeding on accelerated schedules. Fundamental to these developments, and the associated business investment occurring in the region is the extension of the main electricity transmission network to provide a secure and high capacity electricity supply. It is critical that Powerlink's regulatory framework ensures that this essential infrastructure is delivered in the tight timeframes demanded by the already approved projects and with the capacity and high reliability to meet the sustainable long term needs of the Western Downs region."

Hancock Coal's Alpha and Kevin's Corner Projects will employ 5,000 construction workers at peak and 3,000 direct employees. Maximum power demand for these and other Hancock Galilee coal projects is projected to be in excess of 480MW. Hancock Coal reinforced:

> "As the developer of large new coal mines on the Galilee Basin, Hancock Coal acknowledges the importance of transmission infrastructure to achieve the wider benefits that flow to the local community and Queensland as a whole. It is critical that that the regulatory framework enables Powerlink to reinforce their shared transmission network in the tight timeframes required to meet Hancock Coal's electricity demands."

Xstrata Coal's proposed Wandoan coal project is a 22Mtpa product thermal mine, and together with its associated rail and port infrastructure, is expected to require an investment in the order of $6 billion. Xstrata Coal commented:

> "As a prospective investor we expect to have significant increasing power demand requirements in the Wandoan area and support the joint planning and forward looking grid development approach that Powerlink and Ergon Energy are undertaking in South West Queensland. Reliability and quality of supply are essential for the smooth running of our current and future coal mining operations."

Powerlink engages proactively with customer groups such as the Energy Users Association Australia (EUAA), by presenting at many of its Queensland and national conferences, keeping customers informed of Queensland transmission network developments. Whilst the EUAA has raised concerns about electricity prices, the EUAA also acknowledges that transmission costs are a small and reducing component of electricity costs[20]. The need for continued reliability and minimising congestion on the transmission network, through timely augmentations to increase generator competition, improve the overall efficiency of the NEM and reduce costs to customers are frequently raised.

Powerlink also works closely with the Australian Energy Market Operator (AEMO) in the development of the Electricity Statement of Opportunities (ESOO) and, more recently, the National Transmission Network Development Plan (NTNDP). Whilst maintaining the independence of AEMO, the interaction between Powerlink and AEMO enables the appropriate alignment between AEMO's long term planning horizon and Powerlink's more detailed short to medium term planning timeframes.

[20] EUAA Newsletter, Edition 5, October 2009.

3.4 Queensland characteristics

Powerlink agrees with the AER that each transmission network has unique issues relating to its age and technology, its load characteristics, the costs of meeting the demand for new connections, and licensing and reliability/safety requirements[21]. These differences need to be recognised in setting Powerlink's revenue requirements for the next regulatory period.

One of the key differences between Queensland and the other states is the distance over which electricity is transported. Powerlink's transmission network is one of the longest (and "skinniest") high voltage transmission networks in the world, stretching more than 1,700 km from north of Cairns in the far north to the NSW border in the south. The Queensland – NSW Interconnector (QNI) connects Queensland to the rest of the NEM. The Queensland transmission network is shown in Figure 3.1 below.

Figure 3.1: Powerlink's transmission network

Source: Powerlink Annual Report, 2009/10.

Electricity transmission is fundamentally a transport business. As such, the larger the distance that electricity has to be transported, the greater the cost involved. Similarly, load density significantly influences the unit cost of transmission, with a higher load density network facilitating greater economies of scale. Given Powerlink's network is one of the most geographically dispersed in the world and its relatively low load density, it is not surprising that it costs more to transport electricity in Queensland compared to other NEM states.

The LNG industry is also driving change in Queensland's electricity generation operation and location. The location of generation is equally as important as the location of load for a transmission network business. With the progressive establishment of coal seam methane gas fields, ramp up gas is being made available at competitive prices for use in power stations. This has seen (and is expected to continue) the development of significant amounts of new generation in South West Queensland. Whilst helping to reduce Australia's emissions, the arrival of these new generators over recent years has been changing the power flows on the Queensland transmission network, with consequential impacts on the market. For example,

[21] Drivers of Network Investment in Electricity and Gas Networks – an Update, Andrew Reeves (AER), Energy Source and Distribution, December 2010.

Queensland's September 2010 average pool price was the lowest (in real terms) since the start of the NEM in 1998[22]. The last few years have seen a fundamental shift in the major power generation source for the populous South East Queensland. Generation has moved away from Central Queensland with its predominantly coal fired power stations, to South West Queensland, with its recently established gas fired generators.

It is essential that these unique and challenging Queensland characteristics are reflected in setting Powerlink's future revenue.

3.5 Meeting customer demand

The combination of high peak demand growth, more remote power generation developments and mandated reliability obligations continue to drive a major capital investment program of network augmentations. Whilst the global financial crisis provided a temporary slowing of electricity peak demand growth, economic forecasters[23] predict the return to long term economic growth trends and this is already becoming reality with the emergence of record levels of investment in the resources (particularly gas/coal) sector.

3.5.1 Electricity peak demand

Electricity peak demand is the driver for augmentation capital expenditure as the network needs to be adequate to supply forecast peak demand, even with an outage of the most critical single network element.

A superficial analysis of recent peak demand trends in Queensland can be misleading. A combination of atypically mild summers, the global financial crisis, and last summer's extensive floods and cyclones distorts the demand trends. Powerlink has to forecast demand on a forward-looking basis, fully informed by weather-sensitivity, non-flood/cyclone levels of industrial activity, and the unprecedented levels of capital investment in resource developments.

A recent Australian Financial Review[24] article identified that capital investment in the Australian resources sector is skyrocketing, reaching levels about eight times the average. A substantial part of that investment is happening in Queensland.

In recent years, there has been significant population growth in Queensland, primarily from overseas and interstate migration. This trend is expected to continue, albeit not as high as the pre global financial crisis rates, with the National Institute of Economic and Industry Research (NIEIR) forecasting an average increase of 2.2% per annum population growth in Queensland over the next 10 years[25].

Concurrently, there has, and continues to be, increasing penetration of domestic air conditioning. It is estimated that around 76% of Queensland households now have some air conditioning with 16% of homes with air conditioning installed intending to buy additional air conditioners in the near future[26]. The full impact of the recently installed air conditioning load has not been realised as Queensland has not had one of its characteristic "stinking hot and humid" summers since 2003/04. Notwithstanding the recent absence of such weather, it will recur, and Powerlink has to plan for this eventuality.

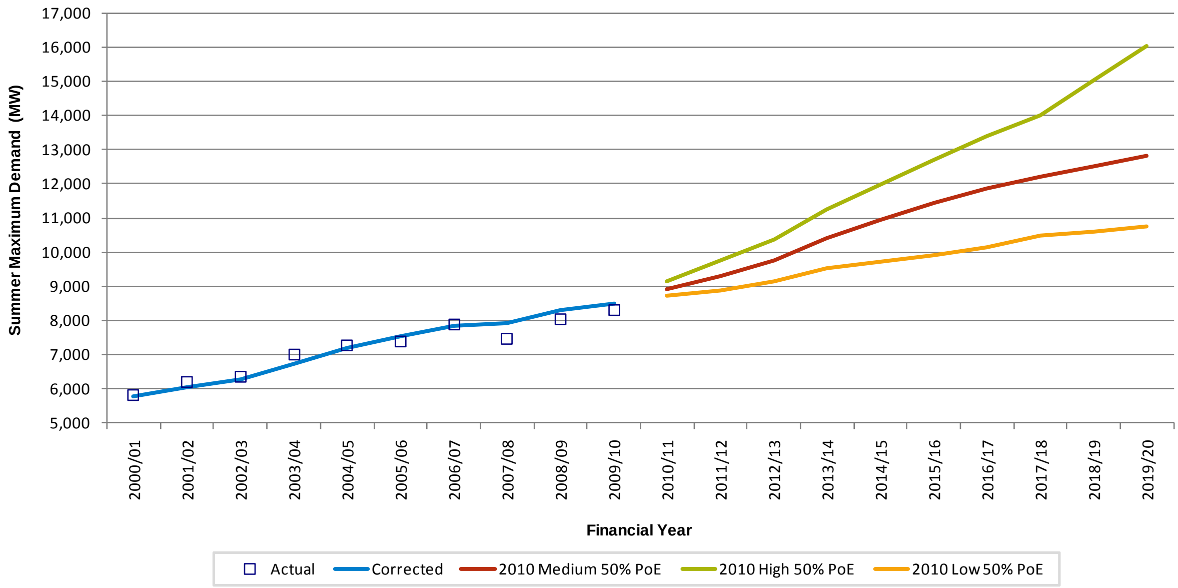
Recently, the steady impact on demand growth due to population influx and the increased use of electrical appliances such as air conditioners has been joined by step increases in load from a

[22] Shareholder Review of Queensland Government Owned Corporation Generators, Queensland Government, November 2010.
[23] Long run economic and electricity load forecasts to 2024-25, NIEIR, April 2010.
[24] Investment surges to 50-year high, Australian Financial Review, p. B7, 11 May 2011.
[25] Long run economic and electricity load forecasts to 2024-25, NIEIR, April 2010.
[26] Queensland household energy survey 2010, Colman Brunton, February 2011.

burgeoning LNG and coal mining industry, driving record levels of electricity peak demand growth. At the present time, Powerlink has actual enquiries from direct connect customers for over 3,000MW[27] of new resources-related load.

Figure 3.2 shows the forecast summer peak demand over the next 10 years, for low, medium and high economic growth scenarios. In the medium growth scenario, peak demand growth is forecast to be around 4.2% per annum over the next 10 years. This is much higher compared to other NEM states and other developed countries. For example, the electricity peak demand in the United Kingdom is forecast to increase by only 4.5% in total over the next five years[28].

Figure 3.2: Queensland forecast summer peak demand

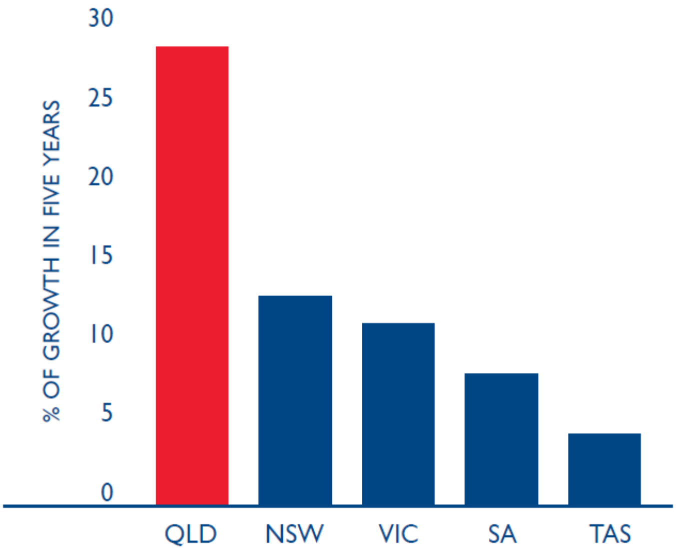


Source: Annual Planning Report, Powerlink, 2010.

As a comparison, Figure 3.3 shows the forecast increase in peak demand for all the NEM States over the next five years.

[27] Only approximately 10% of these customer enquiries are included in the demand forecast.
[28] National Electricity Transmission System Seven Year Statement, National Grid, May 2010.

Figure 3.3: Projected growth rate of peak demand over the next 5 years for NEM States



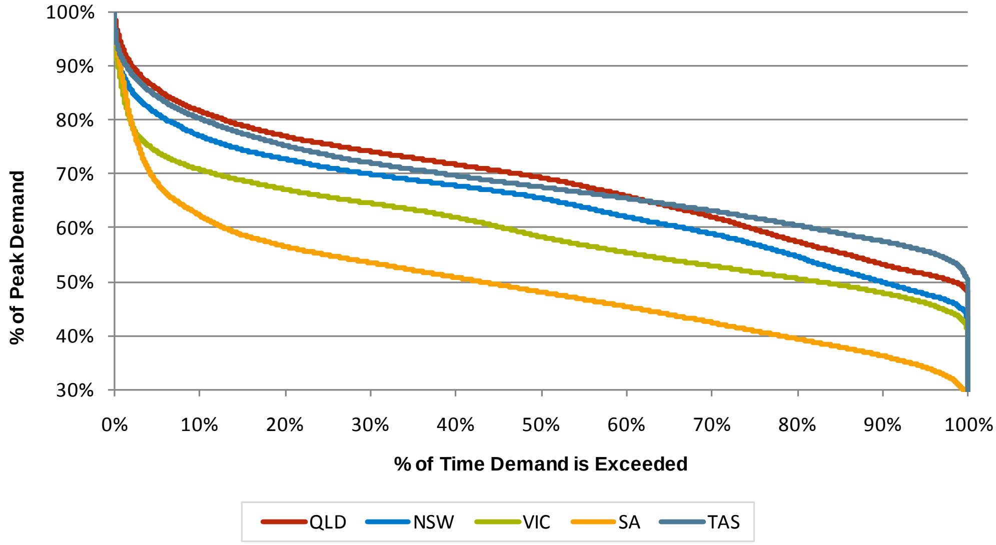
Source: Electricity Statement of Opportunities, AEMO, 2010.

Figure 3.3 clearly shows that Queensland has by far the highest forecast growth in peak demand over the next five years. Queensland's five year demand growth is similar to Western Australia's and reflects the additional growth from increasing population and rapidly expanding coal and gas mining sectors. This higher demand growth, together with Queensland's long distances, drives the need for a much greater investment to extend and augment the Queensland transmission network compared with other States. It is critical that this essential investment is reflected in the amount of augmentation capital expenditure allowed by the AER.

3.5.2 Load profile

Due to the hot and humid summer climate in Queensland, peak summer demand conditions occur for the entire summer period (November – March), not just for a few days as occurs in southern States. Average loading, shown in Figure 3.4, on Powerlink's network throughout the entire year is about 70% of summer peak loading. This is the highest in the NEM and high by world standards.

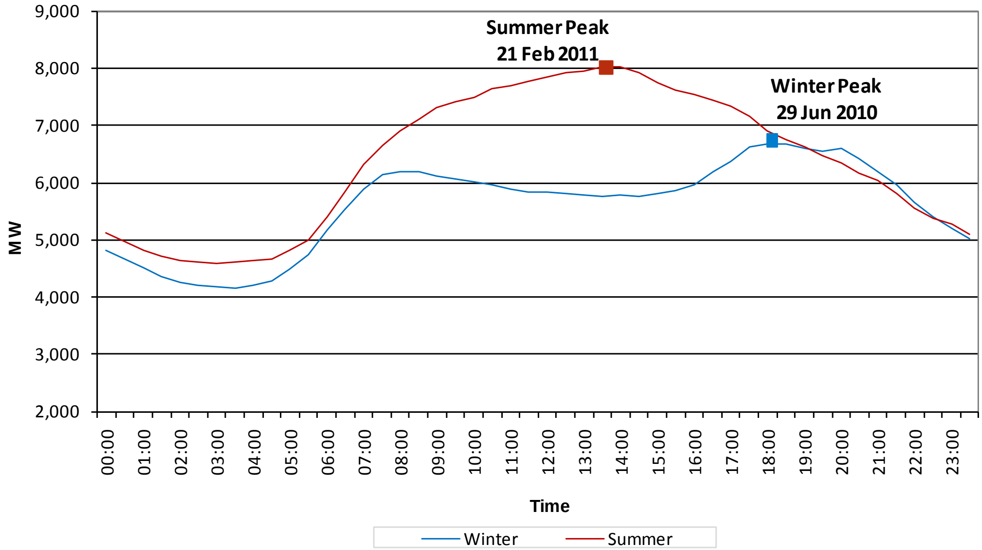
Figure 3.4: 2009/10 load duration curves



Source: Australian Energy Market Operator infoserver data.

The daily load profile on hot summer days also demonstrates high utilisation of the Powerlink network. Figure 3.5 shows the load profile on the day that peak demand was experienced in 2011 where electricity demand exceeded 80% of peak demand for about 12.5 hours.

Figure 3.5: Peak day load profile



Source: Powerlink data.

This load profile means that the Queensland network experiences high levels of loading during onerous summer conditions for much longer periods than networks in other States, creating much greater risk exposures to Queensland customers and significant challenges (and costs) for Powerlink, such as:

- A greater likelihood of outages which could cause supply interruptions and market constraints. This makes it inherently more difficult to meet the same service levels.

- Plant and equipment is subject to higher stresses, increasing wear and tear. This leads to higher maintenance requirements and shorter asset lives.
- Significantly fewer opportunities exist for outages to maintain and augment the network, resulting in the need for higher cost work methods (weekends, overnight, live work).

Notwithstanding these challenges and associated costs: electricity consumers in a modern digital economy have ever-increasing expectations of uninterrupted supply; and market participants demand that transmission network constraints be avoided.

3.6 A growing and mature asset base

Powerlink's high voltage network includes in excess of 13,569 circuit kilometres of lines and cables and 112 substations which include 30,952MVA of installed transformer capacity (as at June 2010). These assets are summarised in Tables 3.2 and 3.3.

Table 3.2: Summary of transmission line assets (at June 2010)

Line Voltage	Route Kilometres	Circuit Kilometres
330kV	347	691
275kV	5,819	8,037
132kV	2,769	4,405
110kV	238	416
66kV and below	1	1
Total lines	**9,174**	**13,550**

Source: Annual Report 2009/10, Powerlink, 2010.

Table 3.3: Summary of substation assets (at June 2010)

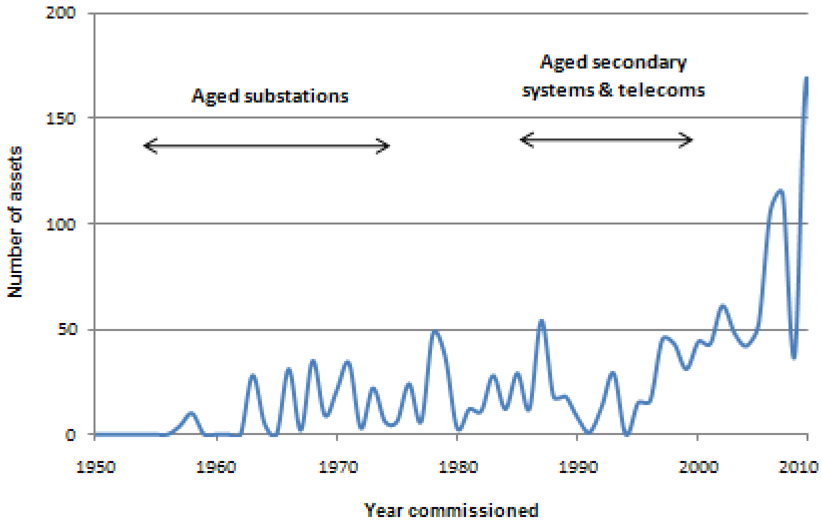
Highest Voltage	Substations	Circuit Breaker Bays	Transformer Number	Transformer MVA
330kV	4	28	5	4,975
275kV	35	412	70	18,225
132kV	58	427	85	5,752
110kV	15	263	27	2,000
66kV and below	0	27	0	0
Total	**112**	**1,157**	**187**	**30,952**

Source: Annual Report 2009/10, Powerlink, 2010.

Powerlink's transmission network has been constructed over a long period of time. Assets built in the 1950s, 1960s and 1970s are now at, or reaching, the end of their lives.

Whilst age itself is not a driver for replacing assets, it does provide an indicator of the assets nearing end of life. Figures 3.6 and 3.7 demonstrate the replacement capital expenditure "wave" which started in the last regulatory period and will continue into the next and future regulatory periods.

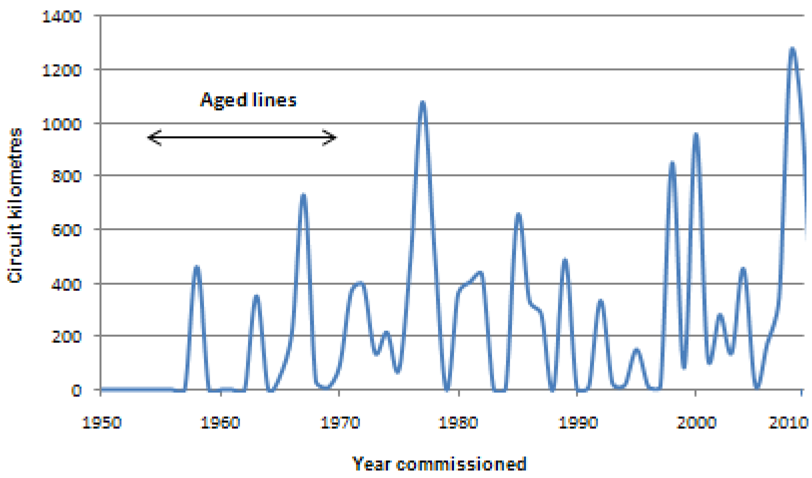
Figure 3.6: Age profile of Powerlink's substation network assets (at June 2010)



Source: Powerlink data.

Figure 3.7 shows there are a number of substation bays that will be over 40 years old by the end of the next regulatory period (commissioned before 1977). It also shows there are a number of secondary systems that will also require replacement.

Figure 3.7: Age profile of Powerlink's overhead line network assets (at June 2010)



Source: Powerlink data.

Figure 3.7 demonstrates there will be a large number of overhead line assets greater than 50 years old by the end of the next regulatory period (commissioned before 1967). These transmission line assets will likely require either refit work or replacement during the next regulatory period.

The need to replace aged assets was reinforced in the Engineers Australia Infrastructure Report Card 2010[29] which stated that a significant rise in the level of upgrades and renewals of network infrastructure is needed. Electricity infrastructure was given a C+ rating overall, with the target being a B or B+. However Queensland's network rating was a C, indicating that further ongoing investment is required.

[29] Australia's Infrastructure Report Card 2010, Engineers Australia, November 2010.

This Revenue Proposal reflects the capital expenditure needed to replace these ageing assets in a timely manner as they reach their end of life. Replacing these assets in a timely manner is critical to maintaining reliability standards and minimising whole of life costs.

3.7 External factors increasing input costs

Whilst Powerlink proactively manages costs, there are a number of external drivers that are expected to increase input costs in the next regulatory period. These external factors by their very nature cannot be controlled by Powerlink and are summarised in the following sections. It is critical that external factors which will drive real costs up are recognised and included when setting Powerlink's revenue for the next regulatory period.

3.7.1 Resources boom and Queensland reconstruction program

The Queensland LNG boom is well underway with three projects worth approximately $66 billion[30] being well advanced. Two have now reached financial closure, and have entered the construction phase, and financial closure for the third is expected in 2011. These LNG projects will require significant levels of skilled labour and materials and will be in competition for the resources used by Powerlink and its contractors. As an example, Energy Skills Queensland anticipates these LNG projects may require more than 18,000 new workers[31]. Queensland is also experiencing a significant expansion and development of coal mines. Australia's exports of coking coal are forecast to grow 55% from 135Mt in 2009 to 209Mt in 2016 with over 80% of the increase in coking coal exports sourced from Queensland[32].

The LNG and coal mining expansion projects are in turn driving major upgrades to electric-powered railways, major port expansions, gas compression loads and water processing. These developments impact Powerlink in two ways – they increase demand for electricity, and increase competition (and hence costs) for scarce skilled labour, materials and contractors.

This, coupled with the requirement to rebuild Queensland infrastructure damaged by the recent floods and cyclone Yasi, will see significant upwards pressure on labour and material costs over the next regulatory period. The Reserve Bank of Australia Board has also identified that growth in wages has returned to rates seen prior to the downturn[33].

3.7.2 New legislation

New environmental legislation is also adding to Powerlink's construction costs, e.g. koala conservation legislation[34] and other biodiversity offset requirements. These new environmental legislative requirements are making a significant impact on the costs of clearing vegetation to construct new transmission lines and substations.

Community expectations are also increasing with regard to environmental accountability associated with the development of new transmission infrastructures. This makes acquiring easements more complex and costly, given the plethora of planning and environment based legislation and consultation that must now be met. By way of example, from 1992 until 2009, the Queensland Government had developed seven State Planning Instruments; however, an additional seven State Planning Instruments have been introduced in the last 12 months with more proposed. Therefore, it is imperative that early planning for easements is undertaken

[30] Queensland's Coal Seam Gas Booms, Australian Associated Press Newswire, 13 January 2011.
[31] Workforce Planning for the Queensland Coal Seam Gas/Liquefied Natural Gas Industry, Energy Skills Queensland, 2011.
[32] Commodities: Coking and Thermal Coal, Commonwealth Bank of Australia, November 2010.
[33] Reserve Bank of Australia meeting Statement, 1 March 2011.
[34] State Planning Policy 2/10: Koala Conservation in South East Queensland; South East Queensland Koala Conservation State Planning Regulatory Provisions; Offsets for Net Gain of Koala Habitat in South East Queensland Policy; and State Government Supported Community Infrastructure - Koala Conservation Policy.

where possible, and strategic easements acquired to meet future needs. For this reason and in line with good industry practice[35], this Revenue Proposal includes the acquisition of strategic easements required for long term network development.

In addition, the proposed Federal government changes to superannuation legislation as recommended by the Henry Tax Review[36] will also increase Powerlink's labour costs, both internally and for external contractors.

3.7.3 Borrowing costs

Borrowing costs have also increased for all businesses following the global financial crisis. For example, debt margins have risen significantly since Powerlink's last revenue reset due to financial conditions both overseas and in Australia, adding in the order of 300 basis points to access debt funding.

3.8 Summary

During the next regulatory period, Powerlink will face a number of challenges that will require ongoing investment in the transmission network. These include meeting the electricity peak demand, driven by the resource's industry and population growth, in a timely manner. At the same time, it will be important to replace aged assets in order to maintain reliability and minimise whole of life costs. Investment in the network will be made more difficult and expensive with the external influences outlined in this chapter that are increasing input costs. The unique Queensland operating environment needs to be taken into account by the AER in setting Powerlink's capital and operating expenditure allowances.

[35] Powerlink Transmission Network Revenue Cap 2007-08 to 2011-12, p. 25, AER, June 2007.
[36] Australia's Future Tax System, Report to the Treasurer, Treasury, December 2009.

4 Operating and Capital Expenditure Compliance

4.1 Introduction

This Revenue Proposal has been prepared to comply with Rules[37] and the Submission Guidelines. The broad governance and compliance requirements are set out in this chapter with the specific compliance requirements set out in the relevant chapters later in the Revenue Proposal.

4.2 Corporate governance

Consistent with good business practice, Powerlink has established and maintained governance processes that provide appropriate accountability and control systems to encourage and enhance sustainable business performance.

Given Queensland's high demand growth environment and the short lead time to deliver transmission augmentations to meet the needs of new energy intensive loads underpinning Queensland's economic growth, Powerlink has an effective framework to ensure efficient and timely delivery of its services.

At its last revenue reset, the AER and its consultants undertook a detailed review of Powerlink's capital governance framework and its capital expenditure policies and procedures. Overall, Parsons Brinckerhoff (PB) found that:

> Powerlink's governance arrangements and its capex policies and procedures were robust and consistently applied and provided a framework that should facilitate efficient investment outcomes.[38]

Further, PB found that:

> … Powerlink's procedures for project development were robust, coordinated across the various business groups, consistent with its asset management strategies, and consistent with the Rules[39].

The AER accepted PB's advice that Powerlink's established governance arrangements and capital expenditure policies and procedures are robust and will deliver efficient investment outcomes[40]. Consistent with this view, the AER determined that all of Powerlink's past capital expenditure was prudent and efficient.

During this regulatory period, Powerlink has refined its established and robust arrangements where opportunities existed. For example, Powerlink has enhanced its program management practices to further improve its capital works delivery capability. This has provided greater awareness of interactions between projects in the same geographical area, supporting the coordination of outages and in the delivery of the overall program of work.

To demonstrate the ongoing robustness of its governance framework, Powerlink has referred to specific policies and processes throughout the Revenue Proposal in relevant areas.

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[37] National Electricity Rules, Chapter 6A, AEMC.

[38] Draft Decision - Powerlink Queensland Transmission Network Revenue Cap 2007–08 to 2011–12, p.51, AER, December 2006.

[39] Draft Decision - Powerlink Queensland Transmission Network Revenue Cap 2007–08 to 2011–12, p.51, AER, December 2006.

[40] Draft Decision - Powerlink Queensland Transmission Network Revenue Cap 2007–08 to 2011–12, p.51 and p.94, AER, December 2006.

4.3 Cost allocation

Powerlink's operating and capital expenditure forecasts have been prepared and properly allocated to prescribed transmission services in accordance with its AER approved Cost Allocation Methodology, which is provided at Appendix B. The methodology sets out the principles and policies for attributing costs to, or allocating costs between or within, the categories of transmission services which Powerlink provides – namely, prescribed transmission services, negotiated transmission services and non-regulated transmission services. Powerlink has used this methodology to prepare its capital and operating expenditure forecasts in this Revenue Proposal.

In practical terms, Powerlink's accounting systems automatically allocate costs at the time a financial transaction is recorded. All projects, assets, cost centres, and activities are categorised as being either prescribed, negotiated or non-regulated.

The Cost Allocation Methodology and related procedures are regularly reviewed to ensure compliance to statutory, taxation and regulatory requirements while meeting Powerlink's business reporting needs.

A Directors' Responsibility Statement also accompanies Powerlink's Revenue Proposal, which attests, inter alia, that historic expenditure is presented fairly and in accordance with the Submission Guidelines and Cost Allocation Guidelines[41]. Powerlink has applied the same principles and policies on a forward-looking basis to both capital and operating expenditure.

4.4 Interaction between operating and capital expenditure

The Rules[42] and Section 4.3.5 of the Submission Guidelines require that a Revenue Proposal identify and explain any significant interactions between capital and operating expenditure. Operating expenditure, capital expenditure and system reliability are intertwined. These aspects need to be carefully balanced to ensure an efficient, reliable, safe and secure transmission network. The more specific linkages between forecast operating expenditure and capital expenditure are outlined below.

Powerlink uses operating expenditure such as maintenance and operational refurbishment projects to retain assets in a suitable condition to ensure reliability and security of supply to customers. When this is no longer prudent, the replacement of the asset is addressed through capital expenditure. Without appropriate levels of operating expenditure, reliability will start to decline and ultimately lead to inefficiencies (and higher costs) as more reactive approaches to maintenance are adopted.

Approximately two thirds of capital expenditure in the next regulatory period is load driven and required to meet growing electricity peak demand. This capital expenditure is essential for Powerlink to meet its reliability requirements and to ensure that demand is met in a timely manner. Operating expenditure has been included for these new assets as they increase the number of assets to be operated and maintained. It is appropriate to include operating expenditure for these new assets, given the costs associated with the well documented "bathtub effect" of early failures[43]. Powerlink notes that, notwithstanding the augmentation and replacement capital expenditure detailed in this Revenue Proposal, Powerlink's average asset lives remain relatively constant throughout the next regulatory period. Economies of scale factors have been applied to operating expenditure to reflect the efficiencies of a larger network.

[41] Electricity Transmission Network Service Providers' Cost Allocation Guidelines, AER, September 2007.
[42] National Electricity Rules, Chapter 6A, schedule S6A.1.3(1), AEMC.
[43] Review of the Effectiveness of the Reliability Centred Maintenance Initiative for Powerlink, The Asset Partnership, November 2010.

Approximately one third of capital expenditure is required to replace assets which have reached the end of their useful lives. Timely replacement of assets is essential to maintain both efficient operating costs and reliability. For example, in the case where manufacturer support and spares are not available, complex, expensive and time consuming workarounds are required in the event of failure. These have the effect of reducing reliability, are more expensive than timely replacement and can potentially lead to further operating and maintenance issues in the future. Powerlink has not included additional operating expenditure as a result of the replacement capital expenditure, as it does not contribute to an increase in the number of assets to be operated and maintained.

The impact of network growth and economies of scale factors on operating expenditure is detailed in Sections 9.6.3 and 9.6.4.

4.5 Capitalisation policies

Section 4.3.4(c)(2) of the Submission Guidelines require any changes to the capitalisation policies to be described. Powerlink's capitalisation policies have not changed in the current regulatory period. At this time, there are no planned changes to Powerlink's capitalisation policies for the next regulatory period.

A new asset class has been created to reflect the appropriate depreciation profile for transmission line refit capital expenditure. Further details of the new asset class are contained in Chapter 10.

4.6 Related parties

As required under Section 4.3.24 of the Submission Guidelines, Powerlink confirms that there are no material related party transactions whose costs are attributed to, or allocated between, categories of transmission services. All related party transactions are made on normal commercial terms and conditions and on an arms-length basis. These transactions are also consistent with Powerlink's Cost Allocation Methodology and are disclosed in the annual regulatory financial statements in accordance with the AER's Information Guidelines[44].

4.7 Summary

Powerlink has, and continues to maintain, robust operating and capital expenditure governance and compliance processes and procedures. Specific governance and compliance requirements are identified and explained in relevant chapters in the Revenue Proposal.

[44] Electricity Transmission Network Service Providers Information Guidelines, AER, September 2007.

5 Historic Cost and Service Performance

5.1 Introduction

This chapter provides an overview of Powerlink's historical capital and operating costs and service performance over the current regulatory period. Where audited results are available, they have been applied in the analysis, whereas Powerlink's estimates have been used for the remaining years. The analysis includes the comparison of Powerlink's capital and operating expenditure performance against the AER allowance. This is followed by a review of Powerlink's performance under the AER's EBSS and the Service Target Performance Incentive Scheme (STPIS).

5.2 Historic capital expenditure performance

The Rules[45] require that certain information be provided as part of a Revenue Proposal in relation to capital expenditure, including in relation to historic capital expenditure. Specifically, this includes:

- an annual summary of capital expenditure for the current regulatory period (actual and expected), categorised in the same way as for the capital expenditure forecast; and
- an explanation of any significant variations between forecast and historical capital expenditure.

These Rules requirements are also identified in Sections 4.3.3(a)(6), 4.3.3(a)(7) and 4.3.3(b) of the Submission Guidelines. Powerlink considers that all relevant information requirements are provided below.

5.2.1 2007 Revenue Cap Decision – capital expenditure

The AER's 2007 Revenue Cap Decision for Powerlink's 2008-12 regulatory period was based on an assessment of Powerlink's Revenue Proposal. Overall, the AER determined that a total ex-ante capital expenditure allowance of $2,628.5m ($2006/07) was appropriate.

Powerlink's current capital expenditure allowance was developed on the basis of a probabilistic scenario approach, which involved the application of 40 input scenarios estimated by an independent consultant and 40 consequential market development scenarios. It is notable that no scenario had a probability of greater than 10.9%, highlighting the uncertainty of the development of any single scenario. Powerlink's capital expenditure allowance for this regulatory period was the probability weighted average capital expenditure profile of all 40 scenarios.

For clarification, it is important to recognise that, as specified by the AER:

> "…This decision does not require Powerlink to undertake or not undertake any particular investment. Under the ex-ante framework, Powerlink has full operational discretion to allocate its expenditure allowances as it sees fit."[46]

In July 2008, the AER made an amendment in relation to Powerlink's contingent project application for the additional costs of undergrounding a section of line between South Pine and Sandgate[47]. The net effect of the Decision was to increase Powerlink's capital expenditure by $19.9m ($2006/07), operating expenditure by $0.3m ($2006/07) and revenue by $0.9m over the

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[45] National Electricity Rules, Chapter 6A, schedule S6A.1.1, AEMC.
[46] Powerlink Queensland Transmission Network Revenue Cap 2007-08 to 2011-12, Decision, p.5., AER, 2007.
[47] The AER released a Revocation and Substitution Decision on Powerlink's 2007/08 to 2011/12 Revenue Cap which considered the contingent project of South Pine to Sandgate underground section as well as an input error in the PTRM.

regulatory period. The relevant contingent project will be completed in the current regulatory period.

5.2.2 *Actual capital expenditure*

Powerlink's current regulatory period ends on 30 June 2012. The information provided in this Revenue Proposal represents:

- actually incurred capital expenditure in 2007/08, 2008/09 and 2009/10[48]; and
- capital expenditure expected to be incurred in the remaining two years of the regulatory period (i.e. 2010/11 and 2011/12), based on Powerlink's latest estimates.

Table 5.1 provides a summary of Powerlink's capital expenditure for the period 1 July 2007 to 30 June 2012 by category. These categories are consistent with forecast capital expenditure for the 2013-17 regulatory period as set out in Chapter 8.

Table 5.1: Capital expenditure by category ($m, nominal)

Project Category		2007/08	2008/09	2009/10	2010/11 (estimate)	2011/12 (estimate)	Total
NETWORK							
Load driven	Augmentation	410.9	344.2	207.0	139.1	293.0	1,394.2
	Easements	23.0	18.9	16.5	14.3	22.1	94.9
	Connections	22.7	27.4	30.8	12.2	16.6	109.8
Non-load driven	Replacements	169.3	186.9	139.8	179.1	338.9	1,014.0
	Security/ compliance	2.2	2.1	9.9	4.6	35.8	54.5
	Other	7.3	16.0	11.6	27.8	49.6	112.3
	Total network	**635.5**	**595.4**	**415.6**	**377.2**	**756.0**	**2,779.7**
NON-NETWORK							
Business IT	Information technology	10.4	12.7	11.6	12.9	14.8	62.4
Support the business	Commercial buildings	4.4	6.7	10.6	14.7	4.2	40.6
	Motor vehicles	1.0	1.3	3.3	3.8	4.4	13.7
	Moveable plant	1.3	1.2	1.4	1.8	1.8	7.5
	Total non-network	**17.1**	**21.8**	**26.9**	**33.1**	**25.2**	**124.2**
Total capital expenditure		**652.6**	**617.3**	**442.5**	**410.3**	**781.2**	**2,903.8**

*Numbers may not add due to rounding.
This table is net of disposals.
Note – actual CPI used for 2007/08 to 2010/11, and forecast CPI of 2.5% for 2011/12.

[48] Regulatory financial statements have been independently audited and provided to the AER for these years.

Table 5.2 presents Powerlink's total actual/estimated capital expenditure by year relative to the AER allowance for the current regulatory period. While there have been some year on year variations relative to the AER allowance, Powerlink considers that the difference is not material/significant on a portfolio basis. Such variations are also to be expected, in particular, given the inherent uncertainties in forecasting capital expenditure recognised by the probabilistic nature of the forecast upon which the capital expenditure allowance was based. That is, the capital expenditure allowance did not represent a fixed list of projects to be undertaken, and hence a variation should be expected.

On a portfolio basis for the current five-year regulatory period, and based upon all information reasonably available to Powerlink at the time of lodging its Revenue Proposal for the 2010/11 and 2011/12 years, Powerlink estimates that there will be no material difference in the total capital expenditure compared to the AER allowance.

Table 5.2: Capital expenditure – allowance vs actual ($m, nominal)

	2007/08	2008/09	2009/10	2010/11 (estimate)	2011/12 (estimate)	Total
Allowance	718.7	680.0	463.7	528.9	462.0	2,853.3
Actual/estimated	652.6	617.3	442.5	410.3	781.2	2,903.8

Audit assurances of historic capital expenditure information have been provided to the AER as part of Powerlink's normal regulatory financial statements reporting process. As required by the Submission Guidelines, Powerlink has prepared and lodged pro forma statements 3.1, 3.2, 3.3 and 3.4 in relation to historic capital expenditure.

5.3 Historic operating expenditure performance

The Rules[49] require that certain information be provided as part of a Revenue Proposal in relation to operating expenditure, including in relation to historic operating expenditure. Specifically, this includes:

- an annual summary of operating expenditure for the current regulatory period (actual and expected), categorised in the same way as for the operating expenditure forecast; and
- an explanation of any significant variations between forecast and historical operating expenditure.

These Rules requirements are also identified in the AER's Submission Guidelines (sections 4.3.4(a)(7), 4.3.4(a)(8) and 4.3.4(c)(1)). Powerlink considers that all relevant information requirements are provided below.

5.3.1 2007 Revenue Cap Decision – operating expenditure

The AER's 2007 Revenue Cap Decision for Powerlink's 2008-12 regulatory period was based on an assessment of Powerlink's Revenue Proposal. Overall, the AER determined that a total controllable operating expenditure allowance of $640.3m ($2006/07) and total operating expenditure allowance of $731.3m ($2006/07) was appropriate.

5.3.2 Actual operating expenditure

Powerlink's current regulatory period ends on 30 June 2012. The information provided in this Revenue Proposal represents:

[49] National Electricity Rules, Chapter 6A, schedule S6A.1.2, AEMC.

- actually incurred operating expenditure in 2007/08, 2008/09 and 2009/10[50]; and
- operating expenditure expected to be incurred in the remaining two years of the regulatory period (i.e. 2010/11 and 2011/12), based on Powerlink's latest estimates.

Powerlink's historic operational expenditure by category is provided in Table 5.3. These categories are consistent with forecast operating expenditure for the 2013-17 regulatory period as set out in Chapter 9. For clarification, it should be noted that Powerlink has previously incorporated insurance and self-insurances as controllable operating expenditure. However, given that insurances are either driven by events exogenous to the business or are an accumulation fund, Powerlink has not included insurance and self-insurances in the controllable operating expenditure in the current and upcoming regulatory period. For clarity, insurances have been removed from both the controllable operating expenditure allowance and the actual/estimated controllable operating expenditure.

Table 5.3: Operating expenditure (2007/08 to 2011/12) - by category ($m, nominal)

	2007/08	2008/09	2009/10	2010/11 (estimate)	2011/12 (estimate)	Total
Field Maintenance	37.0	41.7	44.7	48.0	53.5	224.9
Operational Refurbishment	18.6	20.2	22.2	24.4	27.0	112.4
Maintenance Support	10.3	10.3	11.0	11.7	12.4	55.6
Network Operations	10.4	11.5	12.2	13.0	13.6	60.7
Asset Management Support	25.9	28.2	29.6	31.1	32.6	147.4
Corporate Support	9.0	9.7	12.7	15.2	13.8	60.4
Actual/estimated controllable operating expenditure*	**111.2**	**121.6**	**132.4**	**143.3**	**152.9**	**661.4**
Insurances	5.4	5.9	6.7	7.3	8.0	33.3
Network Support	27.3	15.1	12.7	0.2	0.4	55.7
Debt Raising	0.2	0.2	0.3	0.2	0.3	1.2
Actual/estimated total operating expenditure*	**144.1**	**142.8**	**152.1**	**151.0**	**161.5**	**751.6**

*Numbers may not add due to rounding.
Note – actual CPI used for 2007/08 to 2010/11 and forecast CPI of 2.5% for 2011/12.

[50] Regulatory financial statements have been independently audited and provided to the AER for these years.

Table 5.4 presents Powerlink's total actual/estimated controllable operating expenditure by year relative to the AER allowance for the current regulatory period.

Table 5.4: Controllable operating expenditure – allowance vs actual ($m, nominal)

	2007/08	2008/09	2009/10	2010/11 (estimate)	2011/12 (estimate)	Total
Controllable operating expenditure allowance	111.6	121.6	130.7	142.6	151.2	657.7
Actual/estimated controllable operating expenditure	111.2	121.6	132.4	143.3	152.9	661.4

Table 5.4 demonstrates that there are no material year on year variations between Powerlink's actual/estimated controllable operating expenditure and the AER allowance. Over the current regulatory period, this results in a variation of less than 1% of total controllable operating expenditure.

Table 5.5 outlines Powerlink's total actual/estimated operating expenditure by year relative to the AER allowance for the current regulatory period.

Table 5.5: Total operating expenditure - allowance vs actual ($m, nominal)

	2007/08	2008/09	2009/10	2010/11 (estimate)	2011/12 (estimate)	Total
Total operating expenditure allowance	143.6	147.9	163.6	161.3	171.0	787.4
Total actual/estimated operating expenditure	144.1	142.8	152.1	151.0	161.5	751.6

The variation in total actual/estimated operating expenditure compared to the AER allowance is attributed to exogenous factors outside Powerlink's control impacting upon the volume and demand for network support, e.g. weather impacts.

Powerlink's philosophy for managing its operating expenditure has been consistently applied since the mid-1990s, when the fundamental components of the operating expenditure were identified as separable activities. Consequently, the actual operating expenditure incurred in the regulatory period is related to operational needs as they have arisen, albeit mindful of, and responding to, the economic incentive provided under the AER's EBSS where possible.

Powerlink's consistent operating expenditure performance has been coupled with the development of a transmission network that continued to support Queensland customers and industry, while improving overall transmission system reliability and availability.

Audit assurances of historic operating expenditure information have been provided to the AER as part of Powerlink's normal regulatory financial statements reporting process.

As required by the Submission Guidelines, Powerlink has prepared and lodged pro forma statements 1.1, 1.2, 1.3, 1.4, 1.5, 1.6 and 1.7 in relation to historic operating expenditure.

5.4 Efficiency Benefit Sharing Scheme (2008-12)

For the current (transitional) regulatory period, the Rules[51] provide that Powerlink is subject to the EBSS in force under clause 6A.6.5. In other words, Powerlink is subject to the EBSS finalised by the AER in September 2007[52] (post Powerlink's 2007 Revenue Cap Decision).

The Rules and Submission Guidelines require that a Revenue Proposal contain the values proposed to be attributed to the scheme and an explanation of how these proposed values comply with the scheme. In addition, the Submission Guidelines pro forma statement 7.4 must be prepared and submitted as part of the proposal.

5.4.1 Exclusions and Adjustments

The EBSS allows for certain cost categories to be excluded from the scheme, including those set out in a determination of the AER. In addition, adjustments to forecast operating expenditure can be made in calculating the net carryover amount from one regulatory period to the next.

Exclusions

Powerlink has excluded the costs below from its calculation of the net carryover for the current regulatory period. The first three have been excluded on the basis that these costs are outside the control of the business. Insurance costs have been excluded on the basis that the insurance market is driven by events exogenous to the business. Self-insurance costs have been excluded on the basis that it is an accumulation reserve. These exclusions are consistent with the EBSS, and also with exclusions the AER has agreed to in previous TNSP determinations[53]:

- debt-raising costs;
- equity raising costs;
- network support costs;
- insurance costs; and
- self-insurance costs.

Adjustments

Powerlink also notes that controllable operating expenditure forecasts are to be adjusted for the cost consequences of the difference between forecast and actual demand growth over the regulatory period. This adjustment is to be made using the same relationship between growth and expenditure used in establishing the forecast operating expenditure and applied only to those components of operating expenditure that have a direct relationship to growth.

In this regard, Powerlink notes that neither the potential for, nor proposed method of, adjusting for demand growth was discussed with the AER during its last revenue determination process.

Given that Powerlink and the AER did not agree a method of adjustment of any kind up-front, Powerlink proposes that no adjustment be made to its operating expenditure allowances for the purposes of the EBSS for the current regulatory period. Powerlink considers that to do so would be inconsistent with the objectives of the scheme, in that the AER would be adjusting the targets ex-post, in a way that was unknown to Powerlink at the start of the regulatory period. In effect, the AER would be removing the incentive properties inherent in the scheme and, consequently, affect the magnitude of any gains or losses Powerlink has actually achieved during this regulatory period.

[51] National Electricity Rules, Chapter 11, clause 11.6.12, AEMC.
[52] Electricity Transmission Network Service Providers Efficiency Benefit Sharing Scheme, AER, September 2007.
[53] For example, TransGrid (2009), Transend (2009) and ElectraNet (2008).

5.4.2 *Net carryover amount*

In deriving its net carryover for this regulatory period, Powerlink has included its latest estimate of controllable and non-controllable operating expenditure for the 2010/11 year and, consistent with the scheme, has assumed no incremental efficiency gain for 2011/12. Taking these figures and the exclusions and adjustments identified above into account, Powerlink has determined that this results in a net carryover amount of minus $1.34m. The calculation is summarised in Table 5.6. An adjustment for this amount has been accounted for in the Post Tax Revenue Model (PTRM) for the 2013-2017 regulatory period.

Table 5.6: EBSS carryover (2007/08 to 2011/12) ($m, 2011/12, end)

	2012/13	2013/14	2014/15	2015/16	2016/17	Total
Carryover Amount	-0.8	-0.5	-1.1	1.0	-	-1.3

*Numbers may not add due to rounding.

5.5 Historic service target performance incentive scheme performance

The AER's STPIS provides an economic incentive for TNSPs to further improve its delivery of transmission services. Powerlink's current scheme (that applies to the 2008 to 2012 regulatory period) requires Powerlink to measure its network performance against six parameters. These are:

- Transmission Circuit Availability – Critical.
- Transmission Circuit Availability – Non-Critical.
- Transmission Circuit Availability – Peak.
- Frequency of Loss of Supply Events > 0.2 system minutes.
- Frequency of Loss of Supply Events > 1.0 system minutes.
- Average Outage Duration.

In addition, the AER approved Powerlink's application for the early implementation of the Market Impact of Transmission Congestion (MITC) parameter in June 2010. Powerlink commenced the market impact scheme on 13 July 2010.

Powerlink's historical STPIS performance on a calendar year basis since 2002 is summarised in Table 5.7.

Table 5.7: Historical STPIS performance (2002 to 2010)

Parameter	Measure	Calendar Year								
		2002	2003	2004	2005	2006	2007[a]	2008	2009	2010
Critical Availability	%	99.80	98.50	99.40	99.73	99.12	99.48	99.00	99.20	98.69
Non-critical Availability	%	98.70	98.70	99.00	98.63	98.16	98.78	98.51	97.94	98.85
Peak Availability	%	98.70	98.60	99.00	98.65	98.11	98.66	98.48	97.98	98.64
Loss of Supply > 1.0 System Minutes	Events	3	0	0	0	0	1	0	1	0
Loss of Supply > 0.2 System Minutes	Events	9	6	4	3	2	2	2	2	0
Average Outage Duration	Minutes	743	701	794	1,517	1,410	897	1,046	707	779
MITC	Dispatch Intervals	n/a	n/a	n/a	2,153	3,673	1,702	179	143	1,418[b]

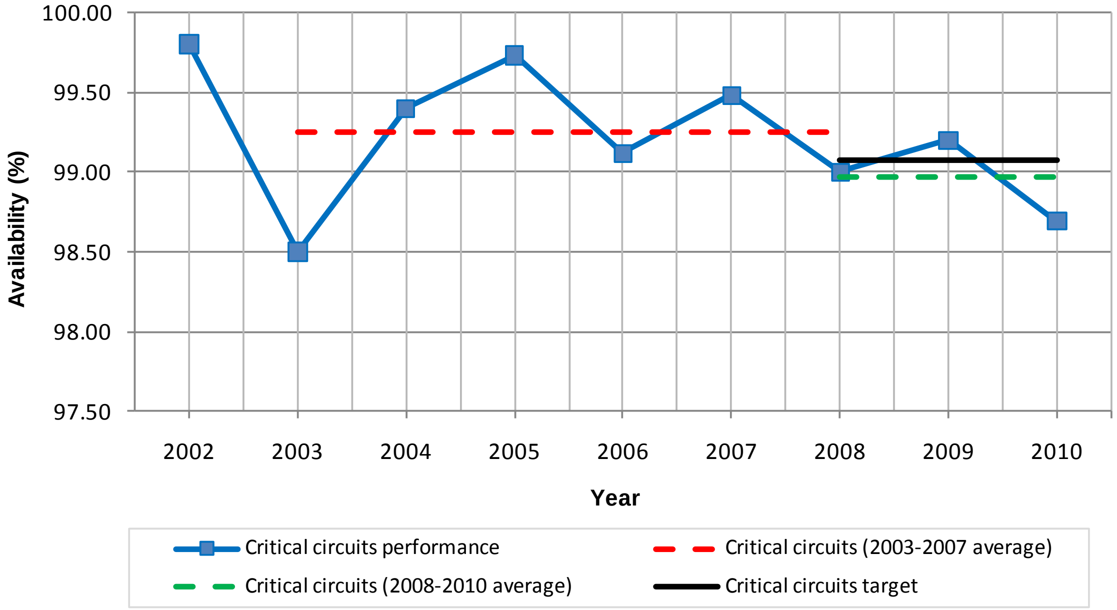
a - Powerlink's 2007 STPIS performance was based on the half-year period from 1 July 2007 to 31 December 2007 given that its new targets were applicable to the new regulatory period from 1 July 2007 to 30 June 2012. The performance detailed in Table 5.6 and Figures 5.1 to 5.3 is the performance for the full 2007 calendar year.

b - Dispatch Interval Count from 13 July 2010 to 31 December 2010 was 11 dispatch intervals.

5.5.1 Historic transmission circuit availability performance

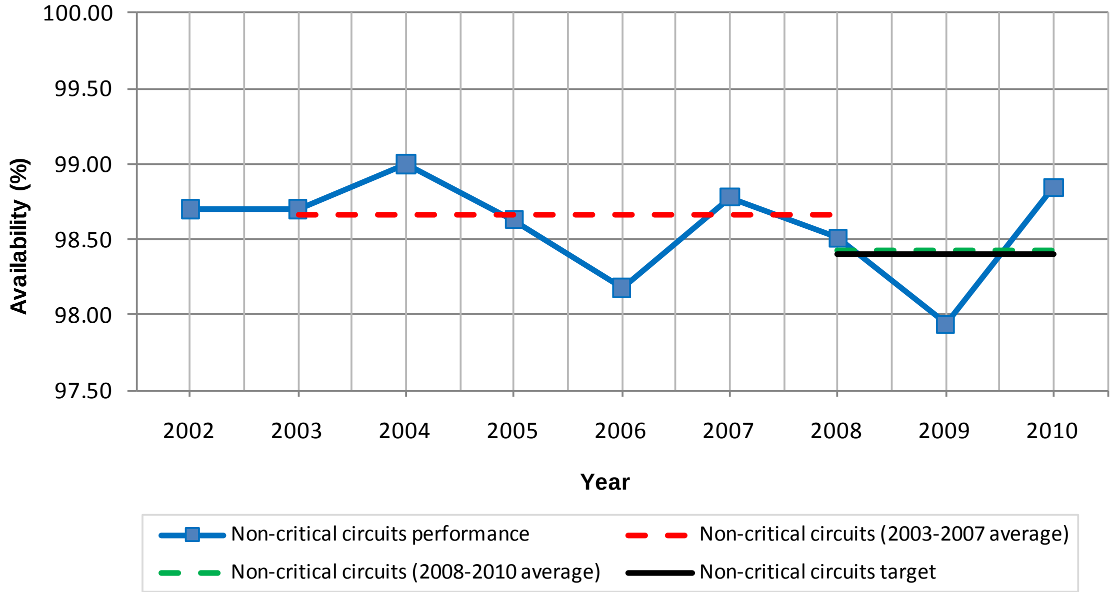
Powerlink's transmission circuit availability from 2002 to 2010 for critical, non-critical and peak circuits is presented in Figures 5.1 through 5.3 , respectively. Figures 5.1, 5.2 and 5.3 demonstrate that Powerlink's availability performance across all three measures during the current regulatory period (from 2008 to 2010, shown by the green line) was lower than the previous period's (from 2003 to 2007, shown by the red line) performance. This is the result of an increase in Powerlink's capital works program which required additional outages to be taken in more recent years.

Figure 5.1: Transmission circuit critical availability performance (2002 to 2010)



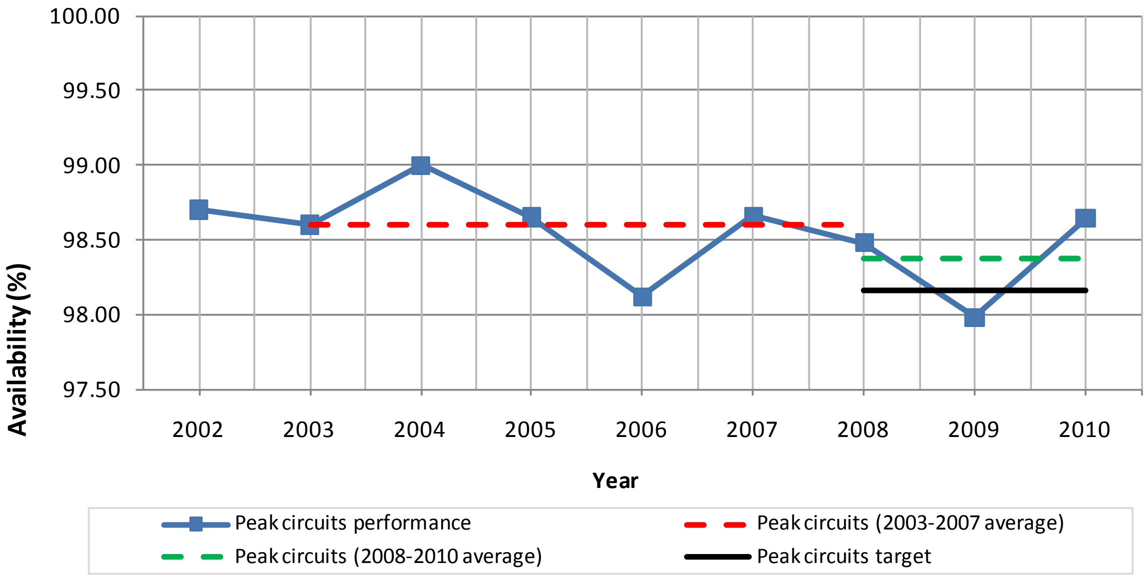
Source: Powerlink data.

Figure 5.2: Transmission circuit non-critical availability performance (2002 to 2010)



Source: Powerlink data

Figure 5.3: Transmission circuit peak availability performance (2002 to 2010)



Source: Powerlink data.

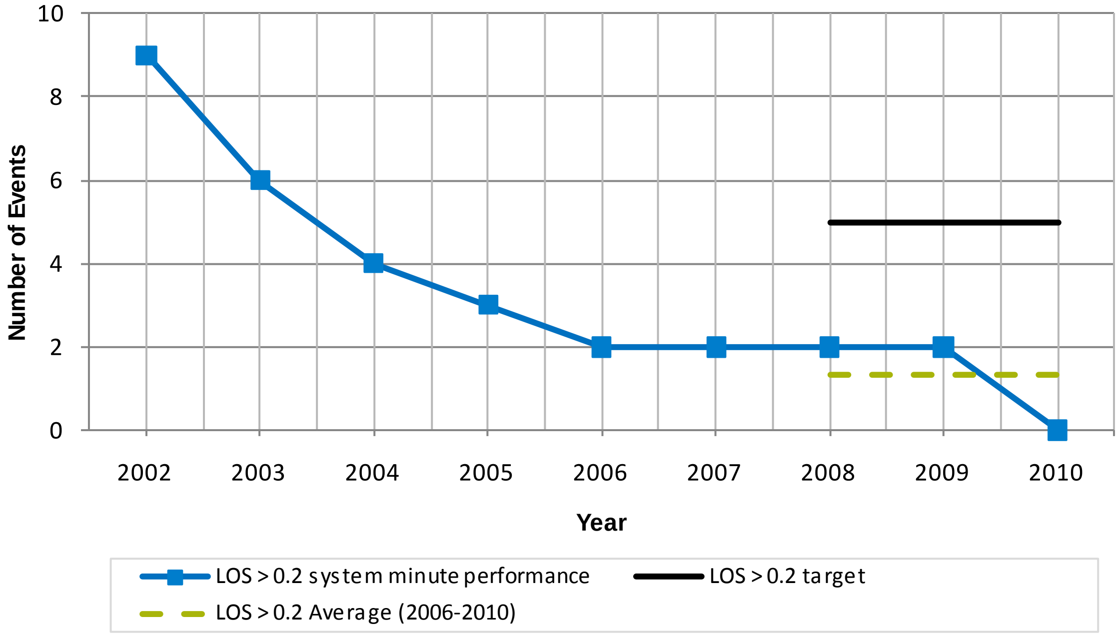
Under Powerlink's current STPIS, transmission circuit availability performance from 2008 to 2010 (shown by the green line) has been close to the target (shown by the black line) set by the AER.

Powerlink has actively managed to achieve the AER's availability targets in the current regulatory period through improved field and support practices, including live line work and improved outage co-ordination. However, Powerlink anticipates that transmission circuit availability improvements will become more difficult during the next regulatory period as similar levels of capital works are forecast to be undertaken, and Powerlink has already realised the available and practical opportunities to minimise outage durations.

5.5.2 Historic frequency of loss of supply performance

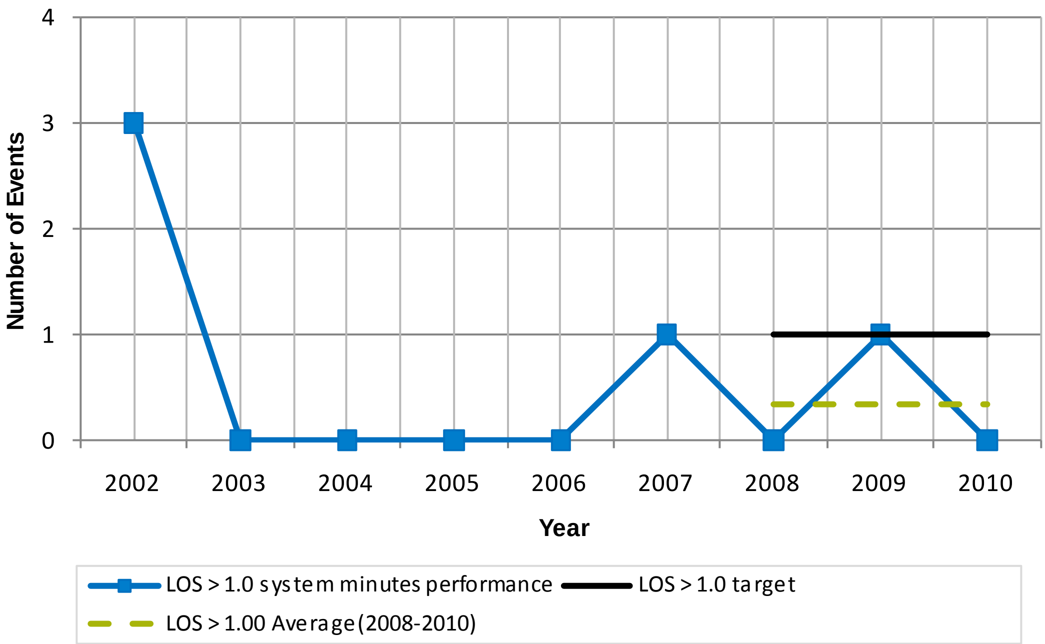
Powerlink's frequency of loss of supply for moderate (greater than 0.2 system minutes) and large (greater than 1.0 system minutes) events from 2002 to 2010 is shown in Figures 5.4 and 5.5. The figures demonstrate that Powerlink has improved and maintained its loss of supply performance in relation to large and moderate events over the last 10 years.

Figure 5.4: Frequency of moderate loss of supply events (2002 to 2010)



Source: Powerlink data.

Figure 5.5: Frequency of large loss of supply events (2002 to 2010)



Source: Powerlink data.

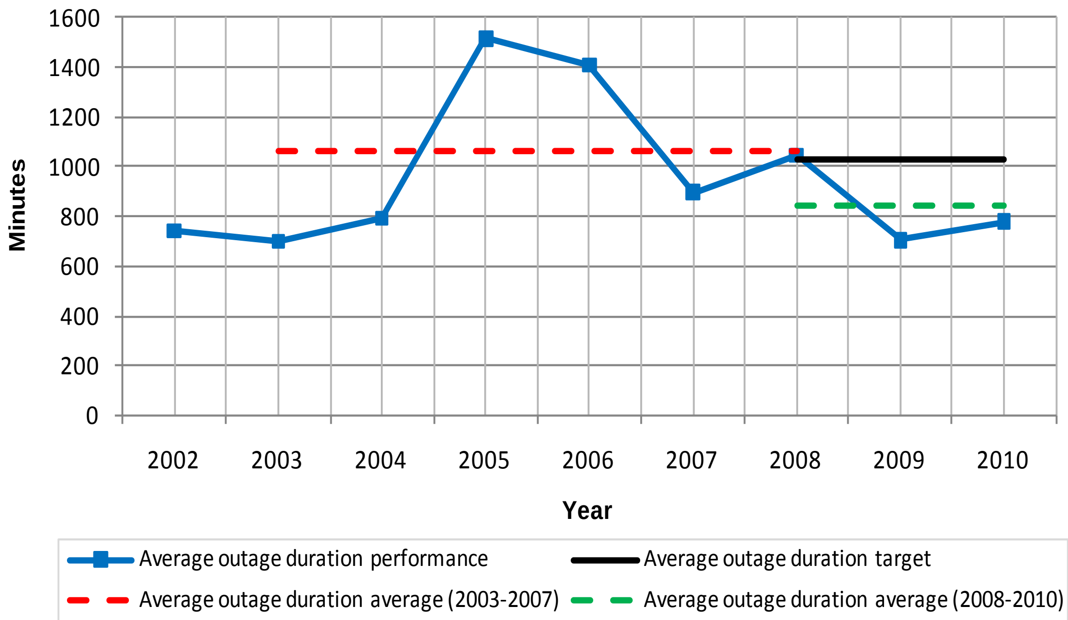
Analysis of the large loss of supply performance shows that it is not unusual for Powerlink to have large system minute events. This is reflective of the "long and skinny" nature of Powerlink's network which results in large loads being supplied via long radial transmission networks, with a heavy reliance on double circuit transmission lines, due to their cost efficiencies over long distances. This differs from the network topology of more geographically compact States.

Powerlink has performed better than the AER target for both the large and moderate system minute thresholds (shown by the black lines in Figures 5.4 and 5.5). This has been achieved in part through the active management of Powerlink's response to loss of supply events and (while Powerlink was monitoring already) the establishment of a team dedicated to the detection, investigation and management of faults on Powerlink's transmission network. Another factor is that the last five years have mostly been an extended drought with fewer periods of intensive storm, lightning and high winds than normal. Like the availability parameter, it is expected that further improvements to the Loss of Supply parameter are unlikely to occur as all the readily identifiable improvements have been achieved, coupled with a return to more typical weather patterns.

5.5.3 Historic average outage duration performance

Figure 5.6 illustrates Powerlink's average outage duration performance from 2002 to 2010. This measure relates only to forced outages and demonstrates that despite its large capital works program, Powerlink has maintained an average outage duration performance at levels comparable to that of previous periods. Relative to the AER target in the current regulatory period, Powerlink's performance has exceeded the average outage duration target from 2008 to 2010.

Figure 5.6: Average outage duration performance (2002 to 2010)



Source: Powerlink data.

5.5.4 Historic market impact of transmission congestion performance

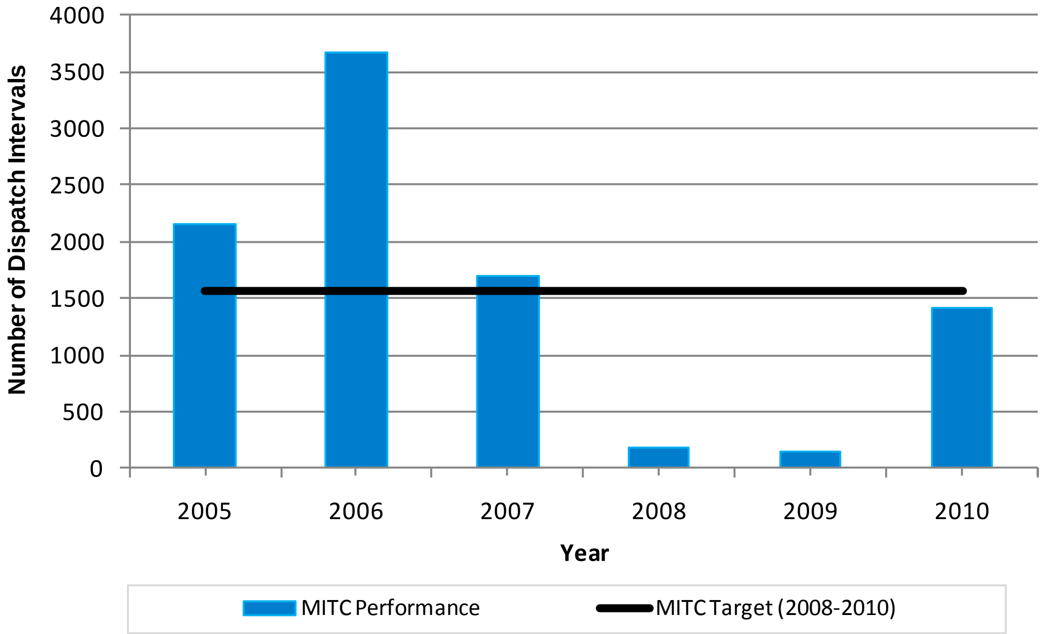
Powerlink has been subject to the MITC parameter from 13 July 2010. In June 2010, the AER approved a performance cap[54] (shown by the black line) based on the average of the five years of data from 2005 to 2009. This will apply to Powerlink until the start of the next regulatory period.

Powerlink's MITC parameter performance from 2005 to 2010 is detailed in Figure 5.7. The 2010 value is reflective of a full calendar year performance.

[54] Final decision - Early application of the market impact component of the Service Target Performance Incentive Scheme for Powerlink Performance Target, p.6, AER, June 2010.

Note that the variability of Powerlink's market component performance is reflective of the timing of capital works associated with transmission network elements around generator connection points and interconnectors, and market activity. Hence it is very volatile in nature. While the majority of these outages did not have any impact on reliability of supply, even for an outage of another network element in the area, they nevertheless impacted the ability of some local generators to be fully dispatched and hence constituted a market impact.

Figure 5.7: Market impact of transmission congestion (2005 to 2010)



Source: Powerlink data.

5.6 Summary

The analysis in this chapter demonstrates that Powerlink's capital and operational expenditure costs have closely aligned to the targets set by the AER for the current regulatory period. This is reflective of Powerlink's active management within the context of the ex-ante framework, as well as the appropriate response under the EBSS.

In addition, Powerlink has performed well under the STPIS, reducing the frequency of loss of supply events, while maintaining transmission circuit availability and the duration of forced network outages. This result is noteworthy, given it has been achieved during a period of increased and sustained capital works on the transmission network.

6 Regulatory Asset Base

6.1 Introduction

As required under the Rules[55] and Sections 4.3.9 and 4.3.19 of the Submission Guidelines, Powerlink is required to provide a completed Roll Forward Model (RFM) with the Revenue Proposal. In addition, the methodology adopted to calculate the opening RAB at 1 July 2012 is to be described. This Chapter addresses these opening RAB requirements.

6.2 Roll forward methodology

Powerlink has calculated the value of its opening RAB for 1 July 2012 by using the AER's RFM. The opening RAB at 1 July 2007 is calculated on an as incurred basis. Specifically, the RAB as at 1 July 2007 established by the AER in Powerlink's 2008-12 revenue cap determination, has been:

- increased by the amount of all capital expenditure incurred during the current regulatory period;
- increased by the amount of the estimated capital expenditure for 2010/11 and 2011/12;
- reduced by the amount of depreciation of the RAB using the rates and methodologies allowed for in Powerlink's 2007 Final Determination[56];
- reduced by the value of assets disposed during the current regulatory period; and
- modified for the difference between the estimated and actual capital expenditure during the last year of the previous regulatory period, 2006/07, and the return on the difference for that year.

The following sections describe Powerlink's approach to the transfer and disposal of assets in more detail.

6.2.1 Transfer of existing assets into the regulatory asset base

Powerlink has previously identified that, due to forecast growth in electricity demand in southern Queensland, the capability of the existing transmission network supplying this area would be fully utilised by late 2011.

Powerlink has undertaken planning and public consultation in accordance with the requirements of the Rules and the Regulatory Test to determine the most efficient option to address the identified need. Part of the recommended solution involves prescribed services being provided by a section of an existing transmission line and other relevant assets, all of which are owned by Powerlink, that currently provide non-prescribed connection services between Kogan Creek power station and Powerlink's Braemar Substation. Powerlink has been in discussions with the AER on this matter.

As Powerlink already owns the relevant assets, the Revenue Proposal includes the actual cost of construction of the relevant non-prescribed assets in the RAB in the amount of $25.4m.

To maintain compatibility with the RFM that accompanies the Revenue Proposal, the transfer has been recorded as though it were capital expenditure in the last year of the current regulatory period (2011/12). The transfer is also included in the pro forma statements for capital expenditure.

[55] National Electricity Rules, clause 6A.10.2(c) and schedule S6A.1.3(5), AEMC.
[56] Powerlink Final Determination, AER, June 2007.

6.2.2 *Disposal of assets*

The AER's RFM requires the disposal of assets to be included in calculating the RAB. As in previous regulatory periods, given the regulatory models are predicated on cash flows, Powerlink has adopted the proceeds value for disposals within the RFM. In the Revenue Proposal, capital expenditure is reported net of disposals.

6.3 Regulatory asset base, 1 July 2012

Applying the roll-forward methodology detailed in Section 6.2 and completing the AER's RFM provided with this Revenue Proposal, Powerlink's opening RAB at 1 July 2012 is calculated to be $6,575.8m, as set out in Table 6.1.

Table 6.1: Opening RAB at 1 July 2012 ($m, nominal)

	2007/08	2008/09	2009/10	2010/11 (estimate)	2011/12 (estimate)
Opening RAB	3,752.8	4,448.3	5,016.2	5,429.8	5,830.4
Capital expenditure*	693.3	640.8	460.6	429.7	812.1
Regulatory depreciation (CPI** adjusted)	2.2	-72.9	-47.0	-29.1	-79.5
Closing RAB	**4,448.3**	**5,016.2**	**5,429.8**	**5,830.4**	**6,562.9**
Add: return on difference for 2006/07					12.9
Opening RAB at 1 July 2012					**6,575.8**

*Capital expenditure in the RFM calculation of RAB is as incurred, net of disposals, and adjusted for WACC.
**Consumer Price Index.

6.4 Redistribution of the asset class values in the regulatory asset base 1 July 2012

As part of the roll-forward methodology used to establish the opening RAB at 1 July 2012, Powerlink has taken the opportunity to align its regulatory and financial asset bases to ensure there is consistency going forward. This has occurred by means of a redistribution across the regulatory asset classes in the proportions represented in Powerlink's financial asset register. The net effect of the redistribution is the retention of the same total real value of the opening RAB.

6.5 Summary

In accordance with the Rules and Submission Guidelines this Chapter explains the derivation of Powerlink's opening RAB at 1 July 2012. As required, a completed RFM accompanies this Revenue Proposal.

7 Cost of Capital and Taxation

7.1 Introduction

The Rules[57] require that the rate of return for a Transmission Network Service provider (TNSP) be the cost of capital as measured by the return required by investors in a commercial enterprise with a similar nature and degree of non-diversifiable risk as that faced by the TNSP.

The regulatory rate of return should be sufficient to ensure the continuing viability of the business, and provide for a reasonable opportunity to recover, at least, the efficient costs of providing prescribed services and complying with regulatory obligations.

On 1 May 2009, the AER released its Final Decision and Statement on its Review of the Weighted Average Cost of Capital (WACC) Parameters for Electricity Transmission and Distribution Network Service Providers[58]. Consistent with the Rules, the outcomes of the AER's WACC Review in relation to certain values, methodologies and credit rating levels apply to Powerlink's 2013-17 Revenue Proposal. The Statement of Revised WACC Parameters (Transmission)[59] specifies the following:

- risk free rate – to be based on the annualised yield on 10-year Commonwealth Government bonds for an agreed or specified period;
- equity beta – a value of 0.8;
- market risk premium – a value of 6.5%;
- capital structure – a debt to total market value proportion of 60%;
- credit rating – a credit rating level of BBB+; and
- gamma – an assumed utilisation of imputation credits of 0.65.

Powerlink has adopted these specified values for the purposes of its Revenue Proposal. However, in deriving the rate of return, a number of other parameters must be estimated.

7.2 Proposed Weighted Average Cost of Capital

Consistent with Sections 4.3.10 and 4.3.15 of the Submission Guidelines, the following provides a breakdown of the WACC calculation and demonstration of compliance with the Rules. Powerlink has also completed and lodged Submission Guideline pro forma statement 7.1.

7.2.1 Nominal risk free rate

Powerlink has nominated a period to be used by the AER to calculate the nominal risk free rate for the 2013-17 regulatory period. This information has been provided to the AER on a confidential basis, and will not be disclosed prior to the release of Powerlink's Final Revenue Cap Determination. However, Powerlink reserves the right to propose an alternative period within a reasonable timeframe, in the event that market conditions within the proposed averaging period appear abnormal.

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[57] National Electricity Rules, clause 6A.6.2, AEMC.

[58] Statement of the Revised WACC Parameters (Transmission), AER, May 2009 and Final Decision, Review of the Weighted Average Cost of Capital (WACC) Parameters, AER, May 2009.

[59] Electricity Transmission and Distribution Network Service Providers Statement of the Revised WACC Parameters (Transmission), AER, May 2009.

7.2.2 Debt margin

In recent years, the AER's approach has generally been to derive its estimate of the debt margin for a 10-year BBB+ rated bond from the fair value curves developed by either CBASpectrum, Bloomberg or some combination of the two sources.

However, in its first regulatory determination since CBASpectrum ceased publication of its fair value curves (in early September 2010) namely, the Victorian Distribution Network Service Providers' Decision[60], the AER adopted a different approach to estimating the debt premium by applying:

- 75% weight to the 7-year Bloomberg BBB debt risk premium extrapolated to 10-years using the rise in the Bloomberg AAA bond from 7 to 10 years.
- 25% weight to the Australian Pipeline Trust (APT) bond's debt risk premium.

To provide independent and expert assistance on this matter, Powerlink engaged PriceWaterhouseCoopers (PwC) to undertake analysis, and provide advice in relation to an appropriate methodology for estimating the debt risk premium. A full exposition of PwC's analysis and evidence is provided in PwC's report on the Methodology to Estimate the Debt Risk Premium, attached at Appendix C. The key findings and recommendations of PwC's analysis are provided below:

- The AER should not have accorded a 25% weighting to the APT bond debt risk premium. Further, the AER's suggestion that the Merton model explains why the APT bond debt risk premium might be expected to be low is heavily flawed in light of evidence pertaining to the Merton model itself (including from other researchers) and market practitioners.
- An appropriate methodology for estimating the debt risk premium would involve undertaking the following key steps:

  Step 1: Obtain Bloomberg estimates of the 5 and 7 year term BBB debt risk premiums.

  Step 2: Obtain an estimate of the debt risk premium for a 10-year BBB+ corporate bond by adding the rise in the last recorded 10-year Bloomberg AAA debt risk premium (from 7 to 10 years) to the Bloomberg 7 year debt risk premium. Obtain an estimate of the 10-year BBB+ corporate bond by applying the rise in the last recorded 10-year Bloomberg AAA debt risk premium (from 5 to 10-years) to the Bloomberg 5-year debt risk premium. Obtain a central estimate of the 10-year BBB+ bond by taking a simple average of the 7 and 5-year extrapolations.

  Step 3: Test whether the central estimate of the 10-year BBB+ debt risk premium obtained in step 2 is reasonable using broader bond information and alternative approaches, including:

  - longer dated fixed and floating rate bonds (adjusted to fixed rate equivalents) that are available in the BBB and A credit rating bands;
  - linear extrapolation of the Bloomberg 5 and 7-year BBB debt risk premiums; and
  - linear regression using available data for Bloomberg fixed and floating bonds (adjusted to fixed bond equivalents).

[60] Final Decision, Victorian Electricity Distribution Network Service Providers, Distribution Determination 2011-2015, AER, October 2010.

- Adopting the methodology outlined above, for the purposes of Powerlink's Revenue Proposal, PwC recommend a 10-year BBB+ debt risk premium of 434 basis points per annum being the average of:
    - An upper value of 456 basis points – the 7-year debt Bloomberg BBB debt risk premium, extrapolated to 10-years using the most recent data for the rise of the Bloomberg AAA debt risk premium between 7 and 10 years.
    - A lower value of 411 basis points – the 5-year Bloomberg BBB debt risk premium, extrapolated to 10-years using the most recent data for the rise of the Bloomberg AAA debt risk premium between 5 and 10 years.

Powerlink recognises that the AER will re-estimate the debt margin applicable to its 2013-17 regulatory period closer to the time of making its Final Decision. Notwithstanding this, Powerlink considers that the methodology used to estimate the debt margin should be appropriate and robust. Powerlink considers that the methodology proposed by PwC is suitable for this purpose.

7.2.3 Forecast Inflation

The AER's inflation forecast methodology is to adopt the Reserve Bank of Australia's (RBA) short term forecasts out two years, then to apply the RBA mid-point of the target range of 2.5% for the remaining three years. For the purposes of its Revenue Proposal, Powerlink has adopted the same approach. To this end, an inflation forecast for the 2013-17 regulatory period of 2.5% pa has been applied.

The PTRM also requires a CPI value applicable to the final two years of the current regulatory period. Powerlink has applied actual CPI of 3.3% for 2010/11 and the RBA mid-point target range of 2.5% for 2011/12.

7.2.4 Summary WACC Calculation

Table 7.2 provides a summary of the relevant parameters for calculation of the rate of return. This, along with other information is contained in AER pro forma 7.1.

Table 7.2: Summary of WACC calculation

Parameter/Definition	Powerlink Revenue Proposal
Nominal risk-free rate	5.62%
Inflation rate	2.50%
Debt margin	4.34%
Proportion of debt funding	60%
Cost of debt (nominal, pre-tax)	9.96%
Market risk premium	6.50%
Corporate tax rate	30%
Gamma	0.65
Equity beta	0.80
WACC (nominal, vanilla)	**10.30%**

7.3 Taxation allowance

As part of the post-tax nominal approach, a separate taxation allowance must be made in the revenue cap for corporate income tax, net of the value ascribed to dividend 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[61] and Section 4.3.17 of the Submission Guidelines require that details relating to the calculation and estimated cost of corporate income tax be provided. The taxation allowance was calculated using the following formula:

ETCt = (ETIt x rt) (1 – y)

- **ETIt** is 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** is the expected statutory income tax rate for that regulatory year as determined by the AER, currently 30%
- **y** is the assumed use of imputation credits, deemed to be 0.65.

Powerlink has used the AER's PTRM to calculate the taxation allowance and it is summarised in Table 7.3 below:

Table 7.3: Tax allowance ($m, nominal)

	2012/13	2013/14	2014/15	2015/16	2016/17	Total
Corporate income tax	57.5	63.3	72.4	78.1	83.2	354.6
Less value of imputation credits	37.4	41.1	47.1	50.8	54.1	230.5
Tax allowance	**20.1**	**22.2**	**25.3**	**27.4**	**29.1**	**124.1**

*Numbers may not add due to rounding.

7.4 Summary

In accordance with the Rules and Submission Guidelines, this Chapter explains the elements of WACC used in the cost of capital. Powerlink has adopted the specific values in the AER's Statement of Revised WACC Parameters where required, and has adopted expert advice and methodology in relation to the debt margin. In addition, the approach for calculating the nominal risk free rate, debt margin and forecast inflation is provided. The completed PTRM and Submission Guideline pro forma 7.1 accompany this Revenue Proposal.

[61] National Electricity Rules, Chapter 6A, clause 6A.6.4, AEMC.

8 Forecast Capital Expenditure

8.1 Introduction

Powerlink's capital expenditure forecasts for each year of the 2013-17 regulatory period, and total for the period, are presented in this Chapter. This Chapter describes Powerlink's capital expenditure categories used in preparing the Revenue Proposal, followed by the methodology adopted to forecast the capital expenditure. The key inputs and assumptions underpinning the forecasts are also explained, along with references to supporting documentation.

The capital expenditure forecast is summarised in this Chapter, along with the projects that contribute most to the forecast. The forecast capital expenditure is then shown to be efficient through benchmarking measures. Powerlink's capability to deliver the capital expenditure in a timely manner is also discussed, along with an outline of proposed contingent projects relevant to the next regulatory period.

8.2 Rules/AER Submission Guidelines requirements

The Rules[62] establish the information and matters relating to capital expenditure that must be provided in a Revenue Proposal. In particular, these include expenditure which:

- meets the capital expenditure objectives;
- complies with the AER's Submission Guidelines;
- is properly allocated to prescribed transmission services consistent with the Transmission Network Service Provider's (TNSP's) Cost Allocation Methodology;
- includes both total and year-by-year forecasts; and
- is a reliability augmentation or has satisfied the AER's Regulatory Investment Test or Regulatory Investment Test for Transmission (RIT-T) where appropriate.

A TNSP's Revenue Proposal should also include capital expenditure required in relation to contingent projects.

Section 4.3.3 of the Submission Guidelines also stipulates the minimum capital expenditure information requirements which a TNSP must provide in its Revenue Proposal, including the nature and form of some of these requirements. Powerlink considers that the information in the sections below meet these requirements. In addition, Powerlink has prepared and submitted the requisite pro forma statements relevant to forecast capital expenditure namely, 4.1, 4.2, 4.3 and 4.4.

Where appropriate, capital expenditure that corresponds to reliability augmentations or which has satisfied the AER's Regulatory Test, or Regulatory Investment Test (RIT-T where appropriate), has been identified.

8.3 Capital expenditure objectives

Powerlink is the sole holder of a Transmission Authority under the *Electricity Act 1994 (Qld)*. Consequently, as noted in Section 3.2, Powerlink is subject to mandated reliability and other obligations under its Transmission Authority.

Powerlink is also a registered TNSP in the National Electricity Market (NEM) and must comply with the Rules. Among other things, Powerlink's obligations under the Rules relate to its

[62] National Electricity Rules, schedule S6A.1.1; clause 6A.6.7, AEMC.

operation as an efficient, regulated network service provider, the connection of distributors and other users to the transmission network, the planning and development of the transmission network and technical performance standards (e.g. planning, design and operating criteria).

In addition, Powerlink is subject to various other environmental, cultural heritage, planning approval, Workplace Health & Safety, financial and other regulatory obligations or requirements under a range of Federal, State and local government legislation, Codes, Standards, policies and other instruments.

Powerlink considers that its Revenue Proposal achieves the capital expenditure objectives in light of, and having regard to, these factors.

8.4 Capital expenditure categories

To assist the AER and stakeholders in understanding the nature of expenditure proposed to be undertaken in the next regulatory period, Powerlink's capital expenditure is divided into the categories below. These categories are consistent with those approved by the AER for Powerlink for the current regulatory period.

Table 8.1: Categories of capital expenditure

Category	Definition	Transmission Service
Network – Load Driven		
Augmentations	Relate to augmentations defined under the Rules. Includes projects to which the RIT-T (or Regulatory Investment Test for Transmission) 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, shared services and exit services

Category	Definition	Transmission Service
Network – Non-load Driven		
Replacements	Relate to the replacement of lines, substations, communications equipment, secondary systems, etc. Projects are primarily undertaken due to end of life, obsolescence, reliability or safety requirements and result in either new assets or an extension to the remaining life of the existing asset. Assets are generally replaced with "modern day equivalent" assets.	Exit services, TUOS services and common services
Security/ Compliance	Projects 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.	Entry/exit services, TUOS services and common services
Other	All other projects associated with the network which provide prescribed transmission services, such as communications systems enhancements, improvements to switching functionality and insurance spares.	Common services
Non-network		
Business IT	Projects to maintain IT capability and improve business system functionality where appropriate.	Common services
Support the Business	Projects to replace and upgrade business requirements including the areas of commercial buildings, motor vehicles and moveable plant.	Common services

8.5 Forecasting methodology

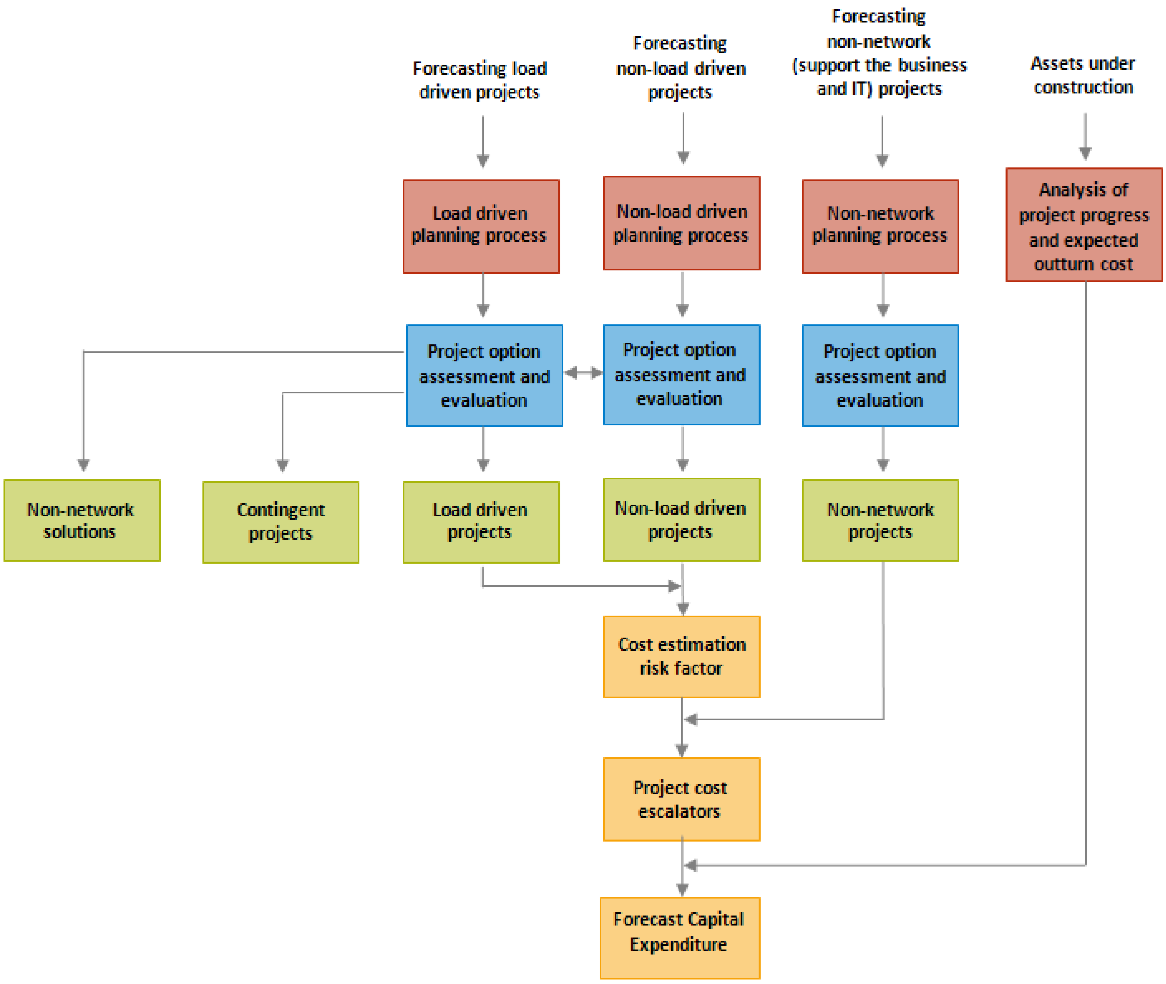
This Section describes Powerlink's capital expenditure forecasting methodology as required under the Rules[63]. Powerlink's approach to forecasting its future capital expenditure requirements is tailored according to the whether the project is:

- Load-driven (network) – in order to comply with its mandated reliability obligations as the load (or demand) grows and/or delivery of net benefits to the market.
- Non-load driven (network) – primarily associated with the replacement of assets to maintain the capacity or capability of the network.
- Non-network – comprising, in large part, business information technology and support the business assets required in the normal day-to-day course of business.
- Classed as assets under construction – either approved (or expected to be approved) and commenced before the end of the current (2008-12) regulatory period.

Figure 8.1 provides an overview of Powerlink's capital expenditure forecasting methodology. Each of the approaches is discussed in the sections below with further detail on key inputs and assumptions in Section 8.6.

[63] National Electricity Rules, schedule S6A.1.1, AEMC.

Figure 8.1: Capital expenditure forecasting methodology



8.5.1 Forecasting methodology – load driven network projects

Load driven network projects include augmentations, connections to the distribution networks, easements and land acquisitions. To derive its forecast capital expenditure for projects in this category, Powerlink adopted a probabilistic capital expenditure forecasting approach.

Economic, environmental and political factors result in considerable uncertainty with respect to the location and amount of generation developments that could meet load forecast requirements in the NEM. To address these and other externally driven uncertainties, Powerlink has (as in previous revenue resets) developed its capital expenditure forecast using a probabilistic approach, with expert assistance from ROAM Consulting.

Key components of ROAM's analysis are to identify the location of generation to service the forecast demand and to develop plausible market development scenarios. For the purposes of Powerlink's Revenue Proposal, ROAM developed 20 plausible market development scenarios, based on similar drivers, or theme sets, to AEMO's 2010 National Transmission Network Development Plan (NTNDP).

Powerlink analysed each of the plausible market development scenarios to identify the limitations that would arise on the Queensland transmission network in the event the market development scenario eventuates. The limitation can be driven by thermal, transient and / or voltage stability constraints. Options to overcome these limitations were developed and their costs are estimated. Options considered included technically and economically feasible network projects and non-network solutions. Powerlink performed an economic comparison of the options using techniques consistent with the assessment of options for the Regulatory Investment Test to determine the preferred option. Where applicable, net market benefits were also considered in the economic analysis.

Load driven projects and associated technical and financial analysis are documented in Powerlink's Grid Plan. Powerlink's detailed Grid Plan has been provided to the AER on a confidential basis. A summary of load driven network projects greater than $25m is provided in Table 8.9.

8.5.2 Forecasting methodology – non-load driven network projects

Powerlink's forecast non-load driven network projects were developed in the context of its asset management practices, embodied in the Asset Management Strategy provided in Appendix D. The strategy discusses the key business drivers and risks for delivery of transmission services by Powerlink, and sets out Powerlink's strategic framework for asset management.

In light of Powerlink's various legislative and other obligations, non-load driven projects were prepared on a risk assessment, prioritisation and management basis to optimise the timing and type of replacement against the risks associated with allowing the asset to remain in service. Plant condition assessments and/or performance reports provided an important input to this assessment.

Once a non-load driven need has been identified, similar to the load driven projects, a detailed option assessment and evaluation is carried out. This includes scoping and estimating the cost of a number of credible options. These costs are compared, along with the inherent network risk, to establish the optimum and most efficient solution.

Powerlink's proposed load and non-load driven network development plans have also been designed to coordinate asset replacement requirements with the broader capital works program. In doing so, Powerlink is able to capitalise on a range of synergistic projects (whether by timing, geographical location or work type) to enhance efficient program delivery.

Non-load driven projects are detailed in Powerlink's Non-Load Driven Plan, inclusive of options, risk and financial analysis. The Non-Load Driven Plan has been provided to the AER on a confidential basis. A summary of non-load driven network projects greater than $25m is also provided in Table 8.9.

8.5.3 Forecasting methodology – non-network projects

Powerlink's future capital expenditure requirements also include non-network investments which comprise primarily business information technology and support the business expenditure (e.g. buildings, motor vehicles, mobile plant and other tools and equipment).

Forecasting of information technology requirements has been undertaken through a planning process that identifies specific future business needs and expenditure required for information technology applications and infrastructure. These needs are integrated within an overall plan aligned with the information technology investment strategies. Forecast expenditure is adjusted within each strategy area to ensure future investment is prioritised in accordance with Powerlink's overall corporate and asset management strategies.

Building, fleet and other support the business capital expenditure was developed with regard to a mix of historic trends and future expectations of business requirements. Future investment requirements for buildings takes into account known projects to renew or expand building capacity based on forecast business requirements. In addition, provisions for future capital expenditure to replace assets forming part of buildings are based on assessed condition and historical expenditure profiles. Fleet, mobile plant and other support the business capital expenditure has predominantly been forecast with regard to historical capital expenditure trends and adjusted where specific future investment requirements have been identified.

Powerlink's detailed Non-Network Plan has been provided to the AER on a confidential basis.

8.5.4 Project risk and cost escalations

Given the exogenous risks associated with estimating projects many years in advance, Powerlink has applied a cost estimate risk factor (based on independent advice using the methodology accepted by the AER in Powerlink's last reset process). It should be noted that the cost estimate risk factor has only been applied to unapproved network projects given the significant nature of the exogenous risks involved.

Project costs are also escalated by the main cost components to reflect the nominal costs associated with future project expenditure. The cost escalators are derived from independent expert advice and include labour, land, material, plant and other components.

8.5.5 Assets under construction

Powerlink's Revenue Proposal also includes a number of committed projects which involve varying amounts of capital expenditure in the 2013-17 regulatory period. An assessment of the need, prudency and efficiency of these projects has, or is expected to be, undertaken by Powerlink during the current regulatory period, in accordance with the Rules and its established capital project governance processes.

Consistent with the ex-ante capital expenditure framework in the Rules, the AER and its consultants undertook a detailed ex-ante assessment of Powerlink's proposed expenditure for this regulatory period at its last regulatory reset to establish Powerlink's capital expenditure allowance. The costs associated with these committed projects have been included in the forecast capital expenditure, and are detailed in the historic and forecast capital expenditure templates.

8.6 Key inputs and assumptions

Powerlink's future capital expenditure forecasts are underpinned by a number of key inputs and assumptions. The following sections explain each of these in turn.

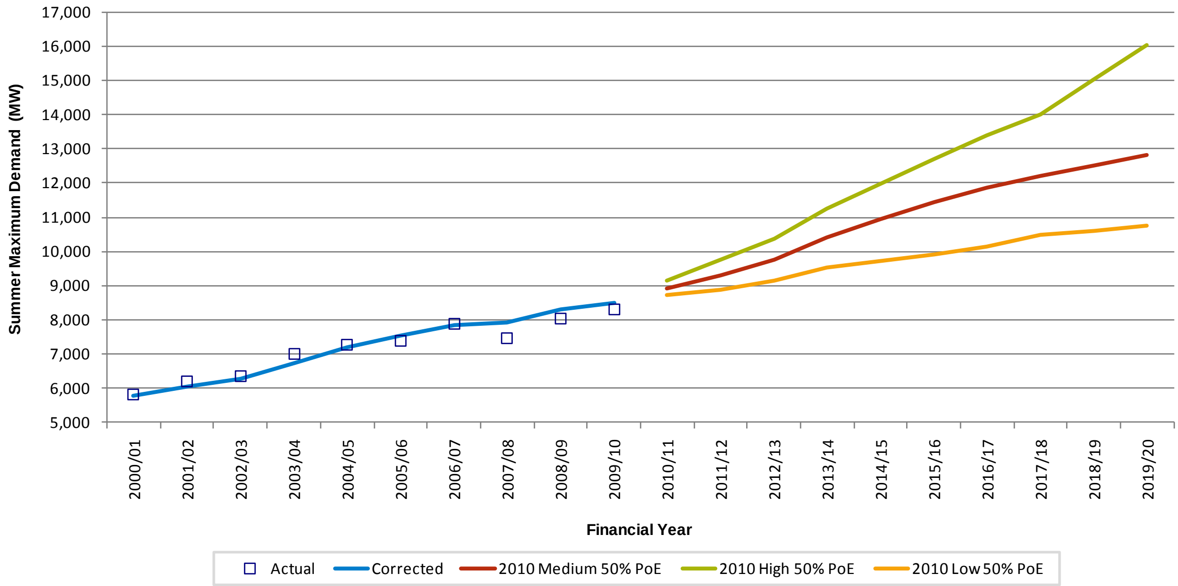
8.6.1 Demand forecasts

As required under Section 4.3.16 of the Submission Guidelines, the demand forecast used in preparing this Revenue Proposal is discussed below. Powerlink has an obligation to produce peak electricity demand (summer and winter) and energy forecasts each year. Powerlink provides these annual forecasts to the Australian Energy Market Operator (AEMO) each year for inclusion into the Electricity Statement of Opportunities (ESOO).

The demand forecasts assumed for the scenarios used to forecast capital expenditure are consistent with the demand and energy forecasts published in Powerlink's 2010 Annual Planning Report[64]. Powerlink has also provided additional supporting data used to develop the 2010 Annual Planning Report demand forecast to the AER on a confidential basis. Figure 8.2 below shows low, medium and high economic outlooks corresponding to the growth in Queensland's Gross State Product (GSP) and Australia's Gross Domestic Product (GDP) forecasts provided by independent market experts.

[64] Annual Planning Report 2010, Powerlink Queensland, 2010.

Figure 8.2: Summer peak electricity demand



Source: Annual Planning Report, Powerlink, 2010.

Electricity usage in Queensland has grown strongly during the past 10 years, and this trend is expected to continue. Under the medium economic (50% Probability of Exceedance (PoE)) outlook, summer maximum demand delivered from the transmission network is forecast to increase at an average annual rate of 4.2% per annum from 8,489MW in 2009/10 to 12,821MW in 2019/20. This demand growth is attributable to the rapid expansion and development of the resource industry and supporting infrastructure such as rail, ports and townships, coupled with strong population growth (albeit at growth rates below the pre-GFC peaks).

Powerlink's demand and energy forecasting process is detailed in the Demand and Energy Forecast Methodology provided to the AER on a confidential basis. Powerlink notes that its methodology is consistent with the AER's recently released view of best practice demand forecasting[65]. Specifically, in relation to maximum demand forecasting, Powerlink's methodology addresses the key areas noted by the review including:

- spatial (bottom up) forecasts validated by independent system level (top down) forecasts;
- weather normalisation;
- adjusting for temporary transfers;
- adjusting for discrete block loads; and
- the incorporation of maturity profiles of service areas in spatial time series.

8.6.2 Market development scenarios

Powerlink commissioned ROAM Consulting to conduct wholesale market modelling and provide expert advice on generation scenarios that will likely influence future transmission development in Queensland out to 2021/22. ROAM's detailed analysis resulted in 20 plausible market development scenarios with various associated load growth assumptions, levels and locations of generation development.

[65] Presentation to ENA Working Group Energy and Demand Forecasting, AER, 18 March 2011.

The outputs from ROAM's analysis were input to Powerlink's network modelling to determine future transmission network limitations and, consequently, identify the need for load-driven augmentations, as well as works to reinforce connections to the Queensland DNSPs.

An overview of the scenario themes analysed by ROAM is provided in Table 8.2 below.

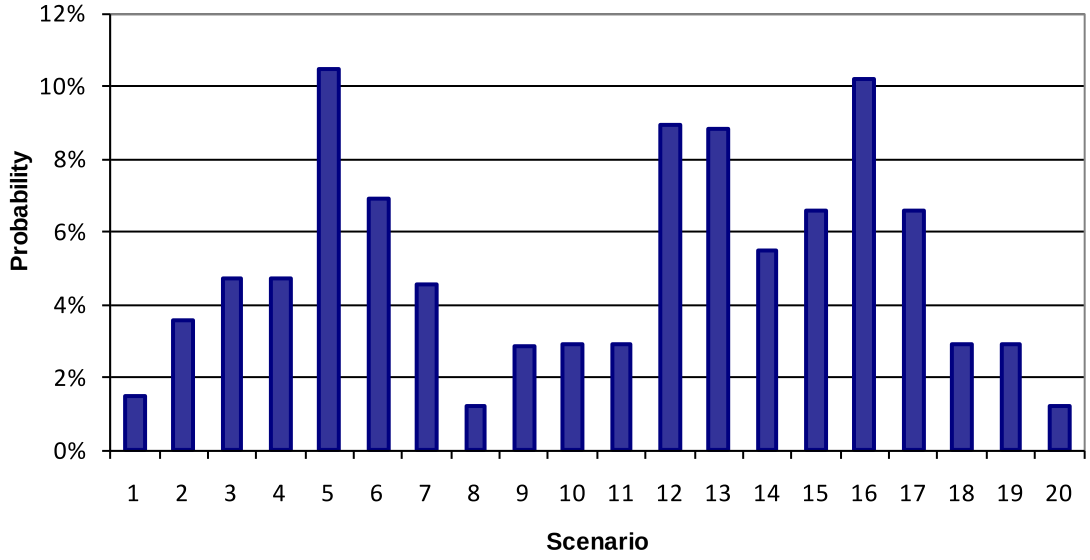
Table 8.2: ROAM market development scenario themes

Themes	Descriptions
Load Growth	
Low	Low economic outlook demand forecast. Representative of the lower 10% probability band over the forecast period.
Medium	Medium economic outlook demand forecast. Representative of the most probable outcome over the outlook period.
High	High economic outlook demand forecast. Representative of the upper 10% probability band over the forecast period.
Carbon Price Trajectory	
-5%	5% reduction in emissions from 2000 levels by 2020.
-10 to -15%	10-15% reduction in emissions from 2000 levels by 2020.
-25%	25% reduction in emissions from 2000 levels by 2020.
LNG Industry Expansion	
MOD	Moderate LNG expansion. Denotes the assumed development of around 1-5 LNG production facilities or trains.
AGG	Aggressive LNG expansion. Denotes that 4-8 LNG trains are assumed to be developed over the next decade.

Source: Generation Scenarios for 2012 Revenue Reset Application, ROAM Consulting, May 2010.

On the basis of a combination of these different theme sets, ROAM recommended that 20 market development scenarios would be applicable for analysis of the Queensland transmission network over the next 10 years. The probabilities of each market development scenario are summarised in Figure 8.3.

Figure 8.3: Market development scenario probabilities



Source: Generation Scenarios for 2012 Revenue Reset Application, ROAM Consulting, May 2010.

In the context of a highly uncertain environment and, given the very nature of probabilistic forecasting, it should be noted that no single scenario has a probability of occurrence of greater than 10.5%.

A full and detailed report of the analysis undertaken by ROAM, including all underlying assumptions and other inputs to the analysis, is provided at Appendix E.

8.6.3 Network modelling

The network models used to develop Powerlink's capital expenditure forecast 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. For existing plant, data is based on primary sources such as transmission line tests, generator tests and transformer test certificates, and on secondary sources such as line impedances calculated from first principles. For future plant, data is based on models of similar plant for generators and transformers and similar transmission lines, adjusted to account for conductor type and configuration, tower geometries, differences in lengths and voltage levels.

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 service providers.
- The key outputs of the modelling are provided to, and discussed with, AEMO (and previously NEMMCO) and other network service providers, where appropriate, on a regular basis.
- The integrity and validity of Powerlink's modelling has been subject to review by the AER and its consultants at each revenue reset.

8.6.4 *Augmentation planning criteria*

An important feature of the arrangements in Queensland is that Powerlink has mandated reliability obligations that drive non-discretionary investment in its network to cater to load growth. Notably, Powerlink's Transmission Authority[66] requires that Powerlink plan and develop its network according to an "N-1" criterion. These mandated obligations also include a requirement to apply "good electricity industry practice" which, in-turn, necessitates the use of a range of supporting technical standards. These mandated obligations, along with the technical standards comprise Powerlink's Planning Criteria, and are provided in Appendix F. The planning criterion reflects Powerlink's statutory obligations to plan and develop its transmission network as prescribed under:

- the National Electricity Rules;
- the Queensland Electricity Act;
- Powerlink's Transmission Authority;
- customer Connection Agreements; and
- other relevant legislation and permitting arrangements.

8.6.5 *Asset replacement framework*

Powerlink has applied its Asset Management Strategy in preparing this Revenue Proposal. Powerlink's asset management system aligns with this strategy, and is designed to ensure that assets are managed in a manner consistent with Powerlink's overall corporate objectives to deliver effective and efficient transmission services.

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. Powerlink evaluates assets in the end of life phase against a set of parameters that may lead to asset replacement, life extension or disposal. The ongoing need to extend the life of, or replace assets, collectively referred to as asset replacement, flows from confirmation that the assets are required to reliably support existing and future network demand.

Powerlink's asset replacement framework is based on the fundamental principle that the age of an asset does not provide automatic justification of its replacement, but is a trigger for condition assessment or other analysis to appraise the overall performance of the asset. The condition assessment and performance appraisal process identifies whether the asset requires replacement due to issues associated with capacity, capability or compliance. Where the observed condition of the asset departs from established functional and performance criteria, a clear need is established to replace the asset through further capital investment.

For identified replacement needs, a range of options with associated estimated cost and timing are developed and an appraisal of technical, economic and risk factors is undertaken to select the preferred option. The risk management framework adopted for asset replacement is in line with Powerlink Queensland's Risk Management Charter, and in accordance with AS/NZS ISO 31000:2009 Risk Management.

[66] Transmission Authority – No. T01/98, Queensland Government, December 2010.

The risk framework has been employed to assess each replacement need against the following criteria:

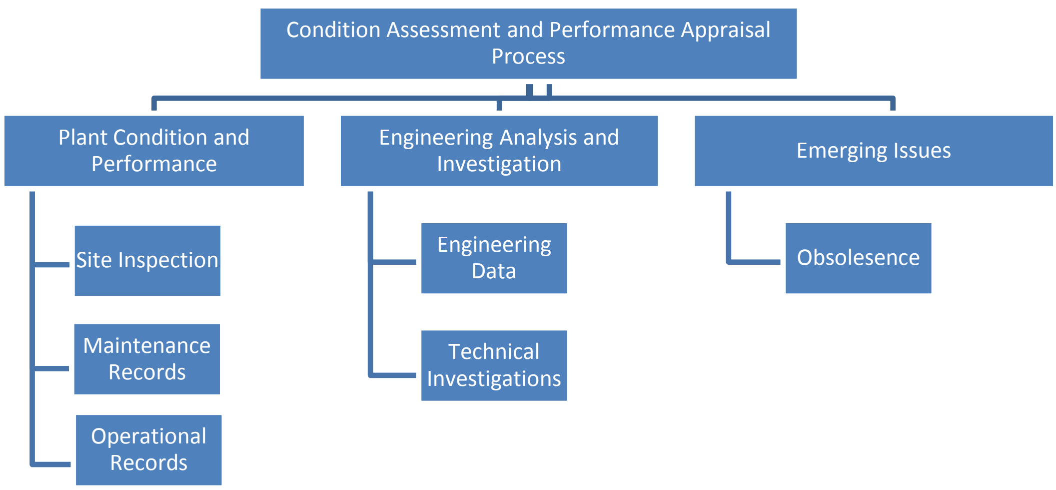
- Reliability (Capability) – The impact on supply reliability can be measured as the number of interruptions, outage duration, cost to repair under emergency situations, or energy not supplied.
- Obsolescence (Capability) – Technical support not available from manufacturer or within Powerlink, equipment out of production and spares unavailable.
- Operational (Capacity) – Potential impact/constraint on the capacity of the network to provide supply.
- Compliance which consists of:
  - Safety – Potential to affect Powerlink personnel (including staff, contractors, etc) and/or the public.
  - Environmental – Potential to impact the environment, external to the asset or site. Legislative obligations result in absolute compliance triggers.

The criteria applied for asset replacement planning provides a framework that clearly establishes the need for replacement at the end of the asset's life, and optimises technical, economic and risk factors associated with options developed to address each need.

8.6.6 Condition assessment and performance appraisal

The condition assessment and performance appraisal process for network assets involves site inspections, analysis of maintenance records, operational performance, engineering data, technical investigations, emerging issues associated with obsolescence and other relevant data to develop a holistic view of the condition of the asset. Figure 8.4 demonstrates how these inputs contribute to the condition assessment and performance appraisal process.

Figure 8.4: Inputs to the condition assessment and performance appraisal process



Depending upon the type of asset, all or parts of the condition assessment and performance appraisal process will be applied to develop an overall strategy for ongoing maintenance, operational refurbishment or asset replacement.

Site inspections

Site inspections are undertaken where the failure modes or degraded condition of the asset is evident through physical observation, and are programmed to occur in line with the age profile of the asset.

Maintenance records

Powerlink implements a program of preventive and corrective maintenance, from which reports are derived regarding defects or the abnormal condition of plant and equipment. In line with normal work management processes, these reports are documented in SAP in the form of defect notifications, work orders and measurement documents.

Operational records

Powerlink maintains a range of systems for monitoring the operational performance of plant and equipment. An example of this includes the Forced Outage Database (FOD) that records forced outages of the high voltage transmission network. This database is supported by a business process that seeks to establish the root cause of each event, and reports to the relevant asset strategies group where this is attributed to the condition or performance of plant or equipment that may require further action.

Engineering data

The collection or analysis of engineering data provides information relating to the designed performance of the asset. This could include structural, electrical, layout and configuration design information.

Technical investigations

Specific issues with plant condition or performance are on occasion referred for further technical investigation to engineering consultants, particularly when the technical solution required to respond to the observed plant or equipment condition is of a compliance nature.

Obsolescence

Powerlink actively monitors emerging issues associated with plant or equipment becoming obsolete, through relationships with product vendors and manufacturers.

8.6.7 Project scope and cost estimates

Powerlink's project cost estimates are developed by means of its estimating cost database which are underpinned by Base Planning Objects (BPOs). BPOs are essentially unit rates applicable to different types of assets (e.g. lines, substations, primary plant, substation secondary systems equipment), and vary with the assumed inputs to construction. These inputs include components such as steel, aluminium, equipment and labour.

Powerlink employs a detailed, bottom-up process to establish and revise its BPOs over time, based upon its experience with implementing projects under Queensland conditions.

Consistent with industry and estimating practice, due to uncertainty, the accuracy of the estimates depends upon the point in time at which the estimate is made relative to project commissioning. In light of the timing and hence level of technical analysis undertaken to formulate its estimates of future projects out to 2016/17 and beyond, Powerlink attributes an accuracy of ±20% to its BPO estimates, commonly referred to as Concept Estimates. The vast majority of Powerlink's future capital expenditure is based on Concept Estimates. However, where projects have been subject to Powerlink's full business estimating and approval process (given their timing), an accuracy of ±5% is attributed to their estimated cost (i.e. for Project Proposals).

To test the veracity of its estimates, Powerlink sought an independent review of a sample of projects from Power Systems Consultants. This is discussed further in Section 8.10.

Powerlink considers that its estimating process is robust, and produces estimates which represent the costs that a prudent operator would incur under the same circumstances.

8.6.8 Cost estimation risk factor

Actual project costs are often higher than initial estimates, due to the level of uncertainty prior to the development of the project's detailed scope and the risks associated with events during the life of a project that were not foreseen at the time of estimation. For example, in preparing a Revenue Proposal, a TNSP is required to develop scopes and estimates for projects which may not be commissioned until some 7-10 years into the future. Under normal business operating conditions, preparation of a detailed scope and estimate for such projects does not occur until much closer to the time of making the investment decision, which is typically three years prior to project completion.

Given this inherent difficulty in estimating, Powerlink has commissioned Evans & Peck to provide expert analysis and opinion on the expected risk distribution of Powerlink's capital project portfolio in the 2013-17 regulatory period. Evans & Peck undertook statistical modelling of the estimated and actual project costs delivered by Powerlink in the current regulatory period to derive a risk adjustment factor. From this data, a risk adjustment factor of 3% has been established. This factor has been incorporated into Powerlink's capital accumulation model for unapproved network projects only, and hence into Powerlink's future expenditure forecasts. A copy of the Evans & Peck report is attached at Appendix G. Further details on the approach to applying the costs estimate risk factor and costs escalators is included in Powerlink's capital accumulation model and Capital Accumulation Model Methodology, which have been provided to the AER on a confidential basis.

8.6.9 Project cost escalators

To determine appropriate rates of escalation for key cost inputs to future capital expenditure projects over the next regulatory period, Powerlink engaged independent experts BIS Shrapnel, Sinclair Knight Merz and Urbis to develop cost escalators for labour, materials and land values, respectively. The three reports are provided at Appendices H, I and J. The reports do not reflect the impacts of the recent Queensland flood and cyclone events. Powerlink may update these expert reports when the impacts of these events are fully reflected in the data used by the Consultants. A brief overview of the recommendations resulting from the analyses is presented below.

Labour

Powerlink commissioned BIS Shrapnel to provide its expert opinion on the outlook for a range of labour cost escalators relevant to electricity networks in Queensland over a seven year period from 2010/11 to 2016/17. BIS Shrapnel recommends that movements in Average Weekly Ordinary Time Earnings (AWOTE) represents the best measure for estimating wage cost movements in Powerlink's Revenue Proposal, as it measures both the changes in the price of grades of specific labour and the changes in skill levels. Specifically, BIS Shrapnel recommend the following escalators:

- AWOTE for the Electricity, Gas and Water (EGW) sector for internal network-related labour, who include a range of skilled labour involved in construction, maintenance, design and operation of the electricity network. Overall, Australia EGW AWOTE growth is projected to average 2.1% p.a. over the next seven years, with Queensland matching the national average. For the five year regulatory period out to 2016/17, Queensland EGW AWOTE growth is forecast to average 2.2% p.a.

- AWOTE in the Business Services (BS) sector for internal general labour, which includes mainly clerical/administration staff which provide mainly administration and corporate services. Over the next seven years, BS wages are forecast to average 2.4% p.a. across Australia. While BS wages for Queensland are forecast to be weaker than the national average over 2010/11 and 2011/12, for the five years thereafter, they are forecast to generally outpace the national average due to stronger economic and investment growth, largely due to another major round of resources investment, averaging 2.8% p.a.
- AWOTE for the construction sector for external labour on construction related projects. Construction AWOTE growth over the next seven years is forecast to average around 2.6% p.a. for Australia and 2.5% p.a. for Queensland. However, over the five year regulatory period, construction AWOTE growth is forecast to average 2.7% per annum.

A summary of relevant forecasts contained in BIS Shrapnel's report and applied in Powerlink's Revenue Proposal are provided in Table 8.3 below:

Table 8.3: Wages growth forecast (% real)

	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
EGW AWOTE - Qld (Internal-Specialist)	2.0	1.8	1.9	2.4	2.6	2.1	2.0
BS AWOTE - Qld (Internal-General)	1.5	1.2	2.8	3.2	3.0	2.2	3.0
Construction AWOTE - Qld (External)	1.7	1.8	2.2	3.9	3.2	2.0	2.4

Source: Labour Cost Escalation Forecasts to 2016/17 - Australia and Queensland, BIS Shrapnel, November 2010.

Materials

Key components of Powerlink's input costs are materials such as aluminium, steel, copper as well as plant. To establish appropriate materials escalation factors for its 2013-17 regulatory period, Powerlink engaged Sinclair Knight Merz (SKM) to provide expert advice. SKM considers that the escalation rates in Table 8.4 below represent the underlying drivers of network infrastructure plant and equipment costs and are specific to the operating environment faced by Powerlink:

Table 8.4: Materials growth forecast (% real)

	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Aluminium	12.6	3.6	0.8	0.0	-0.4	-0.7	-0.8
Copper	18.2	0.2	-5.1	-6.8	-7.7	-8.3	-8.9
Steel	10.2	3.5	0.6	-3.2	-2.0	-2.3	-2.4
Plant and equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: US$ based Cost Escalation Factors for upcoming Regulatory Period to June 2017, Sinclair Knight Merz, 3 Dec 2010.

The escalators provided by SKM were established on the basis of USD forecasts of materials costs. In preparing its capital expenditure and operating expenditure forecasts, Powerlink has adopted SKM's recommended materials escalators and scaled the forecasts to AUD forward price movements using the Econtech US foreign exchange forecast presented in Table 8.5.

Table 8.5: USD/AUD foreign exchange forecast

	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
USD/AUD	0.98	0.93	0.87	0.80	0.81	0.82	0.82

Source: Australian National, State and Industry Outlook - Dec Qtr 2010 to June Qtr 2019, KPMG Econtech, March 2011.

The majority of Powerlink's overseas plant procurement is in USD. As such the USD foreign exchange rate forecast has been adopted as a proxy for foreign exchange rates for the purchase of overseas plant and equipment.

Land

In light of market evidence which indicates that land values have risen in the last decade, Powerlink has sought to ensure its forecast expenditure estimates take account of such trends at an appropriate rate. To this end, Powerlink engaged Urbis to provide its expert opinion on forecast land escalation rates out to 2016/17.

Urbis has provided land escalation rates based on two land use categories – urban and rural, derived from four broad areas in Queensland (North Queensland, Central Queensland, Southern Queensland and South East Queensland). The urban land use category combines residential and industrial land categories. Forecast rates of increase were developed using trend analysis of historic sales data sourced from commercial on line data based systems including RP Data and Property Data Solutions Live, which are recognised data collection agencies within the property industry. Urbis's forecasts also rely on its detailed understanding of the relationships between the real economy, development cycles and the property market as well as major regional drivers.

Powerlink has adopted the following forecasts from Urbis in preparing this Revenue Proposal as summarised in Table 8.6 and provided at Appendix J:

Table 8.6: Land value growth forecast (% real)

	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Urban	-2.5	5.5	10.5	14.5	15.5	14.5	12.5
Rural	1.5	8.5	10.5	9.5	9.5	9.5	8.5

Source: Forecast of Land Value Escalation - Queensland, Urbis, January 2011.

8.6.10 Equity raising costs

Equity raising costs must be paid by an entity when it raises equity capital. These include payments to equity arrangers for services such as structuring the issue, preparing and distributing information and undertaking presentations to prospective investors. These costs have also been included in Powerlink's forecast capital expenditure.

To provide expert advice in relation to equity raising costs, Powerlink engaged PwC to review the AER's current equity raising cost approach and to determine an appropriate methodology for, and estimate of, equity raising costs for the purposes of Powerlink's next regulatory period. PwC's full expert report is provided at Appendix K.

Equity raising cost methodology

PwC considers that a dividend yield approach remains an appropriate means by which to estimate equity raising costs, as opposed to the AER's dividend reinvestment plan approach. Under such an approach, PwC consider that a dividend yield for infrastructure businesses of 8.4% should be applied as the benchmark to determine Powerlink's equity raising cost requirements.

Having analysed the evidence on equity offers undertaken by Australian listed companies between 2004 and 2010, PwC recommend that a 3% allowance for Seasoned Equity Offerings (SEO) costs be maintained.

In addition, PwC investigated dividend reinvestment plans used by energy utilities since 2000. The results of this analysis show that the dividend reinvestment plan amount received for these utilities has averaged 17.7% of the dividends paid. On this basis, PwC consider that an appropriate benchmark assumption is that 18% of dividends paid will be returned through a dividend reinvestment plan at a cost of 1% of the amount raised.

Powerlink proposal – 2013-17 regulatory period

PwC applied its methodology to determine the equity raising costs required by Powerlink in its next regulatory period. This results in a required total equity raising cost allowance of $31.5m over the 2013-17 regulatory period. Discounted back to $2011/12 using a notional 10% WACC for inclusion in the opening RAB, Powerlink's proposed equity raising costs total $24.7m.

Contingent project adjustment

In July 2008, the AER released its Revocation and Substitution of Powerlink's 2007/08 to 2011/12 Revenue Cap – Amendment for the South Pine to Sandgate contingent project. The contingent project related to the inclusion of the additional costs of undergrounding a section of line on the South Pine to Sandgate project.

Powerlink notes that while the AER amended Powerlink's 2007 Revenue Cap Decision for the additional debt-raising costs associated with this project, it did not made a corresponding adjustment for additional equity raising costs. Consequently, Powerlink seeks recovery in the amount of $363,000 in additional equity raising costs, consistent with the Rules requirement to allow for forecast capital expenditure and incremental operational expenditure. To this end, Powerlink's proposed PTRM modelling has been adjusted to allow for such additional costs in the RAB.

8.7 Directors' Responsibility Statement

In accordance with the Rules[67] and Section 4.3.2 of the Submission Guidelines, this Revenue Proposal must contain a certification of the reasonableness of the key assumptions that underlie the capital expenditure forecast by the Directors of Powerlink.

The Director's responsibility statement is included in Appendix L.

8.8 Forecast capital expenditure

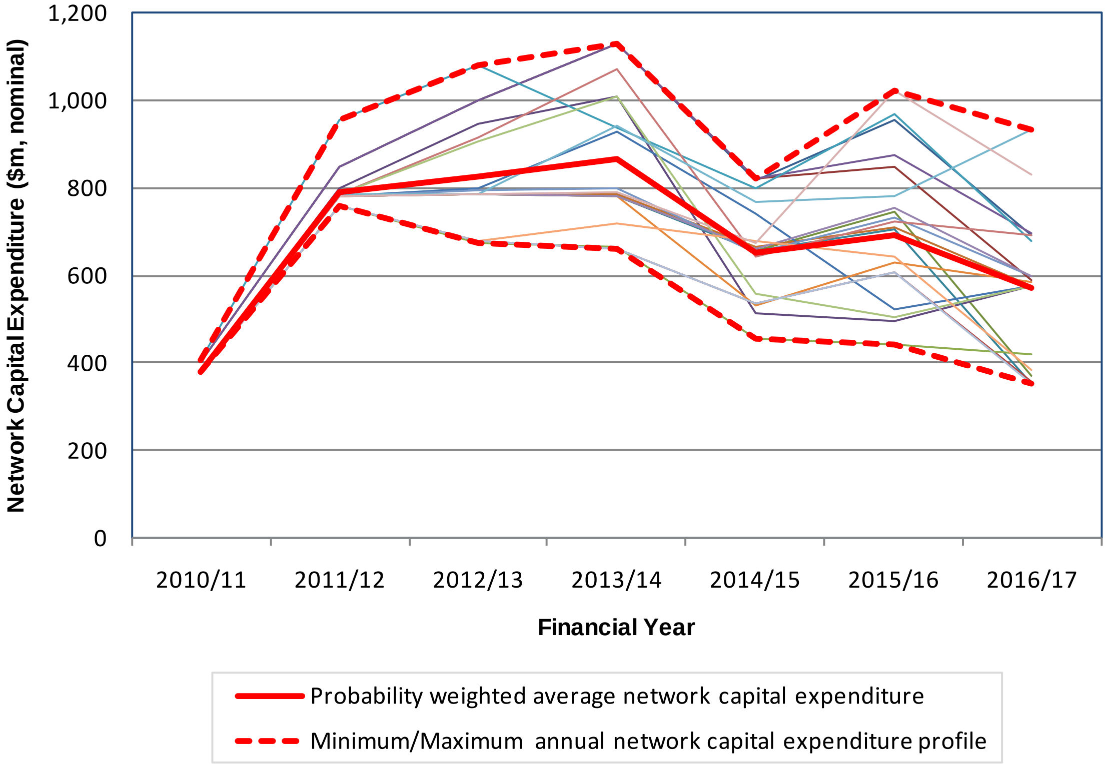
A summary of Powerlink's forecast capital expenditure and the alignment with AEMO's National Transmission Network Development Plan (NTNDP) is contained in the following sections.

[67] National Electricity Rules, Chapter 6A, schedule S6A.1.1(5), AEMC.

8.8.1 Network capital expenditure

Figure 8.5 illustrates the annual capital expenditure profile which results from each of the 20 market development scenarios proposed by ROAM and the non-load driven requirements. For clarification, the red dotted lines show the envelope of expenditure that the scenarios could potentially result in over the next regulatory period. The red solid line represents Powerlink's expected capital expenditure requirement for the period – namely, the probability weighted average expenditure of the 20 market development scenarios and the non-load driven projects. Based upon all information reasonably available to Powerlink at the time of preparing its Revenue Proposal, Powerlink considers that , given that large, uncertain needs are included separately as contingent projects, it should be able to manage its capital expenditure within the envelope of plausible scenarios developed.

Figure 8.5: Network capital expenditure profile ($m, nominal)



Source: Powerlink data.

8.8.2 Statement of consistency with the NTNDP

The Rules[68] require that the Revenue Proposal include a statement of whether it is consistent with the most recent NTNDP and, if not, to identify and give reasons for the inconsistency.

Powerlink considers that its Revenue Proposal is consistent with the 2010 NTNDP to the extent reasonable and practicable. In particular, in relation to:

- Similar demand forecasts - the 2010 NTNDP was based on Powerlink's 2009 APR forecast and verified against Powerlink's 2010 APR forecast prior to release.
- Similar high level themes to drive market scenarios, including the range of economic growth and carbon pricing assumptions.

[68] National Electricity Rules, Chapter 6A, clause 6A.10.1, AEMC.

- The consistent application of Powerlink's mandated reliability criteria in determining triggers for augmentation.
- The range of augmentation options and costs, as provided in Powerlink's 2010 APR.
- The support for a prima facie market benefits case for an incremental QNI upgrade. This upgrade is included as a contingent project in this Revenue Proposal.
- Recognition of AEMO's preliminary analysis on NEMLink by including the Queensland component of any necessary works as a contingent project in this Revenue Proposal.

AEMO published its inaugural NTNDP in December 2010. Under the Rules, Powerlink is required to publish its APR by 30 June each year. Powerlink's Revenue Proposal is underpinned by its 2010 APR, which was released approximately six months prior to publication of the first NTNDP. However, due to the time required to undertake the NTNDP supporting analyses, AEMO had commenced work on the NTNDP using Powerlink's 2009 APR. Notwithstanding this, Powerlink liaised closely with AEMO planning personnel prior to publication of the NTNDP to ensure consideration was given to the 2010 APR information.

Powerlink considers it is also important to recognise that the NTNDP is designed to provide a strategic, high-level, whole of power system view of development paths over a 20 year outlook. In contrast, Powerlink's Revenue Proposal aims to forecast all Queensland's transmission capital expenditure over the next five year regulatory period. In doing so, Powerlink must necessarily focus on local drivers and must also assign probabilities to the scenarios.

The differences between Powerlink's Revenue Proposal and the NTNDP are due to readily-explainable reasons such as newer information, the granularity of assumptions, and granularity of analyses as explained below:

- Newer information – Supply to new loads associated with upstream LNG processing and mining in the Surat Basin. Powerlink notes that the advanced level of commitment of the associated loads was such that they were included in Powerlink's 2010 APR, but were not available for inclusion in AEMO's NTNDP simulation work. AEMO has been briefed on the additional load and associated augmentation as part of Powerlink's Regulatory Test consultation process, and is expected to factor this into its next NTNDP.
- Granularity of assumptions – The "big picture", long term NTNDP necessarily has to make simplifying assumptions, such as not including local and regional externalities (e.g. land use planning and environmental constraints) in modelling the location of new generation. In contrast, Powerlink must include these local and regional externalities in its network planning, which underpins this Revenue Proposal. A salient example is the modelling of the location of new generation in Southern Queensland. The non-inclusion of local and regional externalities results in the NTNDP modelling new generation closer to the major load centre in South East Queensland. However, there are significant land use and environmental constraints in that area, and when those are considered, the most likely location for new generation is further to the west, in South West Queensland. There have recently been major generation developments near the coal seam gas fields in South West Queensland, which are also close to the Queensland – NSW Interconnector. Further, whilst Powerlink has no active generation connection enquiries in South East Queensland, there are several (over 2,000MW of active generation enquiries) in South West Queensland. Based on the above, ROAM's scenarios and Powerlink's modelling result in new generation in South West Queensland rather than South East Queensland.
- Granularity of analysis – The long term nature of the NTNDP also dictates the level of analysis that can be undertaken. The NTNDP planning horizon warrants a higher level of analysis compared to this Revenue Proposal's shorter timeframe, which requires a more detailed

analysis, taking into account the lower voltage network and the full suite of network limitations such as thermal, transient and voltage stability. AEMO acknowledges this in its description of how its analysis links back to TNSPs' processes:

> "AEMO's methodology aims to approximate the various jurisdictional planning criteria. However, we have confined the scope to thermal limitations on the main transmission network that arise during diversified regional peak demands, providing an appropriate balance for a long-term, NEM-wide view."[69]

Similarly the Australian Energy Market Commission (AEMC) stated in the Transmission Framework's Review:

> "The Commission considers that the NTNDP should provide a guide for more detailed assessments to be undertaken by TNSPs. The NTNDP will therefore inform TNSP APRs, and vice versa, but TNSP investment plans justifiably may not precisely match the investments identified in the NTNDP."[70]

After allowing for these "fit for purpose" differences, Powerlink considers that its Revenue Proposal is consistent with the 2010 NTNDP.

8.8.3 Summary of total forecast capital expenditure

This Section provides a summary of Powerlink's forecast capital expenditure by category for the next regulatory period listed in Table 8.7. The proposed expenditure is the result of the methodologies and key inputs and assumptions explained above. Details of the individual projects can be found in the capital expenditure pro forma statements which accompany the Revenue Proposal.

[69] 2010 NTNDP Executive Briefing, p.14, AEMO, December 2010.
[70] Directions Paper, Transmission Frameworks Review, p.72, AEMC, April 2011.

Table 8.7: Capital expenditure forecasts by category ($m, 2011/12)

Project Category		2012/13	2013/14	2014/15	2015/16	2016/17	Total
NETWORK							
Load driven	Augmentation	415.0	489.2	261.3	316.1	248.1	1,729.6
	Easements	24.9	31.4	46.3	54.3	32.5	189.4
	Connections	15.4	12.3	8.0	8.1	11.3	55.1
Non-load driven	Replacements	300.1	241.5	260.0	227.1	200.4	1,229.0
	Security/ compliance	18.7	18.8	8.7	2.8	1.7	50.7
	Other	29.9	29.9	19.6	20.4	10.0	109.9
	Total network	**804.0**	**823.1**	**603.9**	**628.9**	**503.9**	**3,363.8**
NON-NETWORK							
Business IT	Information technology	15.8	14.9	16.1	15.6	15.7	78.1
Support the business	Commercial buildings	5.7	3.3	3.1	2.9	3.1	18.1
	Motor vehicles	2.4	2.7	3.4	2.7	3.7	14.8
	Moveable plant	1.9	1.8	1.7	1.8	1.9	9.1
	Total non-network	**25.8**	**22.7**	**24.4**	**22.9**	**24.3**	**120.1**
Total capital expenditure		**829.8**	**845.8**	**628.3**	**651.8**	**528.2**	**3,483.9**

*Numbers may not add due to rounding.
This table is net of disposals.

By category, augmentations comprise the most significant portion of expenditure followed by replacement capital expenditure. These expenditure patterns are similar to the current regulatory period and reflect the growth in electricity peak demand and the need to replace assets that have reached their end of life.

To further assist interested stakeholders in understanding the drivers that underpin Powerlink's forecast capital expenditure, Powerlink has included a summary of the committed capital expenditure projects greater than $25m and uncommitted capital expenditure projects with weighted expenditure greater than $25m in Tables 8.8 and 8.9 and in more detail in Appendix M.

Details of all forecast capital expenditure projects are contained in the Submission Guideline pro forma statements 4.1, 4.2, 4.3 and 4.4.

Table 8.8: Committed capital expenditure projects > $25m

Project Description	Category	Period capital expenditure ($m, nominal)	Total project costs ($m, nominal)	Description
CP.01875 Halys to Blackwall 500kV operating at 275kV	Augmentation	$374.6	$401.3	Establish approximately 175km of 500kV DCST transmission line (initially operated at 275kV) between Halys and Blackwall, including associated substation works at Halys and Blackwall.
CP.02031 Columboola to Western Downs Network Augmentation	Augmentation	$137.5	$142.0	Establish a 275kV substation at Columboola East including approximately 60km of 275kV DCST transmission line and associated remote substation works at Western Downs. Establish a 275kV substation at Wandoan South and operate the Wandoan South to Columboola circuits at 275kV.
CP.01705 Calvale to Stanwell 275kV DCST line	Augmentation	$78.7	$117.0	Establish approximately 101km of 275kV DCST transmission line between Calvale and Stanwell, including associated substation works at Calvale and Stanwell.
CP.00882 Ingham South to Cardwell 132kV Line Replacement	Replacement	$52.1	$60.2	Replacement of the entire 132kV transmission line between Ingham South and Cardwell.
CP.02030 Columboola to Wandoan South Network Augmentation	Augmentation	$45.5	$92.5	Establish a 132kV substation at Wandoan South including approximately 70 km of 275kV DCST transmission line (initially operated at 132kV), including associated substation works at Columboola.
CP.01780 Gladstone PS Switchyard Rebuild	Replacement	$37.1	$123.8	Replacement of the 275kV and 132kV primary plant and secondary systems at Gladstone Power Station, including associated remote end works.

Table 8.9: Capital expenditure projects > $25m (weighted)

Project Description	Category	Period capital expenditure ($m, nominal)	Total project costs ($m, nominal)	Description
CP.01477.2 Western Downs to Halys 500kV DCST Operating at 275kV	Augmentation	$311.3	$339.3	Establish approximately 135km of 500kV DCST transmission line (initially operated at 275kV) between Western Downs and Halys, including associated substation works at Western Downs and Halys.
CP.01470 Halys to Greenbank 500kV DCST Operating at 275kV	Augmentation	$226.2	$596.4	Establish approximately 218km of 500kV DCST transmission line between Halys and Greenbank, including associated substation works at Halys and Greenbank.
CP.01781 Northern Bowen Basin Augmentation	Augmentation	$82.4	$91.4	Establish approximately 70km of 275kV DCST transmission line (initially operated at 132kV) between Nebo and Moorvale, and approximately 11km of 132kV line between Moorvale and Broadlea, including associated substation works at Nebo and Broadlea.
CP.01195 Larapinta 275/110kV Substation Establishment	Augmentation	$71.1	$71.1	Establish a 275/110kV substation at Larapinta including approximately 6km of 110kV transmission line, including associated substation works at Algester.
CP.01189 Nudgee 275kV Establishment and South Pine to Nudgee DCST	Augmentation	$70.8	$79.4	Establish a 275/110kV substation at Nudgee including approximately 11km of 275kV transmission line and associated line and remote substation works at South Pine.
CP.02222.2 Bergins Hill - Drewvale 275kV Reinforcement Stage 1	Augmentation	$68.0	$76.1	Establish new 275kV transmission line sections, and re-string and reconfigure existing sections between Bergins Hill and Drewvale, including associated substation works at Blackstone.
CP.01710 Gin Gin Substation Plant Replacement	Replacement	$51.2	$51.2	Replacement of the 275kV and 132kV primary plant at Gin Gin Substation.

Project Description	Category	Period capital expenditure ($m, nominal)	Total project costs ($m, nominal)	Description
CP.02271.2 Stanwell to Broadsound Series Capacitors (70% and 65% Compensation)	Augmentation	$41.1	$59.0	Establish 3-phase series capacitors on each of the 3 275kV Stanwell to Broadsound transmission circuits.
CP.01423 Western Downs to Halys 500kV Easement Acquisition	Easement	$39.0	$43.3	Acquisition of approximately 135km of double width 500kV transmission line easements between Western Downs and Halys.
CP.02507 Collinsville to Proserpine 132kV Transmission Line Life Extension	Replacement	$38.0	$38.0	Tower painting, member and hardware replacement of the existing 132kV transmission line.
CP.01546 Callide A Switchyard Replacement	Replacement	$36.2	$36.9	Replacement of the existing 132kV switchyard at Callide A.
CP.02477.3 Western Downs to Halys 500kV DCST Operating at 275kV (circuits 5 and 6)	Augmentation	$35.8	$342.9	Establish approximately 135km of 500kV DCST transmission line (initially operated at 275kV) between Western Downs and Halys, including associated substation works at Western Downs and Halys.
CP.01156.2 Stanwell to Broadsound 275kV Stringing 2nd Circuit	Augmentation	$35.5	$54.2	String the second circuit of approximately 127km of 275kV transmission line between Stanwell and Broadsound including associated substation works at Stanwell and Broadsound.
CP.01128 Mackay Substation Replacement	Replacement	$33.5	$33.5	Replacement of the existing 132kV Mackay Substation.
CP.02583 Steel Conductor OHEW Fault Rating Upgrade - Stage 1	Replacement	$30.0	$30.0	Replacement of the OHEW on identified build sections.
CP.01679 Mudgeeraba 110kV Primary and Secondary Replacement	Replacement	$29.4	$33.3	Replacement of the existing 110kV Mudgeeraba Substation.
CP.02364 EMS Replacement	Replacement	$29.4	$29.4	Replace the existing Energy Management System.

Project Description	Category	Period capital expenditure ($m, nominal)	Total project costs ($m, nominal)	Description
CP.01417 Blackwall iPASS Secondary System Replacement	Replacement	$28.5	$28.5	Upgrade the existing iPASS secondary system at Blackwall Substation.
CP.02532 Bergins Hill - Goodna - Belmont Transmission Line Life Extension	Replacement	$27.6	$27.6	Tower painting, member and hardware replacement of the existing 110kV transmission line.
CP.02453 Moranbah to Goonyella Riverside 132kV Transmission Line	Augmentation	$27.3	$29.2	Establish approximately 30km of 132kV double circuit transmission line between Moranbah and Goonyella, including associated substation works at Moranbah and Goonyella Riverside substations.
CP.01957 Calvale to Larcom Creek DCST	Augmentation	$25.3	$127.2	Establish approximately 76km of 275kV DCST transmission line between Calvale and Larcom Creek, including associated substation works at Calvale and Larcom Creek.

8.9 Proposed contingent capital expenditure projects

Contingent projects are those which are significant, likely to arise in the period, not yet committed and linked to unique investment drivers such as a major point load, rather than to general investment drivers such as expectations of load growth within a region.

As required by the Rules[71] and Section 4.3.14 of the Submission Guidelines, a contingent project must exceed the threshold of either $10m or 5% of the value of the Maximum Allowable Revenue (MAR) for the first year of the regulatory period, whichever is the larger amount. Powerlink's MAR for 2012/13 is $960.6m (see Table 11.7). As a result, the threshold for contingent projects is approximately $48.0m.

The methodology for forecasting expenditure for contingent projects is consistent with the methodology followed for other capital expenditure projects. If a contingent project is triggered, Powerlink will also apply to the AER for additional operating expenditure. The identified contingent projects' indicative costs do not include any capital expenditure forecast in Section 8.8.3. Indicative capital costs to implement the expected network solution are summarised in Table 8.10. Appendix N provides further detail of the individual contingent projects and their triggers. Should the trigger eventuate, at that stage Powerlink will undertake assessment of options to determine the most efficient solution.

[71] National Electricity Rules, Chapter 6A, clause 6A.8.1(b), AEMC.

Table 8.10: Proposed contingent projects

Project Name	Indicative cost $m
Western Downs to Columboola 275kV 3rd circuit	58.0
Columboola to Wandoan South 275kV 3rd circuit	61.7
Mt Isa connection shared network works	72.5
Galilee Basin connection shared network works	86.2
Moranbah area	53.5
Bowen industrial estate	78.7
NEMLink (Queensland component)	768.2
QNI upgrade (Queensland component)	59.1
Gladstone State Development Area connection shared network works	112.8
Callide to Moura transmission line and Calvale transformer	49.5
N-2 security to essential loads (CBD)	112.0
Ebenezer 330/275/110kV establishment	61.1
FNQ 275kV energisation	85.7
Total indicative cost	**1,659.0**

8.10 Capital expenditure

Benchmarking capital expenditure is one of the 10 factors the AER must have regard to under the Rules[72]. Powerlink agrees with the AER that benchmarking is appropriate[73] to use as a "sense check" of a more detailed bottom up analysis. However, benchmarking cannot replace a detailed investigation of costs due to inherent geographic and other differences between transmission networks and their external influences.

Benchmarking of capital expenditure is particularly difficult as the following factors must be taken into account:

- the increase in maximum demand, the driver for augmentation capital expenditure;
- the lumpiness of augmentation investment as an augmentation can address a need for several years;
- the size and load density of the network. Longer distances require more capital expenditure;
- the age profile of assets the driver for replacement capital expenditure;
- the regional differences such as climate and load profile. As shown in Figure 3.4, Queensland demand was over 80% of maximum demand for over 12% of the time in 2009/10 compared to only 6% for New South Wales and approximately 2% for Victoria.

The following capital expenditure benchmarking approaches demonstrate that Powerlink's capital expenditure is, and forecast to remain, efficient.

8.10.1 Capital expenditure ratio analysis

Capital expenditure ratio analysis involves the trending of macro network parameters such as capital expenditure over circuit kilometres. This approach to benchmarking is not appropriate, as

[72] National Electricity Rules, Chapter 6A, clause 6A.6.7(e), AEMC.
[73] Queensland Distribution Determination 2010–11 to 2014–15, p 426, AER, May 2010.

a simple ratio is unable to address the differences in the transmission networks and the many factors that drive capital expenditure. Benchmark ratios such as capital expenditure over peak demand, are inappropriate and in most cases misleading. For example, most of the capital expenditure ratios do not reflect the growth in maximum demand or geography, the key drivers for augmentation capital expenditure.

8.10.2 Historic and forecast capital expenditure comparison

The AER states:

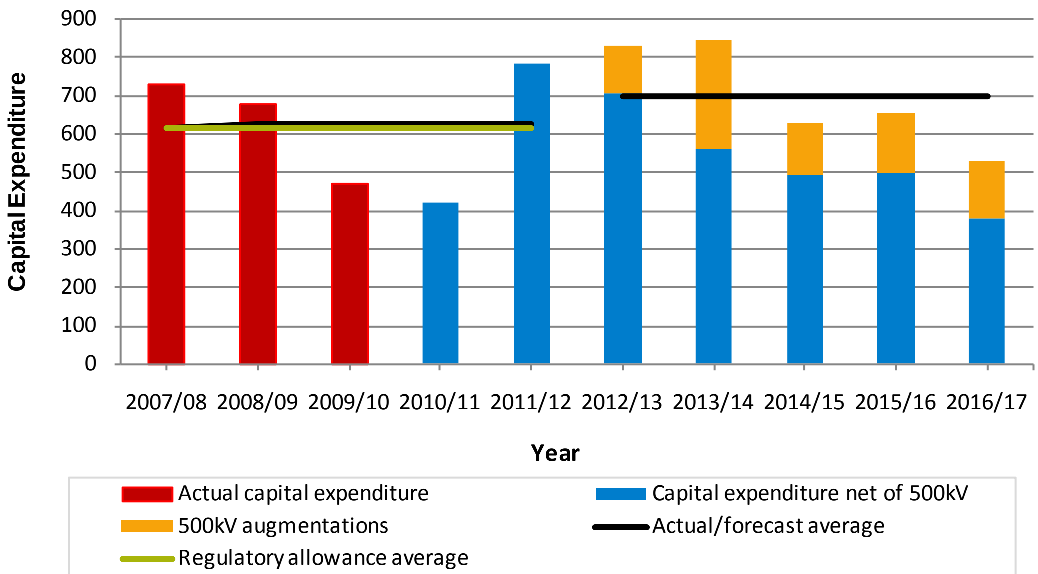
> "Where a business is stable and efficient and its financial controls, governance and operating policies and procedures are sound, it is likely that past investment decisions would be sound. Consequently, it follows that the revealed costs are likely to be a reasonable approximation of efficient costs for the volume of work undertaken, ceteris paribus. Furthermore, comparing actual to forecast expenditure provides a view of the reasonableness of forecasting processes."[74]

The Rules[75] and Section 4.3.3(a)(7) of the Submission Guidelines also require a comparison between forecast and historical capital expenditure.

Powerlink agrees there is some benefit in comparing capital expenditure over time. However, as previously stated, transmission investment is lumpy in nature and care is required when comparing capital expenditure over short periods. For example, augmentations are discrete and can address a need for several years before another augmentation is required. This is particularly true for Powerlink in the next regulatory period with the introduction of a 500kV development in Queensland. Similarly, changes in input costs and the age profile of the network all need to be considered when making a comparison.

Figure 8.6 depicts Powerlink's current and forecast capital expenditure showing the average expenditure in the regulatory periods against the AER allowance.

Figure 8.6: Current and forecast capital expenditure comparison ($m, 2011/12)



Source: Powerlink data.

[74] Final decision - Victorian Electricity Distribution Network Service Providers Distribution Determination 2011–2015, p.401, AER, October 2010.

[75] National Electricity Rules, Chapter 6A, schedule S6A1.1(7), AEMC.

In comparison to the current regulatory period, the next regulatory period:

- continues to have high demand growth, growing from an even higher base;
- has a similar ongoing need to replace assets;
- includes extending the transmission network into the Surat Basin; and
- establishes a 500kV transmission network into South East Queensland.

The forecast capital expenditure for the next regulatory period is, however, only slightly higher compared to the current regulatory period (and very similar when the significant future capacity of the 500kV development is taken into account).

A comparison of the actual capital expenditure against the regulatory allowance shows that actual expenditure was slightly higher than the allowance in the current regulatory period. The capital expenditure overspend was exacerbated in the early years of the current regulatory period when input costs increased significantly. The input cost pressures eased during the global financial crisis, but as detailed earlier, costs are rising again with the mining and LNG boom in Queensland.

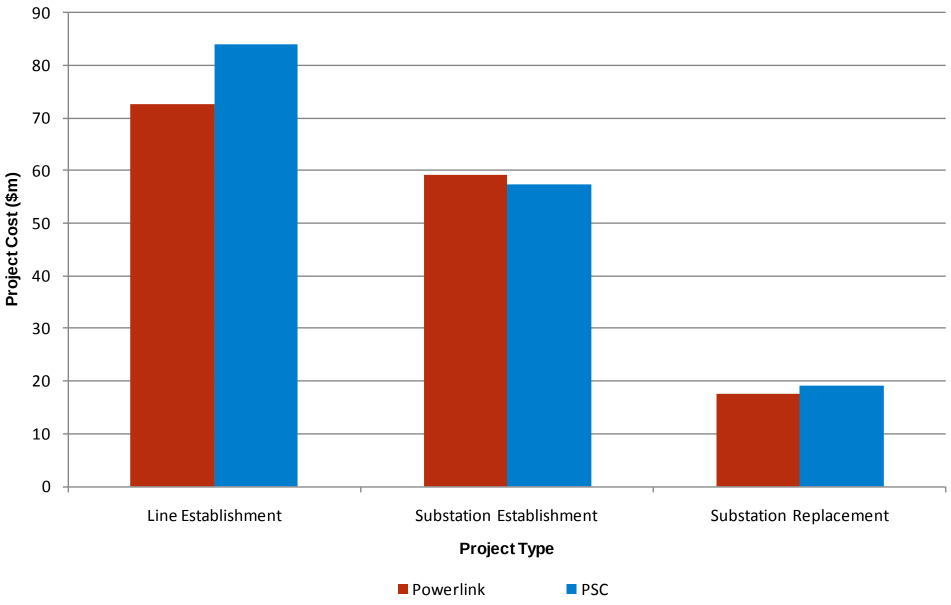
The capital expenditure in the last year of the current regulatory period and first two years of the next period are higher than the long run average, due to the extension of the transmission network into the Surat Basin and the first of the 500kV transmission lines into South East Queensland. The analysis of historic capital expenditure demonstrates that Powerlink's capital expenditure forecast processes are robust, and expenditure in the next regulatory period is not inconsistent with the current period when the differences in circumstances are considered.

8.10.3 External benchmarking

The estimated cost of future projects is important in establishing the forecast capital expenditure. Given this, Powerlink engaged Power Systems Consultants (PSC) to provide an independent cost estimate for a variety of projects for comparison with Powerlink's internally generated project estimates.

PSC was provided with project scopes for three different types of projects including a transmission line, greenfield substation and substation replacement. These were chosen as they make up the majority of Powerlink's future capital expenditure. The comparison of PSC's and Powerlink's estimated project costs is summarised in Figure 8.7. PSC's detailed report estimates have been provided to the AER on a confidential basis.

Figure 8.7: Project estimate cost comparison



Source: Powerlink data.

Figure 8.7 shows that PSC's estimates of project costs are very similar to Powerlink's. As expected some variations exist based on the different estimating assumptions made. However the results of PSC's analysis provides evidence that Powerlink's estimating process and systems are consistent with independent cost estimates.

8.11 Deliverability of future expenditure

Powerlink's successful track record for delivering capital expenditure in the current regulatory period demonstrates that Powerlink has the capabilities to deliver both the forecast capital and operating expenditure programs. In physical terms, the forecast capital and operating expenditure workloads are similar to the current regulatory period. The current regulatory period expenditure programs were delivered in a cost effective and efficient manner due to the successful implementation of a number of initiatives. These initiatives are outlined below and will facilitate the future efficient delivery of the forecast expenditure.

Design standardisation

Designs for new transmission lines and substations adopt a high degree of standardisation. This delivers benefits in terms of design, including the ability to outsource more of the engineering design work and commissioning resources.

Program management

Powerlink has adopted a program management approach to the delivery of similar projects. In particular by managing projects in the same geographic region together. Powerlink has been able to achieve synergies in project delivery. For example, it has enabled Powerlink to optimise the utilisation of its project and construction management delivery resources.

Supply chain management

The combination of design standardisation and the program management approach enables Powerlink to procure materials and equipment via long term, high volume contracts. This enables long lead-time materials and equipment to be ordered in a timely manner.

Streamlined easement acquisition

Each transmission line development requires planning approval – however, the Queensland *Sustainable Planning Act (SPA)* provides a streamlined process in which the Minister can designate the development as “community infrastructure”. In this regard, Powerlink applies a Government-approved process under the SPA to ensure all the relevant requirements are addressed which avoids the need for other, potentially more time-consuming planning approvals.

Outsourcing capability

Powerlink has a well established and proven model for outsourcing the development of new substations and lines. This includes a panel of approved suppliers with whom Powerlink has pre-agreed terms and conditions to perform both design and construction activities. A panel has also been established for telecommunication project delivery, and work has started on the delivery model for lines refit work.

Internal staffing

Powerlink has a low staff turnover rate, typically less than 6%. Powerlink has also an excellent cross section of developing and experienced staff. The low turnover, coupled with a healthy staff age profile, has enabled Powerlink to maintain critical competencies and efficiently deliver the capital and operating expenditure programs.

8.12 Summary

Powerlink’s required capital expenditure for the next regulatory period, the methodology adopted and key inputs and assumptions used to derive it, are explained in this Chapter. Powerlink considers that its capital expenditure forecasts:

- Meet the requirements of the Rules and AER Submission Guidelines.
- Represent efficient costs that a prudent operator would require to meet the capital expenditure objectives.
- Represents a realistic expectation of the demand forecast and cost inputs required to meet the capital expenditure objectives.

9 Forecast Operating Expenditure

9.1 Introduction

Powerlink's operating expenditure forecasts for the 2013-17 regulatory period are presented in this chapter. Powerlink's operating expenditure categories used in preparing the Revenue Proposal are described below, followed by the methodology used to forecast operating expenditure. The key inputs and assumptions underpinning the forecasts are then explained, along with references to supporting documentation. The operating expenditure forecast is then summarised, and shown to be efficient through benchmarking measures.

9.2 Rules/AER Submission Guidelines Requirements

The Rules[76] require that certain information be provided as part of a Revenue Proposal in relation to forecast operating expenditure. Specifically, this includes:

- The forecast of the operating expenditure categorised in the same way for historic operating expenditure.
- The methodology used to determine the forecast.
- The key assumptions and variables that underlie the forecast and methodology.
- Any methodology of programs to improve the performance of the transmission network in relation to the service target performance incentive scheme.
- Directors' sign off on the reasonableness of key assumptions used in the operating expenditure forecast.
- Justification that forecast operating expenditure meets the operating expenditure objectives detailed under the Rules[77].

These Rules requirements are also identified in Section 4.3.4 of the Submission Guidelines. Powerlink considers that all relevant information requirements are provided below.

9.3 Operating expenditure objectives

Powerlink's operating expenditure compliance obligations relate to the operating expenditure objectives as defined in of the Rules[78] and detailed under Section 4.3.4(b) of the Submission Guidelines. Powerlink's justification of the operating expenditure objectives is consistent with the capital expenditure objectives outlined in Section 8.3 of this Revenue Proposal. In addition, Powerlink has prepared and submitted the requisite pro forma statements relevant to forecast operating expenditure, namely, 2.1, 2.2, 2.3, 2.4, 2.5 and 2.6.

Powerlink considers that its Revenue Proposal achieves the operating expenditure objectives in light of, and having regard to, these factors.

9.4 Operating expenditure categories

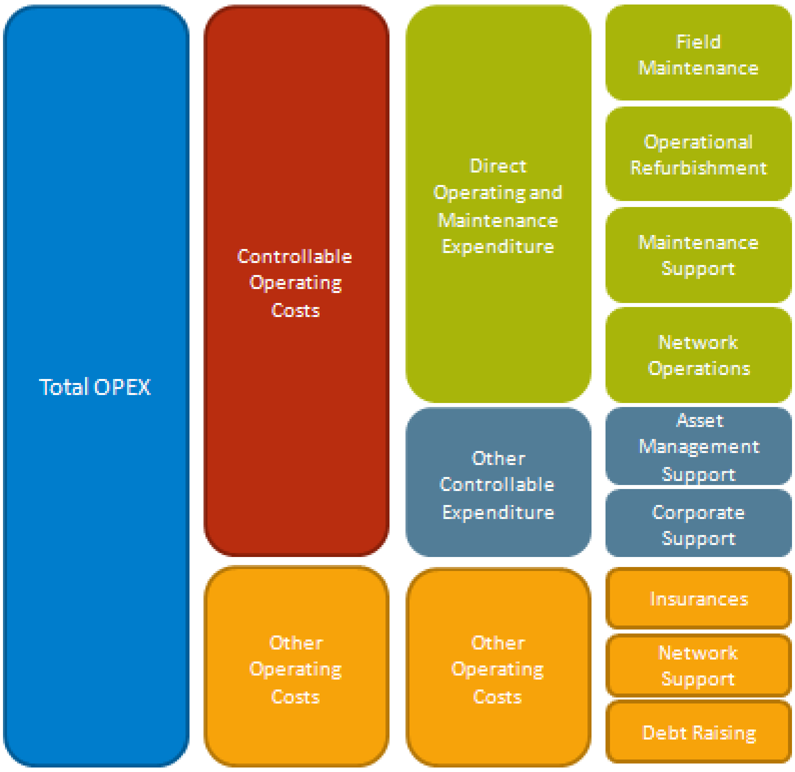
In accordance with the Submission Guidelines, operating expenditure must be presented in well accepted categories, and in a manner consistent with historic operating expenditure. Powerlink's total operating expenditure has three major components. The first two, Direct Operating and Maintenance Expenditure and Other Controllable Expenditure, relate to Powerlink's controllable

[76] National Electricity Rules, Chapter 6A, schedule S6A.1.2, AEMC.
[77] National Electricity Rules, Chapter 6A, clause 6A.6.6(a), AEMC.
[78] Ibid.

operating costs. The third component, Other Operating Expenditure, is impacted by external factors outside Powerlink's control. These expenditure components have remained unchanged since 1999, as the underlying concepts behind them continue to consistently deliver both cost-efficient and effective operational outcomes. For modelling purposes, these components are considered separately and are summarised in Figure 9.1 and in the following sections.

Further information, including the operating expenditure methodology and key cost drivers are included in Powerlink's Operating Expenditure Model Methodology and have been provided to the AER on a confidential basis.

Figure 9.1: Total operating expenditure framework



9.4.1 Direct operating and maintenance expenditure

Direct Operating and Maintenance is the largest operating expenditure component and has four categories:

- **Field Maintenance** – Field Maintenance includes all field-based costs associated with maintaining the physical assets from the time the asset is commissioned to when it is decommissioned, excluding any capital or operational refurbishment expenditure. These works consist of preventative maintenance, such as routine and condition-based activities, and corrective maintenance, such as emergency and deferred activities, encompassing all field-based activities performed by maintenance service providers.
- **Operational Refurbishment** – Operational refurbishment projects are primarily driven by the condition of assets, reliability considerations, compliance obligations and design parameters of the plant and its sub-components, and involves activities that return an asset to its original intended condition or function. The work is undertaken in a similar fashion to field maintenance. A project management approach is applied to operational refurbishments to ensure delivery effectiveness and cost efficiency.

- **Maintenance Support** – Maintenance Support has two major elements. Firstly, it is the activities performed by the Maintenance Service Providers (MSPs) which are not directly related to working on an item of plant or equipment in the field, but associated with supporting the asset management functions for the maintain/operate phase of the asset life cycle. Secondly, it is the direct costs associated with owning and managing assets, e.g. council rates charges, water charges, electricity bills and permits.
- **Network Operations** – Network Operation activities are the control centre functions, as well as those additional activities required to ensure the safe, reliable and efficient operational management of the Queensland electricity transmission network.

9.4.2 Other controllable expenditure

Other controllable costs encompass activities and services integral to managing the network business, but not directly related to maintaining or operating the actual network. These support functions are divided into two categories:

- **Asset Management Support** – Operational activities required to support the strategic development and ongoing asset management of the network including Network Planning, Network Support, IT Support and Network Customer and Regulatory Support.
- **Corporate Support** – Support activities required to ensure adequate and effective corporate governance and business administration which include the provision of: business administrative services such as finance; accounting and facilities; and direct corporate charges such as subscriptions and audit fees.

9.4.3 Other operating expenditure

This expenditure sits outside Powerlink's controllable operating expenditure, and is subject to factors outside Powerlink's control, e.g. borrowing costs, financial markets, weather and power generation patterns. Currently, other operating costs comprise three categories:

- **Insurances** – This covers both insurance premiums for Powerlink's network and non-network assets, and a self-insurance allowance to provide cover for Powerlink's retained losses that are not insured. As previously noted in Section 5.3.2, Powerlink has shifted insurances from controllable operating expenditure to other operating costs. Further details are provided in Sections 9.6.8 and 9.6.9.
- **Network Support** – These are for non-network solutions used by Powerlink as cost-effective alternatives to network augmentation. Powerlink's Network Support expenditure is detailed in Section 9.6.10.
- **Debt Raising** – These relate to the costs incurred by Powerlink when new lines of debt are raised, or current lines of credit are renegotiated or extended. Further details of Powerlink's debt raising costs are detailed in Section 9.6.11.

9.4.4 Categories of prescribed transmission service

The operating expenditure categories to which prescribed transmission services relate (as required by the Rules[79] are detailed in Table 9.1 below.

[79] National Electricity Rules, Chapter 6A, schedule S6A.1.2, AEMC.

Table 9.1: Prescribed transmission service categories

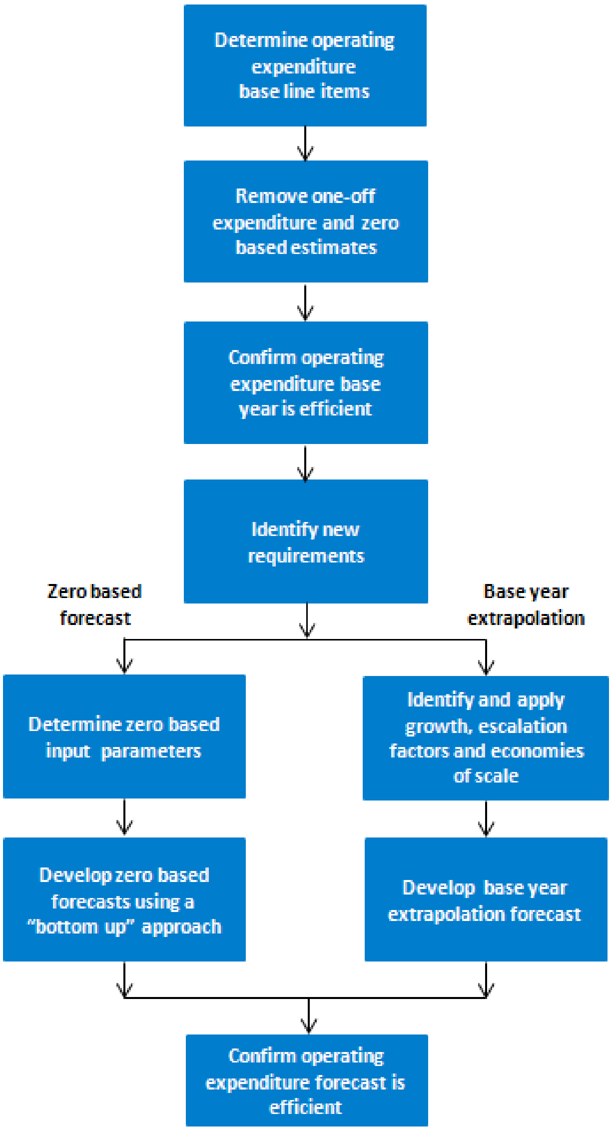
Operating expenditure category	Service Category			
	Prescribed exit services	Prescribed entry services	TUOS	Common services
Field Maintenance	✓	✓	✓	✓
Operational Refurbishment	✓	✓	✓	✓
Maintenance Support	✓	✓	✓	✓
Network Operations	✓	✓	✓	✓
Asset Management Support	✓	✓	✓	✓
Corporate Support	✓	✓	✓	✓
Insurances	✓	✓	✓	✓
Network Support			✓	
Debt Raising	✓	✓	✓	✓

9.5 Operating expenditure forecasting methodology

Powerlink's operating expenditure forecasting methodology treats the line items in each operating expenditure category separately, so that appropriate cost drivers, escalations, efficiencies and economies of scale can be taken into account. Consistent with Powerlink's existing methodology, as well as other recently approved TNSP decisions[80], Powerlink applies both zero-based and "base-year escalated" forecasts, where applicable, to determine its forecast operating expenditure. The methodology used to prepare Powerlink's operating expenditure forecast is summarised in Figure 9.2 and explained in the following sections.

[80] Draft Decision, TransGrid Transmission Determination, 2009–10 to 2013–14, p. 109 AER, 31 October 2008.

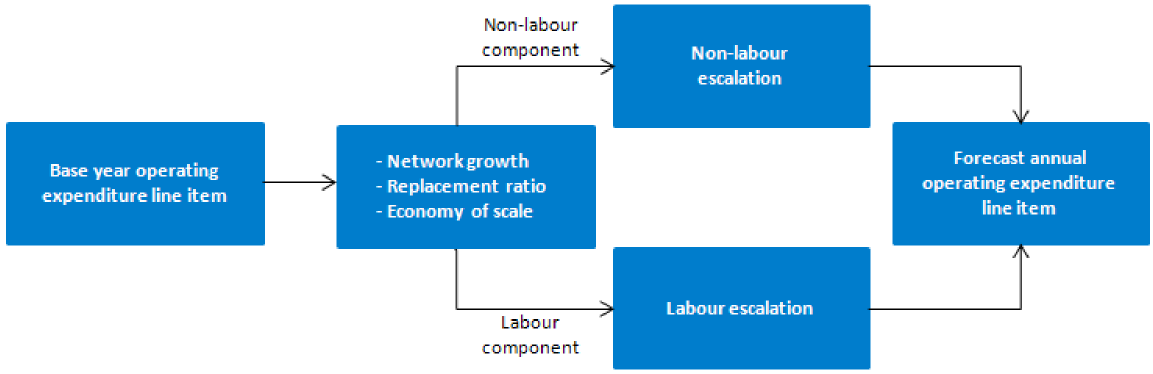
Figure 9.2: Operating expenditure forecast methodology



9.5.1 Base year extrapolation

Powerlink uses 2009/10 as the base reference year on which to extrapolate forward and apply future escalations. Further explanation is provided in Section 9.6.1. The application of the operating expenditure escalators to the base year is illustrated in Figure 9.3.

Figure 9.3: Application of operating expenditure escalators



The steps used to escalate the base year line items are as follows:

- The annual growth, replacement and economy of scale factors are applied to each base year operating expenditure line item.
- The corresponding annual labour and non-labour escalators are applied to the relevant material and labour component.
- The total escalated labour and material portions are added together to give the total annual forecast line item.

9.5.2 Zero based line Items

For some line items, extrapolations of base year forecasts do not reasonably reflect future recurrent operating expenditure requirements. These line items require a different approach to the base year escalation model, and are subject to a zero based forecasting approach, e.g. insurances, operational refurbishment and network support.

The zero based forecasts are often more complex and forecast annual expenditure from the “bottom up” taking into account applicable external factors such as weather patterns, international markets and fuel costs.

9.5.3 Summary of operating expenditure forecast methodology

Table 9.2 below provides a summary of forecast approach adopted for each category in Powerlink’s operating expenditure methodology. Some categories are modelled using both base escalated and zero based forecasts, e.g. field maintenance forecasts routine maintenance using a zero base methodology and condition-based, corrective and deferred maintenance using a base escalated methodology.

Table 9.2: Operating expenditure - base escalated and zero based forecasting methodology

Operating expenditure category	Base escalated	Zero based
Field Maintenance	✓	✓
Operational Refurbishment		✓
Maintenance Support	✓	
Network Operations	✓	
Asset Management Support	✓	
Corporate Support	✓	✓
Insurances		✓
Network Support		✓
Debt Raising		✓

9.6 Key inputs and assumptions

Powerlink's future operating expenditure forecasts are underpinned by a number of key inputs and assumptions. The following sections explain each of these in turn.

9.6.1 Efficient base year

Powerlink has determined the base reference year from which to forecast future operating expenditure to be the 2009/10 financial year. Table 9.3 details a breakdown of the 2009/10 controllable operating expenditure by category.

Table 9.3: Actual controllable operating expenditure for 2009/10 ($m, nominal)

Operating expenditure category	2009/10 $m
Field Maintenance	44.7
Operational Refurbishment	22.2
Maintenance Support	11.0
Network Operations	12.2
Asset Management Support	29.6
Corporate Support	12.7
Total controllable operating expenditure*	**132.4**
Insurances	6.7
Network Support	12.7
Debt Raising	0.3
Total other operating expenditure*	**19.7**
Total operating expenditure*	**152.1**

*Numbers may not add due to rounding.

Source: Powerlink Regulatory Accounts.

Powerlink considers that the 2009/10 operating expenditure represents an efficient base reference year for the following reasons:

- As outlined in Section 9.10, Powerlink participates in benchmarking studies against both international and NEM TNSPs. The latest results, which correspond to the 2009/10 year, indicate that Powerlink is a low-cost, high performing TNSP with the lowest operating expenditure/RAB ratio in the NEM, confirming Powerlink's high efficiency.
- In the current regulatory period, Powerlink has been subject to the AER's Efficiency Benefit Sharing Scheme (EBSS). The EBSS provides a continuous "incentive to achieve efficiencies by allowing the TNSP to retain, for a fixed period, the difference (negative or positive) between its actual and forecast operating expenditure"[81]. Powerlink is of the opinion that the incentive encourages TNSPs to closely monitor and reduce actual expenditure, and has resulted in revealed efficient operating expenditure costs.
- At the time of submission, 2009/10 is the most recent full year of available operational costs, and contains data that has been independently verified and audited.
- Since 2003, Powerlink has adopted Reliability Centred Maintenance (RCM) as its primary approach to physical asset maintenance. Across each network asset class, each asset set has a routine maintenance task assigned with an associated maintenance strategy based on the results of RCM analysis. A recent study by The Asset Partnership reviewed the effectiveness of the RCM process within Powerlink, and determined that any future potential benefits achieved through further application of the philosophy would be minimal. The Asset Partnership found that while some of Powerlink's assets were yet to undergo RCM analysis, these assets were soon to be decommissioned or were of low criticality. The Asset Partnership therefore concluded that application of RCM to these remaining assets would produce improvements that were not statistically significant to the transmission network. As a result, Powerlink considers that all major gains from the transition to RCM have been achieved. A copy of The Asset Partnership report has been provided to the AER on a confidential basis.

When considering the mechanism of the EBSS incentive, Powerlink's continued adherence to RCM asset maintenance philosophy and its top quartile benchmarking performances, Powerlink considers its operating expenditure costs in 2009/10 to be efficient, and a suitable reference on which to base its operating expenditure forecasts.

One-off expenditure

Powerlink has reviewed its operating expenditure costs for 2009/10 to identify items that are non-recurrent, outside the normal scope of providing operating expenditure, and are not reflective of future expenditure requirements. These items are classified as "one-off" expenditures and should be removed from the base year. Powerlink considers that all works in 2009/10 were normal operating costs, with the exception of costs associated with the development of this Revenue Proposal process, which have been removed from modelling of future years. All elements of Other Operating Expenditure, as categorised in section 9.4, have been removed from the base year, as they are impacted by factors outside Powerlink's control. These elements have been forecast using a zero-based methodology.

New requirements

In order to achieve the operating expenditure objectives, Powerlink's forecasts include efficient expenditure associated with the introduction of a number of new requirements. These costs constitute a necessary element of the operating expenditure forecasting process, to ensure that Powerlink can meet its anticipated future network requirements, and is not unduly penalised for

[81] First Proposed Electricity Transmission Network Service Providers Efficiency Benefit Sharing Scheme, Explanatory Statement and Issues Paper, p. 1, AER, January 2007.

prudent changes to its scope and/or methods of operation and maintenance or additional responsibilities associated with compliance or other regulatory and statutory obligations.

Powerlink's key forecast new requirements include:

- Tower refurbishment – to ensure towers in harsh environments can reach their currently projected economic life.
- Land Tax – to meet additional State legislative requirements on freehold land under the Land Tax Act 2010 (Qld).
- Office accommodation – to cater to staff growth resulting from Powerlink's expanding network.
- Superannuation Guarantee Scheme – to address the proposed progressive increase in the Federal scheme as recommended in the Henry Tax Review.
- Climate Change Investigations – to identify and understand the impacts of climate change on the development, operation and maintenance of the network, and develop an adaptation plan, including obtaining independent advice, to efficiently improve the resilience of the network to changing climatic conditions.
- South West Queensland Expansion – the extension well beyond the geographical reach of the existing network will impose additional costs above the inherent network growth factors, in order for Powerlink to effectively maintain this network.

Powerlink notes that the items above are not an exhaustive list of new requirements which are expected to impact its operating and maintenance expenditure over the 2013-17 regulatory period. However, in the interests of efficiency, Powerlink has focused only on those items which it considers to be material to its operations.

9.6.2 Maintenance costs

As previously discussed, Powerlink applies a zero based methodology for routine maintenance, and a base escalated model for condition-based, corrective and deferred maintenance.

Routine maintenance costs

Powerlink develops a routine maintenance task plan for all items of plant and equipment forming part of the transmission network assets based on Reliability Centred Maintenance (RCM). This enables Powerlink to develop a forward projection of the routine maintenance requirement through a forecast of work effort contained in each maintenance task (defined as a work unit). An eight year routine maintenance forecast is developed, which enables a base reference of work effort for existing assets. Forecast routine maintenance requirements for new assets are represented by a network growth factor applied to the base work unit plan. The resulting forecast work unit plan is then coupled with the work unit charge rate, resulting in an eight year routine maintenance cost forecast.

Condition-based and corrective maintenance costs

Powerlink's non-routine maintenance forecasts are underpinned by requirements consistent with the maintenance strategy formed using RCM. The RCM philosophy and process provides a tailored maintenance strategy and tasks relating to the failure modes of individual equipment. Powerlink continually monitors equipment performance to ensure that the optimum maintenance strategy and tasks are implemented.

Future condition based and corrective maintenance trends are therefore reflective of an optimised level of maintenance derived from the application of RCM, that takes into account the inherent changes in maintenance requirements that come with new technology in Powerlink's plant and equipment.

As discussed previously in Section 9.6.1, the benefits associated with the application of the RCM philosophy to Powerlink's maintenance strategies and processes has reached saturation, and further application to the remaining assets would not result in significant network performance improvements. Based on this assessment, Powerlink considers that the gains from the transition to RCM have been achieved, and that the 2009/10 financial year is reflective of an efficient maintenance mix from which to project forward future condition based and corrective maintenance.

Recent Australian Competition Tribunal decisions[82] and industry consultants[83] [84] commentary agree transmission network assets can experience early life failures, resulting in the need for a maintenance requirement in the first five years of an assets life. However, it has also been noted that the maintenance mix in future regulatory periods may vary if there is a material change to the average transmission network asset age.

Powerlink has analysed the average age of its major asset classes, taking into account the impact of its proposed future capital works program. The analysis revealed Powerlink's average network age will not materially change over the next regulatory period. The asset age is maintained as the capital works program for the next regulatory period is small relative to the existing asset base. As a result, the impact on asset age resulting from the addition of the new assets is minimal.

The consistent age profile means there will not be a material change in the maintenance mix in the next regulatory period. Consequently, Powerlink considers that the level of condition based, corrective and deferred maintenance present in the 2009/10 base year is representative of the comparative levels that could be expected in the next regulatory period.

9.6.3 Network growth

As the transmission network grows, Powerlink faces increasing costs of operating and maintaining the network. Operating expenditure is directly related to the size of the transmission network, i.e. more network means additional field maintenance and a greater need for support roles.

The network growth factor is expressed in terms of an annual rate of growth resulting from the increase in the size of the transmission network. Powerlink's network growth factor is based on the change in total asset value, and has an impact on all base-escalated operating expenditure line items.

The network growth factor is specifically associated with augmentation growth only, and excludes the impact of capital replacement activities, which reflects that additional maintenance is only required on additional network assets. Further, an economy of scale factor is applied to the network growth factor to reflect the decreasing long-run average costs associated with increased network size.

9.6.4 Economy of scale factors

As previously discussed, Powerlink applies an economy of scale factor to the network growth escalator. Powerlink's economies of scale are detailed in Table 9.4.

[82] Application by Energy Australia and Others (No 2) (2009), ACompT 9, File 3, Order 2. Australian Competition Tribunal, 25 November 2009.
[83] Letter to TransGrid, p. 3, SKM, 19 December 2008.
[84] Letter to Powerlink, p. 4, The Asset Partnership, 18 January 2007.

Economies of scale are more evident in support activities than in network maintenance activities, as support activities do not require the same marginal effort and the same increase. For example, based on figures in Table 9.4, a 1% increase in network growth will result in a 0.95% increase in field maintenance, but only a 0.25% increase in maintenance support.

The impact of incorporating these factors into the operating expenditure forecast is that not all operating expenditure components increase at the same rate as network asset growth.

Table 9.4: Economies of scale applied to network growth escalator

Activity	Scale Factor	Rationale
Field Maintenance	95%	Almost a one for one increase in maintenance but some efficiencies should be achievable.
Maintenance Support	25%	This is linked to the size of the asset base, however, significant economies of scale and efficiencies achievable through management of this activity.
Direct Charges	100%	These are local council land rates, electricity bills and no efficiencies are available, i.e. they are directly proportional to asset growth.
Network Operations	40%	Economies of scale and efficiencies achievable through management of this activity. However, increased data management reduces overall efficiencies.
Network Planning	25%	Significant economies of scale related to Powerlink's planning function. Less than other Asset Management support to reflect increased requirements of generator compliance and Australian Energy Market Operator oversight.
Asset Management Support	20%	Large economies of scale and efficiencies are available and recognised.
Corporate Support	10%	Large economies of scale and efficiencies are available and recognised.
Insurances	100%	No economies of scale are applicable as costs are based on a zero based forecast provided by insurance broker.
Network Support	100%	No economies of scale are applicable as costs are based on a separate zero based forecast.

9.6.5 Labour cost escalation

The labour cost escalation reflects economic pressures on the labour component of Powerlink's operating expenditure forecast. Trends of above average labour growth (and high labour costs) are expected to continue with sustained competition for skilled resources.

Powerlink's proposed operating expenditure labour cost escalation takes into consideration Powerlink's existing enterprise bargaining agreement and labour cost impacts of its key service providers, as well as the impact of labour escalations.

As discussed in Section 8.6.9.1, Powerlink engaged BIS Shrapnel to review and provide an expert opinion on the labour outlook for Powerlink's upcoming regulatory period. BIS Shrapnel recommended that Powerlink adopt the Queensland Electricity Gas Water (EGW) Average Weekly Ordinary Time Earnings (AWOTE) for skilled labour, and the Queensland Business Services AWOTE for general labour for the purpose of estimating labour cost increases. This is consistent with the labour escalators used to estimate capital expenditure forecasts.

9.6.6 Non-labour cost escalation

Powerlink's operating expenditure non-labour costs reflect a wide range of costs and materials. These aspects relate to a variety of specific equipment and services, making it difficult to categorise and tailor appropriate escalations. Consequently, Powerlink proposes to use a CPI of 2.5% as a conservative measure to reflect general price increases in the non-labour component of operating expenditure. These have been adopted in forecasting operating expenditure, and are consistent with the escalation previously approved by the AER for the non-labour component of operating expenditure.[85]

9.6.7 Operational refurbishment projects

As outlined in Section 9.4.1, Powerlink undertakes operational refurbishment under a project management approach. Operational refurbishment is planned for each asset class and is a category of operating expenditure that is zero based. Under a portfolio arrangement, individual operational refurbishment projects are scoped, estimated and escalated using a similar approach to capital projects. Further information is included in Powerlink's Operational Refurbishment Plan provided to the AER on a confidential basis.

9.6.8 Insurances

Powerlink proposes to adopt a combination of insurance policies, self insurance and pass through arrangements to efficiently manage the risks associated with loss events. Powerlink's forecast insurance requirements are described in more detail in the following sections.

Insurances are summarised in Table 9.5.

Table 9.5: Forecast insurances ($m, 2011/12)

	2012/13	2013/14	2014/15	2015/16	2016/17	Total
Insurances	8.9	9.4	10.1	10.7	11.4	50.5

Source: Powerlink data.

Powerlink secures insurance from both domestic and international markets. In developing its insurance premium forecast for input into its Revenue Proposal, Powerlink sought advice from independent, external actuaries in relation to property and liability insurance, which are placed by Powerlink in the international market. Premiums for insurances placed in the domestic market were developed by Powerlink's insurance brokers.

As outlined earlier, Powerlink's insurance premiums are developed on a bottom-up basis. Powerlink's forecast insurance premiums were prepared having regard to its 2010 insurance renewals, actual loss history, recent trends in insurance markets and forecast increases in Powerlink's asset base. To support its proposal, Powerlink has provided relevant information and expert advice to the AER on a confidential basis.

Powerlink notes that at the time of preparing its Revenue Proposal, the impact of the recent natural disaster events in Australia (flood inundation and cyclone Yasi), New Zealand (Christchurch earthquakes) and Japan (earthquake) have not been reflected in the pricing by global insurance markets. Consequently, the potential premium increases are not encompassed in Powerlink's insurance forecasts. Consequently, Powerlink may submit an updated insurance premium forecast with its Revised Revenue Proposal in early 2012.

[85] Draft Decision – TransGrid Transmission Determination 2009-10 to 2013-14, p. 120, AER, 31 October 2008.

Self insurance

Section 4.3.21 of the Submission Guidelines requires that a Revenue Proposal contain the following information in relation to proposed self insurance costs:

- details of all amounts, values and other inputs used by the TNSP to calculate its proposed self insurance costs;
- an explanation of the TNSP's calculation of these amounts, values and inputs;
- a board resolution to self-insure (i.e. a copy of the signed minutes recording resolution made by the board);
- confirmation that the TNSP is in a position to undertake credible self-insurance for those events;
- self-insurance details setting out the specific risks which the TNSP has resolved to self-insure;
- a report from an appropriately qualified actuary or risk specialist verifying the calculation of risks and corresponding insurance premiums;
- the annual regulatory accounts must record the cost of self insurance as an operating expense, and establish a self insurance reserve; and
- when a claim against self insurance is made, an appropriate deduction to the self insurance reserve must be recorded.

As in the current regulatory period, the Powerlink Board resolved to self-insure specific retained losses as outlined in the confidential extract of Board Minutes provided to the AER with the Revenue Proposal.

In its regulatory financial statements, Powerlink reports self insurance each year as an operating expense equal to the amount of the self insurance allowance. When claims are made for self insured events, there is a corresponding deduction to the self insurance reserve.

Powerlink engaged an independent actuary to assess the risks and notional premiums applicable to uninsurable and uninsured risks associated with its network over the next regulatory period. That is, items that cannot be efficiently insured and below deductible expenses. The methodology employed to forecast these amounts relies on an analysis of recorded past loss events and an estimate of their frequency. On the basis of its expert advice, Powerlink considers that this methodology produces a conservative estimate of future losses as infrequent loss events are understated.

No self insurance allowance has been sought for retained losses that exceed the limits of cover on insurances, which are addressed below. In summary, it is the recommended position by Powerlink's advisors that this is more appropriately covered using regulatory pass through arrangements.

The actuarial self insurance analysis does not include losses from the Queensland flood or Cyclone Yasi events in early 2011. While the losses associated with both events have been incurred in the main by Powerlink, at the time of preparing the insurance consultancies, final cost estimates and repair costs were not available. Therefore, Powerlink may submit an updated self insurance forecast with the Revised Revenue Proposal in early 2012.

Powerlink has provided the AER with the independent actuarial report that details the amounts, values and other inputs used to calculate the proposed self insurance allowance and an explanation of the calculations involved. The total self insurance forecast for the Powerlink network is summarised in Table 9.6.

Table 9.6: Self insurance allowance ($m, 2011/12)

	2012/13	2013/14	2014/15	2015/16	2016/17	Total
Self insurances	1.8	1.8	1.8	1.9	1.9	9.3

Source: Independent actuarial report.

9.6.9 Insurance cost pass through

The objective of the cost pass through provisions in the Rules is to provide a degree of protection from the impact of unexpected changes in costs which are outside a service provider's control. Such a mechanism provides a reasonable reflection of the operation of a competitive market where efficient costs are eventually passed through to customers, whether they are expected/foreseen or not[86]. This enables a service provider to manage its risk of such impacts and for customers to not bear the cost should such changes not eventuate, which would otherwise have to be compensated for in regulated revenues.

The Rules currently provide for the pass through of insurance events for which an allowance is provided in the revenue cap where:

- premiums vary by greater than 1% MAR in a regulatory year;
- the risk eventuates and the deductible varies by greater than 1% MAR in a regulatory year;
- insurance becomes unavailable to the TNSP; or
- insurance becomes available on terms materially different to those existing at the time the revenue cap was set.

Powerlink also notes the Australian Energy Market Commission's view that the re-opener provisions of the Rules[87] are designed to capture large, shipwreck-type events, and gives weight to the use of pass through or contingent project provisions as the primary means of redress following major unforseen events.

While it is considered that the re-opener provisions provide a degree of protection to TNSPs for extreme or major unforseen events, it is important to recognise that this is only the case for capital expenditure greater than 5% of the regulated asset base. To be clear, the re-opener provisions cannot be activated to address an extreme operating expenditure event alone. Such events were considered to be captured by the pass through provisions in the Rules. As it turns out, this is not entirely the case.

Major Risk Exposures

Under the current Rules framework, Powerlink considers that TNSPs remain exposed to the potential cost impact of unforseen, high cost events in the following areas:

- "Above insurance cap losses" – that is where an event results in losses which exceed the limit of cover in insurances.
- Uninsured events – where unidentified and/or uninsured risks eventuate that are outside the terms and conditions of existing insurance policies, and are not otherwise allowed for in self insurance.
- Insurance company failure – namely, counterparty risk, which is where the other party to a contract does not live up to its contractual obligations.

[86] Rule Determination, National Electricity Amendment (Economic Regulation of Transmission Services) Rule 2006, No. 18, p.104, AEMC, November 2006.
[87] Ibid, p.62.

- The aggregation of deductibles – where the actual cost of self insurance events exceed the net self insurance allowance in either a single year or over a regulatory period.

Powerlink considers that while the occurrence of such events may be low probability, if they were to eventuate, Powerlink's operating expenditure costs could be significantly impacted given that the Rules definition of insurance events does not appear to accommodate them. For clarification, Powerlink's insurance premiums and self insurance proposals discussed in Section 9.6.8 do not include any provision for these risks. Notwithstanding this, Powerlink also considers that a prudent service provider would take reasonable measures to manage such risks in meeting its regulatory and other obligations, and that the regulatory framework should facilitate such an outcome.

Proposed treatment

To address this shortcoming in the Rules, Powerlink proposes that the AER agrees to treat the combined costs associated with the occurrence of the events above by means of a cost pass through arrangement, whereby only total exposures greater than 1% of the MAR can be sought. To this end, Powerlink also flags Grid Australia's intention to lodge a Rule change proposal in the near future to address these matters. In the interests of efficiency of process and consistency in application across TNSPs, Powerlink is prepared to engage with the AER and/or AEMC to reach a resolution that accommodates its requirements in the context of the Grid Australia Rule change. For example, to include transitional provisions in the Grid Australia Rule change decision applicable to Powerlink's 2013-17 regulatory period.

However, if the AER considers that the above proposal is not achievable, Powerlink considers that an appropriate allowance should be provided as an insurance item in its operating expenditure as part of its revenue cap decision for the next regulatory period. Powerlink reserves the right to provide additional information to the AER in this regard should this be the case.

Powerlink considers that a pass through arrangement provides an appropriate means to deal with these risks for the following reasons:

- By their very nature, these costs are unpredictable and represent costs that would also be expected to be faced in a competitive market. Therefore, it is appropriate to seek to manage the risk of these events.
- The AER[88] has recently indicated its preference that events relating to key income generating assets, i.e. assets crucial to the delivery of services from which the company's income is generated, be addressed under alternative regulatory options such as the cost pass through mechanism if such an event occurs. This ensures that the efficiency and scale of such an event can be judged in terms of efficiency, once the costs of the event are known with certainty.
- In the absence of a pass through arrangement, Powerlink could otherwise seek to insure for these situations either externally or via its self insurance allowance. Given the uncertainty surrounding the frequency and potential magnitude of these events, Powerlink does not consider that this would provide an appropriate ex-ante incentive to efficiently invest in and operate its network – a fundamental aspect of the Chapter 6 Review identified by the AEMC at the time.

Summary

Powerlink proposes to address the risk exposures 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.

[88] Queensland Distribution Determination 2010/11 to 2014/15, Appendix H, p.3, AER, May 2010.

9.6.10 Network support

The Rules[89] require the pass through of network support costs subject to the relevant factors.

Network support refers to costs associated with non-network solutions used by a TNSP as an efficient alternative to network augmentation. The AER's Regulatory Investment Test for Transmission (RIT-T) and consultation processes in the Rules associated with the application of the RIT-T require TNSPs to identify and evaluate both network and non-network solutions to emerging network limitations. Potential non-network solutions can include local generation, co-generation, demand side response and services from a Market Network Service Provider.

Powerlink's network support forecast for the next regulatory period is based on an estimate of the cost of network support services required to be provided in North Queensland, and is set out in Table 9.7. The detailed Network Support Methodology has been provided to the AER on a confidential basis.

Table 9.7: Forecast network support expenditure ($m, 2011/12)

	2012/13	2013/14	2014/15	2015/16	2016/17	Total
Network Support	1.2	0.8	1.2	2.9	2.2	8.3

Source: Powerlink data

Powerlink's capital expenditure forecast assumes that these network support services for North Queensland will apply. Powerlink has not identified any other network support services for the next regulatory period. However, as noted above, Powerlink is required through the RIT-T process to consider non-network options as an economic means to defer network investment. Should a viable and cost effective non-network alternative to a capital project included in the capital expenditure forecast be identified during the next regulatory period, then Powerlink will necessarily:

- enter into a network support agreement for the provision of the relevant network support services; and
- fund the cost of these network support services from the revenue cap provided by the AER. Powerlink will not be able to seek a pass through for these costs.

Therefore, no "double dipping" has occurred between capital expenditure forecasts and the network support forecast, or will occur between capital expenditure and operating expenditure.

Contingent projects triggered in the regulatory period may impact network support requirements during the regulatory period, but have not been included in Powerlink's network support forecast. Powerlink will seek any resulting network support changes as part of the contingent project application as appropriate.

9.6.11 Debt raising costs

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

To provide expert advice in relation to this matter, Powerlink engaged PwC to:

- Review the methodology currently applied by the AER.

[89] National Electricity Rules, Chapter 6A, clause 6A.7.2, AEMC.

- Develop a revised or new methodology to the extent the current methodology was no longer appropriate.

PwC's full expert report is provided at Appendix K to Powerlink's Revenue Proposal.

PwC considers that the current methodology adopted by the AER remains essentially appropriate. However, PwC concludes that the methodology should be amended to correct for errors in the 2004 Allens Consulting Group (ACG) study and updated for the most recent market evidence. Specifically, PwC has estimated an average size bond issue of $250m. On the basis of a forecast total issuance for Powerlink of $4 billion, this equates to 16 issues and a recommended total debt-raising cost allowance of 9.1 basis points per annum (bppa), comprising the following:

Table 9.8: Estimated debt raising transaction costs

Case	1 issue	16 issues
Amount raised	$250m	$4,000m
Bond arrangement/placement fees	7.2 bppa	7.2 bppa
Other bond raising transaction fees	2.5 bppa	1.9 bppa
Total debt raising transaction costs	**9.7 bppa**	**9.1 bppa**

Source: Powerlink Debt and Equity Raising Costs, PricewaterhouseCoopers, April 2011.

When applied in the PTRM, PwC's recommended allowance equates to a total debt raising cost allowance of $20.3m over the next regulatory period, as provided in Table 9.9 below:

Table 9.9: Debt raising costs ($m, 2011/12)

	2012/13	2013/14	2014/15	2015/16	2016/17	Total
Debt raising	3.5	3.8	4.1	4.3	4.5	20.3

Source: Powerlink data.

9.7 Programs associated with the service target performance incentive scheme

Powerlink's maintenance programs are undertaken to meet all of Powerlink's operating expenditure objectives and not to meet any specific performance target. The programs are designed to ensure continued reliability, availability and quality of electricity supply to all consumers. However, they do not include specifically designed activities to improve the performance of the transmission system for the purpose of the Service Target Performance Incentive Scheme that will apply to Powerlink in the 2013 to 2017 regulatory period. Powerlink's maintenance policies and procedures are based on best industry practice, and have been adopted by a number of other TNSPs.

9.8 Directors' responsibility statement

In accordance with the Rules[90] and Section 4.3.2 and 4.3.4(a)(6) of the Submission Guidelines, this Revenue Proposal must contain certification of the reasonableness of the key assumptions that underlie the operating expenditure forecast by the Directors of Powerlink.

The Director's responsibility statement is included in Appendix L.

[90] National Electricity Rules, Chapter 6A, schedule S6A.1.2(6), AEMC.

9.9 Forecast operating expenditure

Powerlink's forecast operating expenditure by category is shown in Table 9.10 below. The table details the forecast values for upcoming regulatory period from 2013 to 2017. The forecast is the result of applying Powerlink's operating forecasting methodology outlined in Section 9.5 and the key inputs and assumptions outlined in Section 9.6.

As discussed previously, Powerlink's operating expenditure costs are either zero based or base-year escalated estimates. While some of these costs are set for defined periods, none of these costs span the entire regulatory period, but rather are impacted by network growth, labour cost movements, international markets and evolving weather patterns. Consequently, Powerlink considers all operating expenditure costs to be variable.

Table 9.10: Forecast operating expenditure by category ($m, 2011/12)

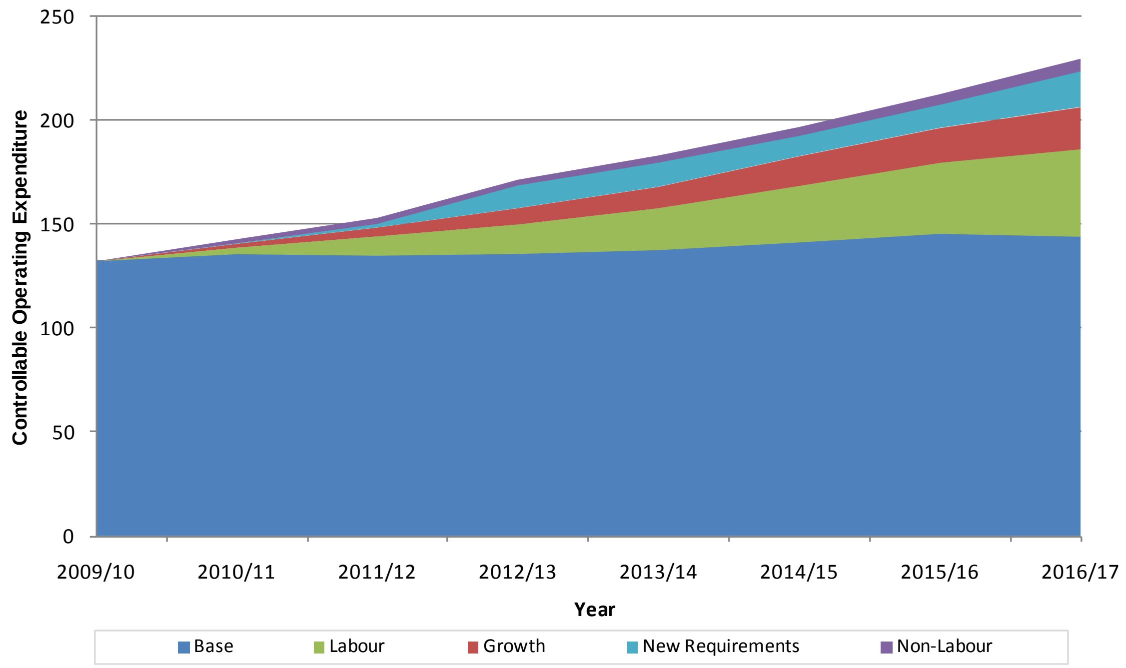
	2012/13	2013/14	2014/15	2015/16	2016/17	Total
Field Maintenance	57.7	60.8	65.2	68.8	73.3	325.8
Operational Refurbishment	34.8	35.6	34.0	35.3	39.8	179.5
Maintenance Support	12.8	13.3	14.0	14.4	14.9	69.3
Network Operations	14.1	14.7	15.5	16.1	16.8	77.3
Asset Management Support	33.6	34.7	36.1	37.2	38.5	180.0
Corporate Support	14.8	15.8	18.4	21.4	20.4	90.9
Total controllable operating expenditure*	**167.8**	**174.9**	**183.3**	**193.2**	**203.6**	**922.7**
Insurances	8.9	9.4	10.1	10.7	11.4	50.5
Network Support	1.2	0.8	1.2	2.9	2.2	8.3
Debt raising costs	3.5	3.8	4.1	4.3	4.5	20.3
Total operating expenditure*	**181.3**	**188.9**	**198.7**	**211.1**	**221.7**	**1,001.8**

*Numbers may not add due to rounding.

Source: Powerlink data.

Figure 9.4 shows the major operating expenditure growth drivers for Powerlink's operating expenditure for the next regulatory period. The application of economies of scale to the growth factors reduces the operating expenditure required. However, external cost drivers, such as labour cost increases, lead to overall increases in total operating expenditure.

Figure 9.4: Components of operating expenditure ($m, nominal)



Source: Powerlink data.

9.10 Operating expenditure benchmarking

Benchmarking operating expenditure is one of the 10 factors the AER must have regard to under the Rules[91]. Similar to capital expenditure, Powerlink agrees with the AER that benchmarking operating expenditure is appropriate[92] to use as a "sense check" of a more detailed bottom up analysis. However, benchmarking operating expenditure cannot replace a detailed investigation of costs due to inherent differences between transmission networks and operating environments in which they operate.

In order to account for different operating conditions and network characteristics, the following factors must be taken into account as a minimum with regard to operating expenditure benchmarking:

- size of the network - larger networks need more operating expenditure;
- load density of the network - longer distances require more operating expenditure; and
- regional differences such as climate and load profile.

The following operating expenditure benchmarking approaches demonstrate that Powerlink's operating expenditure is, and is forecast to remain, efficient.

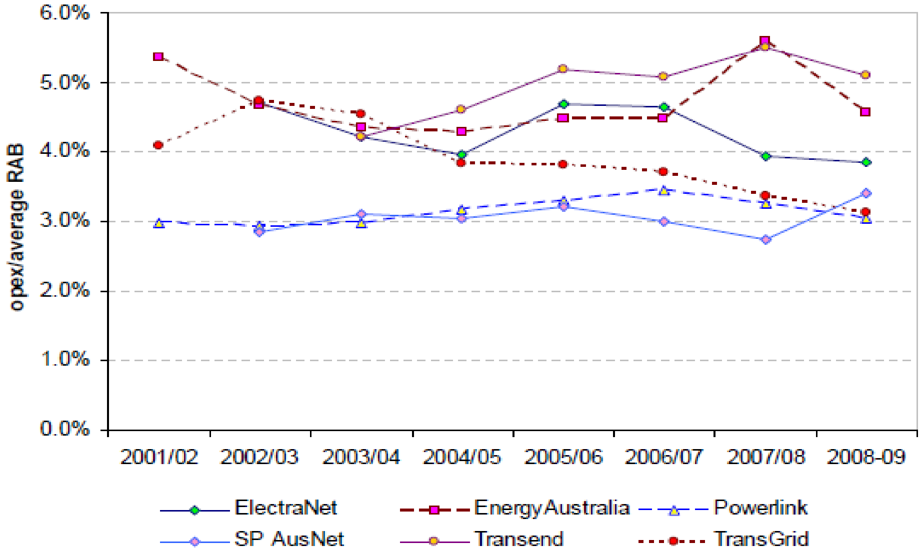
9.10.1 Operating expenditure ratio analysis

Operating expenditure ratio analysis of macro network parameters that take into account the above factors can provide a "sense check" of the operating expenditure efficiency of the transmission business. However these simple ratios are not infallible given the inherent differences in the transmission networks and environments in which they operate.

[91] National Electricity Rules, Chapter 6A, clause 6A.6.6(e), AEMC.
[92] Queensland Distribution Determination 2010–11 to 2014–15, p 426, AER, May 2010.

A ratio measure that reflects a number of the key factors influencing operating expenditure, including geography, is opex/RAB. Figure 9.5 shows the opex/RAB ratio trended over time which is sourced from the AER's Annual Transmission Network Service Providers Electricity Performance Report[93].

Figure 9.5: Operating expenditure as proportion of average RAB 2001/02 to 2008/09



Source: Transmission Network Service Providers Electricity performance Report for 2008-09, p.51, AER, February 2011.

Figure 9.5 shows Powerlink's operating expenditure over RAB ratio has consistently benchmarked well compared to other NEM TNSPs. Based on this Revenue Proposal, it is forecast that Powerlink's operating expenditure over RAB ratio will reduce to approximately 2.5% in 2017.

9.10.2 Historical and forecast operating expenditure comparison

Similar to capital expenditure benchmarking, the AER states:

> where a business is stable and efficient and its financial controls, governance and operating policies and procedures are sound, past operating expenditure allowances and actual expenditure can be used to infer if future operating expenditure levels were consistent with historic activity and the reasonableness of forecasting processes[94].

The Rules[95] and Section 4.3.4(a)(8)of the Submission Guidelines also require a comparison between forecast and historical operating expenditure.

Powerlink agrees there is some benefit in comparing operating expenditure allowances over time, but cautions that care is required to ensure significant new legislative and business requirements are taken into account. Figure 9.6 shows Powerlink's current and forecast controllable operating expenditure compared to the AER allowance.

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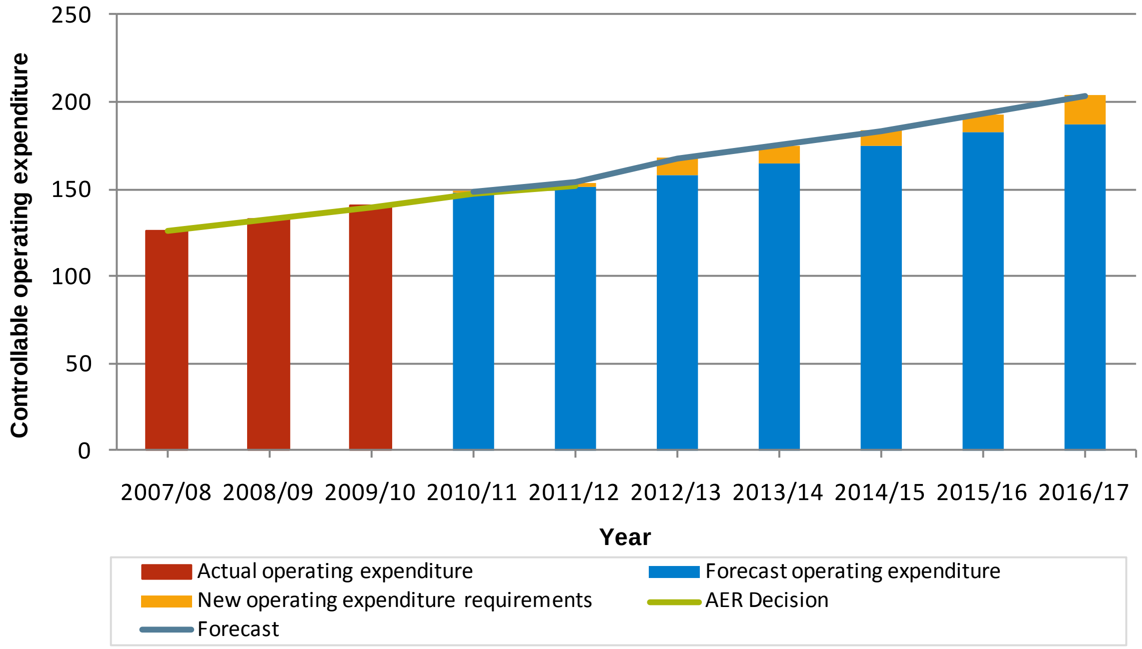
[93] Transmission Network Service Providers Electricity Performance Report for 2008-09, AER, February 2011.
[94] Final Decision - Victorian Electricity Distribution Network Service Providers Distribution Determination 2011–2015, p.401, AER, October 2010.
[95] National Electricity Rules, Chapter 6A, schedule S6A1.2(8), AEMC.

Figure 9.6: Current and forecast operating expenditure comparison ($m, 2011/12)



Source: Powerlink data.

Figure 9.6 shows that Powerlink's forecast controllable operating expenditure follows the trend of actual operating expenditure in the current regulatory period, which has a comparable capital expenditure program. Comparing the actual operating expenditure incurred with the operating expenditure allowance also shows close correlation.

The analysis of current regulatory period operating expenditure demonstrates that Powerlink's operating expenditure forecast processes are robust, and forecast operating expenditure is also consistent with historic operating expenditure.

9.10.3 External benchmarking

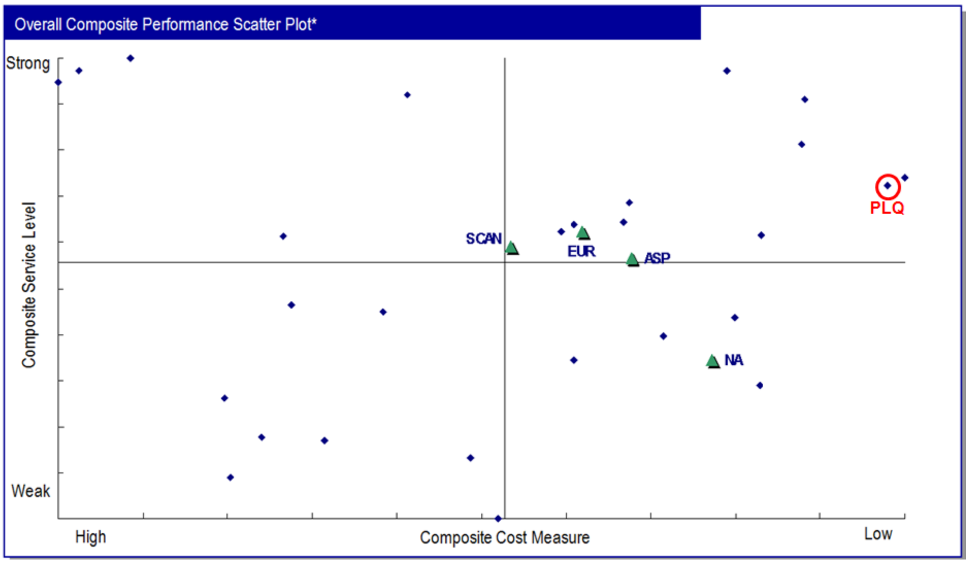
Powerlink participates in international operating expenditure benchmarking exercises to assess its performance against similar transmission businesses worldwide. The results of the International Transmission Operations and Maintenance Study (ITOMS) 2009 were released in early February 2010. They show that Powerlink remains one of the most cost-efficient transmission business not only in Australia, but also internationally.

The study involves companies from the Asia Pacific, Europe, Scandinavia and North America. It focuses on competing indicators of cost (operations and maintenance) and service performance (network reliability). This benchmarking recognises that cost and reliability cannot be considered in isolation – it would be easy to have a low cost network if reliability was of no consequence; likewise it would be easy to have a high reliability network if cost was no object. The real challenge (and one at which the results demonstrate that Powerlink excels) is to have a network which consistently delivers network reliability above the average of its peers for below average cost. Benchmarking results are presented as a cross plot of reliability and cost in the following figures.

As can be seen in Figure 9.7 for the overall performance benchmark, Powerlink is well positioned in the "best performer" quartile of lower than average cost and above average reliability (the upper right quartile).

The average result for transmission entities in the Asia Pacific region is shown by the "ASP" triangle. Powerlink's network performance is above the regional average and costs substantially lower than the regional average.

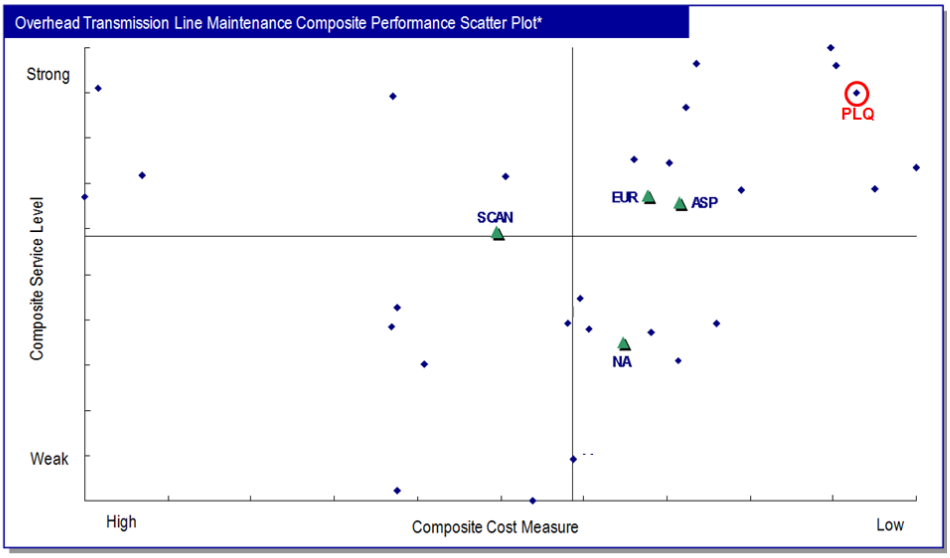
Figure 9.7: Overall composite performance scatter plot



Source: ITOMS 2009.

To enable a more detailed analysis, the ITOMS study breaks down these results into the main asset categories of substations and transmission lines. The result for transmission lines is shown in Figure 9.8. Again Powerlink's performance is in the top quartile, which displays excellent cost performance with high service level. This result can be attributed in part to Powerlink's efficient fleet management approach to lines refurbishment rather than refurbishing individual structures. By replacing insulators and other line hardware (at the appropriate time) for large sections of the transmission line rather than on individual structures enables economies of scale, reduced inspection costs and increased reliability.

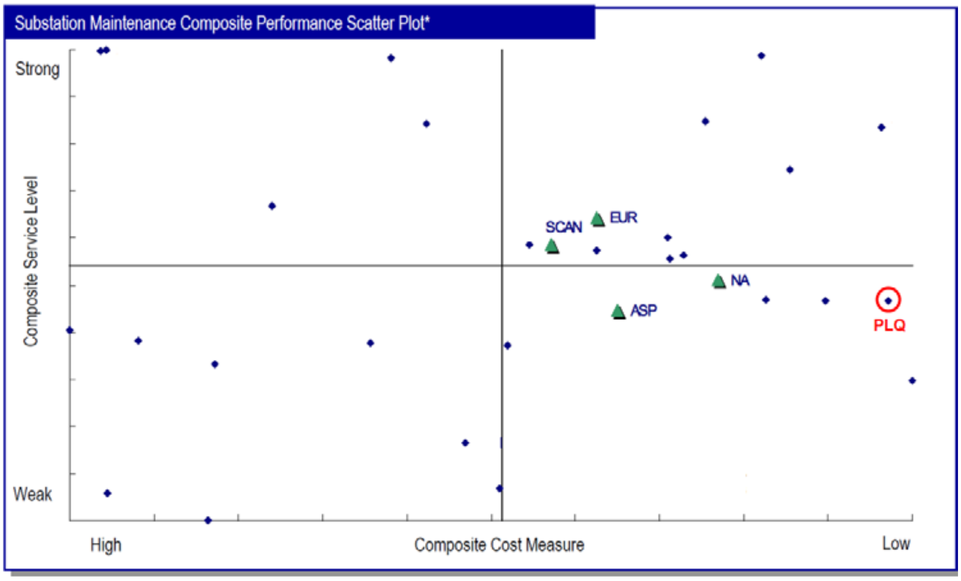
Figure 9.8: Transmission line maintenance performance scatter plot



Source: ITOMS 2009.

Results for substation performance are shown in Figure 9.9 which demonstrates that Powerlink's cost performance is very good compared to other entities and service level performance is slightly below the average. In order to improve upon this relative position, the timely refurbishment and the replacement of substation assets that have reached the end of life detailed in Chapter 8 is critical.

Figure 9.9:   Substation maintenance performance scatter plot



Source: ITOMS 2009.

9.11   Summary

Powerlink's required operating expenditure for the next regulatory period, the methodology adopted, and key inputs and assumptions used to derive it are explained in this Chapter. Powerlink considers that its operating expenditure forecasts:

- Meet the requirements of the Rules and Submission Guidelines.
- Represent efficient costs that a prudent operator would require to meet the operating expenditure objectives.
- Represents a reasonable expectation of the key inputs and assumptions required to meet the operating expenditure objectives.

10 Depreciation

As required under Section 4.3.11 of the Submission Guidelines, this Chapter presents Powerlink's assessment of the allowable depreciation on regulated assets during the regulatory period. The annual allowances for regulatory depreciation is referred to as the "return of capital".

Under the Rules[96], 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. Powerlink has depreciated each asset class in the RAB on a straight-line basis over the economic life of the asset. The depreciation methodology and resulting depreciation forecast are detailed in the following sections.

10.1 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[97].

Powerlink's audited financial accounts apply a straight line depreciation methodology. The straight line depreciation methodology has also been applied in the RFM and PTRM using the standard asset lives for each regulatory asset class.

The annual depreciation charge for the 2013-17 regulatory period is calculated within the Post-Tax Revenue Model (PTRM) using:

- The asset base value as at 1 July 2012 derived from the RFM.
- The standard asset lives set out in Section 10.2.
- The remaining asset lives set out in Section 10.3.
- The annual capital expenditure forecasts set out in Chapter 8.

For assets in existence as at 1 July 2012, the remaining asset lives and written down asset values as at 1 July 2012 are used to determine the annual depreciation charge. For assets added to the asset base in the next regulatory period, a depreciation charge is calculated for each asset class based on the amount of capital expenditure commissioned, and the standard asset life for each asset class. The PTRM depreciates assets at the beginning of each financial year after the assets are physically commissioned.

A total depreciation charge for each year of the regulatory period is then determined. This is based on the summation of the annual depreciation charges on existing assets as at 1 July 2012, and the assets added to the RAB during the next regulatory period.

Where assets are forecast to be decommissioned during the regulatory period, they are disposed of using the same asset class on a straight-line depreciation basis. The decommissioned assets are deducted from the commissioned capital expenditure in the year of disposal.

Powerlink's depreciation calculations are included in the completed PTRM submitted with this Revenue Proposal.

[96] National Electricity Rules, Chapter 6A, clause 6A.6.3, AEMC.
[97] Ibid.

10.2 Standard asset lives

In accordance with the Rules[98], Powerlink has established a straight line 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.

Minor asset classes have been combined with related asset classes for administrative convenience when forecasting future projects. The asset life used in each asset class represents an average of all the assets in that category. It should be recognised that within an asset class, individual assets may have an expected life that can be different to this average. For example, vehicles have a nominated useful life of seven years. However, different types of vehicles will have different useful lives. In general, the regulatory, the financial accounting, and technical lives of an asset are similar.

The standard asset lives for existing asset classes have not changed in the current regulatory period. However, Powerlink has introduced a new asset class for transmission lines which have undergone a transmission line refit.

Modifications and improvements to existing assets can extend the life of the asset beyond the original design life. Historically, when a transmission line has undergone refit works, the additional assets have been added to the 50 year transmission line asset class. Powerlink does not consider this to be appropriate as the remaining life of a refitted transmission line, without further intervention, is much less than 50 years. This is because the line may be 45 years old at the time it was refitted.

To reflect this, Powerlink has introduced a new asset class called "transmission line refit" with a more reflective asset life of 15 years. Consistent with its financial asset register, Powerlink will treat the value of the refit works as a new asset in the transmission line refit asset class and will continue to depreciate the existing asset value in the transmission line asset class to zero.

Powerlink’s asset classes and standard asset lives are shown in Table 10.1 below. These asset classes have been used to forecast Powerlink’s revenue requirements in the PTRM.

[98] National Electricity Rules, Chapter 6A, clause 6A.6.3, AEMC.

Table 10.1: Asset class and standard lives

Asset class	Asset life (years)*
Overhead lines	50
Underground Lines	45
Lines - Refit	15
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 & Miscellaneous	7
Office Machines	7
Vehicles	7
Moveable Plant	7
Insurance Spares	n/a

*Asset classes marked n/a do not depreciate.

10.3 Remaining asset lives

The Rules[99] require TNSPs to depreciate its assets using a profile that reflects the nature of its category of assets over the economic life of the category of assets. For assets in existence at the start of the regulatory period, the profile is determined from the average remaining asset lives in the PTRM and RFM.

For assets in existence as at 1 July 2012, Powerlink has calculated the remaining asset lives from the financial accounting asset register. The methodology is as follows:

> Remaining asset life = Net Book Value (NBV) at year end divided by the following year's depreciation.

Calculating the remaining asset life in this manner produces a depreciation profile that better reflects the economic life of that category of assets.

[99] National Electricity Rules, Chapter 6A, clause 6A.6.3(b), AEMC.

The forecast for remaining asset lives that are included in the Revenue Proposal have been calculated as follows:

1. Determine the remaining asset life from the financial asset register at 30 June 2010.
    - The financial asset register NBV for the year ended 30 June 2010 is the base year.
    - The remaining asset life for the asset class is calculated for the year ended 30 June 2010.
2. Roll forward the remaining asset life calculation from 30 June 2010 to the year ended 30 June 2012.
    - The financial NBV and the financial asset life details are rolled forward using forecast capitalised assets for the years 2010/11 and 2011/12.
    - Regulatory depreciation is applied for the years 2010/11 and 2011/12.
3. Calculate the remaining asset life at 30 June 2012.
    - The remaining asset life is calculated from the forecast financial NBV at 30 June 2012 and the forecast depreciation in the year 2012/13.

10.4 Regulatory depreciation

According to the Rules[100] regulatory depreciation is one of the building blocks of the MAR. Regulatory depreciation is made up of depreciation and an adjustment for the annual inflation of the opening RAB. This adjustment is added to the RAB and deducted from the MAR in the same year. The adjustment, for inflation of the opening RAB, is included as part of regulatory depreciation.

10.5 Depreciation forecast

Powerlink has derived its forecast of depreciation for the forthcoming regulatory period based on:

- the methodology, asset classes and standard lives outlined above;
- the opening asset base and forecast RAB values described in Chapter 6 (which reflect Powerlink's forecasts of asset additions and disposals); and
- the PTRM calculating the depreciation forecast on a straight-line basis.

The Rules[101] require Powerlink to provide depreciation schedules, which categorise the relevant assets by reference to well accepted categories. Powerlink has provided the depreciation schedules by asset class in the Submission Guidelines template 7.2. For convenience, the total proposed regulatory depreciation allowance is shown in Table 10.2.

[100] National Electricity Rules, clause 6A.5.4, AEMC.
[101] National Electricity Rules, Chapter 6A, schedule S6A.1.3(7), AEMC.

Table 10.2: Total depreciation forecast 2012/13 to 2016/17 ($m, nominal)

	2012/13	2013/14	2014/15	2015/16	2016/17	Total
Straight line depreciation	239.9	278.4	312.5	351.9	373.6	1,556.3
Less inflation adjustment on RAB	164.4	185.5	206.5	221.6	237.3	1,015.3
Regulatory depreciation	**75.5**	**92.9**	**106.0**	**130.3**	**136.4**	**541.0**

*Numbers may not add due to rounding.

10.6 Summary

Powerlink has prepared its forecast depreciation allowance at an asset class level using straight-line depreciation, with all assets within a class assigned weighted average standard and remaining lives.

The AER's PTRM has been used to calculate the regulatory depreciation allowance.

As required by the Submission Guidelines the depreciation pro forma template 7.2 is provided with the Revenue Proposal.

11 Maximum Allowable Revenue

11.1 Introduction

Powerlink's Revenue Proposal is based on the post-tax building block approach outlined in the Rules[102] and PTRM. This chapter summarises the building block approach, the components of which are detailed in the preceding chapters as required under Section 4.3.8 of the Submission Guidelines. The resultant MAR and X factor are calculated along with the average price path. Future revenue cap adjustments are also discussed.

11.1.1 Building block approach

The building block formula to be applied in each year of the regulatory period is:

MAR = return on capital + return of capital + opex + tax

= (WACC * RAB) + D + operating expenditure + tax

Where:

MAR = Maximum Allowable 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[103].

The Rules[104] allow for revenue increments and decrements arising from the Efficiency Benefit Sharing Scheme (EBSS). The net carry over for the EBSS as calculated in Chapter 5 has been included in the operating expenditure building block.

The increment or decrement associated with the Service Target Performance Incentive Scheme (STPIS) are not included in this Revenue Proposal, but rather included as future revenue cap adjustments.

The values reported in the following sections are "end of year" nominal as sourced from the PTRM.

11.2 Building block components

11.2.1 Regulatory asset base

The estimated 1 July 2012 opening RAB of $6,575.8m was established in Chapter 6.

Asset values have been rolled forward using the capital expenditure forecast in Chapter 8 and expected regulatory depreciation as detailed in Chapter 10. The RAB for the next regulatory period is summarised in Table 11.1.

[102] National Electricity Rules, Chapter 6A, AEMC.
[103] National Electricity Rules, Chapter 6A, clause 6A.6.8, AEMC.
[104] National Electricity Rules, Chapter 6A, clause 6A.5.4. (a)5, AEMC.

Table 11.1: Summary of RAB ($m, nominal)

	2012/13	2013/14	2014/15	2015/16	2016/17
Opening RAB	6,575.8	7,419.9	8,260.3	8,864.9	9,490.3
Net capital expenditure	919.6	933.3	710.6	755.7	627.6
Regulatory depreciation	75.5	92.9	106.0	130.3	136.4
Closing RAB	**7,419.9**	**8,260.3**	**8,864.9**	**9,490.3**	**9,981.5**

11.2.2 Return on capital

Return on capital has been calculated by applying the post-tax nominal vanilla WACC to the opening RAB in the respective year.

The post-tax nominal vanilla WACC of 10.3% was established using the methodology detailed in Chapter 7. Powerlink has calculated the return on capital in line with the PTRM. This calculation is summarised in Table 11.2 below.

Table 11.2: Summary of return on capital forecast ($m, nominal)

	2012/13	2013/14	2014/15	2015/16	2016/17
Opening RAB	6,575.8	7,419.9	8,260.3	8,864.9	9,490.3
Return on capital	677.6	764.5	851.1	913.4	977.9

11.2.3 Return of capital

The return of capital provided by depreciation has been derived and detailed in Chapter 10 of this Revenue Proposal. The regulatory models combine both the straight line depreciation and an adjustment for inflation on the opening RAB. A summary of the regulatory depreciation allowance is given in Table 11.3.

Table 11.3: Summary of return of capital - regulatory depreciation ($m, nominal)

	2012/13	2013/14	2014/15	2015/16	2016/17	Total
Regulatory depreciation	75.5	92.9	106.0	130.3	136.4	541.0

11.2.4 Operating expenditure

Chapter 9 of this Revenue Proposal details Powerlink's requirement for operating expenditure requirements in each year of the next regulatory period summarised in Table 11.4.

The total operating expenditure requirement is a composite value which includes allowances in addition to controllable operating expenditure.

- Controllable Operating Expenditure – Section 9.9.
- Insurances – Section 9.6.8.
- Debt Raising costs – Section 9.6.11.
- Network Support – Section 9.6.10.
- EBSS – Section 12.2.2.

Table 11.4: Summary of forecast operating expenditure ($m, nominal)

	2012/13	2013/14	2014/15	2015/16	2016/17	Total
Controllable operating expenditure	174.1	186.0	199.8	215.9	233.2	1,009.0
Network support	1.3	0.8	1.3	3.3	2.5	9.1
Insurances	9.2	10.0	11.0	12.0	13.1	55.3
EBSS	-0.8	-0.5	-1.2	1.1	0.0	-1.4
Debt raising costs	3.6	4.1	4.5	4.8	5.2	22.2
Total operating expenditure	**187.4**	**200.4**	**215.5**	**237.1**	**253.9**	**1,094.2**

11.2.5 Tax allowance

The tax allowance associated with the RAB is outlined in Chapter 7. The forecast tax allowance is summarised in Table 11.5.

Table 11.5: Summary of tax allowance ($m, nominal)

	2012/13	2013/14	2014/15	2015/16	2016/17	Total
Corporate income tax	57.5	63.3	72.4	78.1	83.2	354.6
Less value of imputation credits	37.4	41.1	47.1	50.8	54.1	230.5
Tax allowance	**20.1**	**22.2**	**25.3**	**27.4**	**29.1**	**124.1**

*Numbers may not add due to rounding.

11.3 Maximum Allowable Revenue

As required in the Section 4.3.8 of the Submission Guidelines, the total revenue cap and the MAR for each year of the next regulatory period is provided below. Based on the building blocks outlined in the previous section, the total revenue cap and maximum allowable unsmoothed revenue requirement is summarised in Table 11.6.

Table 11.6: Summary of unsmoothed revenue requirement ($m, nominal)

	2012/13	2013/14	2014/15	2015/16	2016/17	Total
Return on capital	677.6	764.5	851.1	913.4	977.9	4,184.6
Return of capital	75.5	92.9	106.0	130.3	136.4	541.0
Total operating expenditure	187.4	200.4	215.5	237.1	253.9	1,094.2
Tax allowance	20.1	22.2	25.3	27.4	29.1	124.1
Unsmoothed revenue requirement	**960.6**	**1,080.0**	**1,197.9**	**1,308.2**	**1,397.3**	**5,944.0**

11.4 X-Factor smoothed revenue

As required in Section 4.3.12 of the Submission Guidelines, the Revenue Proposal must contain the X factors nominated for each year of the regulatory period and that the X factors comply with the Rules[105]. A net present value (NPV) neutral smoothing process is applied to the building block unsmoothed revenue requirement, while ensuring the expected MAR for the last regulatory year is as close as reasonably possible to the annual building block revenue requirement. The X factors are presented in Table 11.7.

Table 11.7: Smoothed revenue requirement and X factor ($m, nominal)

	2012/13	2013/14	2014/15	2015/16	2016/17	Total
Unsmoothed revenue requirement	960.6	1,080.0	1,197.9	1,308.2	1,397.3	5,944.0
Smoothed revenue requirement*	960.6	1,064.0	1,178.5	1,305.3	1,445.7	5,954.0
X factor		**-8.06%**	**-8.06%**	**-8.06%**	**-8.06%**	

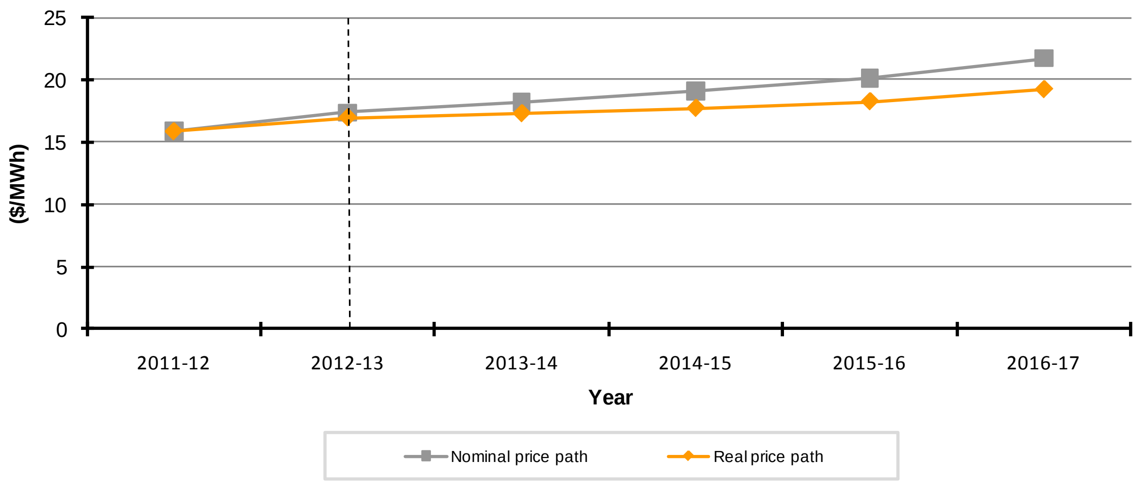
*Totals are in nominal values. The net present value of the smoothed and unsmoothed cash flows are equal for the regulatory period.

11.5 Average price path

Powerlink determines its transmission charges based on the AER's approved revenues and the pricing principles contained in the Rules. The effect of this Revenue Proposal on average transmission charges can be estimated by taking the maximum allowed revenue and dividing it by the forecast energy delivered in Queensland[106].

Figure 11.1 shows the average price path resulting from this Revenue Proposal during the next regulatory period, compared with the average price for the final year of the current regulatory period. Average transmission charges are estimated to increase in nominal terms from around $15.83 per MWh in 2011/12 to $21.72 per MWh in 2016/17.

Figure 11.1: Average price path from 2011/12 to 2016/17 ($/MWh)



Source: Powerlink data.

[105] National Electricity Rules, Chapter 6A, clause 6A.6.8, AEMC.
[106] Annual Planning Report 2010, Powerlink Queensland, 2010.

TUOS charges represent approximately 8% of residential electricity charges in Queensland[107] [108]. Powerlink estimates that the increase in transmission charges under this Revenue Proposal will add approximately $2.34 to the typical quarterly residential electricity bill of $393[109], or a nominal electricity price increase of approximately only 0.6% per annum.

11.6 Revenue cap adjustments

In accordance with the Rules[110], Powerlink's revenue cap determination by the AER may be subject to adjustment during the next regulatory period for the reasons outlined in the following sections.

11.6.1 Adjustment for actual CPI

Powerlink's revenue cap will be calculated each year using the actual CPI.

11.6.2 Adjustment for network support costs

Network support costs are treated as a pass through as required by the Rules[111]. An adjustment will be made to the revenue cap in each year based on the difference between the forecast and actual network support costs.

11.6.3 Other adjustments

The Rules[112] allows the pass through of other approved costs related to an insurance event, a regulatory change event, a service standard event, a tax change event or a terrorism event as defined in the Rules.

11.6.4 Contingent projects

Contingent projects have been included in Section 8.9 of this Revenue Proposal. If a trigger event for a contingent project occurs, then Powerlink will assess the projects using the RIT-T, where applicable, and lodge an application to the AER requesting a revised MAR stream in accordance with the Rules[113].

11.7 Summary

This Chapter details how Powerlink's MAR is calculated, and provides a forecast for each year and the total for the next regulatory period. The impact on the average price path is forecast and is expected to increase electricity prices minimally by only 0.6% per annum.

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[107] Energy User News - Edition 11, Energy Users Association of Australia, March 2011.
[108] The Boomerang Paradox, Part I, Paul Simshauser (AGL) *et. al*, February 2011.
[109] Department of Employment, Economic Development and Innovation, Queensland Government, March 2011.
[110] National Electricity Rules, Chapter 6A, AEMC.
[111] National Electricity Rules, Chapter 6A, clause 6A.7.2, AEMC.
[112] National Electricity Rules, Chapter 6A, clause 6A.7.3, AEMC.
[113] National Electricity Rules, Chapter 6A, clause 6A.8.2, AEMC.

12 Efficiency Benefit Sharing Scheme (2013-17)

12.1 Introduction

The Rules[114] and Section 4.3.7 of the Submission Guidelines require that a Revenue Proposal contain the values proposed to be attributed to the EBSS in the next regulatory period, and an explanation of how these proposed values comply with the scheme. In addition, the Submission Guideline pro forma statement 7.4 must be prepared and submitted as part of the proposal.

The AER's EBSS Guidelines[115] also provide that any proposed changes to the EBSS applicable to the next regulatory period be proposed to the AER at least 22-months before commencement of that period (i.e. by end August 2010). For clarification, Powerlink did not propose any changes to the existing EBSS at that time.

12.2 Exclusions and adjustments

The EBSS allows for certain cost categories to be excluded from the scheme, including those set out in a determination of the AER. In addition, adjustments to forecast operating expenditure can be made in calculating the net carryover amount from one regulatory period to the next.

12.2.1 Exclusions

For the next regulatory period, Powerlink proposes to maintain all exclusions applicable to its current regulatory period, namely:

- debt-raising costs;
- equity raising costs;
- network support costs;
- insurance costs; and
- self-insurance costs.

Powerlink considers that these proposed exclusions are either outside its control, costs are driven by exogenous events or are an accumulation fund. As such these proposed exclusions are consistent with the EBSS and exclusions approved by the AER in relation to other TNSP revenue determinations to date. Such exclusions are in addition to pass through events, which are already recognised as exclusions under the scheme.

12.2.2 Adjustments

As required by the EBSS, Powerlink proposes to adjust for the cost consequences of the difference between forecast and actual demand growth in calculating the net carryover for the 2013-17 regulatory period, which will occur at the end of the next regulatory period. However, Powerlink also considers that in the interests of efficiency and practicality, a proportionate approach should be applied to such adjustments as the AER has previously agreed in relation to TransGrid[116] and Transend. Specifically, Powerlink proposes that its controllable operating expenditure forecasts only be adjusted where total cumulative controllable operating expenditure for the regulatory period exceeds 1%. Such an approach would ensure that any year on year movements in capital expenditure (which is both common and to be expected due to, for

[114] National Electricity Rules, Chapter 6A, AEMC.
[115] Electricity Transmission Network Service Providers Efficiency Benefit Sharing Scheme, AER, September 2007.
[116] Where a growth adjustment is only required if actual demand is outside the range of scenarios modelled in developing the Revenue Proposal.

example, changing circumstances and the prudent reprioritisation of workload) do not unduly impact either the operating expenditure forecasts or the incentives underpinning the scheme. This approach provides greater certainty.

For the purposes of establishing the controllable operating expenditure forecasts applicable to the EBSS calculation for the next regulatory period, Powerlink proposes the following values as outlined in Table 12.1.

Table 12.1: EBSS operating expenditure forecasts ($m, 2011/12, mid-year)

	2012/13	2013/14	2014/15	2015/16	2016/17	Total
Forecast operating expenditure	181.3	188.9	198.7	211.1	221.7	1,001.8
Adjustment for debt raising costs	3.5	3.8	4.1	4.3	4.5	20.3
Adjustment for network support	1.2	0.8	1.2	2.9	2.2	8.3
Adjustment for insurances	8.9	9.4	10.1	10.7	11.4	50.5
Forecast operating expenditure for EBSS purposes	**167.8**	**174.9**	**183.3**	**193.2**	**203.5**	**922.7**

Powerlink considers that these values are compliant with the EBSS, given they represent the net result of the proposed exclusions.

13 Service Target Performance Incentive Scheme (2013-17)

13.1 Introduction

In accordance with Section 2.3(d) of the STPIS Guideline[117], Powerlink submitted a proposal to the AER on 31 August 2010 to refine the STPIS applicable to Powerlink in the 2013 to 2017 regulatory period.

The AER released an Explanatory Statement on 3 December 2010 in response to Powerlink's proposed refinements. Powerlink provided a response to the Explanatory Statement on 21 January 2011.

The AER released Powerlink's approved STPIS on 31 March 2011[118]. The scheme provides Powerlink with an incentive or penalty of 1% of MAR under the network component, and an incentive of up to 2% of MAR under the market component. The scheme will measure performance against eight parameters, as follows:

- Transmission Lines Availability;
- Transformer Availability;
- Reactive Plant Availability;
- Peak Transmission Availability;
- Frequency of Large Loss of Supply Events greater than 0.75 system minutes;
- Frequency of Moderate Loss of Supply Events greater than 0.10 system minutes;
- Average Outage Duration; and
- Market Impact of Transmission Congestion.

The following sections contain Powerlink's proposed targets, caps, collars and weightings as required by Section 3.3 of the STPIS Guideline and Section 4.3.6 of the Submission Guidelines. Further details and calculations are included in the Powerlink's STPIS Target, Caps, Collars and Weighting Methodology in Appendix O. In addition, the Submission Guideline pro forma statement 7.3 has been submitted as part of the proposal.

13.2 Service component - transmission circuit availability

Powerlink's current STPIS has three transmission circuit availability sub parameters (critical, non-critical and peak). The AER approved STPIS (for the next period) includes individual plant (transmission lines, transformers and reactive plant) and peak circuit sub parameters.

These sub parameters reduce the potential overlap between the service component and market component of the scheme, whilst ensuring that customers are not impacted during peak periods.

13.2.1 Target, cap and collar methodology

Recent revenue determinations have set the target for the transmission circuit availability sub parameter as an average of the five most recent years of performance data. This is consistent with section 3.3 (g) of the STPIS Guideline. In addition, the cap (maximum bonus) and the collar (maximum penalty) have been set at two standard deviations either side of the target. Powerlink proposes to apply this methodology to the transmission circuit availability parameters.

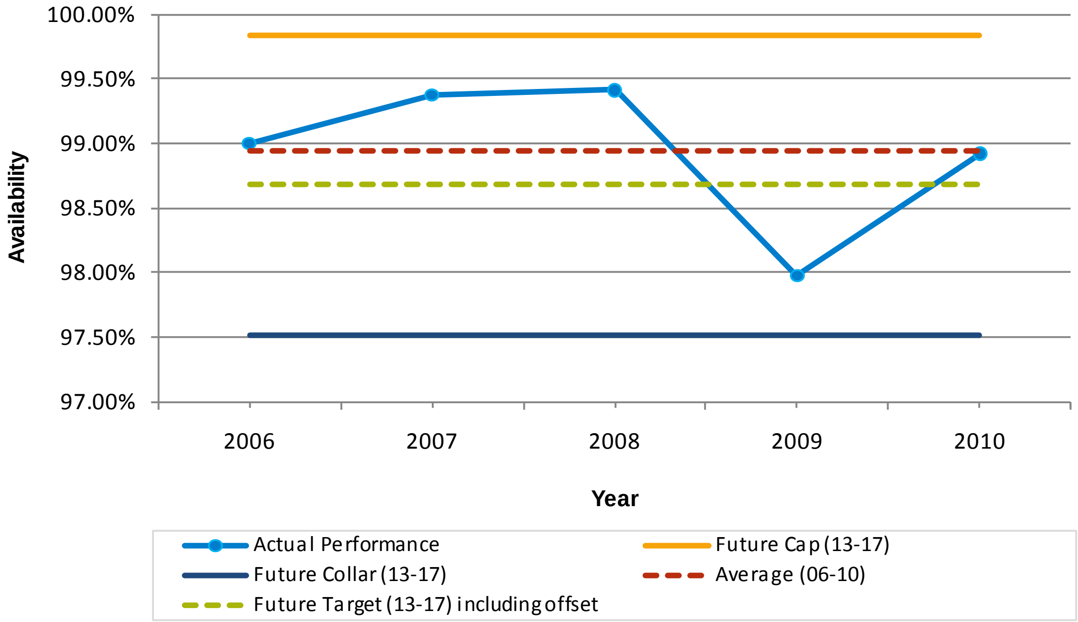
[117] Electricity transmission network service providers – Service Target Performance Incentive Scheme, p.4, AER, March 2008.
[118] Final - Electricity transmission network service providers, Service target performance incentive scheme, AER, March 2011.

In addition, Powerlink is proposing to undertake a program of capital and operational refurbishment of transmission lines and transformer refurbishment works in the 2013 to 2017 regulatory period. These works have not previously been undertaken by Powerlink and will require substantial outages of the transmission network. Section 3.3(k)(2) of the STPIS Guideline allows a TNSP to reasonably adjust the performance target for the expected increase in the volume of capital works. To take account of these works, and in line with the STPIS Guideline, Powerlink has calculated the annual availability impact and proposes to apply this average five year target.

13.2.2 Transmission line availability

Figure 13.1 below details Powerlink's transmission line availability performance from 2006 to 2010.

Figure 13.1: Transmission line availability performance (2006 to 2010)



Source: Powerlink data.

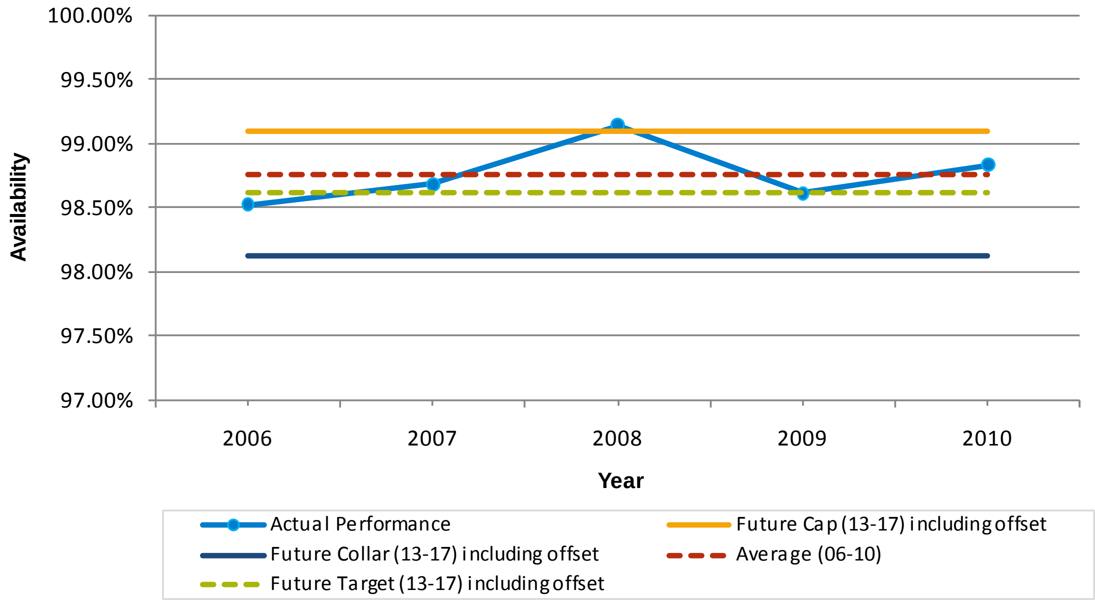
Powerlink proposes a target based on the average performance history from 2006 to 2010 adjusted for the availability impact of the proposed transmission line works not previously captured in Powerlink's performance history. The 2006 to 2010 average, when adjusted, results in a target of 98.67%. Further details of the offset are provided in Appendix O.

Powerlink has calculated the cap and collar at two standard deviations from this target. This results in a symmetric performance band with a cap and collar of 99.83% and 97.51% respectively.

13.2.3 Transformer availability

Figure 13.2 below details Powerlink's transformer availability performance from 2006 to 2010.

Figure 13.2: Transformer availability performance (2006 to 2010)



Source: Powerlink data.

Powerlink proposes a target based on the average performance history from 2006 to 2010 adjusted for the availability impact of the proposed transformer refurbishment projects not previously captured in Powerlink's performance history. The 2006 to 2010 average, when adjusted, results in a target of 98.59%. Further details of the offset are provided in Appendix O.

Powerlink has calculated the cap and collar at two standard deviations from this target. This results in a symmetric performance band with a cap and collar of 99.08% and 98.11% respectively.

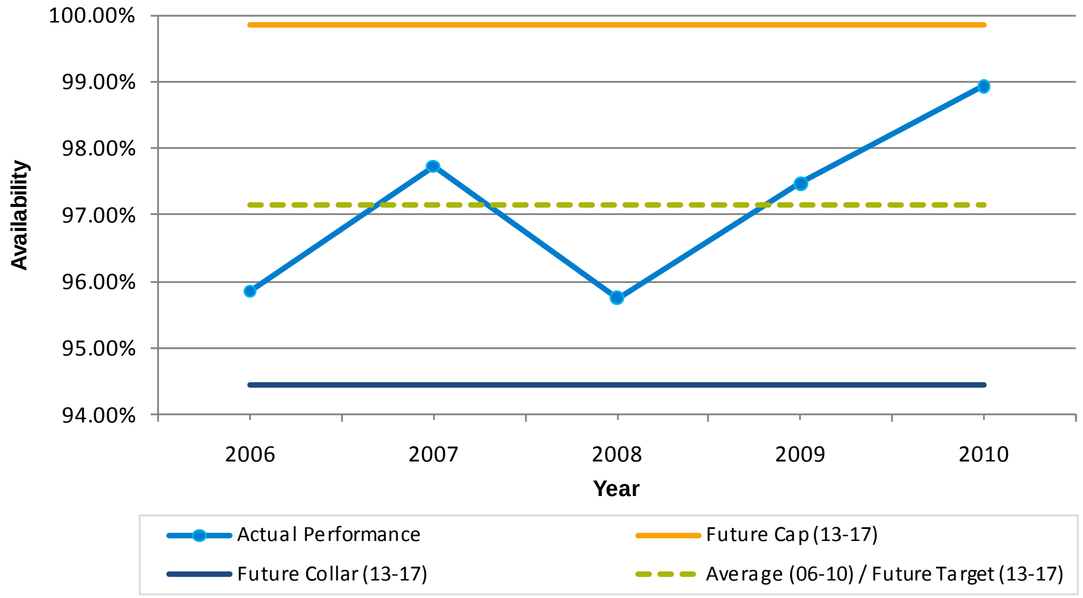
13.2.4 Reactive plant availability

Reactive plant availability relates to the cumulative availability performance of capacitors, reactors and static VAr compensators in Powerlink's network.

As part of the STPIS review, the AER approved Powerlink's proposal to exclude capacitor banks during off-peak periods from 1 April through to 31 October each year. This impacts the calculation of the target, caps and collars for both reactive plant availability and also the average outage duration.

Figure 13.3 details Powerlink's reactive plant availability from 2006 to 2010.

Figure 13.3: Reactive plant availability performance (2006 to 2010)



Source: Powerlink data.

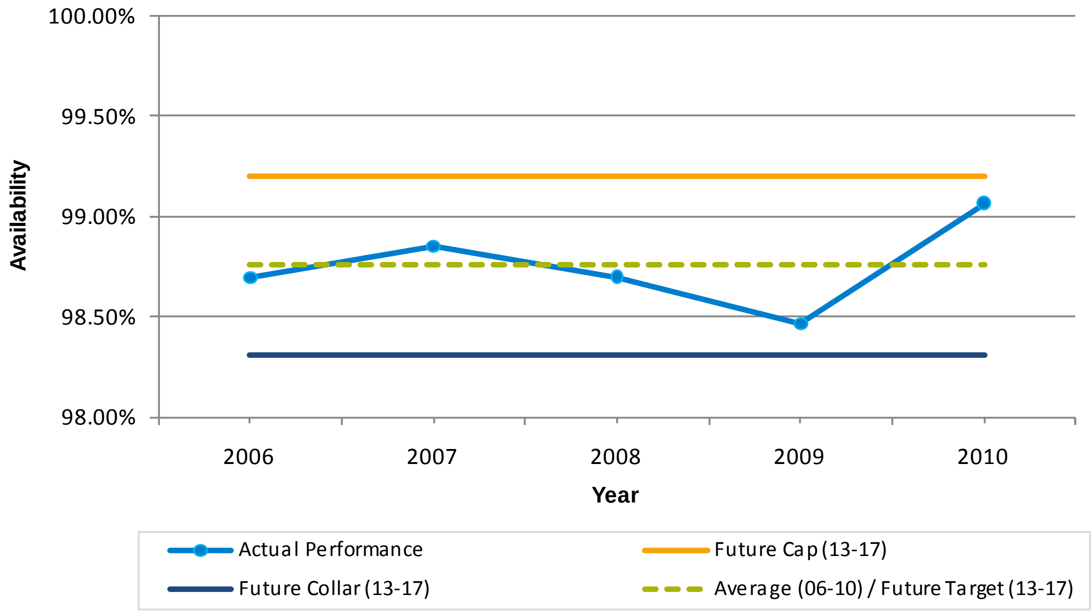
Powerlink proposes a target based on the average performance history from 2006 to 2010 which results in a target of 97.15%.

Powerlink has calculated the cap and collar at two standard deviations from the target. As shown in Figure 13.3 above, this results in a symmetric performance band with a cap and collar of 99.84% and 94.45% respectively.

13.2.5 Peak availability

The peak availability parameter applies to all individual plant of transmission lines, transformers and reactive plant. The peak period refers to the months from November to March, with a time period from 07:00 to 22:00 (not including weekends and public holidays). This period complements the "off-peak" months of April to October (accepted by the AER for the exclusion of capacitor banks). Figure 13.4 below details Powerlink's peak availability performance from 2006 to 2010.

Figure 13.4: Peak availability performance (2006 to 2010)



Source: Powerlink data.

Powerlink proposes a target based on the average performance history from 2006 to 2010, which results in a target of 98.76%. No offset is proposed for peak availability measures as Powerlink is not planning to undertake the additional transmission line or transformer works during the peak period.

Powerlink has calculated the cap and collar at two standard deviations from the 2006 to 2010 average. This results in a symmetric performance band with a cap and collar of 99.20% and 98.31% respectively.

13.3 Service component– frequency of loss of supply

The frequency of loss of supply parameter uses a system minute calculation to measure moderate (x) and large (y) unplanned outage against the total network energy supplied. The system minute calculation represents the duration and size (MWh) of each unplanned outage as a proportion of the TNSP's peak system usage.

Powerlink has calculated a performance target based on the average performance history over the most recent five years. This is consistent with section 3.3(g) of Powerlink's approved Scheme.

Cap and collar values have been evaluated (at the 10th and 90th percentiles) with the "best-fit" curves using 10 years of history. The "best-fit" curves have been evaluated using standard "goodness-of-fit" tests to evaluate how well the model fits the set of observations.

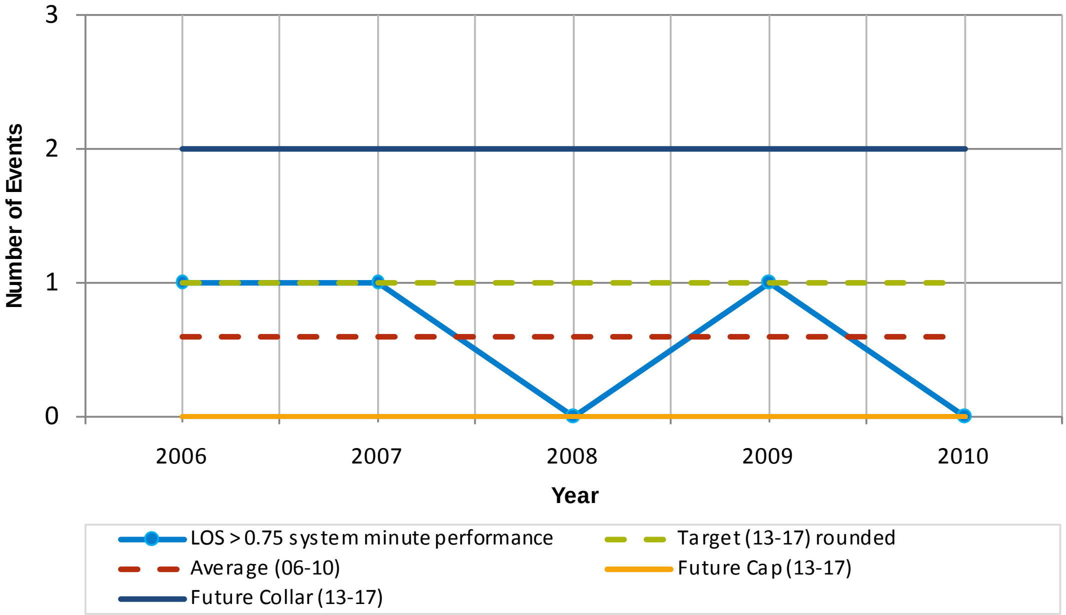
This is consistent with the methodologies previously accepted by the AER for other TNSPs. A 10 year time period ensures that the inherent variability of the loss of supply data is taken into account and provides a larger number of events on which to establish cap and collar values.

13.3.1 Loss of supply events > 0.75 system minutes

The new large (y) threshold for the loss of supply event is 0.75 system minutes. The average number of loss of supply events from 2006 to 2010 greater than 0.75 system minutes is

0.6 events (shown by the red line). In line with the STPIS Guideline[119], this target must be rounded to the nearest integer number, in this case, one event (shown by the green line). Figure 13.5 below details Powerlink's loss of supply performance greater than 0.75 system minutes from 2006 to 2010.

Figure 13.5: Frequency of large loss of supply events (2006 to 2010)



Source: Powerlink data.

Powerlink has calculated the cap and collar at the 10th and 90th percentile respectively of the curve of best-fit. Using this methodology, the cap and collar using the last 10 years performance history is 0.6234 and 2.7167 events respectively. The application of the appropriate rounding results in a cap and collar of 1 and 3 events respectively.

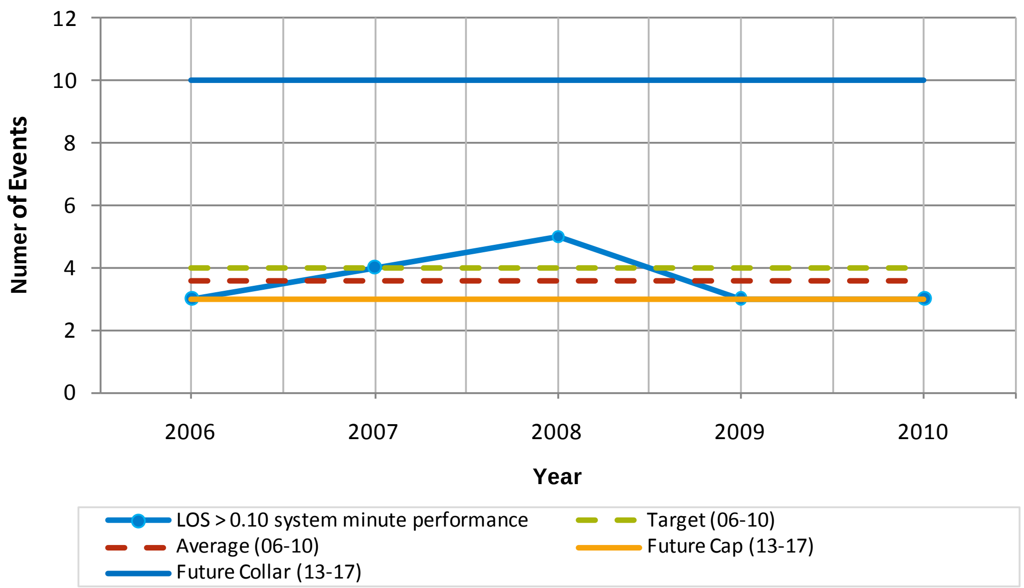
The above calculation results in a rounded value of 1 event which is equal to the performance target. Under the Scheme, this outcome is nonsensical as it would result in a situation where Powerlink could receive both the financial reward associated with the cap (maximum bonus) and target (no bonus or penalty). In consideration of this result, Powerlink has set the cap at the 5th percentile (0.4739) with a value of 0 events.

13.3.2 Loss of supply events > 0.10 system minutes

The threshold for the moderate (x) loss of supply event is 0.10 system minutes. The average number of loss of supply events from 2006 to 2010 greater than 0.10 system minutes is 3.6 events (shown by the red line). Powerlink proposes to use a target of the 2006-2010 average of 3.6, rounded to 4 events (a shown by the green line). Figure 13.6 below details Powerlink's loss of supply performance greater than 0.10 system minutes from 2006 to 2010.

[119] Electricity Transmission Network Service Providers, Service Target Performance Incentive Scheme, p.8, AER, March 2011,

Figure 13.6: Frequency of moderate loss of supply events (2006 to 2010)



Source: Powerlink data.

Powerlink proposes to calculate the cap and collar at 10th and 90th percentile respectively of the curve of best-fit. Using this methodology, the cap and collar using the last 10 years performance history is 2.6579 and 9.5535 events respectively. The application of the appropriate rounding results in a cap and collar of 3 and 10 events respectively.

13.4 Service component– average outage duration

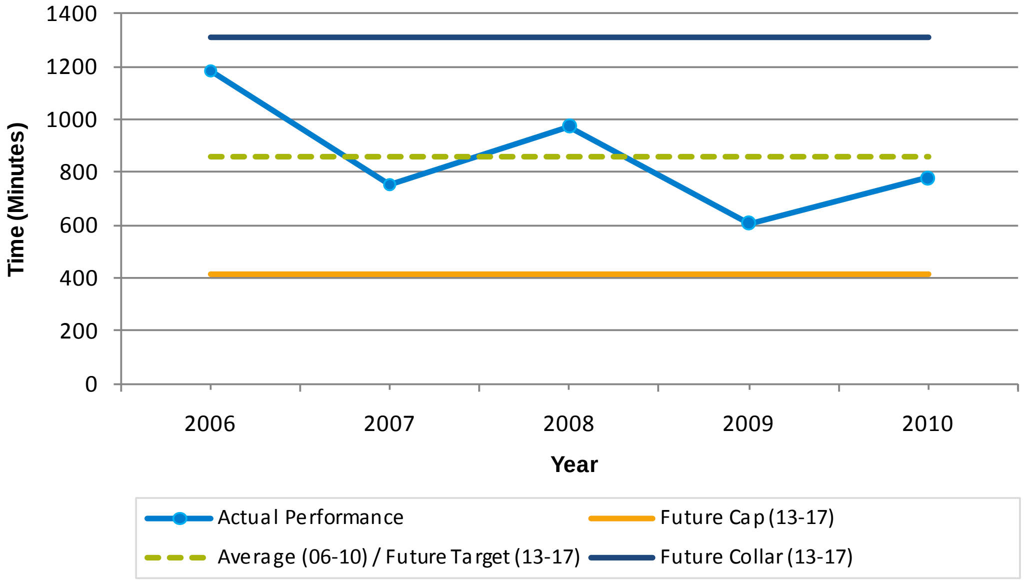
The average outage duration parameter reflects the time a TNSP takes to return a circuit to service by measuring the average length (in minutes) of an unplanned outage. Under the AER approved STPIS, all unplanned outages greater than 1 minute are included in the calculation for this parameter while large duration outages are capped at 7 days. As discussed previously, capacitor bank outages from April through October are excluded from the calculation.

Similar to the transmission circuit availability sub parameters, recent revenue determinations have set the:

- Performance target for the average outage duration parameters as an average of the five most recent years of performance data; and
- Cap and collar at the normal approximation of two standard deviations from the performance target.

Figure 13.7 below details Powerlink's average outage duration (from 2006 to 2010) adjusted for capacitors in the off-peak season.

Figure 13.7: Average outage duration performance from (2006 to 2010)



Source: Powerlink data.

Powerlink proposes a target based on the average performance history from 2006 to 2010 which results in a target of 859 minutes.

Powerlink has calculated the cap and collar at two standard deviations from the 2006 to 2010 average. This results in a symmetric performance band with a cap and collar of 412 and 1306 minutes respectively.

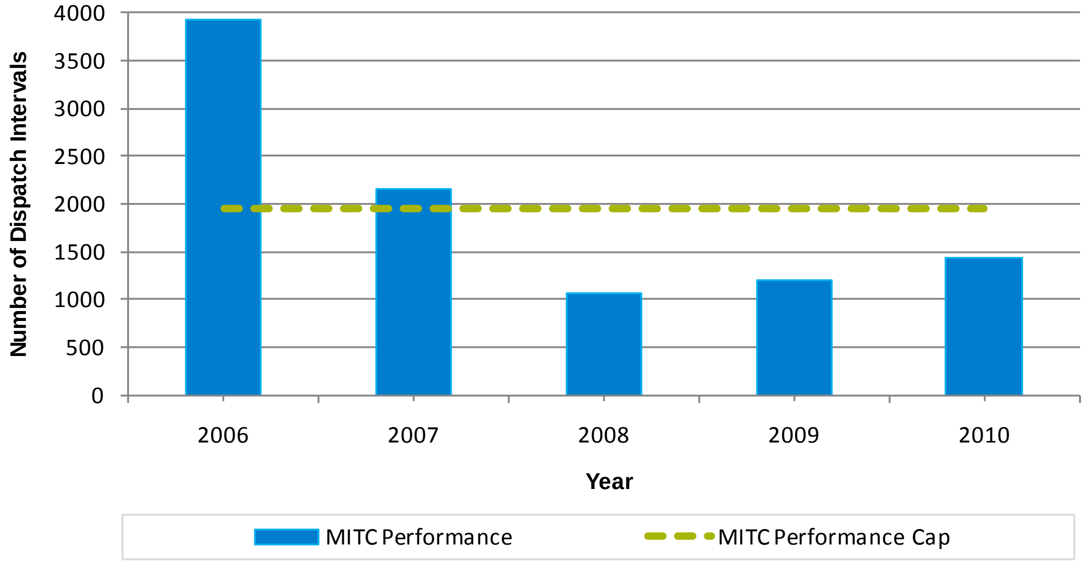
13.5 Market component

The market component of the STPIS has a single Market Impact of Transmission Congestion (MITC) parameter that incentivises TNSPs to minimise transmission outages that can affect the dispatch of generation in the National Electricity Market (NEM). This is measured by a count of the number of five-minute dispatch intervals where an outage on the transmission network results in a network outage constraint with a marginal value greater than $10/MWh.

The STPIS approved by the AER dictates that the market component is a bonus only scheme with up to 2% of MAR at risk. Consequently, a collar is set at zero dispatch intervals, similar to previous AER decisions. The performance cap has been set equal to the average of the most recent five year performance history.

To efficiently facilitate future prescribed capital augmentations to support increasing loads in South West Queensland, Powerlink will be acquiring existing network assets currently owned by a DNSP prior to the commencement of the next regulatory period. Therefore, to adequately reflect appropriate targets for the next regulatory period, the performance history of these assets needs to be taken into consideration when calculating performance targets for the 2013 to 2017 regulatory period. Powerlink has calculated the performance target for the MITC parameter using the average 2006 to 2010 performance. This results in a performance cap of 1,953 dispatch intervals (as shown by the green line in Figure 13.8).

Figure 13.8: Market impact of transmission congestion performance (2006 to 2010)



Source: Powerlink data.

13.6 Weightings

As dictated by Sections 3.4 and 4.3 of the STPIS Guideline, Powerlink can earn a revenue increment or decrement of up to 1% of MAR under the service component and a revenue increment of up to 2% of MAR under the market component. Table 13.1 outlines Powerlink's proposed sub-parameter and parameter weighting for the next regulatory period compared to the parameter weightings of the existing scheme.

Table 13.1: Proposed STPIS weightings

Parameter	Sub-Parameter Weighting (% of MAR)	Proposed Parameter Total (% of MAR)	Current Parameter Total (% of MAR)
Transmission Lines Availability	0.175	0.450	0.395
Transformer Availability	0.115		
Reactive Plant Availability	0.090		
Peak Availability	0.070		
Loss of Supply > 0.75 system minutes	0.300	0.450	0.455
Loss of Supply > 0.10 system minutes	0.150		
Average Outage Duration	0.100	0.100	0.150
Total Service Component	1.000	1.000	1.000
MITC	2.000	2.000	2.000

Powerlink has increased the total transmission circuit availability (from 0.395% of MAR in the existing Scheme) to 0.45% of MAR to accommodate the additional transmission circuit availability sub parameter. This ensures that availability parameters are not diluted and continue to provide a financial incentive under the Scheme.

The three plant sub parameters (transmission lines, transformers and reactive plant) availability have been weighted to reflect the number of plant elements in each particular availability sub parameter. The peak availability sub parameter has been allocated a weighting of 0.07% of MAR to reflect the period that it will apply (November to March). This allocation is consistent with the Rules[120] and will continue to provide Powerlink with appropriate incentives to improve the availability of the transmission network.

Powerlink's customers and Queensland industry place significant importance on the reliability of electricity supply. Consequently, Powerlink proposes to maintain the weighting for the large loss of supply sub parameter at 0.30% of MAR. Powerlink intends to slightly reduce the moderate loss of supply sub parameter by 0.005% to 0.15% of MAR. At 0.45% of MAR, Powerlink will continue to have one of the highest frequency of loss of supply parameter weightings in the NEM.

It is proposed that the remaining weighting be allocated to average outage duration. The reduction in the average outage duration weighting is reflective of Powerlink's improved performance over the last five years. This is in accordance with Section 3.5(d)(3) of the STPIS Guideline which requires the weighting to take into account the potential scope for improvement for the parameter.

13.7 Summary

The table below summarises Powerlink's proposed targets, caps, collars and weightings under the STPIS for the next regulatory period.

Table 13.2: Proposed STPIS targets, caps, collars and weightings

Parameter	Unit	Collar	Target	Cap	Weighting (% of MAR)
Transmission Lines Availability	%	97.51	98.67	99.83	0.175
Transformer Availability	%	98.11	98.59	99.08	0.115
Reactive Plant Availability	%	94.45	97.15	99.84	0.090
Peak Availability	%	98.31	98.76	99.20	0.070
Loss of Supply > 0.75 system minutes	Events	3	1	0	0.300
Loss of Supply > 0.10 system minutes	Events	10	4	3	0.150
Average Outage Duration	Minutes	1,306	859	412	0.100
Market Impact of Transmission Congestion	Dispatch Intervals	-	1,953	0	2.000

[120] National Electricity Rules, Chapter 6A, clause 6A.7.4(b), AEMC.

14 Pricing Methodology and Negotiating Framework

14.1 Pricing Methodology

Powerlink's current transitional provisions[121] provide that Powerlink is not required to have an approved Pricing Methodology under Chapter 6A of the Rules in place until its next regulatory period (1 July 2012 to 30 June 2017). In the meantime, Powerlink is subject to the old Chapter 6 pricing arrangements.

However, Powerlink also notes that the Rules and Submission Guidelines require that its proposed Pricing Methodology which relates to its prescribed transmission services for the next regulatory period accompany Powerlink's Revenue Proposal.

Powerlink's proposed Pricing Methodology is provided at Appendix P. Powerlink considers that the methodology meets all compliance requirements, given that it includes all relevant information prescribed under the Rules and identified in the Submission Guidelines.

14.2 Negotiating Framework

The Rules[122] and Section 5 of the Submission Guidelines establish the information that must be contained in, or to accompany, a TNSP's Negotiating Framework. The Negotiating Framework document sets out the procedure to be followed in negotiations between Powerlink and any person (service applicant) who makes an application in accordance with Chapter 5 of the Rules to receive an offer for a negotiated transmission service from Powerlink, as to the price and other terms and conditions for the provision of the negotiated service.

Powerlink's proposed Negotiating Framework and associated compliance checklist are provided at Appendices Q and R. Powerlink considers that the framework meets all compliance requirements, given that it includes all relevant information prescribed under the Rules and identified in the Submission Guidelines.

[121] National Electricity Rules, Chapter 11, clause 11.6.12, AEMC.
[122] National Electricity Rules, Chapter 6A, clause 6A.9.5, AEMC.

Glossary

AASB	Australian Accounting Standards Board
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
APR	Annual Planning Report
AWOTE	Average Weekly Ordinary Time Earning
BPO	Base Planning Objects
CPI	Consumer Price Index
DCST	Double Circuit Steel Tower
DNSP	Distribution Network Service Provider
DRP	Debt Risk Premium
EMS	Energy Management System
ESOO	Electricity Statement of Opportunities
EUAA	Energy Users Association of Australia
ITOMS	International Transmission Operations and Maintenance Study
kV	Kilovolt
LNG	Liquefied Natural Gas
MAR	Maximum Allowable Revenue
MVA	Megavolt Amperes
MW	Megawatt
MWh	Megawatt hours
NEM	National Electricity Market
NEMMCO	National Electricity Market Management Company
NPV	Net Present Value
NTNDP	National Transmission Network Development Plan
PoE	Probability of Exceedance
PTRM	Post Tax Revenue Model
QNI	Queensland – NSW Interconnector
RAB	Regulatory Asset Base
RBA	Reserve Bank of Australia
RCM	Reliability Centred Maintenance
RFM	Roll Forward Model
RIT-T	Regulatory Investment Test for Transmission
Rules	National Electricity Rules
TNSP	Transmission Network Service Provider
TUOS	Transmission Use of System
WACC	Weighted Average Cost of Capital

Appendices

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Reliably supporting Queensland's economic growth and a lower emissions NEM

Powerlink Queensland
ABN 82 078 849 233

33 Harold Street Virginia
Queensland Australia 4014

PO Box 1193 Virginia
Queensland Australia 4014

Telephone: (07) 3860 2111
Facsimile: (07) 3860 2100

www.powerlink.com.au