Level 26, 385 Bourke Street, Melbourne VIC 3000
GPO Box 1533N, Melbourne VIC 3001 | DX 252 Melbourne
T +61 3 8602 9200 | F +61 3 8602 9299

21 February 2014

The Director
Operations 1
Anti-Dumping Commission
5 Constitution Avenue
Canberra ACT 2600

Our ref: ATH
Matter no:

By email: Operations1@adcommission.gov.au

Dear Sir or Madam

Investigation into alleged dumping of Power Transformers exported from the People's Republic of China, the Republic of Indonesia, the Republic of Korea, Taiwan, Thailand and the Socialist Republic of Vietnam
Submission by Hyosung Corporation

We refer to our previous correspondence to the ADC on behalf of Hyosung Corporation ("**Hyosung**") in relation to the Investigation.

We have now been instructed to make the following submission in response to issues raised during the verification visit at Hyosung's premises starting 17 February 2014. Please note that this submission does not exclude further comments made throughout the Investigation.

For the purposes of this submission, all defined terms have the same meaning as set out in the attached Schedule of Definitions unless otherwise defined.

1. Distribution Transformers

1.1 Definition of Distribution Transformers

As stated in the Application, CON Report and PAD Report, the goods that are the subject of the Investigation are certain "power transformers" of a type having power ratings of equal to or greater than 10MVA and a voltage rating of less than 500kV. Certain types of "power transformers" are expressly identified as being included in the description of the GUC while "distribution transformers" are specifically excluded.

In undertaking the verification visit, the ADC is seeking cost verification details on all of the power transformers produced by Hyosung in its domestic market that meet that capacity, whether or not Hyosung believes they are more accurately defined as distribution transformers.

The definition of "distribution transformers" in the Application does not define the excluded goods in terms of their capacity. As such, they are not able to be clearly distinguished from the GUC. They are loosely defined as being smaller, manufactured in greater quantities, having different design and manufacturing technology and are generally used at the lower end voltages of the power distribution system.

Hyosung contends that the definition it adopts to distinguish distribution transformers from power transformers should be taken into account by the ADC to exclude distribution transformers from the ADC's calculation of Hyosung's constructed normal value.

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1.2 Further definition required for certainty

For any investigation into the alleged dumping of goods, particularly one as complex and large as this Investigation, words used to exclude goods from the description of the GUC must be clear otherwise the description may be void for uncertainty.

1.3 Define by physical features and uses

While there is no dictionary definition for the terms "power transformer" and "distribution transformer", Hyosung contends that they are used for different purposes as follows:

(a) "power transformers" are used in a transmission network of high level voltages for step-up and step down application; and

(b) "distribution transformers" are used for lower voltage distribution networks as a means to connect the end user, the final voltage transmission in the electrical power distribution system.

Distribution transformers are physically smaller than power transformers due to their different uses outlined above. Power transformers are used in transmitting power from the generating stations and therefore have near full loads at all times and have high insulation levels in comparison to distribution transformers. As distribution transformers step down the voltage for distribution to the consumer, they work at lower efficiency levels, are much smaller in size, are easier to install and have low magnetic losses.

1.4 Define by capacity

Hyosung's policies define distribution transformers by their capacity as being up to 66kV. As such, it contends that the goods sold in its domestic market during the Investigation Period that meet this level of capacity should be excluded when constructing Hyosung's normal value.

The AER's Transmission Network Service Providers Electricity Performance Report 2010-2011 at "**Attachment A**" describe the transmission lines and cables as having nominal voltages of 66 kV and higher. These transmission lines and cables are used for the transmission as opposed to the distribution of power for which power transformers and distribution transformers are used, respectively.

As you can see from Figure 1 below from the United States' Federal Energy Regulatory Commission, distribution transformers are similarly used in voltages lower than 69kV in comparison to the power transformers used in the transmission line, the lowest of which is 138kV.

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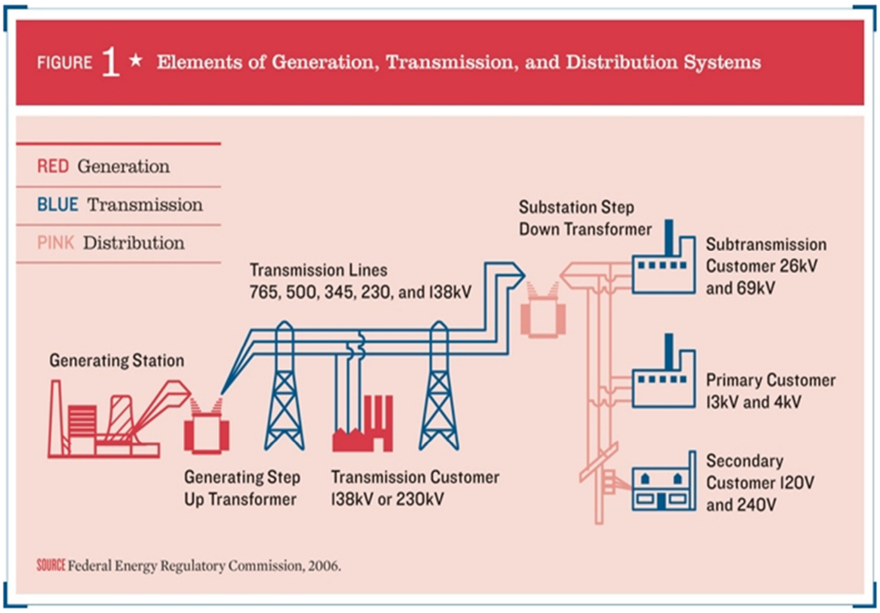

Further, on page 10 of Wilson's brochure at "**Attachment B**" Wilson defines its distribution transformers as having voltages up to 72kV.

Accordingly, our client requests that the ADC adopt an approach to the definition of distribution transformers consistent to the approach of the parties identified above.

2. Comparison of prices

Australia's anti-dumping legislation places responsibility on the ADC to make due allowance in each case (on its merits) for differences that affect price comparability. Specifically, section 269TACB of the Act provides that the ADC must compare the prices of goods exported to Australia with corresponding normal values. Further, subsections 269TAC(8) and (9) of the Act require the ADC to make any necessary adjustments to domestic prices in the following ways so they can be fairly compared to the export price:

(a) where domestic and export prices relate to sales occurring at different times or are not in respect of identical goods, the price for like goods on the domestic market will be adjusted, in accordance with subsection 269TAC(8); and

(b) where normal values is calculated using costs, adjustments must be made to ensure normal values are fairly comparable to export prices, in accordance with subsection 269TAC(9).

In light of the significant differences we have outlined in paragraphs 1.3 and 1.4, Hyosung requests that the ADC calculate the constructed normal value by excluding Hyosung's domestic sales for transformers that have a voltage rating of up to 66kV (which they define as distribution transformers) ("**Additional Transformers**"), in accordance with Chapter 14 of the ADC Manual. This will enable a fair comparison to be made between the export price and the normal value in determining the dumping margin (if any).

2.2 Particular differences that affect price comparability

As outlined in paragraphs 1.3 and 1.4 above and during the verification visit, there are substantial differences in the physical, features, use, sales and capacity of the Additional Transformers in comparison to Hyosung's power transformers. Hyosung has provided evidence to the ADC of these differences during the verification visit. Hysoung has also provided additional information on the general market conditions and sales processes

Other differences that demonstrate that the Additional Transformers are not identical goods to those exported to Australia include:

(a) As confirmed during the verification visit, the Additional Transformers are sold at different times to the power transformers in the domestic market and those exported to Australia.

(b) Our client produces large amounts of Additional Transformers (more than 400 during the Investigation Period) in comparison to power transformers (which totalled 211 during the Investigation Period).

(c) The levels of trade in selling the Additional Transformers are different to those in selling the power transformers in the domestic market and those exported to Australia. This is because of the different quantities of the two products sold and the different market and consumers that purchase Additional Transformers (as a result of their different uses, as outlined in paragraph 1.3 above).

(d) As you are aware from the information gathered during the verification visit, the price of an Additional Transformer is lower than that of a power transformer.

These significant differences demonstrate that the Additional Transformers are not identical goods to those exported to Australia. Including these in the calculation of the constructed normal value would unfairly affect the price comparability.

As such, in accordance with subsections 269TAC(8) and (9) of the Act, the prices and costs for the goods on the domestic market should be adjusted to take these differences into account to ensure a fair comparison between normal values and export prices is achieved.

2.3 KEPCO type equipment the appropriate basis for comparison

Further, Hyosung submits that given the policy and practice of the ADC set out in the ADC Manual as well as the provisions of the Act, the appropriate direct comparison of equipment and adjustment of values for the purposes of subsections 269 TAC (8) and (9) of the Act (including profit) should be made based on values of power transformers produced by our client for KEPCO . Details of the KEPCO equipment and the sales processes and values were provided during the verification visit. We also attach as **Attachment "C"**, a diagrammatic representation of our client's domestic market which illustrates that the power transformers manufactured for KEPCO are the only ones properly fitting the characteristics as power transformers which should be used for fair comparison purposes This material supports the proposition that fair comparison and adjustment of normal values and export prices should be based on constructed normal values for power transformers manufactured for KEPCO.

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3. Material injury and causation

As mentioned in our previous submissions to the ADC on behalf of Hyosung dated 11 September 2013, 17 October 2013 and 16 January 2014, there is insufficient evidence of causation and no ample evidence of material injury having been suffered by the Applicant. Indeed, during the verification visit, officers of our client have confirmed that price alone is not the sole determinant of a decision to purchase a Power Transformer and other issues take precedence, contrary to the claims of the Applicant.

We also repeat that there does not appear to be sufficient consideration given to the effects of the measures on the Australian purchasers of Power Transformers.

These observations have been made by a number of other submissions including those by Rio Tinto limited on 10 December 2013, Shinlin Electric and Engineering Corporation on 9 December 2013 and Origin Energy Resources on 10 October 2013.

Accordingly, Hyosung again calls on the ADC to provide further details for its findings with respect to causation and material injury and an analysis of its consideration of the downstream effects of the measures on purchasers. Our client believes that there is ample evidence before the ADC to the effect that any alleged dumped "price" is not the cause of any alleged injury. Taken with the significant adverse effect of the imposition of measures for the purchasers of Power Transformers, our client believes that no measures should be imposed on the GUC.

4. Inclusion of the value of the "turn-key" in the price of the goods

Hyosung also is also seeking that the value of Power Transformers sold on a turn-key basis in Korea (to include the assembly, disassembly, relocation, erection, testing and commissioning costs) be included in the assessment of Normal Values. The Power Transformer is a crucial aspect and the mere fact that other associated services are provided should not exclude the value of the Power Transformer being included.

Hyosung strongly urges that the information above be considered by the ADC and looks forward to its response.

Yours faithfully
Hunt & Hunt

Andrew Hudson

Andrew Hudson
Partner

D +61 3 8602 9231
E ahudson@hunthunt.com.au

Attachments

A **Australian Energy Regulator's Transmission Network Service Providers Electricity Performance Report 2010-2011**

B **Wilson Transformer Company Pty Ltd's brochure**

C **Diagrammatic representation of the domestic markt of Hyosunbg**

Schedule of Definitions

(a) "**Act**" means the *Customs Act 1901*.

(b) "**ADC**" means the Anti- Dumping Commission.

(c) "**ADC Manual**" means the ADC Dumping and Subsidy Manual published in December 2013.

(d) "**AER**" means Australian Energy Regulator.

(e) "**Applicant**" or "**Wilson**" means Wilson Transformer Co Pty Ltd being the applicant for the measures.

(f) "**Application**" means the application dated 4 July 2013 by Wilson seeking publication of dumping duty notices in respect of Power Transformers exported to Australia from the PRC, Indonesia, Korea, Taiwan, Thailand and Vietnam as referred to in the ADN.

(g) "**GUC**" means those Power Transformers the subject of the Application.

(h) "**Investigation**" means the investigation by the ADC in response to the Application.

(i) "**Investigation Period**" has the same meaning as in Consideration Report Number 219 issued by the ADC in response to the Application dated 4 July 2013 by the Applicant.

(j) "**KEPCO**" means Korea Electric Power Corporation.

(k) "**kV**" means kilo vaults.

(l) "**MVA**" means mega volt ampers.

(m) "**PAD Report**" means the Preliminary Determination report No. 219 made by the ADC on 20 November 2013.

(n) "**Power Transformers**" means power transformers as described in the Application, the ADN and the Consideration Report.

Transmission Network Service Providers Electricity Performance Report 2010-11

July 2013

AUSTRALIAN ENERGY REGULATOR

Inquiries about this performance report should be addressed to:

Australian Energy Regulator

GPO Box 520

Melbourne Vic 3001

Tel: (03) 9290 1444

Fax: (03) 9290 1457

Email: AERInquiry@aer.gov.au

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Glossary

Abbreviation	Definition
ACCC	Australian Competition and Consumer Commission
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
CAM	Cost allocation methodology - the method by which the businesses allocates its costs over its services - so as to recover revenue from customers
Capex	Capital expenditure
CPI	Consumer price index
EBIT	Earnings before interest and tax. Operating profit or operating income is a measure of a firm's profit that excludes interest and income tax expenses. It is the difference between operating revenues and operating expenses
EBSS	Efficiency benefit sharing scheme - this scheme sets out an incentive mechanism whereby the business can earn additional revenue or be penalized depending on whether the business beats or exceeds targets for its operational expenditure in each year of the regulatory control period.
Gearing	The percentage of the firm's funding which is attributed to debt. Calculated by dividing debt by the sum of debt and equity.
GW	Gigawatts
GWh	Gigawatt hours
Interest coverage	Measures whether a firm's earnings can cover its gross interest expense. Calculated by dividing Earnings before interest and tax by the gross interest expense.
KPI	Key performance indicators
kWh	Kilowatt hour
kV	Kilovolts

MAR	Maximum allowed revenue
MIP	Market impact parameter
MW	Megawatts
MWh	Megawatt hour
NEM	National Electricity Market
NPAT	Net profit after tax (EBIT minus interest and tax expense)
Opex	Operating expenditure
PS	Prescribed services - provided by transmission network assets or associated connection assets which are determined as those which should be subject to economic regulation.
PTRM	Post tax revenue model
s- factor	The s-factor represents the upward or downward adjustment in the calculation of the maximum allowed revenue as a result of performance being above or below pre-determined targets, as set out in the STPIS.
STPIS	Service targets performance incentive scheme - this scheme relates to the actual services provided by the regulated business. It provides opportunities for additional income or penalties to apply depending on whether a business meets, or fails to meet, performance targets for the identified services
TNSP	Transmission network service provider
RAB	Regulatory asset base - The RAB represents the value of the assets used for the regulated activities. The RAB provides a means for determining charges – and spreading impact on customers over time.
ROA	Return on assets - Measures the efficiency of the use of the business' assets in producing operating profit. Calculated by dividing Earnings before interest and tax by the average regulatory asset base.
WACC	Weighted average cost of capital - The WACC is the minimum return that a company must earn on an existing asset base to satisfy its creditors, owners, and other providers of capital, or they will invest elsewhere.

1 Overview

The National Electricity Market (NEM) in eastern and southern Australia provides a fully interconnected transmission network from Queensland through to NSW, the ACT, Victoria, South Australia and Tasmania. The NEM transmission network is characterised by a long, low energy density, reflecting the location of, and distance between, major demand centres.

This report provides a summary of the performance of the five transmission network service providers (TNSPs) in the NEM (ElectraNet in South Australia; Powerlink in Queensland; SP AusNet in Victoria; Transend in Tasmania and TransGrid in New South Wales), plus the two interconnectors (Directlink the interconnect between Queensland and New South Wales and Murraylink the interconnect between Victoria and South Australia). SP AusNet in Victoria and ElectraNet in South Australia and the two interconnectors are privately owned.

The transmission network structure in Victoria is different to the other states in that it separates asset ownership from planning and investment decision making. SP AusNet owns the transmission assets in Victoria, but the Australian Energy Market Operator (AEMO) plans and directs network augmentation. Accordingly, SP AusNet's capital expenditure (capex) excludes capex to expand the capacity of the network.

The TNSPs transmit energy across the high voltage transmission lines to the distribution networks. The TNSPs charge the distribution businesses for the energy transmitted into the distribution businesses network. The profitability of the TNSPs is not impacted directly by energy distributed over the regulatory control period. This is because they operate under a revenue cap. Under this form of regulation the regulator determines the revenue a business can earn in any one year and over the whole regulatory control period. A revenue cap allows a business to recover a certain amount of revenue each year irrespective of energy transmitted. Under a revenue cap if a business under or over recovers in any one year, an adjustment (increase or decrease) is made to the allowed revenue in the following year. Profitability of individual businesses operating under a revenue cap is measured by efficiencies in expenditures compared to forecasts determined at the commencement of the regulatory control period.

Recent shifts in demand and impact on network expenditures

Overall, across all jurisdictions both energy and maximum demand have generally increased in the last ten years and this has largely driven significant growth in network investment. However, more recently, this trend of growing demand has weakened appreciably. In more recent years, growth has slowed or even declined in some jurisdictions. ElectraNet in South Australia is an exception and has experienced consistent growth in both energy transmitted and peak demand. In the last five years energy transmitted by ElectraNet increased by 2.9 per cent and peak demand increased by 21.7 per cent. Powerlink in Queensland experienced consistent growth in both energy transmitted and maximum demand until 2008-9, when energy transmitted declined by two per cent. TransGrid in NSW experienced a decrease in energy transmitted over the last five years of five per cent. Peak demand transmitted by TransGrid however increased by 14.3 over the same five years.

As maximum demand is a key driver of capex, this trend has important implications for the TNSPs recent capex performance. In 2010-11, the TNSPs incurred about 39 per cent of their total capex to expand the network, (except Victoria) followed by an increasing proportion of capex to replace the existing network (36 per cent).

The capex allowance approved by the AER increased by 136 per cent between 2006-07 and 2010-11. This forecast increase in capex reflected the anticipated need to meet peak demand projections and the need to replace ageing assets. Actual aggregate capex across all TNSPs in the same period however increased 51 per cent (this was $6.4 billion over the past 5 years). This shows the TNSPs continue to invest to upgrade and replace ageing networks to meet network performance requirements. The TNSPs comment that this reduction in actual expenditure against forecast reflects a combination of factors including, the deferral of several major augmentation projects as a result of slower load growth on the network and efficiencies in the delivery of projects.

In their current regulatory control periods both Transend and TransGrid spent 26 per cent less on capex than forecast to date, followed by ElectraNet (18 per cent less) and SP AusNet (14 per cent less). Powerlink has spent two per cent more on capex than forecast for its current regulatory control period. For the industry as a whole in 2010-11 actual capex was 14 per cent less than forecast capex.

Overall the value of the networks has continued to increase reflecting the investment in infrastructure. In 2010-11 the aggregate value of the TNSPs' and interconnectors' closing regulatory assets now stands at $15.577 billion (or $15.353 billion excluding interconnectors). This is an increase of four per cent since 2009-10.

Compared to capex the operating opex allowance approved by the AER has remained relatively stable across recent regulatory control periods for all TNSPs. Since 2006-07 aggregate actual opex spend increased in total by eight per cent. (. For the industry as a whole in 2010-11 actual opex was 8.8 per cent less than forecast opex (or $44.6 million). In 2010-11 all TNSPs underspent on opex[1] compared to forecast. Transend underspent on opex by 18 per cent, followed by SP AusNet (16 per cent)[2]. TransGrid underspent on opex by 10 per cent, followed by Powerlink (two per cent) and ElectraNet (three per cent).

In 2010-11, maintenance expenditure[3] was the primary driver for opex. For all TNSPs maintenance expenditure accounted for 67 per cent of opex. Powerlink and ElectraNet spent the most on maintenance in 2010-11 (78 per cent and 69 per cent, respectively). For some of the TNSPs maintenance expenditure has either been steadily increasing as a proportion of total opex or has remained relatively steady over the last few years. The increase in capex to replace existing assets by the TNSPs in recent years is expected to reduce the industry trend increase in maintenance expenditure as new assets require less maintenance. While a TNSP replaces a proportion of assets during a regulatory control period, to the extent that the age profile of the network remains reasonably constant, maintenance expenditure should also (assuming all other things equal) remain reasonably constant.

Increased profitability

Earnings before interest and tax (EBIT) on prescribed services increased to $1.3 billion in 2010-11 and has exceeded $5.2 billion over the past five years. Net profit after tax (NPAT) of TNSPs increased to $518.5 million in 2010-11 and over the past five years has exceeded $2.1 billion. TNSPs paid dividends to their shareholders of $398.5 million in 2010-11. This is an increase of 8.4 per cent compared to 2009-10. Over the past five years dividend payments have exceeded $1.7 billion.

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[1] This opex comparison excludes grid support and self insurance.
[2] This excludes accounting for SP AusNet's easement tax.
[3] Maintenance expenditure is expenditure to maintain the capability of the network. Generally expect maintenance expenditure to increase as the assets become older.

In 2010-11 the aggregate forecast maximum allowable revenue (MAR) for all TNSPs was 2.472 billion. The actual aggregate revenue received for prescribed services was $2.474 billion.

Improved service reliability

Transmission networks are designed to deliver high rates of reliability. The AER monitors performance through its service target performance incentive scheme (STPIS). The scheme sets performance targets on network reliability measures and a measure of transmission congestion, which targets outages which have an adverse impact on generator dispatch outcomes. The AER revised the STPIS in December 2012 to focus more on leading indicators of reliability. This includes the introduction of a network capability component to incentivise a TNSP to identify and implement low cost solutions to network constraints. Overall all businesses achieved positive financial incentives for their service standard performance, except for Transend and Directlink who achieved negative outcomes of $0.83 million and $0.11 million. Powerlink performed best achieving positive financial outcomes of $18.4 million, followed by TransGrid ($9.6 million), SP AusNet ($3.7 million), ElectraNet ($2.4 million) and Murraylink ($0.97 million).

2 Summary

The ACCC/AER has been collecting information from transmission network service providers (TNSPs) and reporting on their financial and operational performance since 2002-03. The 2010-11 report is the ninth performance report on the electricity transmission sector to be released by the AER. We consider that this monitoring program provides transparency to stakeholders regarding the financial and operational performance of transmission businesses in the National Electricity Market (NEM).

This monitoring program is an important component of the AER's regulatory role because it provides transparent information for stakeholders and interested parties on the performance of TNSPs. This ensures accountable performance outcomes and facilitates informed public input into the AER's decision making.

Information regarding the following TNSPs and Interconnectors is included in this report:

- ElectraNet (South Australia)
- Powerlink (Queensland)
- SP AusNet (Victoria)
- Transend (Tasmania)
- TransGrid (New South Wales)
- Directlink (interconnect between Queensland and New South Wales)
- Murraylink (interconnect between Victoria and South Australia).

The TNSPs and the interconnectors Murraylink and Directlink regulated by the AER are required to provide certified annual statements containing details of their financial performance. This information is submitted in accordance with the AER's information guidelines. These businesses are also required to submit service quality information in accordance with the AER's service standard guidelines.

The reporting year for the TNSPs is from 1 July to 30 June, with the exception of SP AusNet and the Interconnectors. SP AusNet has a reporting year from 1 April, whereas the interconnectors have a reporting year from 1 January.

The AER, in April 2011, published its statement of approach to the priorities and objectives of the electricity performance reports. The AER has stated its objectives in publishing network performance reports are to provide transparency and maintain accountability as an incentive to improve performance.

The objectives of this report are:

- to review the performance of TNSPs regulated by the AER
- to provide stakeholders with access to comparative data on the financial performance of TNSPs; and
- to make comparisons with the forecasts incorporated in the regulatory revenue determination decisions.

Consistent with these objective, the AER has made some changes for the 2010-11 report, which include:

- An overview section and a business by business summary section to provide a summary of key trends affecting the industry and individual businesses.
- Presentation of all information from nominal to real dollars. The previous TNSP report presented the majority of information in nominal dollars, (the report included the CPI in performance trends over time). The impact of the CPI has been removed as this obscures performance trends which are due to underlying revenue and expenditures. Accordingly, the 2010-11 report presents all financial information in real terms using the 2011 March quarter CPI to allow comparisons between the TNSPs and over time.
- Explanations from the TNSPs underlying their performance outcomes and monitoring against the forecasts in the determinations.
- Historical service standards performance relative to target performance (with and without exclusions) for each TNSP to provide additional information to stakeholders on service performance trends.
- Benchmarking measures and a section on peak demand outcomes. In particular, the 2010-11 report includes some performance measures relative to load density (MW/km). These measures recognise that more expenditure is required for less dense networks which are likely to have lower economies of scale for service delivery. In addition, given the importance of peak demand as a driver of network investment, the 2010-11 report has been amended to include a comparison of actual peak demand relative to capex incurred to expand the network and provides some commentary on any reasons underlying peak demand trends.
- The report provides updated comparisons of actual performance relative to forecast as made at the start of each TNSPs regulatory control period for revenue, profit, expenditure and service standards information on each TNSP for the 2010-11 financial year.

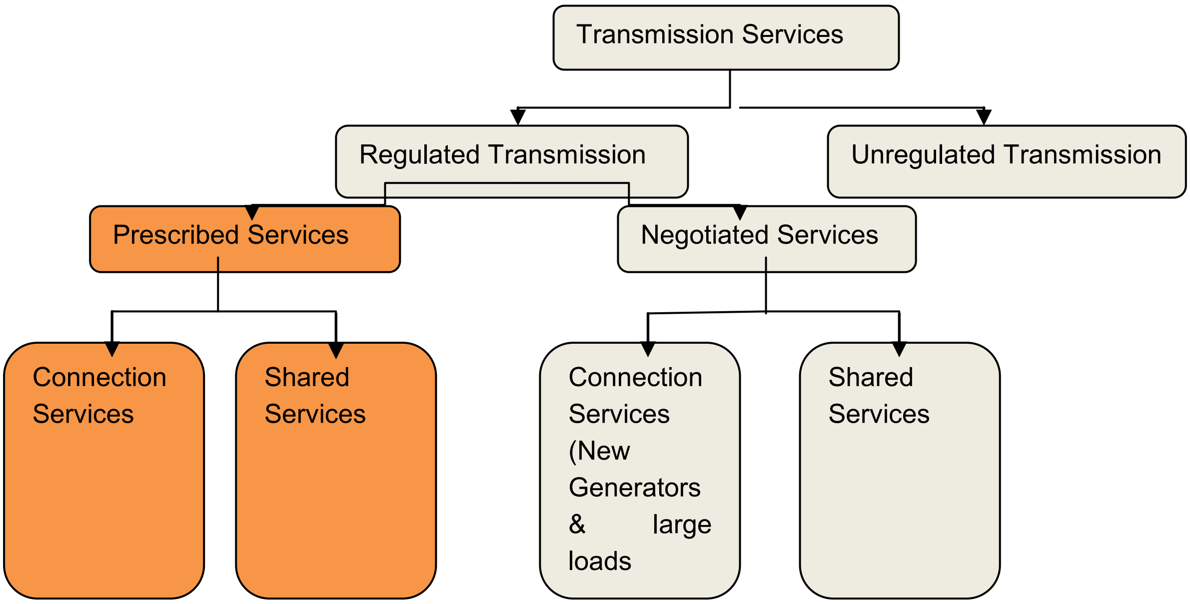
This report is structured as follows:

- Chapter 2 provides a summary of the report
- Chapter 3 provides a summary of each TNSPs energy transmitted, expenditures, and financial benefits / penalties based on performance
- Chapter 4 provides an introduction of the AER's methodology for setting revenue determinations and its information gathering functions under the NER.
- Chapter 5 provides a description of the national electricity market and comparisons of the main features of the TNSPs.
- Chapter 6 provides details of each TNSPs financial performance. It compares actual maximum allowed revenue (MAR) against forecast maximum allowed revenue, and sets out the industry's overall financial performance and each TNSP's financial performance.
- Chapters 7 and 8 provide an overview capital expenditure (capex) and operating expenditure (opex) including information on variations between actual expenditure and forecast in the TNSPs' revenue determinations.
- Chapter 9 sets out information on service standards performance for the TNSPs.

2.1 Transmission determinations outcomes

The AER is responsible for regulating the prescribed services provided by the TNSPs. The revenue and expenditures outcomes in this report relate only to the prescribed services provided by the TNSPs. The services regulated by the AER are highlighted in Figure 2.1.

Figure 2.1 Electricity transmission services



The TNSP forecast maximum allowed revenue (MAR) (i.e. the regulated revenue cap) for prescribed services is determined at each AER determination at the commencement of the regulatory control period by the building block approach (refer to Figure 2.2).

The MAR reflects allowed opex and a return on the regulatory asset base (including capex allowances). In addition, the MAR also provides an allowance for tax, any incentive rewards or penalties for improved/reduced financial and service standard performance and for the depreciation of existing assets (i.e. recovery of assets).

Figure 2.2 The AER's building block approach (MAR)

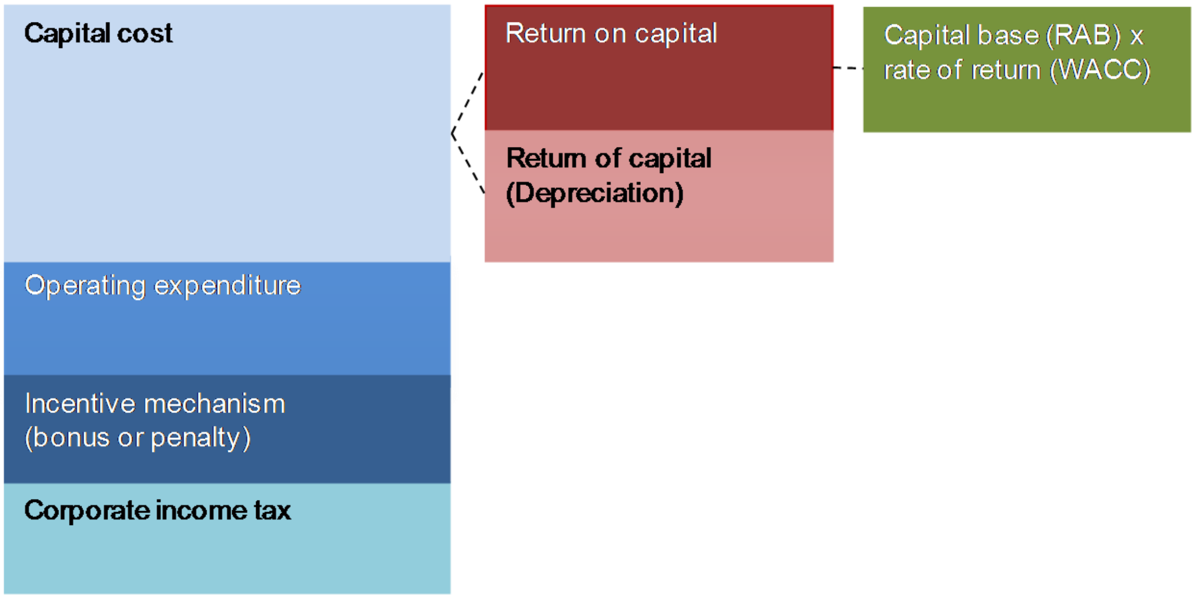


Table 2.1 compares the actual revenue and expenditure outcomes against the forecast maximum allowed revenue (MAR) and forecast expenditure.

Aggregate figures are presented to provide an overall view of the average variations from forecast amounts. The outcomes for individual TNSPs may differ markedly from the average due to the influence of regional factors, and should be assessed in that context.

Overall Table 2.1 shows that the industry has under spent on capex, opex and grid support payments[4] compared to forecasts made at the start of the regulatory control period. The actual revenue in aggregate was similar to forecast.

Table 2.1 TNSPs' Transmission determinations outcomes, 2010-11

	Actual ($m)	Forecast ($m)	Difference ($m)	Difference (%)
Revenue	2,474.4	2,468.1	6.3	-0.25%
Capex	1,299.3	1,509.2	-209.9	-13.9%
Opex	465.0	509.6	-44.6	-8.76%
Grid Support	9.3	20.9	-11.6	-55.41%

Source: 2010-11 Regulatory accounts and the AER's Revenue Transmission Determinations.
Forecast revenue does not include network support pass throughs and service standard incentives scheme payments.
Grid support applies to ElectraNet, Powerlink and TransGrid.

4 Grid support payments / network support payments are payments made to third parties which recognise that some non-network investments will allow the TNSP to defer a network investment.

Figure 2.3 Aggregate actual and forecasts capex

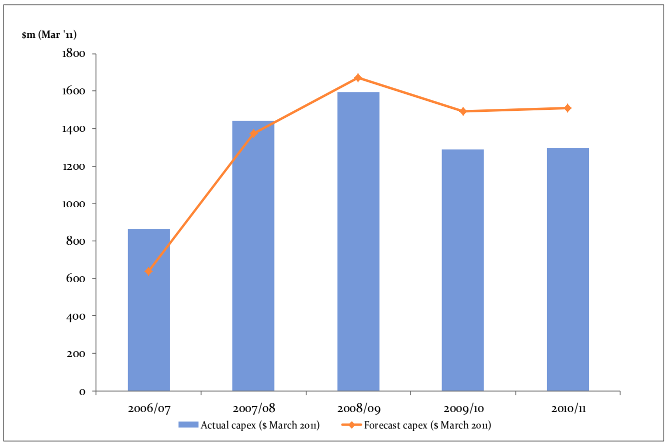


Figure 2.3 illustrates the TNSPs' aggregate actual capex (in real terms) against the forecasts contained in their revenue determinations. Since 2006--07 aggregate actual capex has exceeded $6.4 billion. This reflects expenditure by the TNSPs to upgrade and extend their networks to meet demand and reliability requirements. In 2010-11 actual aggregate capex was 14 per cent lower than forecast. Each TNSP's contribution to the overall difference is discussed in chapter 7.

Figure 2.4 Aggregate actual and forecasts opex

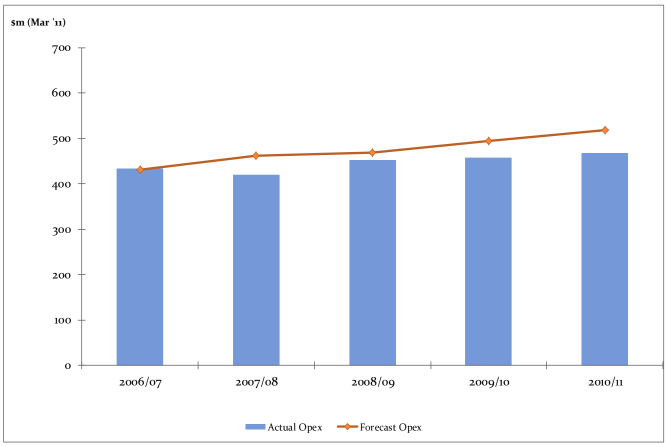


Figure 2.4 shows that aggregate actual opex was 9.8 cent lower than forecast in 2010-11. However, actual opex was 2.2 per cent higher than the previous year. Each TNSP's operating expenditure is discussed in chapter 8.

Table 2.2 compares the TNSPs' capex and opex as a percentage of their regulatory asset base (RAB).

Table 2.2 TNSPs' Transmission determinations outcomes, 2010-11

	Average RAB($m)	Opex/ average RAB (%)	Capex/ average RAB (%)
ElectraNet	1,703.6	3.4	14.7
Powerlink	5,109.6	2.9	9.0
SP AusNet	2,128.3	3.4*	6.4**
Transend	1,115.3	3.9	10.4
TransGrid	4,755.2	2.9	7.7
Murraylink	120.2	2.6	-
Directlink	103.1	2.7	-

Source: 2010-11 Regulatory accounts and the AER's Revenue Transmission Determinations. Opex/Average RAB ratios for ElectraNet, Powerlink, and TransGrid exclude grid support. Opex/Average RAB ratio for SP AusNet does not include network planning which is undertaken in Victoria by AEMO. SP AusNet's opex ratio also does not include SP AusNet's easement tax.

**Due to the regulatory arrangements in Victoria, SP AusNet's capex does not include augmentation expenditure. Murraylink and Directlink do not have a capex allowance as part of their revenue determination.

Table 2.2 indicates as in previous years that expenditure as a percentage of RAB varied amongst the TNSPs, particularly the capex ratio. These variances may be explained by key drivers of expenditure such as load growth and the ageing of assets, which can vary significantly among individual TNSPs. The differences in the network characteristics of individual TNSPs are discussed in further detail in chapter 5.

Table 2.3 TNSP's opex / average RAB ratios 2003-04 to 2010-11 (per cent)

TNSP	2003-4	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
ElectraNet	3.7	3.2	3.8	3.3	3.3	3.5	3.4	3.4
Powerlink	3.3	3.5	3.8	3.5	3.2	3.0	2.9	2.9
SP AusNet*	3.1	3.1	3.3	3.1	2.7	3.6	3.7	3.4
Transend	6.0	6.2	5.5	5.1	5.5	5.0	4.3	3.9
TransGrid	4.1	4.0	3.8	3.6	3.3	3.0	2.8	2.9
Murraylink	2.6	2.9	3.0	3.7	3.3	4.7	3.3	2.6
Directlink	n.a	n.a	n.a	3.1	2.5	2.8	2.3	2.7

Table 2.4 TNSP's capex / average RAB ratios 2003-04 to 2010-11 (per cent)

TNSP	2003-4	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
ElectraNet	3.5	4.8	4.7	6.2	12.4	7.0	8.3	14.7
Powerlink	6.2	7.7	9.1	8.2	18.6	16.0	10.1	9.0
SP AusNet*	5.4	6.3	8.7	8.8	8.5	6.3	7.2	6.4
Transend	9.5	8.3	10.1	13.4	7.6	7.8	13.0	10.4
TransGrid	9.3	4.5	4.9	6.4	8.9	14.3	9.2	7.7

A summary of each TNSP's performance and financial outcomes for 2010-11 can be found in Appendix A and B.

2.2 Service standards performance

The service performance regime is aimed at deterring TNSPs from cutting costs at the expense of service performance. The service standards guidelines are forward-looking and use targets based on historical performance as a benchmark to compare future performance by a TNSP within a regulatory control period. Following the measurement of performance against established targets, a TNSP's MAR is adjusted by the prescribed amount. Therefore, the service standard guidelines provide TNSPs with a financial incentive to improve service performance and financial penalties for deterioration in service performance. These financial incentives and penalties affect the TNSP's annual revenue calculation.

Table 2.5 shows the financial incentive based on performance outcomes for each relevant TNSP for the 2004-2011 calendar years.

Table 2.5 Financial incentives / (penalties) for 2004 – 2011 based on performance with exclusions, ($million Mar'11)

TNSP	2004	2005	2006	2007	2008	2009	2010	2011
ElectraNet	1.2	1.4	1.2	0.6	(0.2)	1.5	-	2.4
Powerlink	-	-	-	2.5	3.3	1.1	11.7	18.4
SP AusNet*	0.7	0.9	(1.0)	0.2	3.2	2.6	2.9	3.7
Transend	0.7	0.2	0.1	0.8	1.3	0.8	0.7	(0.8)
TransGrid	3.1	4.0	3.5	0.7	1.9	1.1	8.8	9.6
Murraylink	(0.1)	(0.0)	0.0	(0.0)	0.1	0.1	0.1	0.1
Directlink	-	-	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)

Source: Financial incentives are capped at + 1.0 per cent of each TNSP's MAR for that year. For example, an s-factor of 0.50 would result in a financial incentive of 0.5 per cent of the TNSP's MAR, or half of the potential maximum financial incentive available under the service standards performance incentive scheme. Powerlink and TransGrid were subject to the market impact of transmission congestion (MITC) scheme in 2010. This is a bonus only scheme of up to 2 per cent for a full calendar year.
*SP AusNet's financial incentive in its previous regulatory control period was capped at + 0.5 per cent of its MAR. In 2008, SP AusNet transitioned into a new regulatory control period, and its financial incentive is now capped at +1.0 per cent.

A detailed summary of each TNSPs performance outcome for the 2010 and 2011 calendar years can be found in Chapter 9. TNSP performance reports for 2004 – 2010 (for participating TNSPs) can be found on the AER's website (www.aer.gov.au).

3 Business by Business Summary

3.1 ElectraNet (South Australia)

For the reporting period 2010-11, ElectraNet was owned by a consortium of three private entities and Powerlink Queensland. Powerlink Queensland, which was the largest shareholder, recently sold its share to State Grid International Development Asia and Australia Holding Company. ElectraNet ownership now consists of YTL Power Investments Limited, Hastings Fund management and State Grid International Development Asia and Australia holding company.

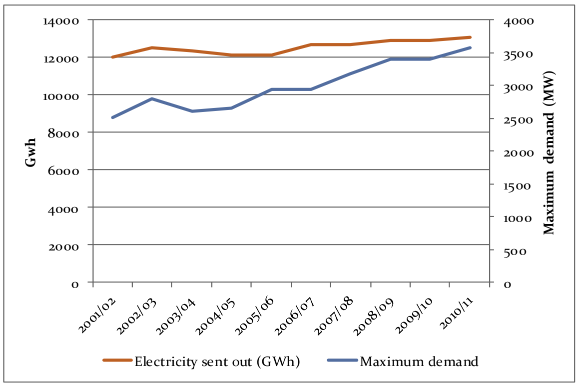
ElectraNet owns, operates and manages the South Australian electricity transmission network which spans more than 1000 kilometres, from the Victorian border near Mount Gambier to Port Lincoln on the Eyre Peninsula. ElectraNet operates radial extensions of over 200 kilometres each from the main network to Leigh Creek, the Yorke Peninsula and Woomera. It connects major generation sources at Port Augusta, Torrens Island and the eastern states via the Heywood and Murraylink interconnectors. Wind energy is a growing source of generation in South Australia. ElectraNet’s network also connects to ETSA Utilities’ distribution business and eight directly connected industrial customers.

ElectraNet operates 5,591 circuit kilometres of transmission lines and cables, with nominal voltages of 275 kV, 132 kV and 66 kV. Further, it operates and maintains 79 substations and switchyards. Transmission from the main network to country areas of South Australia is via long radial 132 kV lines. With approximately 35 per cent of its transmission assets being 40-60 years old, ElectraNet has one of the oldest networks in Australia.

The South Australian transmission network is characterised by long distances, a low energy density and a small customer base compared with other states. The peak demand profile mainly reflects residential air conditioning load over the summer period.

ElectraNet's current regulatory control period is 2008-09 to 2012-13. This report focuses on information reported in ElectraNet's current regulatory control period.

Figure 3.1 Energy and maximum demand



As shown in Figure 3.1 in 2010-11 ElectraNet experienced a maximum demand of 3,570 MW and transmitted 13,045 GWh. Since 2001-02, energy transmitted by ElectraNet has increased by 8.8 per cent, and maximum demand has increased by 42.1 per cent. In the last 5 years, since 2006-07 electricity transmitted has increased by 2.9 per cent and maximum demand by 21.7 per cent.

Figure 3.2 Comparison of forecast and actual expenditures

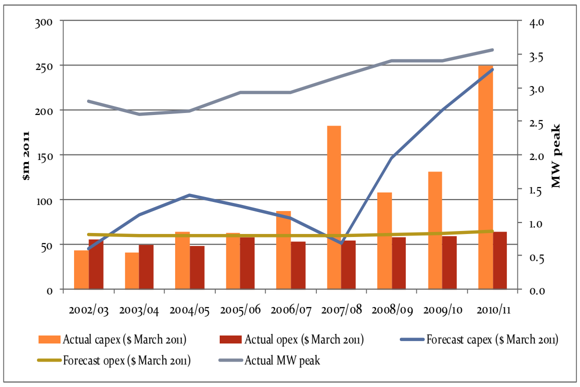


Figure 3.2 shows an increase in the capex allowance from the start of the regulatory control period. Allowed opex[5] has remained constant compared to the last regulatory period. Since the start of the current regulatory period ElectraNet has spent on average four per cent less each year on opex than forecast. ElectraNet has also underspent on capex relative to forecast. 2010-11 is the first year in the current period in which ElectraNet's actual capex is greater than forecast.

Figure 3.3 Cumulative actual capex compared to forecast capex

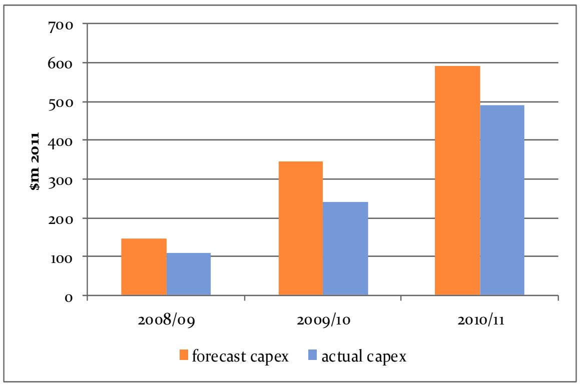


Figure 3.3 shows ElectraNet's cumulative actual capex against forecast capex. For the current regulatory period ElectraNet has spent 17 per cent less on capex than forecast. ElectraNet comment that the key drivers of the difference between forecast and actual capital expenditure include:

- the global liquidity crisis in the early part of the current regulatory period, which led to a lack of available capital in international debt market. This required the deferral of non-essential capital investment until the required debt funding became readily available; and
- resource adequacy - delivery of the Adelaide Central Reinforcement project in 2010-11 to ensure compliance with ETC requirements absorbed considerable specialist engineering and internal resources. This led to delays in achieving timely early phase works and internal approvals for other projects across the portfolio[6].

Figure 3.4 Capex drivers

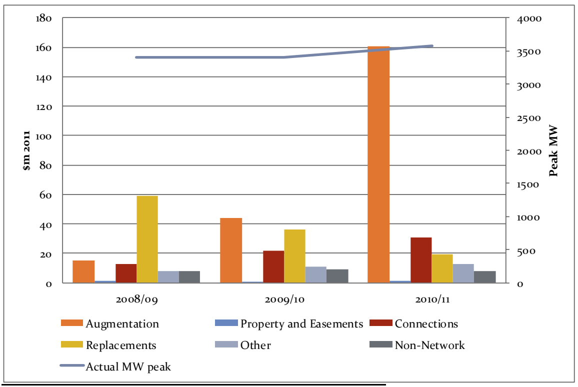


Figure 3.4 shows ElectraNet's main drivers of capital expenditure. In 2010-11 ElectraNet spent 64 per cent of its capex on augmentation. Followed by connections (35 per cent). As noted in section 4.3.4 the significant increase in capex in 2010-11 is directly attributable to a significant increase in augmentation capital expenditure associated with the Adelaide Central Reinforcement contingent project commissioned in December 2011.

[5] Grid support is included in opex.
[6] ElectraNet, email of 31 May 2013

Figure 3.5 Opex drivers

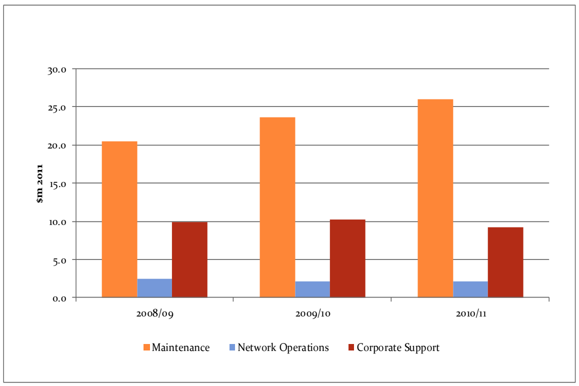


Figure 3.5 shows that most of ElectraNet's opex is spent on maintenance and this has been steadily increasing, where in 2010-11, 70 per cent of ElectraNet's opex was on maintenance. This can be explained by the age profile of ElectraNet's assets resulting in a high proportion of expenditure to maintain network[7].

Figure 3.6 Financial incentives ($million 2011)

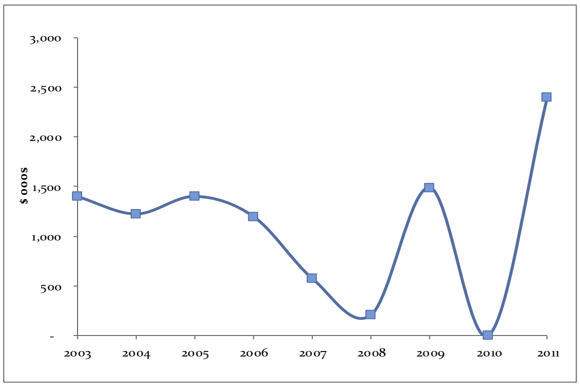


Figure 3.6 shows ElectraNet's financial benefits earned or penalties paid by ElectraNet since 2003 as a result of ElectraNet's performance based on the following measures: total transmission circuit availability, critical transmission circuit (peak and non-peak), loss of supply events (>0.05 and > 0.2 system minutes) and average outage duration.

[7] ElectraNet, email of 31 May 2013 - ElectraNet comments that ElectraNet's 2007 Revenue Proposal identified emerging network reliability risk and that the prevailing asset maintenance regime was no longer adequate for an ageing asset base.
ElectraNet proposed an asset management plan built on a risk based approach to managing the lifecycle of each transmission network asset in order to achieve acceptable levels of reliability. The approach has led to increased maintenance expenditure requirements including:
* Routine maintenance - increased level of routine aerial inspection associated with condition based maintenance plans and vegetation clearance requirements;
* Corrective maintenance - increased corrective maintenance effort to manage revealed asset risk identified through improved condition and risk inspection; and
* Operational refurbishment - additional refurbishment requirements to manage high priority asset risks identified through the condition assessment program

3.2 Powerlink (Queensland)

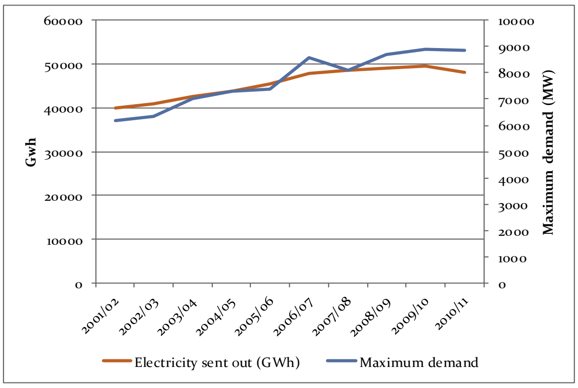
Powerlink is a Queensland government owned corporation that owns and operates the Queensland electricity transmission network. Powerlink's $5.3 billion transmission network spans more than 1,700 kilometres, from Cairns in far north Queensland to the NSW border in the south. It connects to 15 regulated customers comprising generators, distribution businesses (primarily Ergon Energy and Energex, but also Essential Energy in northern NSW) and directly connected major loads. Powerlink's network connects to the rest of the NEM via the Queensland–NSW interconnector and the Directlink interconnector.

Powerlink operates 13,968 circuit kilometres of transmission lines and cables (the highest among the TNSPs in the NEM), with nominal voltages of 330 kV, 275 kV, 132 kV, 110 kV and 66 kV. Further, it operates and maintains 114 substations which include 186 transformers.

The Queensland transmission network is characterised by long distances. Queensland is one of the most decentralised states in the NEM with electricity networks servicing low load density cities, towns and industrial areas.[8] Due to the constant hot and humid summer climate in Queensland, peak summer demand conditions occur for the entire summer period (November–March) compared to isolated hot days in the southern states.

Powerlink's current regulatory control period is 2012-13 to 2016-17. This report focuses on information reported in Powerlink's 2007-08 to 2011-12 regulatory control period.

Figure 3.7 Energy and maximum demand



In 2010-11 Powerlink had a maximum demand of 8,836 MW and transmitted 48,020 of GWh. Figure 3.7 shows that electricity transmitted by Powerlink has increased by 20.4 per cent since 2001-02. During the same period maximum demand has increased by 43 per cent. However, in the last five years electricity transmitted has increased by 0.6 per cent and maximum demand has increased by 2.9 per cent.

Figure 3.8 Comparison of forecast and actual expenditures

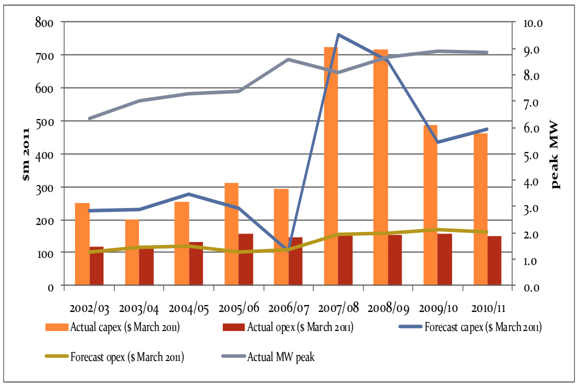


Figure 3.8 shows that for the previous regulatory control period, Powerlink's actual capex and opex expenditure closely reflected the forecasts for capex and opex. Opex includes grid support and self-insurance.

8 Powerlink, Queensland transmission network revenue proposal for the period 1 July 2007 to 30 June 2012, p.8

Figure 3.9 Cumulative actual capex compared to forecast capex

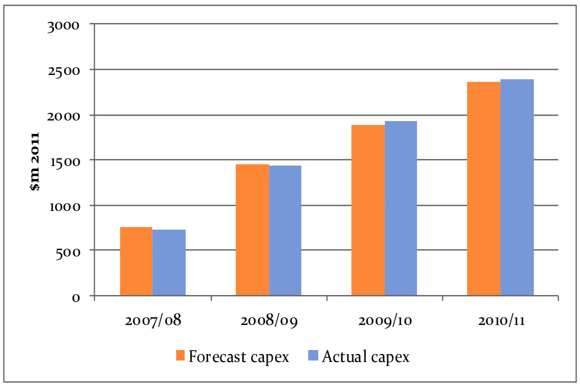


Figure 3.9 shows Powerlink's actual cumulative capex from 2007-08 to 2010-11 compared to forecast. In 2010-11 Powerlink's cumulative capex was two per cent more than forecast for that period.

Figure 3.10 Capex drivers

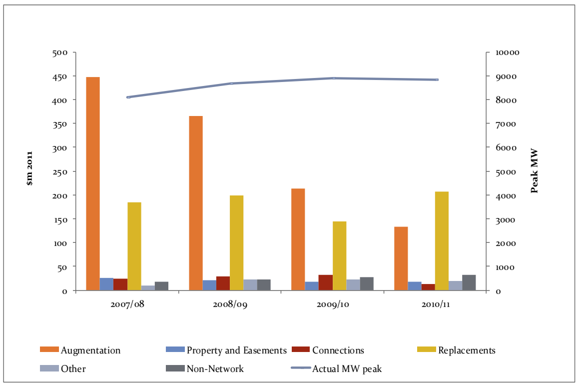


Figure 3.10 shows Powerlink's main drivers of capital expenditure. The two main drivers for capex are augmentation and replacement. Between 2006-07 and 2010-11 Powerlink's augmentation capex decreased from 60 per cent of total capex to 30 per cent. During the same period replacement capex increased from 25 per cent to 47 per cent of total capex.

Figure 3.11 Opex drivers

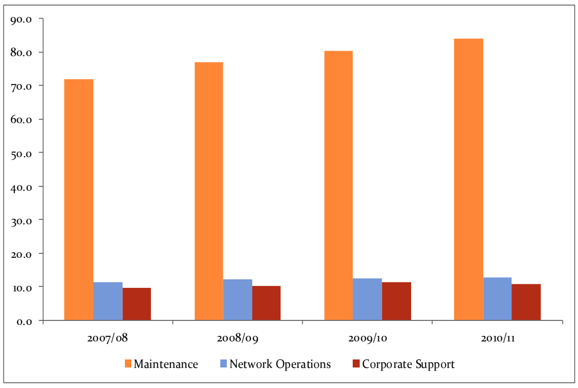


Figure 3.11 shows the drivers of Powerlink's opex. In 2010-11 maintenance opex made up 78 per cent of Powerlink's total opex and this proportion has been steadily increasing over the last five years.

Figure 3.12 Financial incentives ($ million 2011)

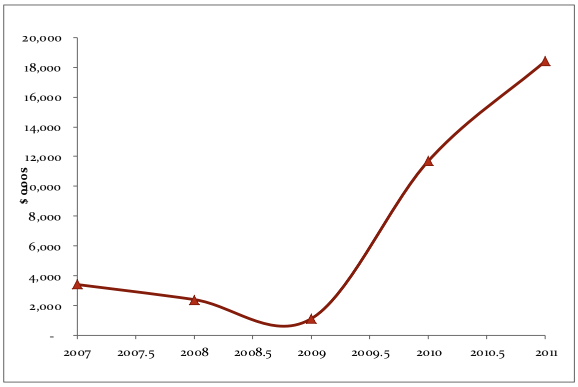


Figure 3.12 shows Powerlink's financialbenefits earned or penalties paid by Powerlink since 2007 (the first year the STPIS scheme applied to Powerlink). Powerlink's performance is measured on the following: transmission circuit availability, critical elements, non-critical elements and peak hours), loss of supply events (>0.2 and > 1.0 system minutes) and average outage duration

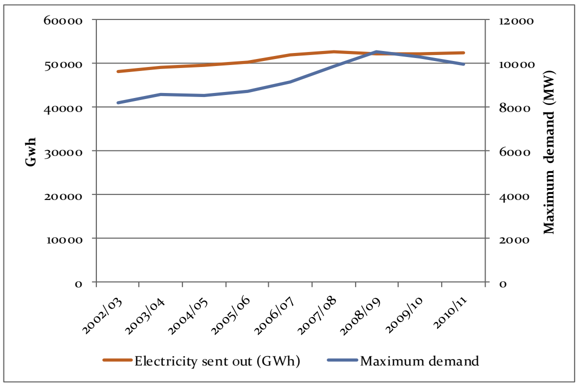
3.3 SP AusNet (Victoria)

SP AusNet is Victoria's largest utility company, providing electricity transmission, gas distribution and electricity distribution services. SP AusNet is publicly listed on the Australian and Singapore Stock Exchanges. Singapore Power International Pty Ltd, a wholly-owned subsidiary of Singapore Power, owns a 51 per cent interest in SP AusNet. Public investors own the remaining 49 per cent.

SP AusNet's transmission network is built around a 500 kV backbone running from the major generating source in the Latrobe Valley, through Melbourne and across the southern part of the state to Heywood near the South Australian border. The network provides key physical links in the NEM, connecting with networks in South Australia, NSW and Tasmania. The network consists of 6,553 kilometres of cable, running at voltages of 500kV, 330kV, 275kV, 220kV and 66kV.

SP AusNet's current regulatory control period is 2008-09 to 2013-14.

Figure 3.13 Energy and maximum demand



In 2010-11, SP AusNet had a maximum demand of 9,982 MW and transmitted 52,352 GWh. Since 2002-03 electricity transmitted has increased by 8.8 per cent, with a sharp increase between 2002-03 and 2007-08. In the last five years electricity transmitted has increased by only 0.7 per cent. Since 2002 maximum demand has increased by 21.7 per cent, peaking in 2008-09 to 10,554 MW and then declining to 9,982 MW in 2010-11 (refer to Figure 3.15).

Figure 3.14 Comparison of forecast and actual expenditures

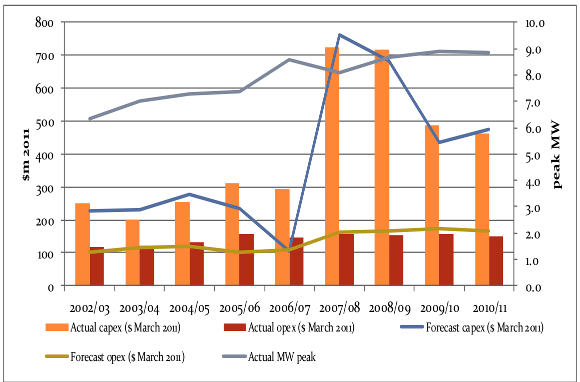


Figure 3.14 shows SP AusNet's forecast and actual capex and opex. It also shows SP AusNet's forecast and actual easement tax, separate from opex[9]. Opex includes self-insurance.

Figure 3.16 shows for the years 2002-03 to 2008-09 capex has mostly been higher than forecast (on average 37 per cent higher). Since 2008-09 actual capex has on average been about 14 per cent less than forecast.

SP AusNet's actual opex has on average been 10 per cent less than forecast since 2002-03. Since 2008-09 it has been about 6 per cent less than forecast. SP AusNet's easement tax, however, has on average been about 8 per cent higher than forecast since 2008-09.

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[9] In 2004, the Victorian Parliament introduced the Land Tax (Amendment) Act 2004. The effect of this was to extend Victoria's land tax regime to easements held by electricity transmission companies. The cost of the tax is recovered from transmission customers.
For the regulatory control period 2008-09 to 2013-14 SP AusNet is required to forecast its easement land tax liability as part of the forecast opex component.

Figure 3.15 Cumulative actual capex compared to forecast capex

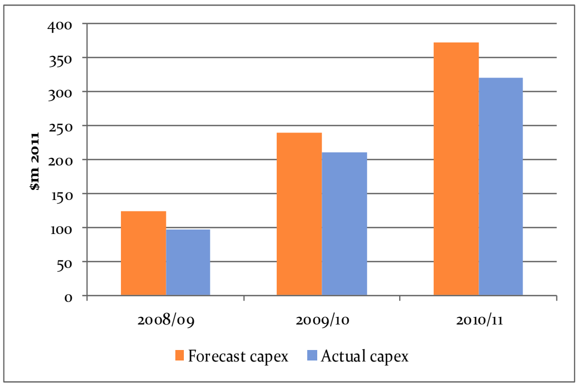


Figure 3.15 shows in the current regulatory control period SP AusNet's cumulative actual capex from 2008-09 to 2010-11 has been 14 per cent less than forecast.

Figure 3.16 Capex drivers

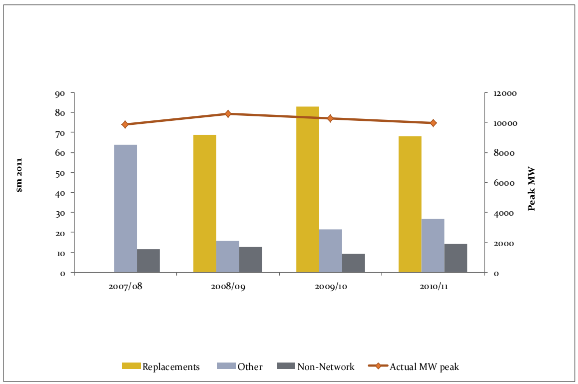


Figure 3.16 shows that 62 per cent of SP AusNet's capex is driven by replacement of assets. SP AusNet does not have any augmentation capex. AEMO has the role of the Victorian transmission planner, where network augmentations are managed in Victoria by AEMO[10].

Figure 3.17 Opex drivers

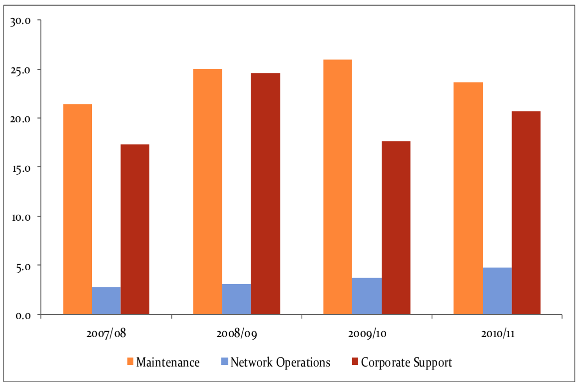


Figure 3.17 shows that most of SP AusNet's opex is for maintenance followed by corporate support. In 2010-11 SP AusNet spent 48 per cent of its opex on maintenance and 42 per cent on corporate support.

[10] In Victoria AEMO manages network augmentation work. Where the augmentation is deemed contestable and procured through a competitive tender process, the assets remain outside of the regulatory asset base. Where the augmentation is deemed non-contestable, the assets are rolled into SP AusNet's regulatory asset base at the end of the regulatory control period.

Figure 3.18 Financial incentives ($ million 2011)

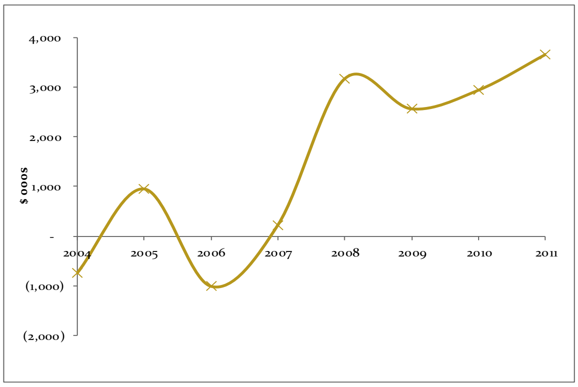


Figure 3.18 shows SP AusNet's financial benefits earned or penalties paid by SP AusNet since 2004. SP AusNet's performance is measured on the following: transmission circuit availability, peak critical transmission circuit availability and peak non critical circuit availability, intermediate critical and non-critical transmission circuit availability), loss of supply events (>0.05 and > 0.3 system minutes) and average outage duration (lines and transformers).

3.4 Transend (Tasmania)

Transend is a public corporation that owns and operates the electricity transmission system in Tasmania. It owns 49 substations and eight switching stations including 101 supply and 17 network transformers operating at voltages of 220kv and 110kv. It is connected to 18 regulated customers, including four generators and the Bass link interconnector. A backbone network operating predominantly at 220 kV connects generators to major load centres, including major industrials, while a network operating predominantly at 110 kV connect generators to regional centres.[11] Transend's transmission system also includes sub-transmission assets that operate at voltages of 6.6 kV, 11 kV, 22 kV, 33 kV and 44 kV.[12] These are connected via substations to the distribution system.

Transend has the smallest network in the NEM. Over 70 per cent of the generation in Tasmania is hydro generation with a comparatively large number of small generators, which are widely dispersed. Tasmania's generators are usually energy constrained rather than capacity constrained. Hydro generation's variable nature (with a requirement for more transmission network to deliver the same amount of electricity to customers) has also been a major contributor to the evolution of the network. World heritage status in some areas contributes to increased transmission costs. Also due to the majority of Tasmania's generation being hydro-electricity and variations involved in generation output, Transend may encounter additional costs in providing transmission services relative to other TNSPs.

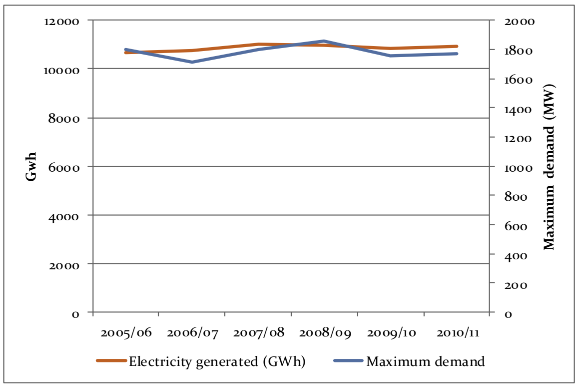
Tasmania is connected to mainland Australia via the Basslink interconnector which operates between Loy Yang substation in Gippsland and the George Town substation in Tasmania. Basslink transfers energy at 480 MW import to Tasmania and up to 630 MW export from Tasmania for limited periods.

During 2010-11, aside from Murraylink and Directlink, Transend had the lowest maximum demand (1,770 MW) and shortest circuit kilometres (3,469 kilometres) among the TNSPs regulated by the AER.

Transend has a high number of transmission connection points which reflects a relatively high number of generators, distribution connections, directly-connected industrial customers, and a Market Network Service Provider (MNSP), relative to the load served.

Transend's current regulatory control period applies from 2009-10 to 2013-14.

Figure 3.19 Energy and maximum demand



In 2010-11 Transend transmitted 10,913 GWh of electricity and experienced a peak demand of 1,770 MW. Since 2002-03 Transend electricity increased by 5 per cent. Since 2006-07 Transend electricity transmitted has increased by 3.4 per cent. Maximum demand has increased by 1.6 per cent in the last 5 years. Maximum demand reached a peak in 2008-09 of 1,861 MW (refer to Figure 3.22).

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11 Transend transmission revenue proposal for the regulatory control period 1 July 2009 to 30 June 2014, 30 May 2008, p.18

12 Ibid p19.

Figure 3.20 Comparison of forecast and actual expenditure

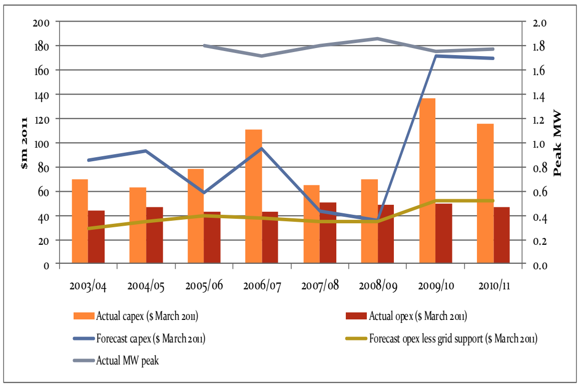


Figure 3.20 shows that for the first two years of the current regulatory control, Transend has underspent on both opex[13] and capex. In 2009-10 Transend underspent on opex by 5 per cent and underspent on capex by 20 per cent. In 2010-11 Transend underspent on opex and capex by 11 per cent and 32 per cent, respectively. Transend comments that this reflects a range of factors, including efficiencies and changes in demand for services.

Figure 3.21 Cumulative actual capex compared to forecast capex

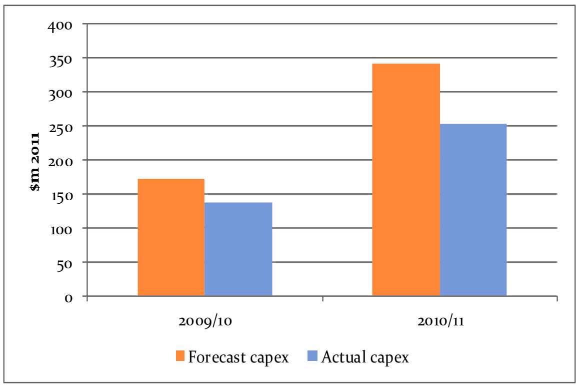


Figure 3.21 shows actual cumulative capex for the current regulatory control period compared to forecast capex. Transend has underspent by 26 per cent. Transend comment that some of this reduction reflects efficiencies in delivery of the Waddamana to Lindisfarne 220 kV transmission upgrade.

Figure 3.22 Capex drivers

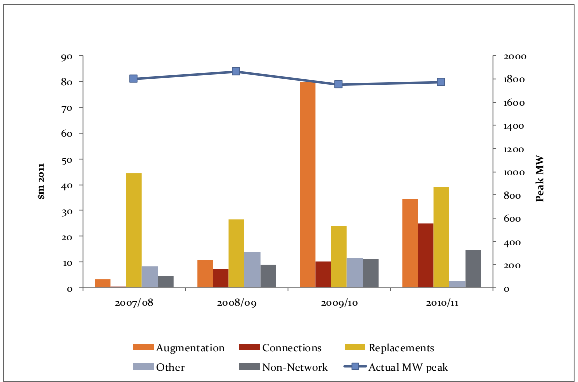


Figure 3.22 shows Transend's main capex drivers. In 2009-10 augmentation capex was 58 per cent of total capital expenditure. In 2010-11 augmentation capex reduced to 30 per cent of total capex, and replacement capex increased to 34 per cent of total capex. Replacement capex has been Transend's main capex driver in each year since 2007-08 except for in 2009-10. Transend comment that augmentation capex is inherently lumpy. In 2009-10 Transend delivered a number of large augmentation projects, including the Waddamana to Lindisfarne 220 kV transmission upgrade augmentation project.

[13] Opex includes grid support and self insurance.

Figure 3.23 Opex drivers

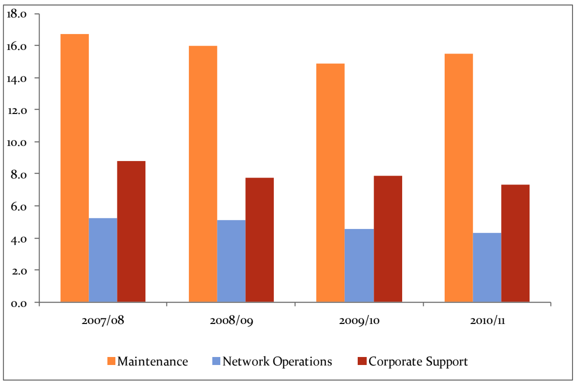


Figure 3.23 shows that maintenance expenditure is the main driver of operating expenditure. In 2010-11, maintenance expenditure made up 57 per cent of operating expenditure, followed by corporate support (27 per cent). These components of opex have been relatively steady over the period.

Figure 3.24 Financial incentives ($2011 million)

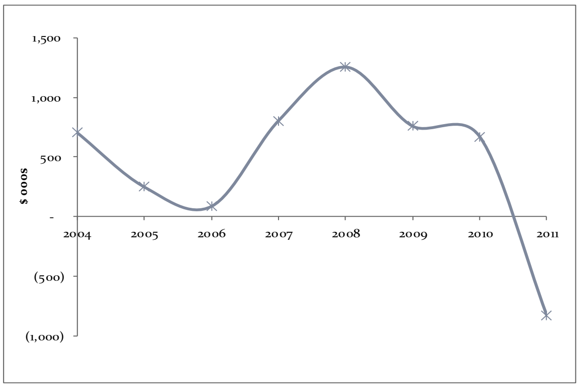


Figure 3.24 shows Transend's financial benefits earned or penalties paid by Transend since 2004. Transend's performance is measured on the following: transmission circuit availability critical and non-critical circuit availability, transformer availability, loss of supply events (>0.1 and > 1.0 system minutes).

3.5 TransGrid (NSW)

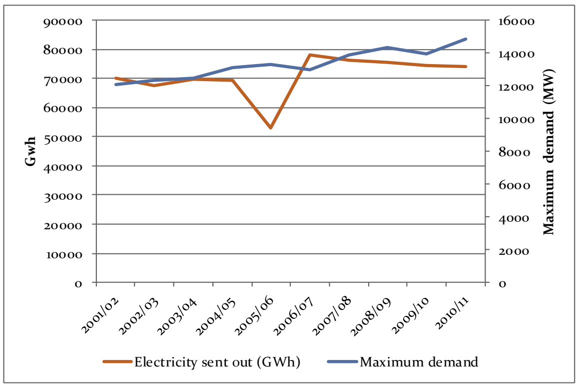
TransGrid is a NSW government owned corporation that owns, operates and manages the NSW electricity transmission network. TransGrid's network stretches along the east coast of Australia from Queensland to Victoria, then inland to Broken Hill, making it the backbone of the NEM. It connects major generation sources in the Central Coast, Hunter Valley, Lithgow area and Snowy Mountains, and is interconnected with the Victorian and Queensland networks. TransGrid's network also connects to 4 distribution businesses (in NSW and ACT). In 2010-11 TransGrid has 14 customers connected through its network including three directly connected industrial customers.

In 2010-11 TransGrid operated 12,657 circuit kilometres of transmission lines and cables, the second highest in the NEM, with nominal voltages of 500 kV, 330 kV, 220 kV and 132 kV. TransGrid also operates and maintains 91 substations and switching stations and 389 distributor and direct customer connection points servicing over 3 million households and businesses across NSW and the ACT.[14]

The NSW transmission network facilitates inter-state electricity trading and plays a central role in the NEM as a result of both its geographic location and the flexible generation plants located in NSW. At times of high demand, Queensland and Victoria can rely on imports from NSW, and export power to NSW at other times.

TransGrid's current regulatory control period is 2009-10 to 2013-14.

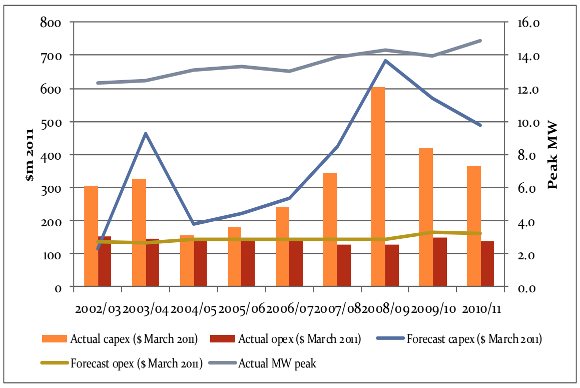
Figure 3.25 Energy and maximum demand



In 2010-11 TransGrid's maximum demand was 14,863 MW and electricity transmission was 74,282 GWh[15]. Since 2001-02 TransGrid's energy transmitted has increased by 6 per cent and maximum demand has increased by 23.2 per cent.

In the last 5 years electricity sent out decreased by 5.5 per cent and maximum demand increased by 14.3 per cent.

Figure 3.26 Comparison of forecast and actual expenditures



In 2002-03 TransGrid overspent on capex by 163 per cent. Since then TransGrid has underspent on capex on average by 20%.

Since 2002-03, TransGrid has underspent on average by three per cent on opex[16]. However, in the last four years the underspend has on average been 11 per cent. TransGrid comments that the

[14] Ibid.
[15] TransGrid's energy and peak demand is as reported by AEMO. This is "native energy" or "native demand". The definition is "Energy / demand that is inclusive of Scheduled, Semi-Scheduled and Non-Scheduled generation.
[16] Opex includes grid support and self-insurance.

lower actual opex is primarily due to efficiencies achieved in labour cost growth, IT expenses and office accommodation expenses, which demonstrate that TransGrid also comments that it has responded appropriately to the incentives applied in its revenue determination. TransGrid also comments that it also reflects external factors such as favourable market conditions that have led to a downward shift in provisions, and lower than expected network growth due to lower than expected peak demand growth[17].

Figure 3.27 Cumulative actual capex compared to forecast capex

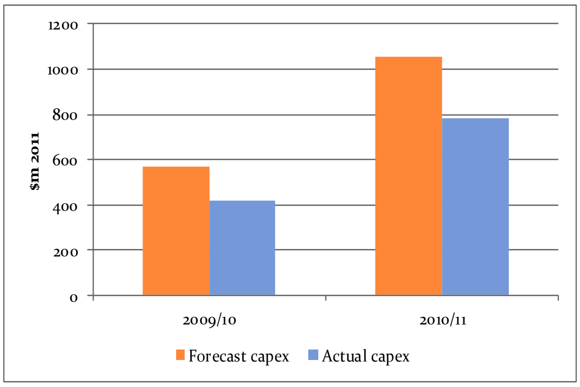


Figure 3.27 shows cumulative actual capex against forecast capex. Since the start of the current regulatory control period, TransGrid has underspent on capex by 26 per cent. TransGrid comments that the difference between forecast and actual capex reflects the prudent deferral of load-driven projects in response to a slowing in peak demand growth since the last revenue proposal. In the current regulatory period several major augmentation projects have been deferred as a result of slower load growth on the network.

Figure 3.28 Capex drivers

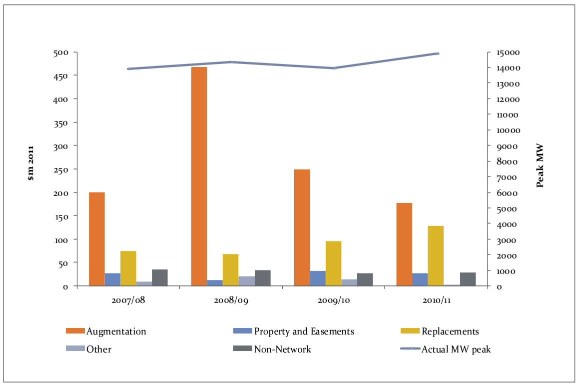


Figure 3.28 shows that TransGrid's main capex driver is augmentation capex, followed by replacement capex. In 2010-11 augmentation capex was 47 per cent capex and replacement capex was 34 per cent of total capex, respectively. TransGrid comments that the decrease in augmentation capex is due to the deferral of several major augmentation projects as a result of lower load growth on the network. The level of replacement capex reflects that approved in TransGrid's current revenue determination, and has been driven by an increase in the number of assets reaching the end of their serviceable life[18].

Figure 3.29 Opex drivers

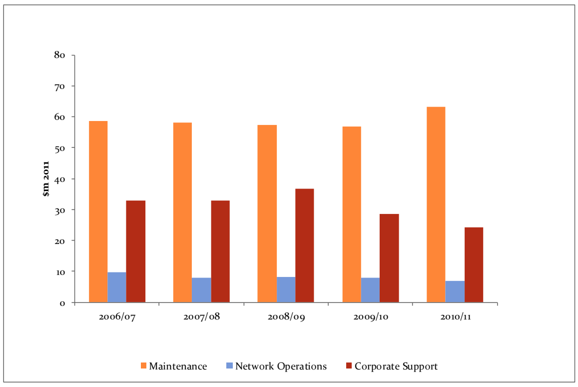


Figure 3.29 shows that TransGrid's main opex driver in 2010-11 is maintenance at 67 per cent followed by corporate support at 26 per cent. TransGrid comments the decrease in corporate support costs is primarily due to efficiencies relating to growth in labour costs, IT costs and office accommodation. TransGrid also comments that this demonstrates it has responded appropriately to the incentives applied in its revenue determination. It also reflects external factors such as favourable market conditions that

[17] TransGrid, email of 3 June 2013.
[18] TransGrid, email of 3 June 2013

have led to a downward shift in provisions[19].

Figure 3.30 Financial incentives ($ million 2011)

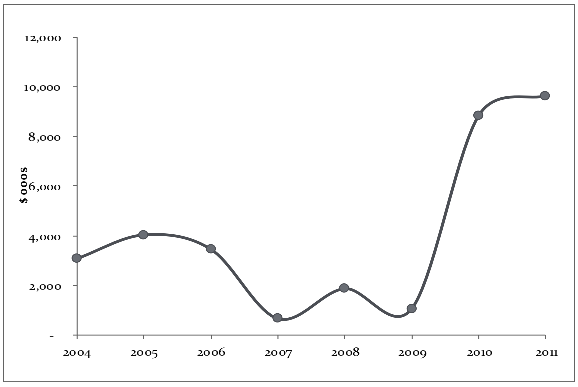


Figure 3.30 shows TransGrid's financial / benefits earned or paid by TransGrid since 2004. TransGrid's performance is measured on the following: transmission line availability, transformer availability, reactive plant availability, loss of supply (>0.05 and >0.25 system minutes) and average outage duration.

[19] TransGrid, email of 3 June 2013.

4 Introduction

4.1 Scope of the report

The TNSP performance report provides stakeholders and interested parties with information and comparative data on financial and operational performance of TNSPs. In particular, the report details overall financial performance, capex and opex outcomes and service standards performance. A comparison of the financial and operational performance levels achieved by TNSPs must allow for basic differences between networks such as diverse geographical and environmental factors.

The AER’s objective in monitoring and publishing the performance of TNSPs is to increase the accountability for performance through greater transparency. In particular, the AER’s performance report aims to:

- facilitate informed public input into future decisions by the AER
- allow public scrutiny of performance against revenue determinations
- increase transparency of the regulatory process and the outcomes that are generated.

4.2 Priorities and objectives of performance reporting

In April 2011, the AER published its statement of approach to the priorities and objectives of electricity network service provider performance reports. The AER's objectives in publishing network performance reports are to provide transparency, and to maintain accountability as an incentive to improve performance.

In order to achieve these objectives the priorities of TNSP performance reporting are to:

- report on service performance
- report on compliance with the TNSP’s approved cost allocation methodology (CAM)
- report the profitability of TNSPs
- report on performance against and compliance with revenue determinations in a format that allows for comparison between different jurisdictions and regulatory control periods
- report information in a format that can be utilised for future revenue determinations, to reduce information asymmetry and to streamline the revenue reset process
- assess whether the national electricity objective is being achieved.

4.3 Sources of information

The report draws upon information from the following sources:

- annual regulatory financial statements and service standards performance data provided by the TNSPs in accordance with the AER’s transmission information guidelines
- revenue proposals made by the TNSPs
- annual statutory reports and reviews published by the TNSPs

- current revenue determinations made by the AER (and previously by the ACCC)
- other AER publications such as the State of the Energy Market reports; and
- previous TNSP performance reports.

4.4 The AER's role

The AER is responsible for the economic regulation of networks as well as compliance monitoring, reporting and enforcement in the NEM. In carrying out these functions, the AER collects a wide range of regulatory, financial and operational information from TNSPs annually. This is done for a variety of reasons, including:

- monitoring compliance with revenue determinations
- identifying any cross-subsidisation of costs between the regulated and unregulated parts of the TNSP's business
- using the information as an input for setting future revenue determinations
- monitoring performance against the service target performance incentive scheme (STPIS)
- assessing whether the national electricity objective is being achieved through regulation and the revenue determination in particular.

4.5 Collection of data under the information guidelines

TNSPs are required to submit certified annual financial statements to the AER in accordance with the AER's information guidelines. The guidelines contain information templates which provide the source data for this report.

The types of information collected may be categorised as:

- Financial information – mainly sourced from the TNSP's income statement and balance sheet prepared in accordance with the relevant accounting standards. This information is presented in chapter 6 and appendix A of this performance report and has been submitted by TNSPs in accordance with the AER's guidelines. While the AER's Post Tax Revenue Model will provide much of the ongoing data for assessing compliance and for future revenue determinations, this information is useful in providing a general guide for assessing progress in achieving the national electricity objective between regulatory reviews, and identifying areas of interest that may need to be explored during upcoming revenue determination processes.
- Revenue determination related information – actual revenue, opex and capex outcomes are gathered and compared to the underlying forecasts contained in the TNSP's revenue determination (adjusted for actual CPI) made by the ACCC/AER. This information is presented in chapters 6, 7 and 8 of the report. TNSPs are able to comment on the reasons for any variances between actual and forecast figures.

This information should be read as a whole and, when combined with the service standards data in the report, is intended to present an overall picture of the TNSPs' performance.

4.6 Presentation of data

The following points should be taken into account when considering the data presented in this report:

- Capex - there are two alternatives under which capex data may be reported by TNSPs:
  - on an as-commissioned basis: the expenditure is not reported until the project is completed or commissioned (i.e. in operation) or
  - on an as-incurred basis: the expenditure is reported on a progressive basis as it is made or incurred by the TNSP.
- Opex – some TNSPs' opex allowances include an amount for network or grid support. Grid support figures are shown separately from opex in the report as it is essentially a substitute for capex and volatile in nature. This treatment ensures comparability of TNSPs' opex outcomes.
- Forecast figures – throughout the report, where forecast figures are compared with actual outcomes (e.g. revenue, capex, and opex), forecast figures have been taken from final ACCC/AER decisions. Forecast inflation is removed and forecasts are first adjusted for actual March quarter (or December quarter for Transend) CPI figures at the commencement of the regulatory control period for each TNSP and then adjusted to March 2011 dollars.
- Regulatory framework – there have been changes in recent years to the regulatory framework under which TNSPs' revenue determinations are set. For example, the ex-ante approach to determining capex allowances was introduced in the ACCC's Statement of Regulatory Principles (SRP) (released December 2004 and adopted by the AER in 2005). This approach has since been formalised in chapter 6A of the National Electricity Rules (NER).
- The calculations that appear in this report, such as the financial indicators and operating ratios detailed in chapter 6 and 8 are made by the AER and not TNSPs. The AER uses data provided by the TNSPs in the calculations.

4.7 Key Performance Indicators (KPIs) for performance monitoring

In order to assess the performance of the electricity transmission sector and its businesses in terms of the priorities and objectives of performance monitoring as discussed in the previous section, a number of performance measures or key performance indicators (KPIs) are considered in this report.

Performance depends on a number of factors, both internal and external to a company's management strategies and decision making processes. Performance can vary over time for the business in general and in any specific areas of operation or service delivery. Also, there may be trade-offs between short-term and long-term performance for the sector and its businesses.

The KPIs used in this report are common measures that are objective, quantifiable and verifiable – they are based on data provided by the various businesses. Different measures are used in order to form a view on the overall performance of the industry and its businesses in a particular year, as well as trends over time. This is undertaken in terms of the reliability and quality of supply of electricity and service incentives, financial performance and outcomes monitoring by comparing actual outcomes to forecasts at time of revenue determinations largely with respect to capex and opex.

For the purposes of this report, the KPIs or performance measures are grouped into separate but inter-related categories. These are:

- Revenue
- Capex

- Opex
- Service incentives and service standards
- Profitability and financial; and
- Network statistics.

For example, the "transmission charges outcome (price path)" revenue KPI shows the extent to which actual revenue per megawatt hour transmitted varies from forecast revenue per megawatt hour transmitted. More importantly, it illustrates the differences that may arise in a given period due to pass through events, contingent projects and incentive payments and how these may vary between the businesses.

Another example is "comparing actual capex, and the AER final allowance for capex" in the capex KPIs. This measure illustrates the extent to which TNSPs have out-performed on their capex relative to the AER allowance over time.

Comments from interested parties

Comments from interested parties regarding this report are welcomed and can be submitted via email to AERinquiry@aer.gov.au, or by mail to:

Chris Pattas
General Manager
Network Operations and Development
Australian Energy Regulator
GPO Box 520
Melbourne Victoria 3001

5 Industry background and main features

This chapter provides a short description of the national electricity transmission market and its main features.

5.1 The National Electricity Market

The National Electricity Market (NEM) is a wholesale market through which generators and retailers trade electricity in eastern and southern Australia.

Transmission Network Service Providers (TNSPs) provide transmission infrastructure that enables the transfer of electricity between NEM participants. The electricity networks within the NEM are illustrated in Figure 5.1.

The Australian Energy Market Operator (AEMO) is responsible for managing the transmission elements of the physical power system to ensure that electricity supply and demand are balanced in each of the NEM's five regions. In addition, AEMO has adopted the central planning role of National Transmission Planner, and annually publishes the National Transmission Network Development Plan (NTNDP). The NTNDP outlines the long-term, efficient development of the national power system with a focus on national transmission flow paths.

The NEM has around 200 large generators, five state based transmission networks linked by cross-border interconnectors and 13 major distribution networks that supply electricity to customers. The NEM meets the demand of almost nine million residential, commercial and industrial energy users and is the largest interconnected power system in the world in geographic span, covering a distance of 4,500 kilometres. In Australia, the NEM network spans six jurisdictions including Queensland (Qld), New South Wales (NSW), the Australian Capital Territory (ACT), Victoria (Vic), South Australia (SA) and Tasmania (Tas) that are physically linked by an interconnected transmission network.

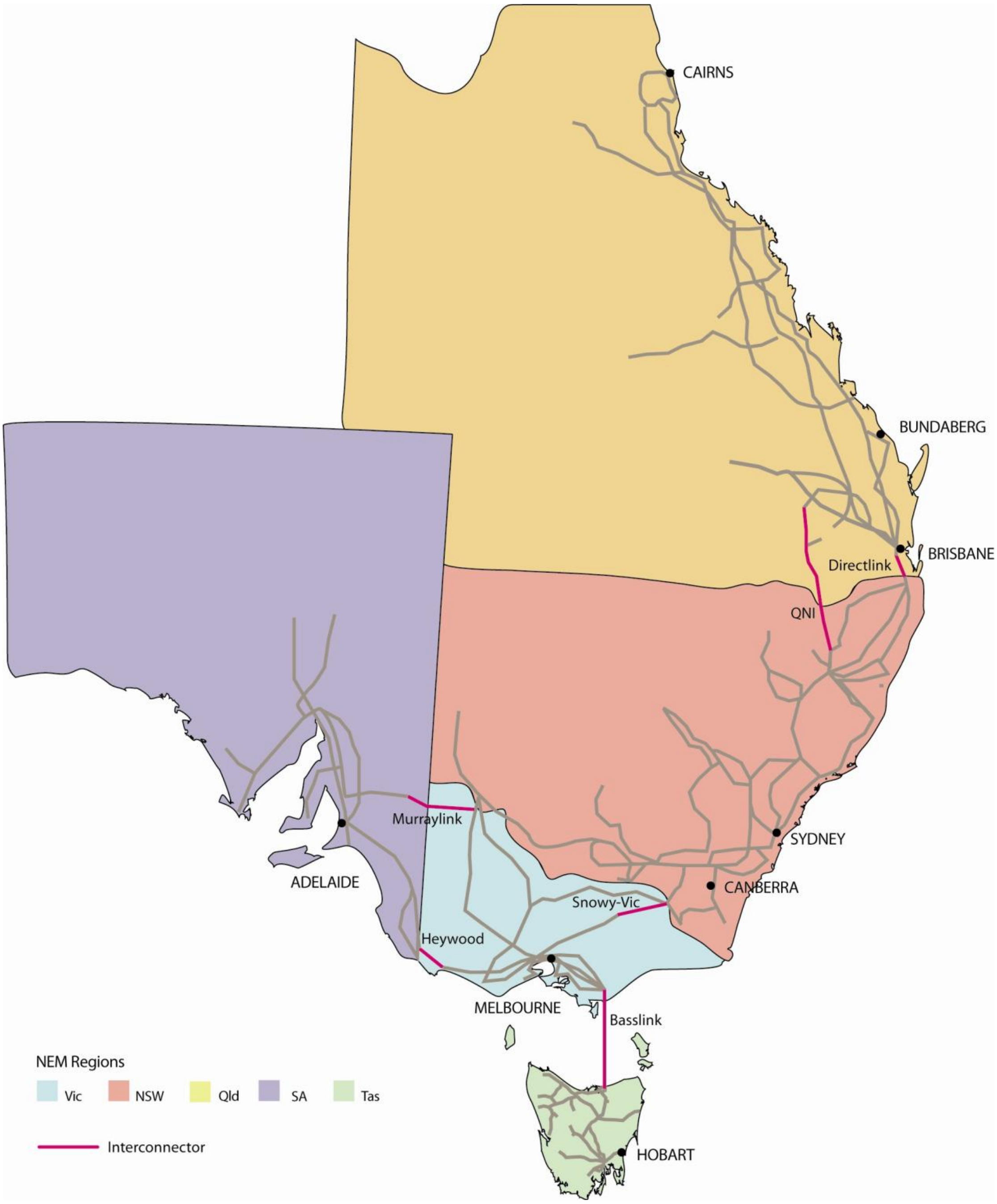
The AER regulates the five transmission businesses; ElectraNet (SA), Powerlink (Qld), SP AusNet (Vic), Transend (Tas), TransGrid (NSW), and the two interconnectors Directlink (Qld NSW) and Murraylink (Vic SA). This report focuses on the five TNSPs. A business by business summary of each of the TNSPs is set out in chapter 3.

The interconnectors Murraylink and Directlink are owned by Energy Infrastructure Investments and managed by APA. Murraylink connects the Victorian and South Australian regions of the NEM and came into operation in early October 2002. The AER issued a revenue determination for Murraylink covering the period of 2003-2013. Murraylink consists of approximately 180 kilometres of transmission line that transfers power between the Red Cliffs substation in Victoria and the Monash substation in South Australia and a converter terminal station at either end. At any given time Murraylink is capable of delivering 220 MW.

Directlink connects the Queensland and NSW regions of the NEM and came into operation in July 2000 as an unregulated interconnector. It remained unregulated until March 2006, when the AER approved Directlink's application to become a regulated interconnector. Directlink has a total nominal rated capacity of 180 MW and consists of 63 kilometres of underground cables or cables laid in galvanised steel and runs between Mullumbimby and Bungalora (80 kV DC) and between Bungalora and Terranora (110 kV DC). Directlink has the lowest maximum demand and circuit kilometres among the TNSPs regulated by the AER.

Basslink which connects Victoria and Tasmania is currently the only unregulated transmission network in the NEM.

Figure 5.1 Electricity transmission networks in the National Electricity Market



5.2 Main features of Transmission Network Service Providers

Table 5.1. provides a brief overview of the TNSPs in the NEM. The TNSPs in Queensland, NSW and Tasmania are owned by their respective State Governments. The TNSPs in Victoria and South Australia, and the two interconnectors are privately owned.

Table 5.1 NEM TNSPs at a glance

NER factor	Region	Current Regulatory Period	Owner
ElectraNet	SA	1 Jul 08 - 30 Jun 13	Powerlink (Queensland Government), YTL Power Investment, Hastings Utility Trust
Powerlink	Qld	1 Jul 07 - 30 Jun 12	Queensland Government
SP AusNet	Vic	1 Apr 08 - 30 Mar 14	Publicly listed company (Singapore Power International 51%)
Transend	Tas	1 Jul 09 - 30 Jun 14	Tasmanian Government
TransGrid	NSW	1 Jul 09 - 30 Jun 14	New South Wales Government
Interconnectors			
Directlink	Qld-NSW	1 Jul 05 - 30 Jun 15	Energy Infrastructure Investments (Marubeni 50%, Osaka Gas 30%, APA Group 20%)
Murraylink	Vic-SA	1 Oct 03 - 30 Jun 13	Energy Infrastructure Investments (Marubeni 50%, Osaka Gas 30%, APA Group 20%)

The two interconnectors have a ten year regulatory period and report annually on a calendar year basis. With the exception of SP AusNet, the other TNSPs report on a financial year basis (end of June) and have five year regulatory periods. SP AusNet reports annually on a 1 April to 30 March calendar year and currently has a six year regulatory control period.

The size of the TNSPs by a number of metrics is provided in Figures 5.2 to 5.5.

Figure 5.2 Size of TNSPs, by kilometre of line length

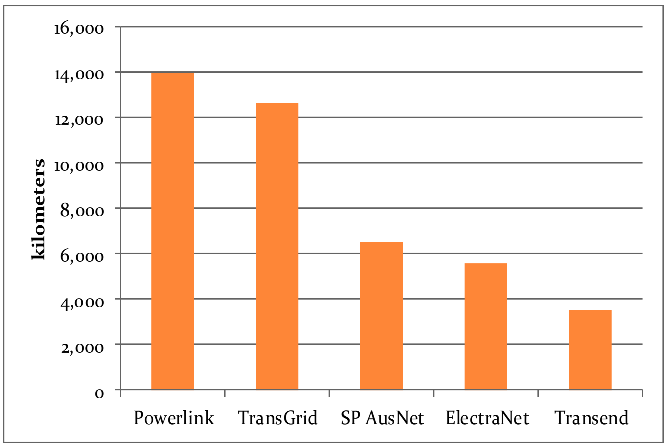


Figure 5.2 shows that Powerlink and TransGrid have the largest networks in the NEM. With over 13,986 circuit kilometres of transmission lines and cables Powerlink (QLD) has the most kilometres of line length in the NEM. TransGrid (NSW) closely follows at 12,657 kilometres. Powerlink's network spans from Cairns in far north Queensland to the NSW border in the south. Based on line length SP AusNet in Victoria is the third largest. However, with 6,553 kilometres, SP AusNet is half the size of TransGrid and Powerlink.

Figure 5.3 Size of TNSPs, by average RAB

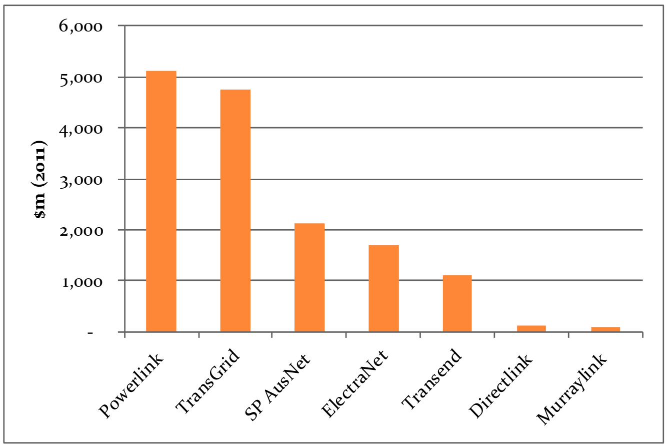


Figure 5.3 shows that based on the regulatory asset base Powerlink is the largest TNSP in the NEM, with an average RAB of $5.1 billion. TransGrid closely follows at $4.8 billion. SP AusNet has the third largest average RAB at $2.1 billion, which is less than half of TransGrid and Powerlink.

Figure 5.4 Size of TNSPs by, peak demand

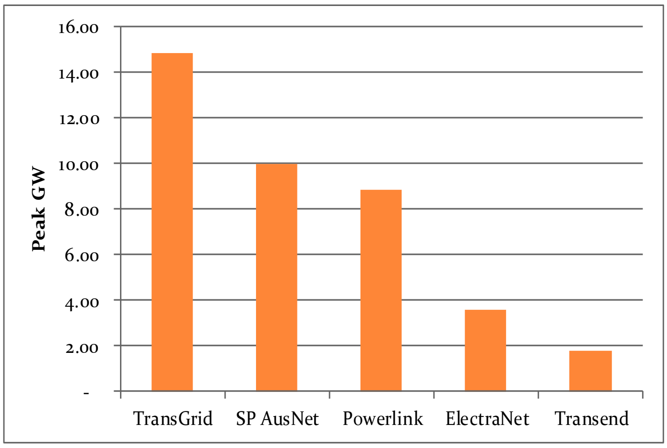


Figure 5.4 shows that in terms of peak demand TransGrid is the largest 14.86 GW, respectively.

SP AusNet, with a network half the size of Powerlink and TransGrid, transmits the second highest maximum demand in the NEM of 9.9 GW. Followed by Powerlink which transmitted 8.84 GW.

Figure 5.5 Size of TNSP, by Load density

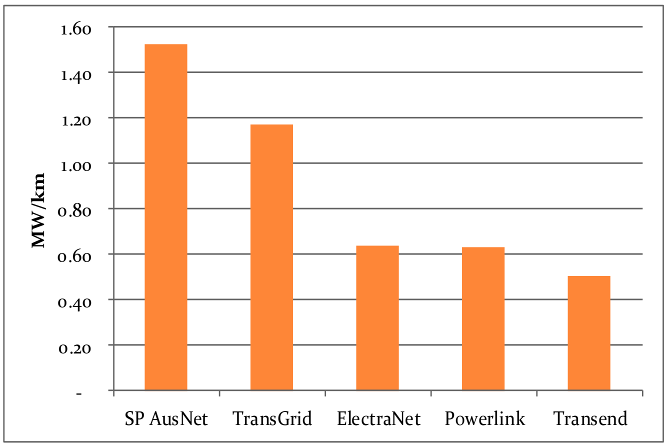


Figure 5.5 shows that SP AusNet in Victoria, with 6,553 circuit kilometres has the network with the highest energy density. SP AusNet is built around a 500 kV high voltage line running from the major generating source in the Latrobe Valley, through Melbourne and across the southern part of the state to Heywood near the South Australian border. SP AusNet transmits the most MW per kilometre of line length at 1.5 MW per kilometre. TransGrid is the next largest transmitting 1.17 MW per kilometre.

These key features of the NEM are set out in Appendix A table A.1

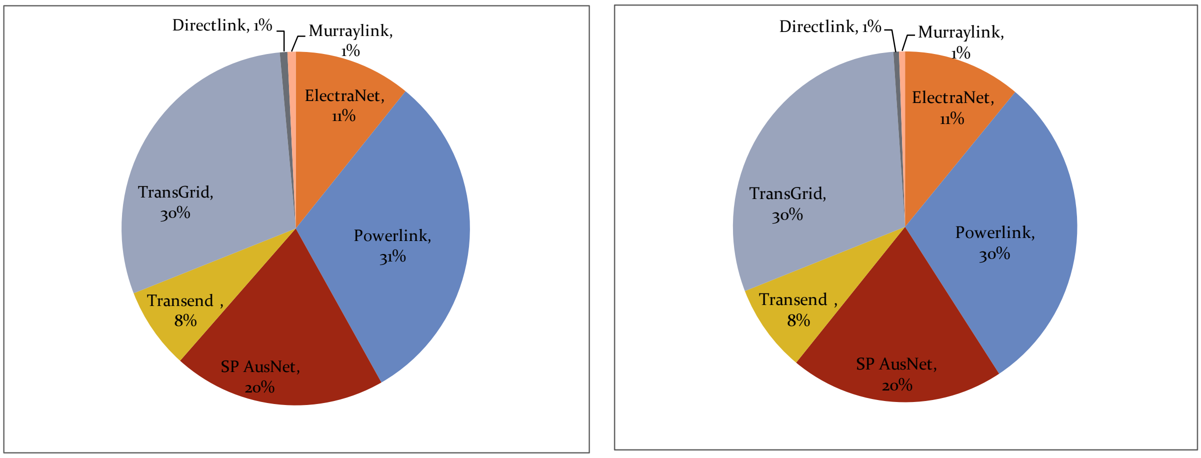
5.3 Different characteristics of TNSPs

In this section, differences between the TNSPs are illustrated in terms of their revenue, size, network utilisation and expenditure. Any changes over time with respect to these differences are also provided.

5.3.1 TNSP revenue and size

One way to illustrate the varying sizes of the TNSPs is to compare their revenue. Figures 4.6 and 4.7 show the actual revenue of each of the TNSPs for 2006-07 and 2010-11. In terms of "market shares" as illustrated by the revenue, Powerlink and TransGrid have the largest shares of the industry revenue with 30 per cent each. Transend has eight per cent of the market share of revenue and the interconnector's one per cent each. Between 2006-07 and 2010-11, SP AusNet's market share increased from 19 per cent to 20 per cent and Powerlink's market share decreased from 32 per cent to 30 per cent.

Figure 5.6 Actual revenue (prescribed services)

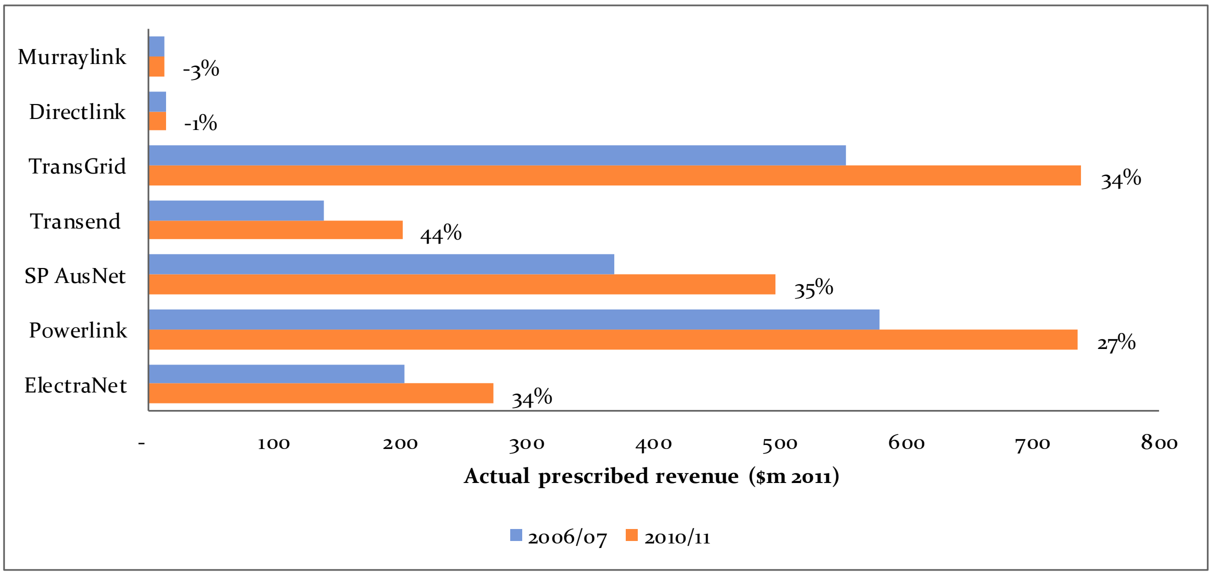


While the distribution of the total revenue across the TNSPs has not changed since 2006-07, there has been a strong increase in the aggregate revenue of all TNSPs by 32 per cent. Revenues for individual TNSPs have increased between 27 per cent and 44 per cent between 2006-07 and 2010-11.

The revenues from the interconnectors, on the other hand, have contracted between one and three per cent over the last five years.

Figure 5.7 shows each TNSP's change revenue from 2006-07 to 2010-11 in real terms.

Figure 5.7 Change in revenue between 2006-07 and 2010-11



The increase in the RAB over the five year period to 2010-11 is a major reason for the change in the revenue allowance for the TNSPs.

Figure 5.8 shows that the market share by size of RAB for Powerlink and TransGrid increased. For Powerlink the market share increased from 30 per cent to 34 per cent. TransGrid's market share increased and from 31 per cent to 32 per between 2006-07 and 2010-11.

SP AusNet's market share fell of RAB fell from 19 per cent to 14 per cent.

Figure 5.8 Change in market share of closing RAB between 2006-07 and 2010-11

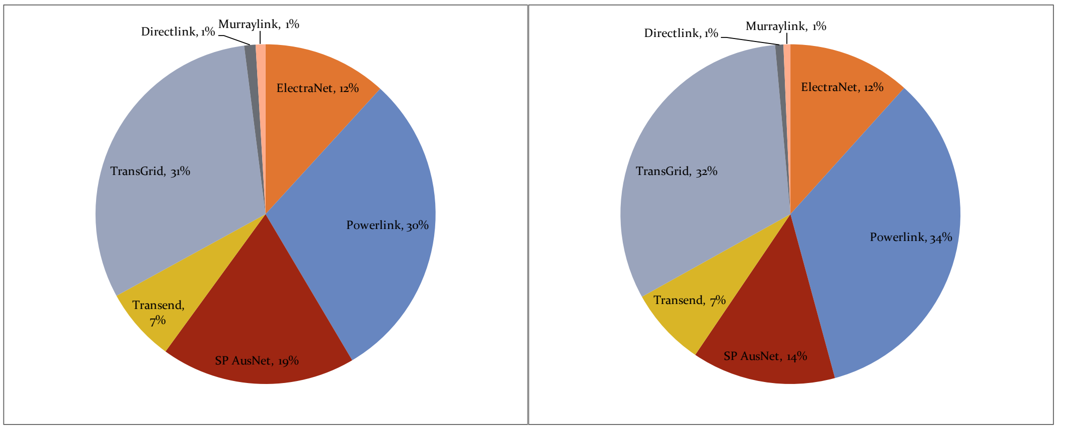
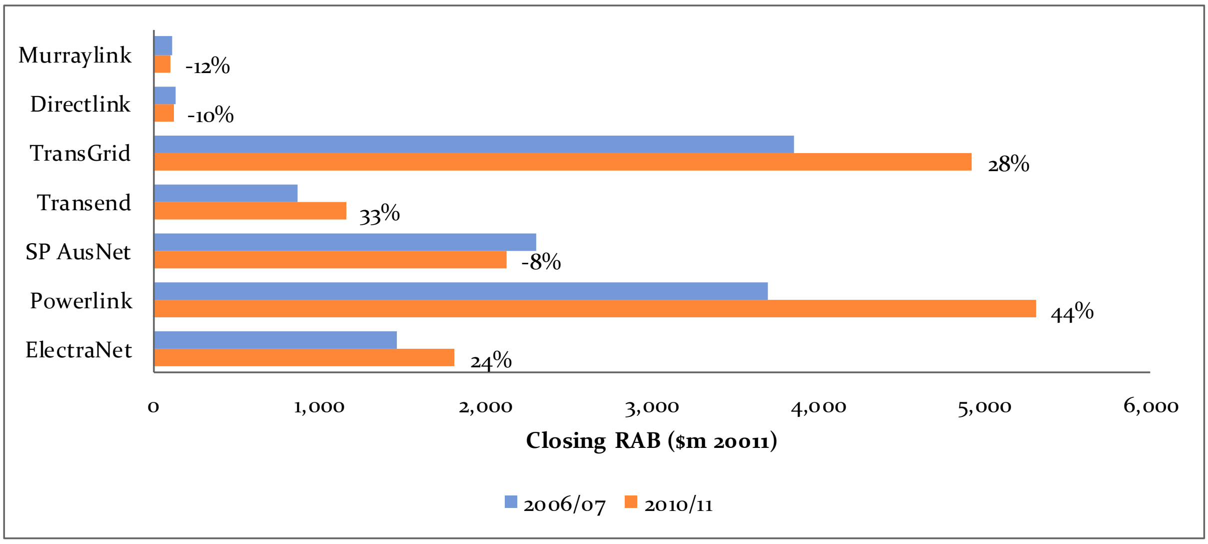


Figure 5.9 shows the change in closing RAB for each of the TNSPs between 2006-07 and 2010-11.

Figure 5.9 Change in closing RAB between 2006-07 and 2010-11



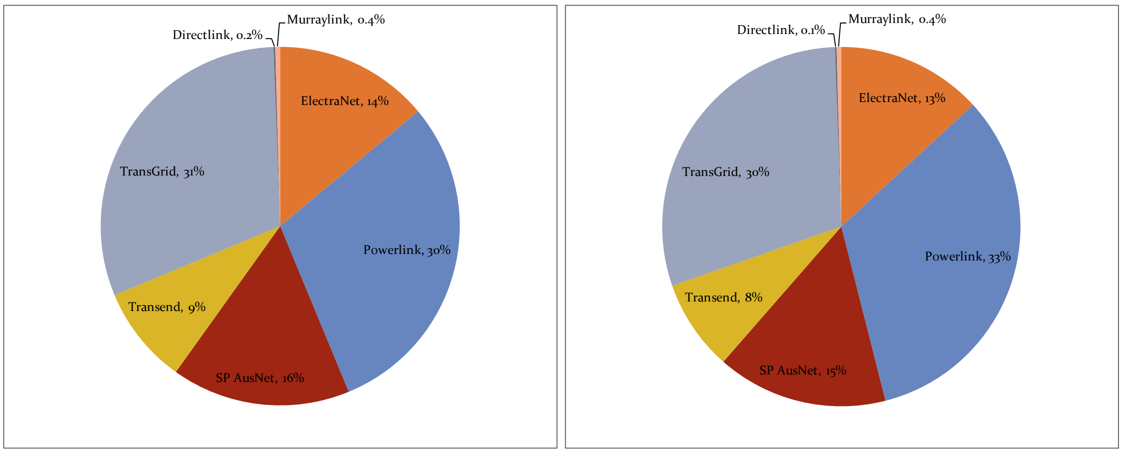
Powerlink and Transend both experienced the largest increases in the RAB of 44 per cent and 33 per cent since 2006-07.

Murraylink and Directlink experienced decreases in their closing RAB of 12 per cent and 10 per cent. This reflects that there has been no additional capex incurred by Murraylink and Directlink over the period. SP AusNet also experienced a decrease in its closing RAB of eight per cent.

5.3.2 TNSP Market share by line length

Figure 5.10 shows the market share of each TNSP based on line length.

Figure 5.10 Change in market share by line length between 2006-07 and 2010-11



There has not been a significant change in the relative shares of line length between TNSPs over the past five years. The most notable increase in line length has been for Powerlink from 30 per cent to 33 per cent.

Figure 5.11 provides a breakdown by line length in the years 2006-07 and 2010-11.

Figure 5.11 Change in line length between 2006-07 and 2010-11

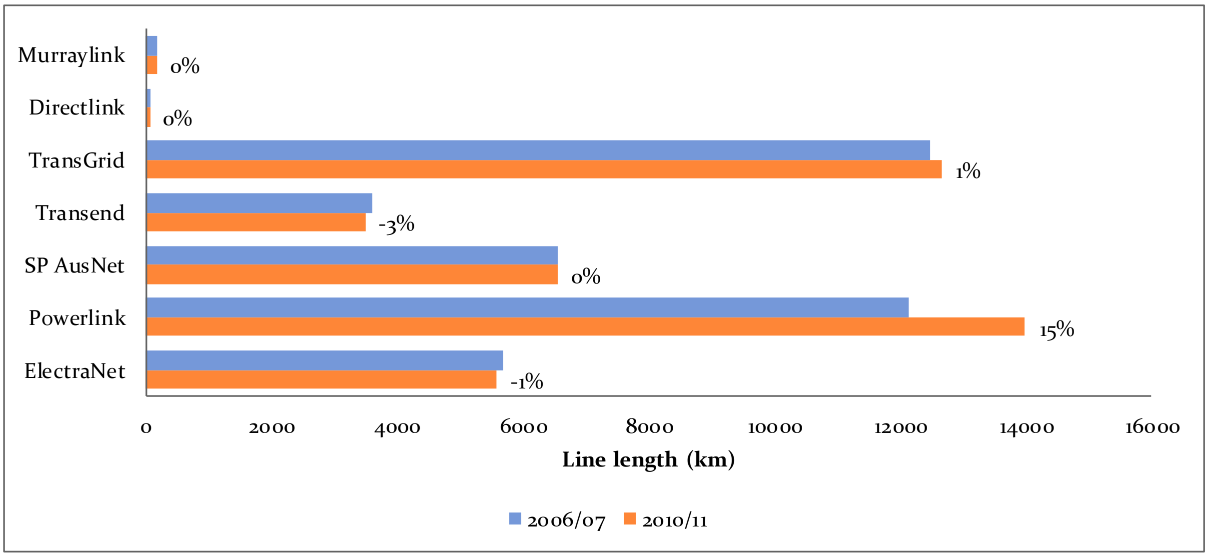


Figure 5.11, shows that since 2006-07 there minimal expansion of transmission lines, with the exception of Powerlink whose network expanded by 15 per cent.

Appendix A contains a summary of various TNSP network data for 2010-11 and earlier years and more detailed descriptions of each TNSP.

5.3.3 Transmission densities and network utilisation

The NEM is a relatively sparse electricity network, reflective of the vast distances between major centres in each state. This is evident in figures 5.12 and 5.13, which plot the relationship between line length and electricity transmitted and peak demand for each TNSP from 2006-07 to 2010-11, respectively.

Figure 5.12 Electricity sent out compared to line length 2006-07 to 2010-11

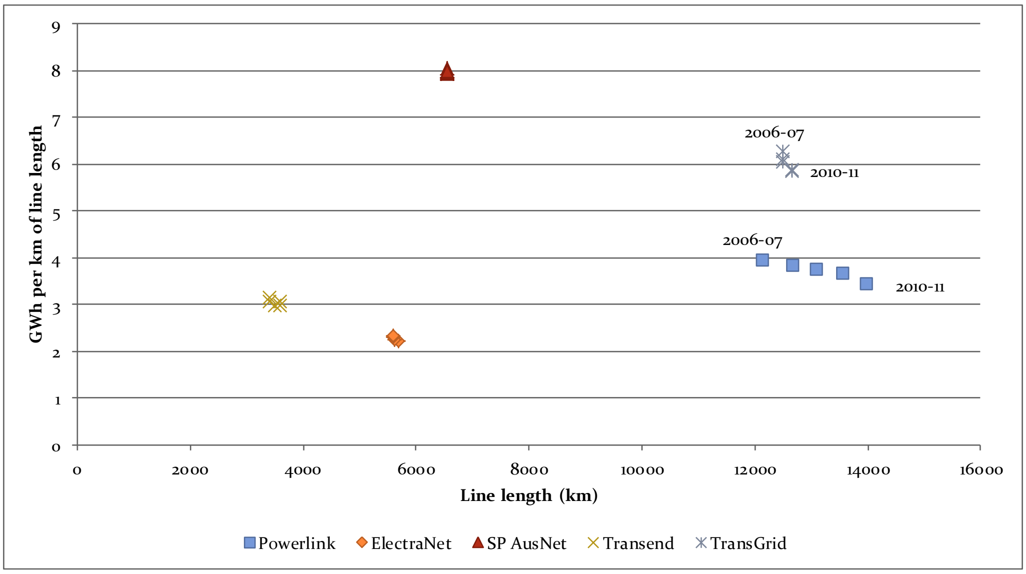


Figure 5.12 shows that Powerlink has the largest network in terms of total line length but transmits the third largest amount of GWh per kilometre. SP AusNet, which has half the line length of Powerlink and TransGrid, transmits the most GWh per kilometre. ElectraNet and Transend operate smaller

networks in terms of both line length and electricity transmitted. This is reflective of the smaller markets in which they operate.

Figure 5.13 shows that while TransGrid has roughly the same line length as Powerlink, it is subject to a higher network peak demand per kilometre of line.

Figure 5.13 Peak demand sent out compared to line length 2006-07 to 2010-11

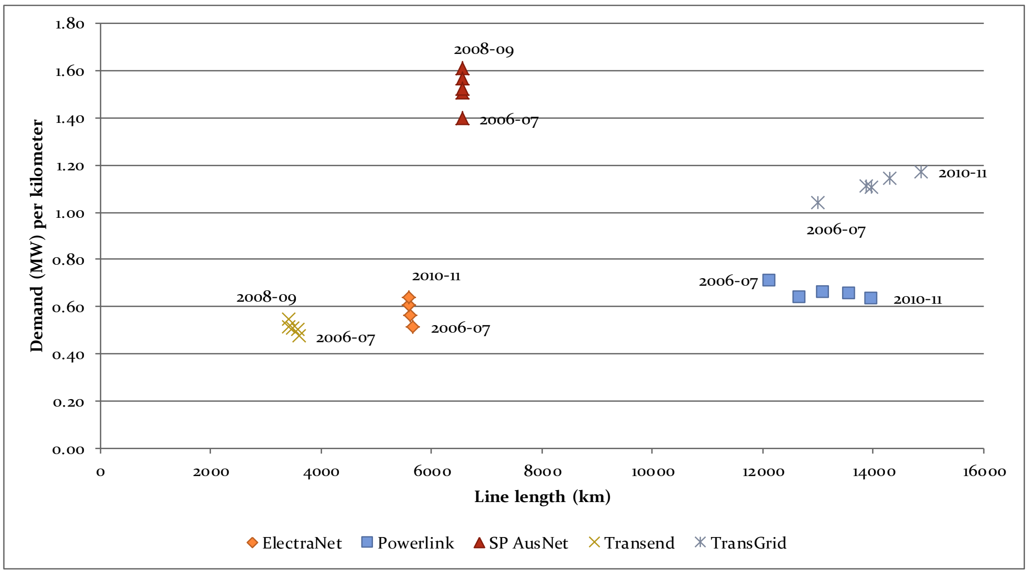


Figure 5.14 compares the relationship between network size and network utilisation for each TNSP. Network utilisation is represented by electricity transmitted (GWh) as a proportion of the closing RAB of each individual TNSP (excluding the interconnectors). The RAB is used as a measure of the relative size of different TNSPs in the NEM. For each TNSP there has been a downward trend in network utilisation as the size of their asset bases relative to GWh has increased in recent years, except for SP AusNet which increased from 23 GWh per million dollars of average RAB to 25 GWh.

Figure 5.14 Electricity sent out compared to average RAB 2006-07 to 2010-11

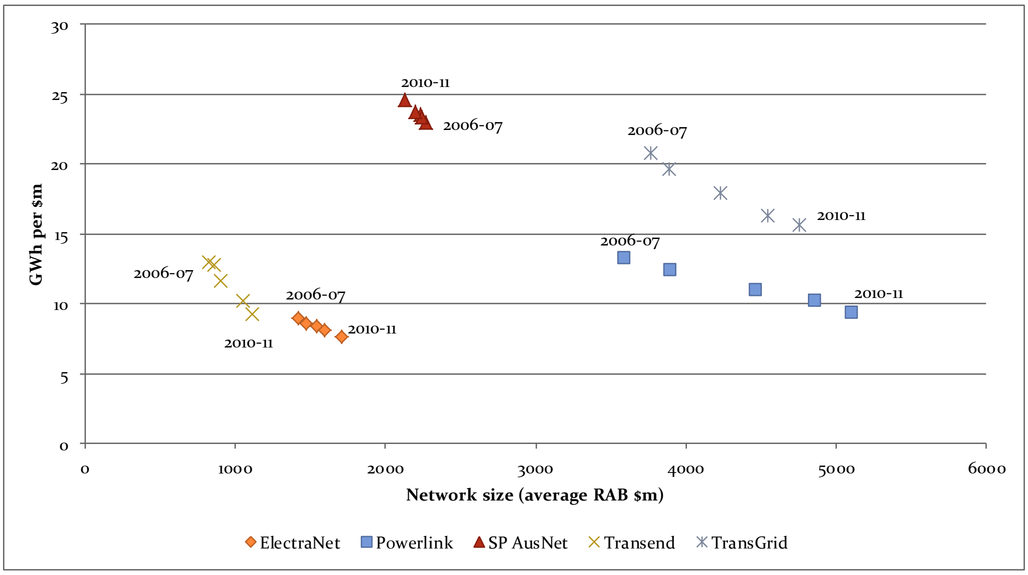
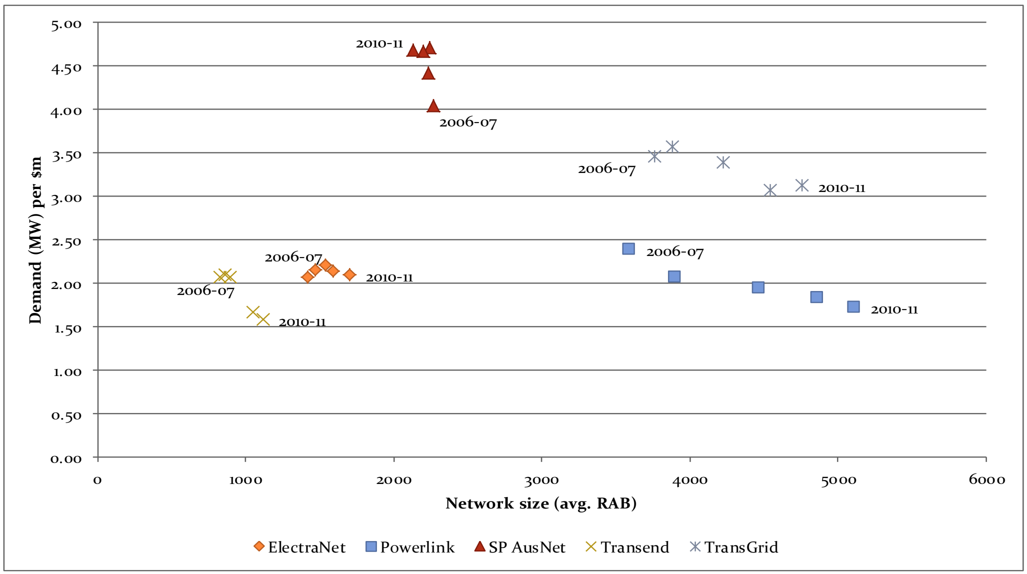


Figure 5.15 below shows that network utilisation in terms of MW has decreased relative to the RAB. The exception is SP AusNet where maximum demand relative to RAB has increased since 2006-07.

Figure 5.15 Maximum demand compared to average RAB 2006-07 to 2010-11



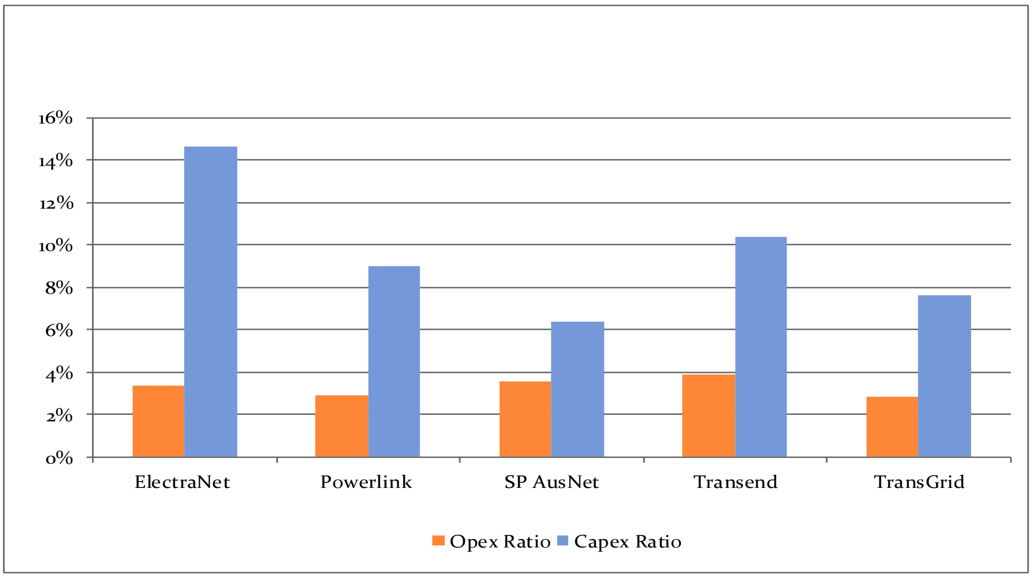
5.3.4 TNSP expenditure breakdown

Figure 5.16 provides the opex and capex ratios for the five TNSPs for 2010-11 and the opex ratios for the interconnectors. The TNSPs' expenditures are presented as a percentage of each TNSP's average RAB. SP AusNet's ratio of capex to RAB is lower than the other TNSPs. This is likely to reflect the Victorian arrangements, where SP AusNet does not recognise capex to expand the network until the RAB is updated at the next regulatory control period. Contestable assets are not rolled into SP AusNet's RAB at any point.

ElectraNet's capex to RAB ratio is significantly higher in 2010-11 than in previous years. This is due to an increase in its actual capex spend in 2010-11 compared to 2009-10 and is significantly above its historical annual capex spend. ElectraNet comment that the significant increase in capital expenditure in 2010-11 is directly attributable to a significant increase in augmentation capital expenditure associated with the Adelaide Central Reinforcement (ACR) contingent project commissioned in December 2011[20].

[20] ElectraNet note that the ACR work was necessary to meet new Electricity Transmission Code (ETC) reliability standards requiring N-1 transmission line and substation capacity for at least 100 per cent of agreed maximum demand for the Adelaide CBD load

Figure 5.16 Capex and opex ratios for 2010-11



Opex excludes grid support and self-insurance. SP AusNet opex excludes easement tax.

6 Financial Performance

6.1 Revenue

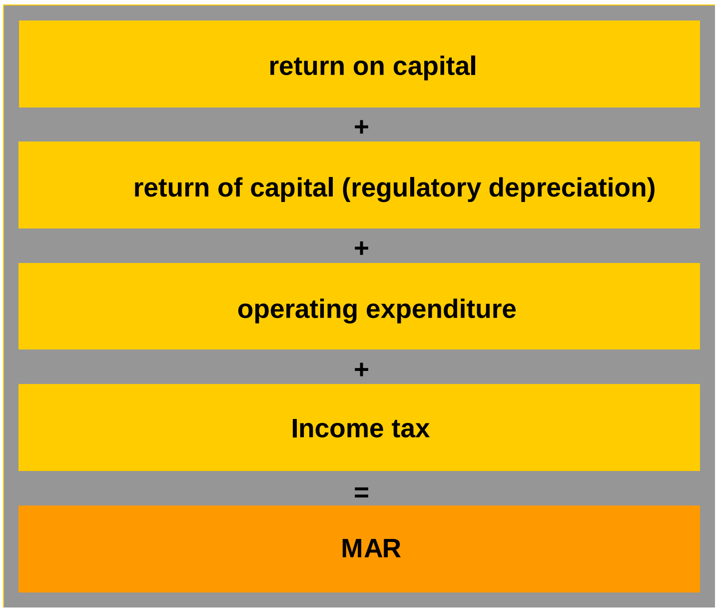
The AER is responsible for regulating the revenues associated with non-contestable elements of the electricity transmission services provided by TNSPs (i.e prescribed services).

Chapter 6A of the NER sets out the regulatory framework and the process the AER applies to determine a TNSP's revenue determination.

In determining the revenue for each year of the regulatory period, the AER adopts the accrual building block approach which requires the Maximum Allowed Revenue (MAR) to be calculated as the sum of the return on capital, the return of capital (regulatory depreciation), an allowance for operating and maintenance expenditure (opex) and an income tax allowance (refer to figure 6.1).

The TNSP then uses the MAR to determine transmission prices (tariffs). These tariffs are determined in accordance with the NER[21] and the AER's pricing methodology guidelines. The TNSPs set tariffs to recover the MAR for each year of the regulatory period. A number of adjustments can be made so that the TNSP does not over or under recover its MAR over the whole regulatory period.

Figure 6.1 The revenue building blocks



A TNSP's revenue allowance can vary over the regulatory control period. As part of the revenue determination process, a TNSP's MAR is determined using a forecast inflation rate for the duration of the regulatory control period. The MAR is adjusted annually for actual CPI to preserve the real value of the revenue stream. Payments and penalties awarded under the service standards performance incentive scheme will result in differences between forecast and actual revenue reported by TNSPs. Additionally, certain unexpected costs[22] that the AER allows TNSPs to pass onto customers (known as cost past-through events) can lead to differences between the actual revenue from prescribed services (actual MAR) and the forecast MAR. Box 6.1 shows how the MAR is adjusted each year within a regulatory control period.

[21] National Electricity Rules version 54 Part J Prescribed Transmission Services - Regulation of Pricing

[22] For example, damage caused to transmission lines as a result of a cyclone.

Box 6.1 Method for calculating maximum allowed revenue

The allowed revenue for each TNSP in the first year of the regulatory period is fixed and is determined by the AER based on the building block model. To adjust the MAR annually within a regulatory control period the allowed revenue for the subsequent year requires an annual adjustment based on the previous year's allowed revenue and the approved CPI - X methodology.

$AR_t = AR_{t-1} \times (1 + CPI) \times (1-X)$

AR = the allowed revenue

t = time period / financial year

X = smoothing factor

The maximum allowed revenue (MAR) for any year within the regulatory period is determined annually by adding to (or deducting from) the allowed revenue (AR), the STPIS[23] revenue increment (or revenue decrement) and any approved pass through amounts.

Therefore MAR_t = allowed revenue + performance incentive + pass through.

This chapter discusses the TNSP's reported revenues in 2010-11, including:

- revenue from prescribed services and other sources
- actual prescribed revenue achieved compared to the forecast MAR as set by the AER in its revenue determinations. It should be noted that forecast figures for MAR have been taken from final AER decisions and adjusted for March quarter CPI figures for the later year of the relevant period;[24] and
- the transmission charges outcome (or price path).

6.1.1 Prices and charges for transmission customers

The MAR is recovered from customers through inter-regional settlement residues[25] and customer charges.

The TNSPs customers are the large customers directly connected to its transmission network and the distribution network service providers (DNSPs). The TNSP recovers their allowed revenue (MAR) through charges to large customers directly connected to their network and through charges to the DNSPs. The DNSPs pass through the transmission costs to end customers through their distribution charges.

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[23] STPIS - service targets performance incentive scheme - performance is measured against certain targets such as circuit availability and loss of supply events. Businesses are rewarded or penalised based on actual performance against target performance.

[24] For example, forecast MAR for the period 2009-10 is adjusted using the March quarter 2010 CPI with the exception of SP AusNet which has been adjusted using the December quarter 2009 CPI. CPI data is sourced from the ABS website (www.abs.gov.au).

[25] Inter-regional settlements arise as generation in the NEM is dispatched optimally based on marginal costing, marginal network losses, are charged for the transmission of power. Charging customers at marginal costs yields excess revenue, as marginal costs generally exceed average costs. This excess revenue is known as 'settlements residue" and the settlements residue due to intra-regional loss factors is distributed to the relevant TNSP. This amount is then passed back to customers by reducing the revenue required to be sourced from customer charges.

Transmission network charges typically make up about 10 per cent of a household customer's bill, but a much bigger proportion of a larger customer's electricity costs.

Prices and charges for transmission customers are developed in accordance with each TNSPs pricing methodology. Transmission prices and charges apply for the following categories of prescribed services:

- Prescribed entry services (entry services which include assets that are directly attributable to serving a generator or a group of generators at a single connection point);
- Prescribed exit services (exit services include assets that are directly attributable to serving a transmission customer or group of transmission customers at a single connection point);
- Prescribed common transmission services (which are services that provide equivalent benefits to all transmission customers without any differentiation based on their location, and therefore cannot be reasonably allocated on a locational basis) - $/MW/day (contract demand) or $/MWh (historical demand); and
- Prescribed transmission use of system services (which include services that provide benefits to transmission customers depending on their location within the transmission system, that are shared by a greater or lesser extent by all users across the transmission system and are not prescribed common transmission services, prescribed entry services or prescribed exit services) - $/MW/day (contract demand) or $/MWh (historical demand).

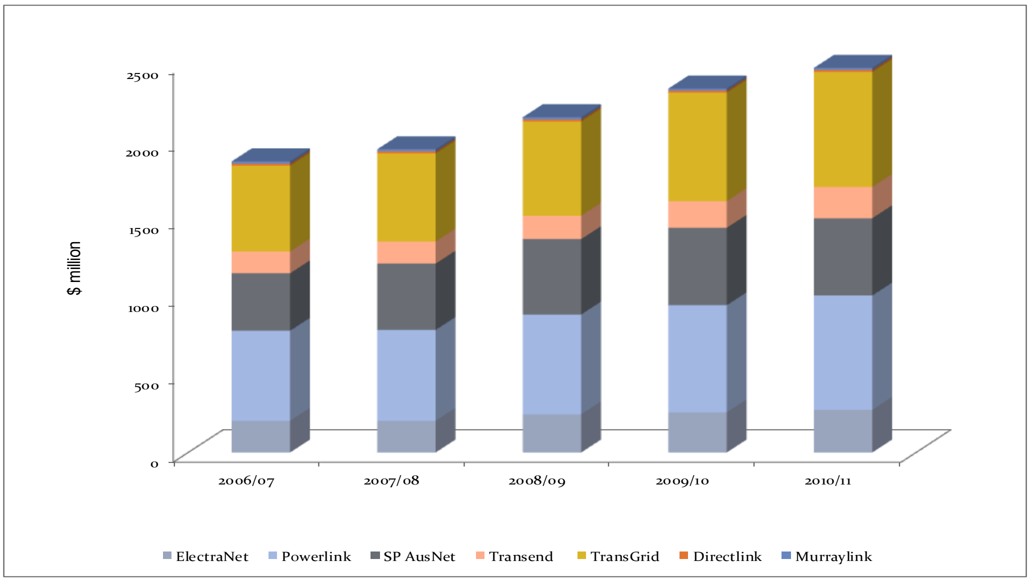
Generally, the TNSPs base their prices and charges on agreed contract demand and historical energy. However, where historical energy is not available or is expected to be significantly different to current energy then current energy is used to set prices. Charges based on current energy are a small proportion; accordingly revenue does not tend to fluctuate significantly as a result of differences between forecast and actual demand and energy. As set out in tables 6.1 and 6.2 there is not much variation between forecast MAR and actual prescribed revenue received (actual MAR).

6.1.2 TNSPs revenues in 2010-11 and recent years

The electricity transmission industry is capital intensive in nature and the size of a TNSP’s asset base is positively correlated with revenue. That is, revenue from prescribed services is about 15-20 per cent of the regulatory asset base, irrespective of the size of the TNSP’s asset base.

Total transmission revenue from prescribed services increased from about $2.34 billion in 2009-10 to about $2.47 billion in 2010-11. This equates to an aggregate increase of $133 million or 5.7 per cent in annual terms. Since 2006-07 aggregate revenue has increased 32 per cent, with Transend and SP AusNet experiencing the largest increases of 44 per cent and 35 per cent, respectively. This is followed by ElectraNet and TransGrid (34 per cent) and Powerlink (27 per cent), respectively. Both the interconnectors Murraylink and Directlink experienced decreases in revenue from 2006-07of 3 per cent and 1 per cent, respectively.

Figure 6.2 Actual prescribed revenue (MAR) 2006-07 to 2010-11

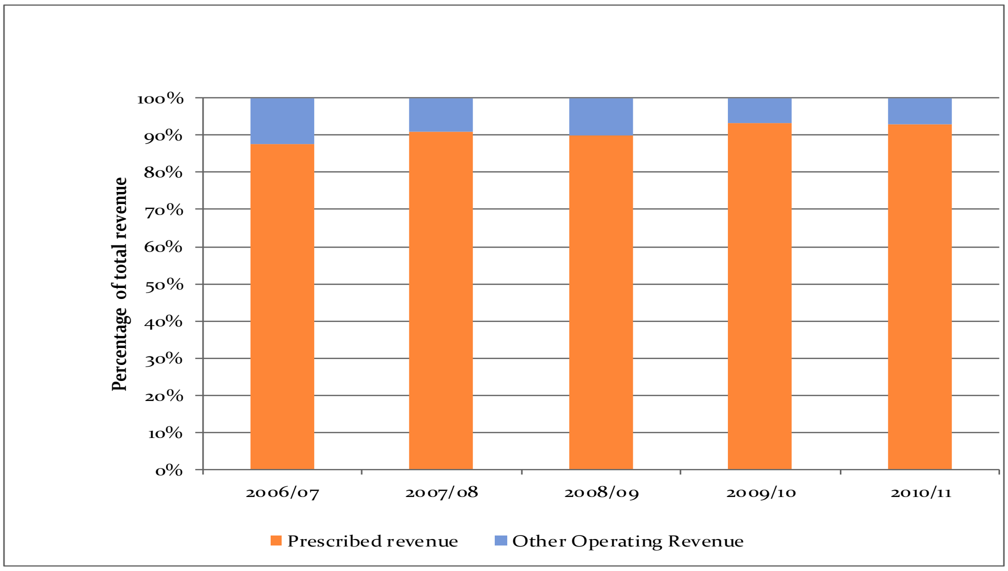


Source: AER calculations based on TNSPs regulatory accounts.
Note: Actual MAR for each TNSP and interconnector is also set out in the Appendix.

TNSPs can also earn non-regulated revenue in a number of ways. These include revenue earned by renting line space to telecommunications companies for optic fibre cabling and by providing connection services for other businesses.

The revenue from prescribed services as a share of total revenue for the transmission sector increased from 87.8 per cent in 2006-07 to 93 per cent in 2010-11 (figure 6.3). This increase was largely due to relatively higher prescribed services revenue as a share of total revenue. In 2010-11 TransGrid's, share of revenue from prescribed services increased from 89.6 per cent in 2006-07 to 97.6 per cent in 2010-11. Over the same period SP AusNet's share increased from 77.3 per cent in to 89.9 per cent. Transend's share of revenue from prescribed services has decreased from 96.5 per cent to 91.4 per cent.

Figure 6.3 Percentage of total revenue 2006-07 to 2010-11



The actual average increase in revenue for prescribed services for the transmission sector between 2006-07 and 2010-11 is 6.7 per cent. Despite Transend's share of prescribed revenue decreasing over the period, Transend experienced the largest increase of prescribed revenue of 17.4 per cent between 2009-10 and 2010-11[26].

Comparison of actual MAR and forecast MAR

Variations between actual prescribed revenues for TNSPs and forecast MARs made at the start of the regulatory period may occur due to pass throughs events, contingent projects and incentive payments.

Table 6.1 summarises the forecast MAR at the time of each TNSP's determination adjusted for the appropriate CPI.

Table 6.1 Differences between the total actual MARs and the total forecast (MARs) of all TNSPs (in $m 2011)

	2006-07	2007-08	2008-09	2009-10	2010-11
Transmission Revenue (PS[27])	1,872.73	1,950.8	2,157.1	2,341.5	2,474.4
Forecast MAR (adjusted for actual CPI)	1,811.9	1,884.4	2,143.1	2,339.5	2,468.1
Difference ($m)	60.8	66.3	14	(1.5)	6.29
Difference (%)	3.4	3.5	0.7	(0.06)	0.25

Source: AER calculations based on TNSPs regulatory accounts. Excludes AEMO data and interconnectors. The forecast MAR does not include network support pass throughs or service target performance incentive scheme payments

In 2010-11, as indicated in table 6.2, the difference between the actual MAR and forecast MAR was the largest for SP AusNet (1.26 per cent) excluding Muraylink.

[26] Transend's revenue increase from 2009-10 was primarily due to the impact of the merits review decision, which resulted in an increase in revenue in 2010-11 including a catch up for the shortfall in 2009-10.

[27] PS = prescribed services

Table 6.2 Differences between actual MAR and forecast MAR by TNSP 2010-11

	Transmission Revenue (PS)	Forecast MAR based on determination (adjusted for actual CPI)	Difference ($m)	Difference (%)
ElectraNet	273.4	273.0	-0.56	-0.20%
Powerlink	736.2	736.5	0.24	-0.03
SP AusNet	497.4	491.2	6.19	1.26%
Transend	201.2	196.4	4.8	2.5%
TransGrid	739.3	743.9	-4.63	-0.62%
Directlink	14.0	13.9	0.06	0.42%
Murraylink	13.1	12.4	0.64	5.20%

Source: AER calculations based on TNSPs regulatory accounts. The forecast MAR does not include network support pass throughs or service target performance incentive scheme payments

Table 6.3 below shows the calculation of the MAR for each TNSP for 2010-11 based on actual outcomes.

Table 6.3 Calculation of 2010-11 MAR

TNSP	Allowed CPI adjustment (per cent)	X factor (per cent)	ARt-1	Performance incentive (s-factor)	Pass-through	Under / over recovery	MAR for 2010-11
ElectraNet	2.89	-5.95	272.1	1.4	-	-	273.4
Powerlink	2.89	-7.61	663.9	1.1	-	-	736.2
SP AusNet	2.11	-1.01	476.5	2.4	3.5	-	497.4
Transend	2.89	-5.53	177.2	0.7	4.1	.	201.2[28]
TransGrid	2.9	-5.61	678.4	8.6		-6.5[29]	739.3

TNSP transmission charges outcomes

Figures 6.4 to 6.8 show the indicative price path of TNSPs' actual allowed transmission charges (expressed on a $/MWh basis) compared to the transmission charges that were forecast based on the allowed revenues at the time of the regulator's determination.

These price paths indicate the extent to which actual revenue per megawatt hour transmitted varies from forecast revenue per megawatt hour transmitted. Differences may arise due to variation between forecast and actual CPI, contingent projects, any cost 'pass throughs'. The movement in actual indicative prices for all TNSPs were generally very close to those forecast in the respective transmission determinations. The differences that were evident appeared to be primarily due to actual

[28] $3.9 million is also included as a result of the catch up for the shortfall in 2009-10 as per the merits review decision
[29] Includes under-recovery and pass through of unspent network support

revenue containing STPIS (s-factor) payments and network support pass throughs, which are not incorporated in the original revenue allowances by the AER.

The price paths set out in figure 6.4 to 6.8 show that ElectraNet and Transend have the highest costs per kilowatt hour. SP AusNet had the lowest cost per kilowatt hour followed by TransGrid.

Figure 6.4 ElectraNet

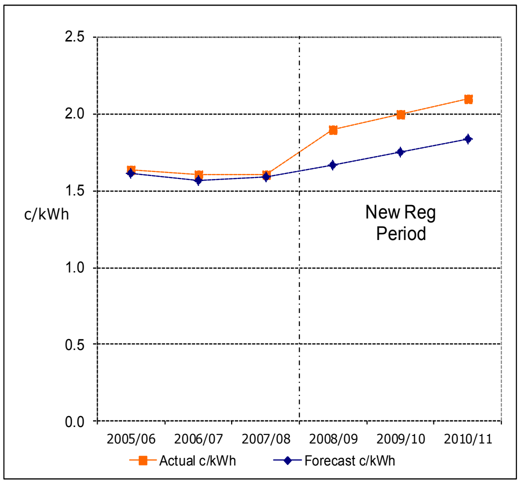


Figure 6.5 Powerlink

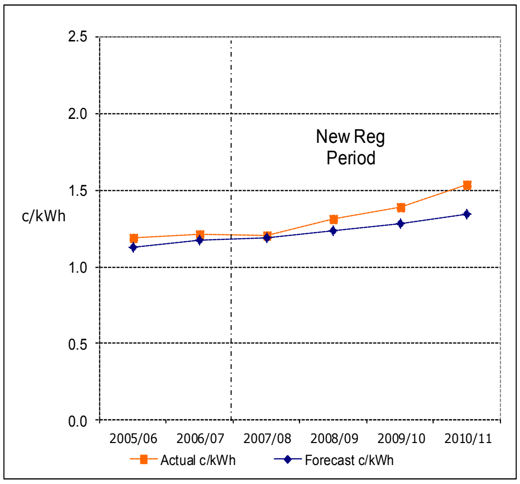


Figure 6.6 SPAusNet

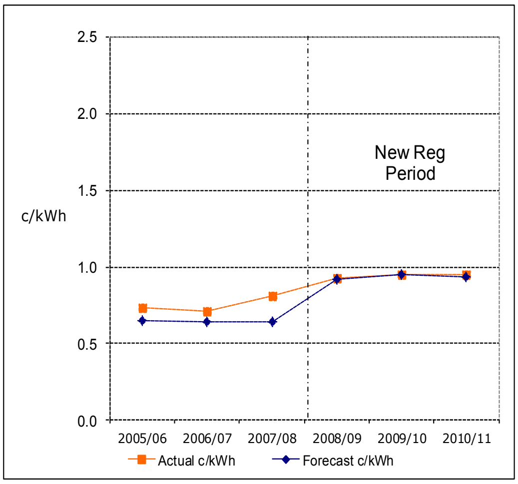


Figure 6.7 Transend

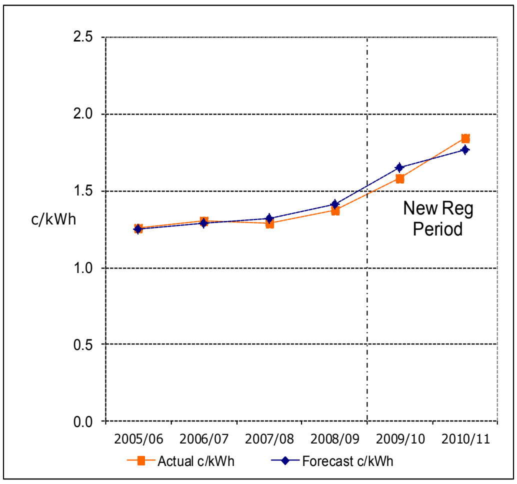
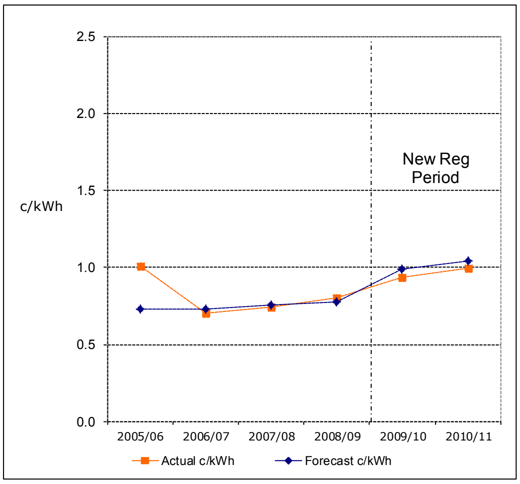


Figure 6.8 TransGrid



6.2 Financial Indicators

This section describes the financial performance of TNSPs in the 2010-11 financial year and where appropriate compares their performance against previous financial years. In particular, this section of this report provides a summary of key items and financial indicators derived from TNSPs' income statements and balance sheets.

Under the building block methodology for regulating prices, TNSPs are provided with a MAR which provides them with a consistent and relatively predictable cash flow - regardless of seasonal fluctuations and volume changes. This cash flow supports the TNSPs' operations and planned capital investments and also service debt.

Key factors in determining TNSPs' profits include actual capex and opex. As the TNSPs' regulatory asset bases grow, the depreciation expense will also increase and can affect reported profit and return on equity.

6.2.1 Financial ratios

The ratios used by the AER to assess TNSPs' financial performance are set out in Table 6.3 relate to prescribed services (PS) where indicated. These financial ratios are widely accepted and have been adopted by the AER on this basis.[30]

Table 6.3 Key financial performance indicators

Financial ratio	Description	Calculation
Return on Equity (ROE)	Measures the firm's profitability and allows investors to compare returns for investments with similar risk profiles.	Net Profit After Tax / Average Equity
Return on Assets (ROA)	Measures the efficiency of the use of the business' assets in producing operating profit.	Earnings before Interest and Tax (PS) / Average Regulatory Asset Base
Gearing	The percentage of the firm's funding which is attributed to debt.	Debt / (Debt + Equity)
Interest cover	Measures whether a firm's earnings can cover its gross interest expense.	Earnings before Interest and Tax (PS) / Gross Interest Expense

In this report, the return on equity (ROE) is calculated using net profit after tax (NPAT) and average equity as measured for the whole of a TNSP's business.

The return on assets (ROA) and interest cover are calculated using prescribed service earnings before interest and tax (EBIT) and the average regulatory asset base (RAB) associated with prescribed services. These prescribed services provided by the TNSP typically account for more than 90 per cent of the total revenue of a TNSP.

30 As noted in the 2008-09 performance report, for businesses that own more than one regulated network, pay tax and hold debt at the corporate level, any allocation of tax or debt to an underlying line of business will be somewhat arbitrary. The allocation is only done for regulatory accounts and not statutory accounts (e.g. SP AusNet). Therefore, care must be taken when assessing the financial ratios and measures for these businesses.

6.2.2 Aggregate TNSP performance

Table 6.4 below identifies which TNSPs have contributed to the aggregate TNSP performance indicators, as reported in this performance report.

Table 6.4 TNSPs included in aggregate financial indicators

	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
ElectraNet	✓	✓	✓	✓	✓	✓	✓
Powerlink	✓	✓	✓	✓	✓	✓	✓
SP AusNet	✓	✓	✓	✓	✓	✓	✓
Transend	✓	✓	✓	✓	✓	✓	✓
TransGrid	✓	✓	✓	✓	✓	✓	✓
Directlink			✓	✓	✓	✓	✓
Murraylink	✓	✓	✓	✓	✓	✓	✓

Aggregate TNSP performance is outlined in table 6.5. It should be noted that:

- Opex, grid support and depreciation relate to prescribed services only.
- Gross interest, tax and dividends are aggregated figures relating to both prescribed and other services.

Table 6.5 TNSPs' aggregate financial performance ($real 2011)

	2009-10	2010-11
Income statement – Prescribed Services	$ million	$ million
Transmission revenue (PS) *	2,341.6	2,474.4
Operating expenditure (PS)	454.77	464.98
Grid support (PS)	41.2	9.31
Depreciation (PS)	592.2	643.4
Earnings before interests and tax (EBIT, PS)	1,152.7	1,267.3
Income statement – Aggregate **		
Gross interest expense (aggregate)	658.4	691.2
Tax (aggregate)	185.0	212.6
Net profit after tax (aggregate)	464.2	518.5
Dividends (aggregate)	367.8	398.5
Balance sheet		
Closing RAB (PS)	14,976.4	15,577.2
Total assets (aggregate)	19,308.1	13,721.8
Total debt (aggregate)	9,906.9	9,493.1
Total liabilities (aggregate)	12,769.2	13,141.7
Total equity (aggregate)	6,348.2	6,575.7

* Transmission revenue is from prescribed services network charges only.
** This information is not reported or requested at a prescribed services level and therefore aggregate figures can only be provided for these categories.

6.2.3 Return on assets

Return on assets is a measure of each TNSPs overall financial performance in providing transmission services. In general, an increase in revenue or a reduction in operating expenses increases the return on assets. A reduction in capital expenditure reduces the regulatory value of TNSPs assets, resulting in an increase in the return on assets during the regulatory control period. The actual pre-tax return on assets for each TNSP is set out in table 6.6. It is calculated by dividing each TNSP's EBIT, as reported in their 2010-11 regulatory accounts, by the average regulatory asset base.

The ROA for each TNSP cannot be compared to the forecast ROA for each TNSP, as set at the time of the start of their regulatory period. The AER has found that comparisons between the actual ROA as calculated in table 6.6 for each TNSP and the forecast ROA set at the time of the determination are not comparable due to the TNSPs including amortisation in their depreciation allowances in the regulatory accounts. The AER notes significant differences between reported actual depreciation (which includes amortisation) and forecast depreciation. Accordingly, for the purposes of this report the AER has not included a comparison between actual and forecast ROA.

Table 6.6 2010-11 Return on assets, 2010-11, per cent

TNSP	2008-09	2009-10	2010-11
ElectraNet	8.30	8.67	8.74
Powerlink	6.96	6.65	7.10
SP AusNet	10.29	10.81	11.67
Transend	5.88	6.75	9.04
TransGrid	7.42	8.04	8.14
Directlink	12.21	5.85	7.69
Murraylink	14.28	9.59	9.56
Industry ROA	**7.75**	**7.97**	**8.43**

6.3 Individual TNSP performance

A business' operating environment has a direct impact on its financial performance. The following sections provide snapshots of individual TNSPs' performances.

6.3.1 ElectraNet

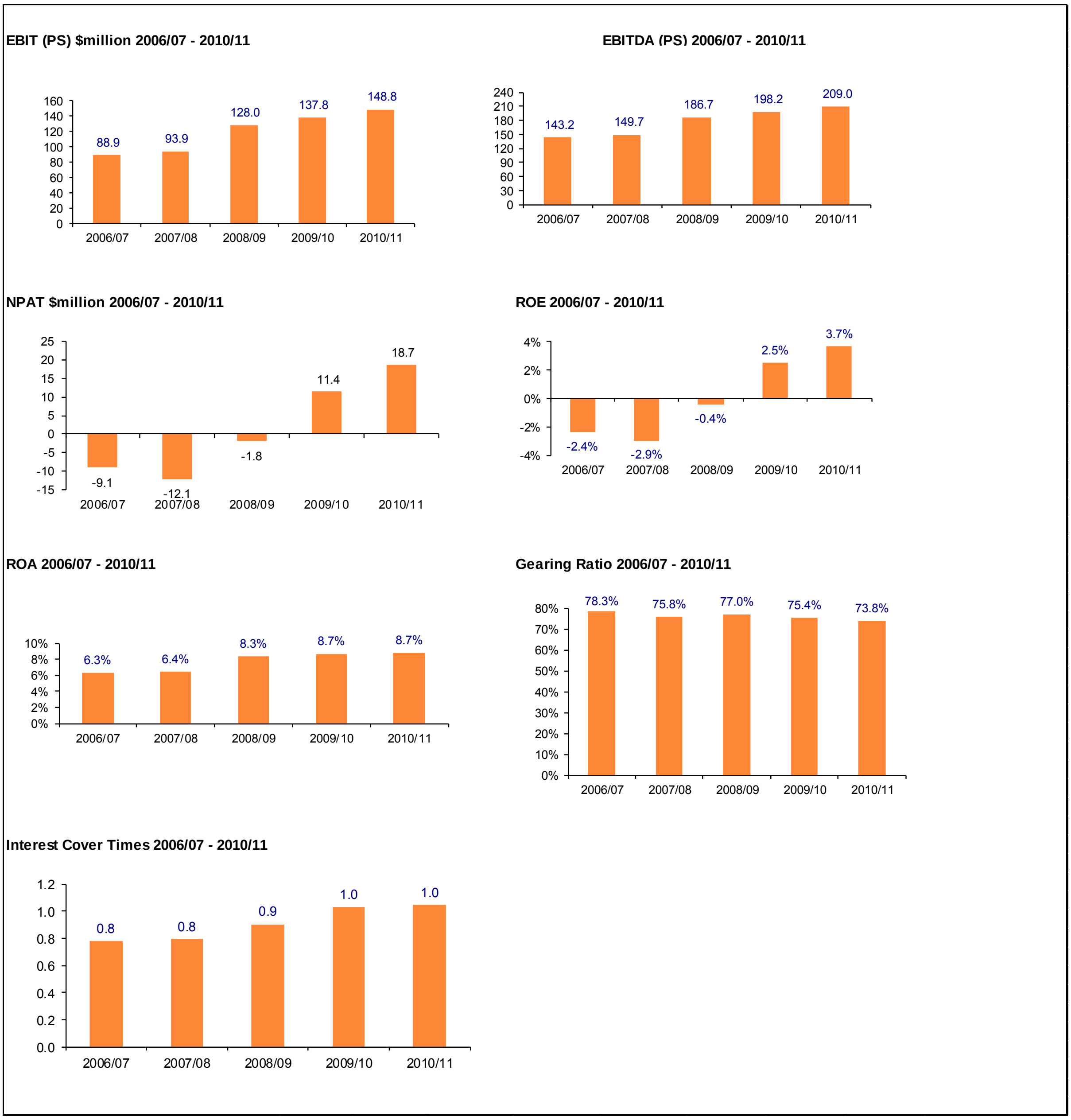
Figure 6.9 shows ElectraNet's financial performance since 2006-07. In 2010-11 ElectraNet's earnings before interest and tax (EBIT) increased by 8 per cent to $148.8 million, as indicated in figure 6.9.

From 2006-07 to 2008-09 ElectraNet recorded net losses after tax. These losses resulted from high interest expenses on debt. However, since 2009-10 ElectraNet has recorded a net profit after tax (NPAT). In 2010-11, ElectraNet's net profit after tax increased by 64 per cent to 18.7 million. In 2010-11 ElectraNet reported a return on equity of 3.7 per cent. ElectraNet's overall return on assets In 2010-11 is 8.7 per cent.

ElectraNet's gearing ratio has been decreasing since 2006-07 from 78.3 per cent to 73.8 per cent in 2010-11. At the same time interest coverage[31] has trended up from 0.8 times to 1.04 times.

[31] This represents the degree of security that an NSP has to meet its interest payments.

Figure 6.9 ElectraNet Financial Summary



6.3.2 Powerlink

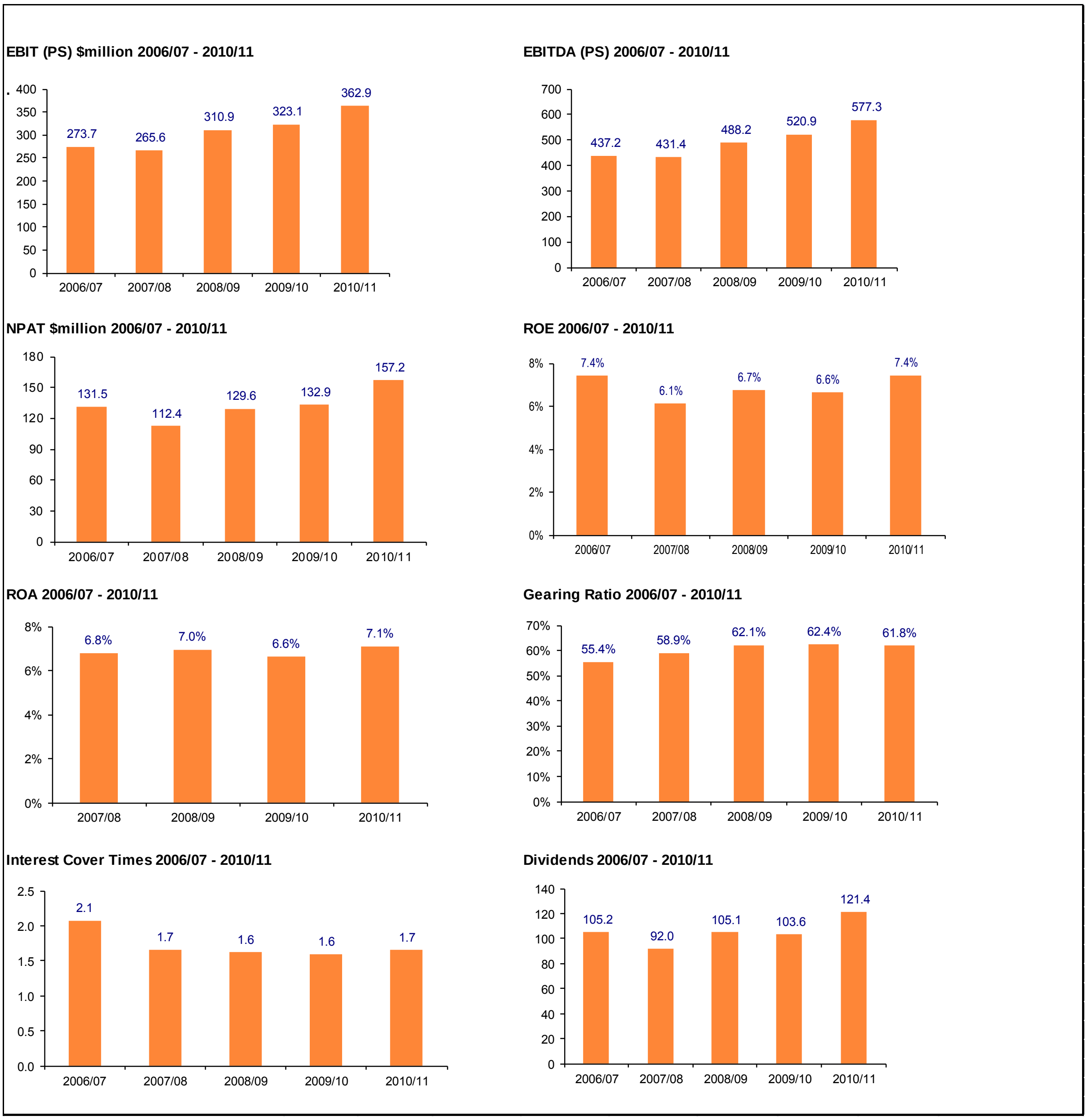
Figure 6.10 shows Powerlink's financial performance since 2006-07. Powerlink's EBIT increased by 12 per cent from $323.1 million in 2009-10 to $362.9 million in 2010-11.

Net profit after tax (NPAT) also increased by 18 per cent from $132.9 million in 2009-10 to $157.2 million in 2010-11. Dividends payments increased from $103.6 million in 2009-10 to $121.4 million in 2010-11. ROE increased from 6.6 per cent in 2009-10 to 7.4 per cent in 2010-11. While, ROA increased from 6.7 per cent in 2009-10 to 7.1 per cent in 2010-11.

Powerlink's gearing ratio and interest coverage has remained relatively constant from 2009-10. Powerlink's NPAT has been steadily increasing since 2007-08 from 112.4 million to $157.2 million in 2010-11. Similar to other TNSPs, NPAT is influenced by Powerlink's interest expenses and to a smaller extent its depreciation and amortisation expenses. Between 2006-07 and to 2008-09 dividend payments were around 80 per cent of NPAT. Since 2009-10 dividend payments are around 77 per cent of NPAT. Dividend payments increased by 19 per cent in 2010-11 from $103.6 million to $121.4 million.

Powerlink's gearing ratio has trended upwards since 2006-07 to 2010-11 from 55.4 per cent to 61.8 per cent to support its increasing capital investment program. Powerlink's interest coverage ratio has also moved down since 2006-07, decreasing in 2010-11 to 1.65 times.

Figure 6.10 Powerlink Financial Summary



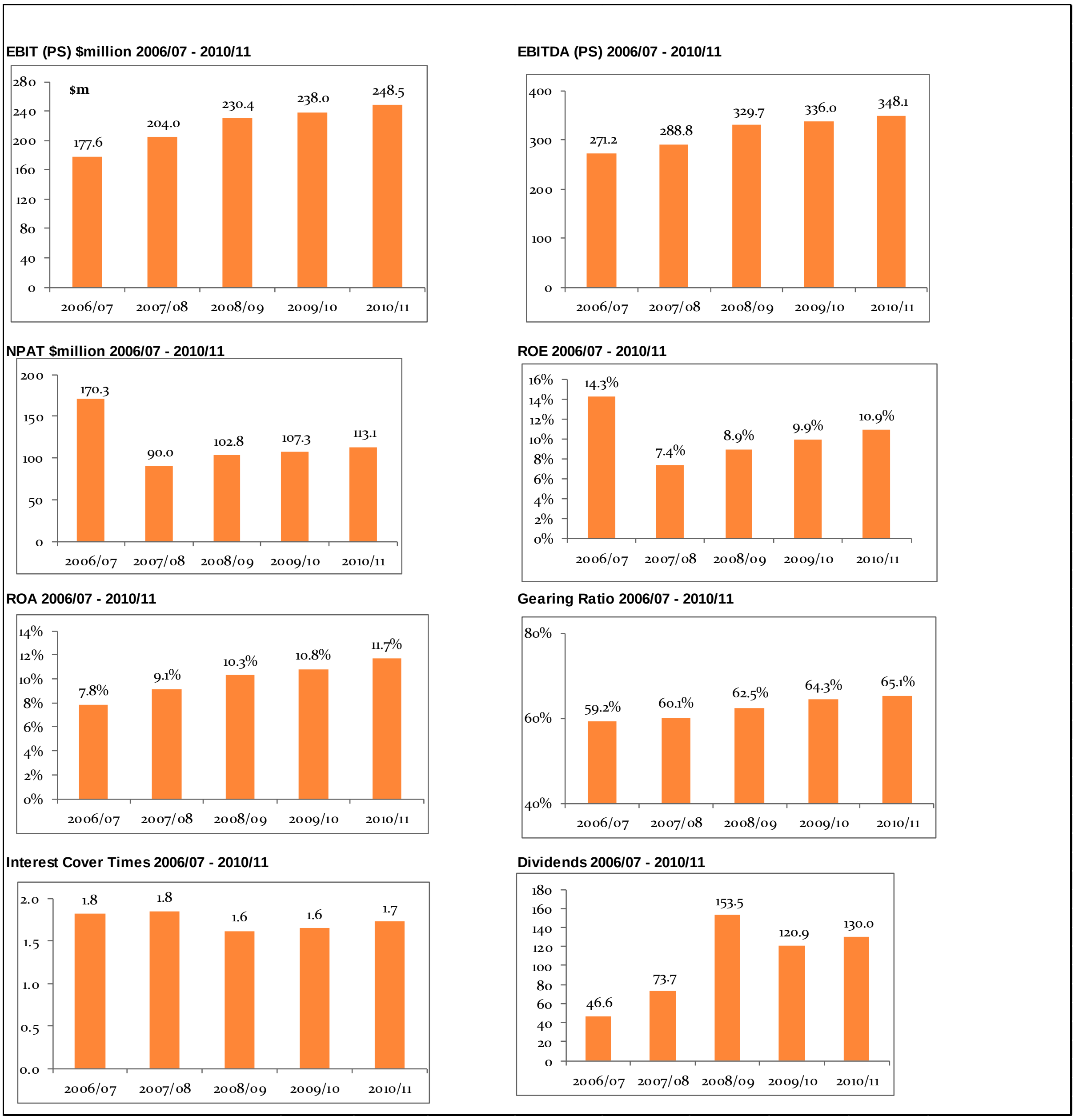
6.3.3 SP AusNet

Figure 6.11 shows SP AusNet's financial performance. SP AusNet’s EBIT and NPAT increased by four per cent and five per cent in 2010-11 compared to 2009-10, to $248 million and $113.1 million, respectively.

The ROE increased from the previous financial year by 10 per cent to 10.9 per cent. SP AusNet's ROA also increased from 10.8 per cent in 2009-10 to 11.7 per cent in 2010-11. Dividends to shareholders increased by eight per cent in 2010-11 to $130 million. In 2010-11 dividend payments are 115 per cent of NPAT.

In 2010-11 SP AusNet’s gearing ratio continued a trend increase to 65.1 per cent while interest coverage increased 5 per cent to 1.7 times.

Figure 6.11 SP AusNet's Financial Summary

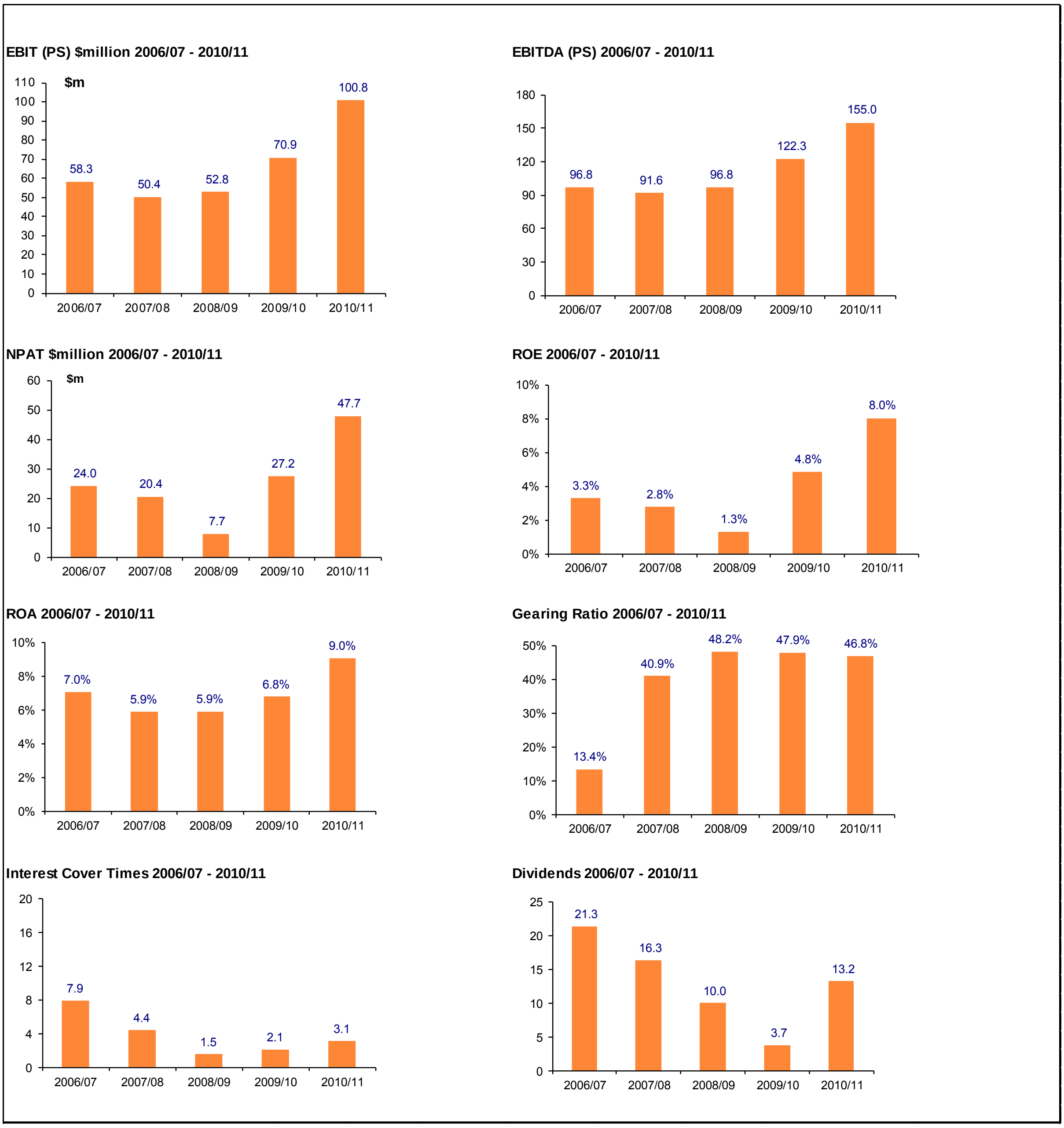


6.3.4 Transend

Figure 6.12 shows Transend's financial performance. In 2010-11 Transend recorded significant increases in EBIT and NPAT of 42 per cent and 75 per cent, respectively. In 2010-11 EBIT was $100.8 million up from $70.9 million and NPAT was 47.7 million up from $27.2 million, respectively. In 2010-11 dividends paid by Transend increased to $13.2 million (28 per cent of NPAT). This reverses the trend of a steady decline in dividend payments since 2006-07. The ROE increased from 4.8 per cent in 2009-10 to 8.0 per cent in 2010-11. The ROA increased from 6.8 per cent in 2009-10 to 9.0 per cent in 2010-11. Transend's NPAT has fluctuated over the five year period to 2010-11. Decreasing from $24 million in 2006-07 to $7.7 million in 2008-09 and then increasing again up to $47.7 million in 2010-11. NPAT was influenced by Transend's interest and depreciation expenses and, unlike other TNSPs, Transend's operating and maintenance expenditure contributed to falling NPAT over time.

Transend's gearing ratio decreased from 48 per cent in 2009-10 to 46.8 per cent in 2010-11 and interest coverage increased by 46 per cent from 2.1 times to 3.08 times.

Figure 6.12 Transend's financial summary

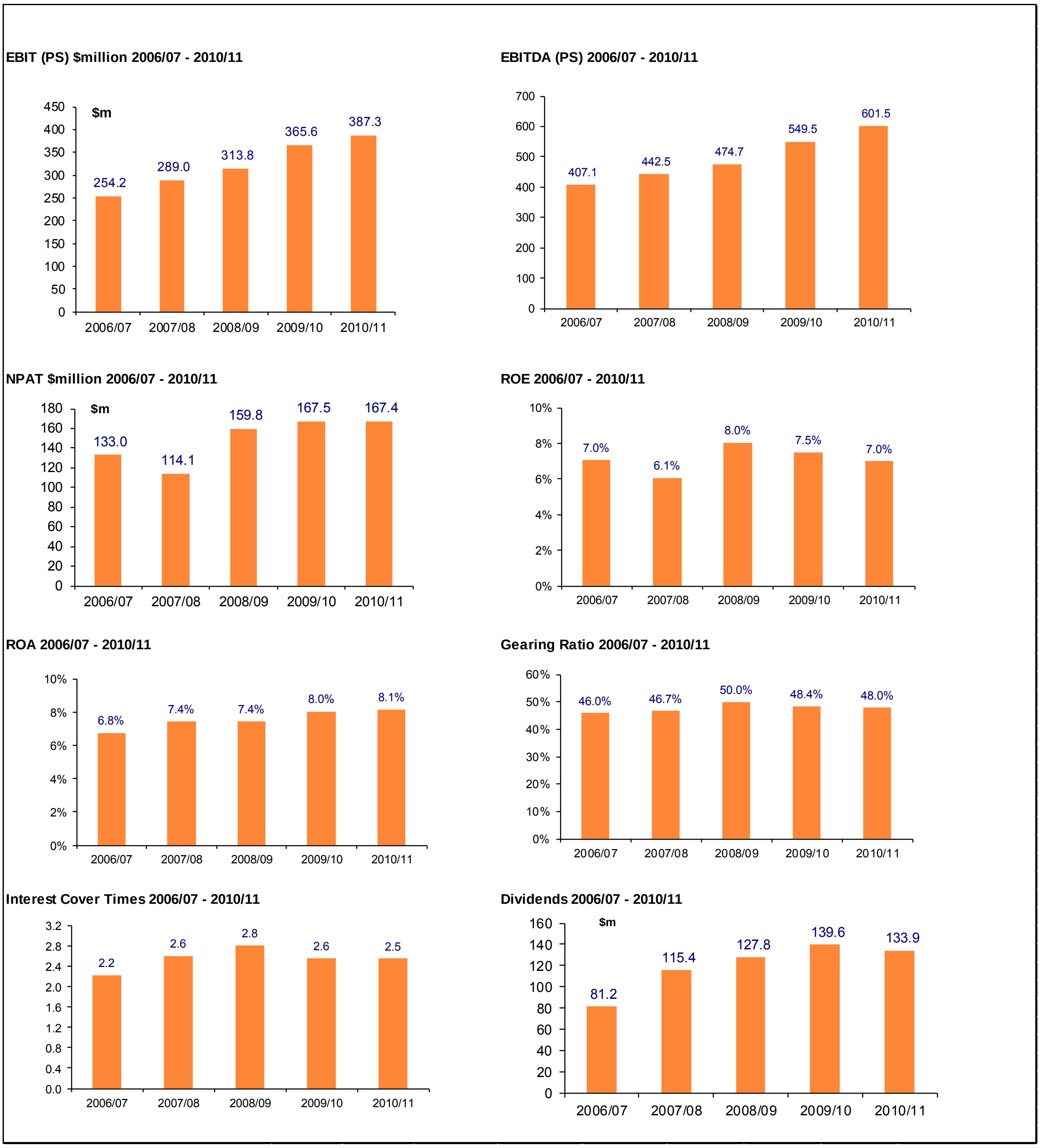


6.3.5 TransGrid

Figure 6.13 shows TransGrid's financial performance. TransGrid's EBIT continued to grow reaching $387.3 million in 2010-11 up 6 per cent from 2009-10. However, NPAT remained constant at $167.4 million in 2010-11. Dividend payments decreased four per cent to $133.9 million (and were 80 per cent of NPAT in 2010-11). ROE decreased to 7.0 per cent in 2010-11 compared to 2009-10 (7.3 per cent). The ROA increased slightly from 8.0 per cent in 2009-10 to 8.1 per cent in 2010-11.

TransGrid's NPAT has fluctuated over the five year period to 2010-11 from $133 million in 2006-07 to $114.1 million in 2007-08 and increasing to in 2008-09 to $159.8 million to $167.4 million in 2010-11. The NPAT was influenced by TransGrid's depreciation and amortisation costs and operation and maintenance expenditure and to a smaller extent interest expenses from liabilities. In 2010-11 TransGrid's gearing ratio remained relatively constant at 48 per cent and interest coverage remained constant at 2.54 times.

Figure 6.13 TransGrid's financial summary



7 Capital Expenditure

7.1 Introduction

Electricity transmission networks are typically comprised of large assets with long asset lives. Capital expenditure (capex) is required when these assets expire. In addition, capex includes expenditure to augment transmission networks to provide extra capacity in order to maintain a consistent and reliable supply of electricity for consumers.

Capex is one component of the building block model that the AER uses to make a determination on the revenue that a transmission business needs to cover its efficient costs while providing for a commercial return to the business. At the beginning of a regulatory control period, the AER approves a forecast of efficient capex for each TNSP. This capex allowance is intended to cover a TNSP's expected infrastructure investments, including augmentation of the network, replacement of aging or redundant assets and investment in business support systems.

TNSPs determine which capital investment projects they will undertake within this allowance, subject to service standards requirements. The objective of the ex-ante allowance is to provide certainty and a strong incentive for efficient investment.

The AER sets capex targets for each TNSP at the time of its revenue determination. In its revenue proposal, TNSPs are required to propose a forecast capex that aims to achieve the capex objectives of:[32]

- meeting the expected demand for prescribed transmission services over that period
- complying with all applicable regulatory obligations associated with the provision of prescribed transmission services
- maintaining the quality, reliability, safety and security of prescribed transmission services and in turn the transmission system.

TNSPs that spend less than the allowance set by the AER retain the benefit of that lower expenditure (both the return on and return of capital) for the remainder of the regulatory control period. Conversely, TNSPs exceeding the allowance forgo any return on or return of capital for the remainder of the regulatory control period.

This chapter discusses TNSPs’ capex performance in 2010-11, including comparisons to previous years. Murraylink and Directlink have been excluded from the aggregate capex measures as they do not have any capex forecasts during their current control regulatory periods.

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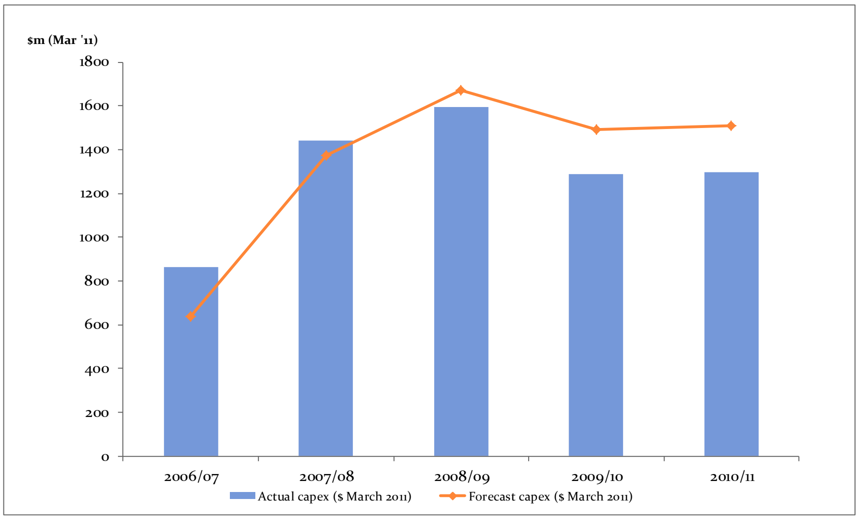
[32] Rule 6A.6.7(a), NER.

7.2 Capex in 2010-11 and recent years

Capital expenditure for the TNSPs has generally been increasing over time, with a noticeable increase in expenditure in 2007-08. As shown in Figure 7.1, in 2006-07 and 2007-08, the TNSPs' aggregate actual capex was above forecast capex. However, from 2008-09 to 2010-11, actual capex has been less than forecast.

Figure 7.1 Comparison of TNSP aggregate forecast and actual capex 2006-7 to 2010-11



As shown in Figure 7.2 overall, capex has increased over time for most of the TNSPs. This is in line with increasing demand and the need for network expansion. SP AusNet is the only TNSP to experience a decrease in capex of 13 per cent in the five year period. In contrast, over the same period, ElectraNet experienced a 184 per cent increase. The other TNSPs each experienced increases ranging from approximately 4 per cent to 57 per cent in the five year period to 2010-11. TransGrid makes the comment that the levels of capex in each year reflect the particular augmentation and asset replacement needs required at those times in line with capital expenditure objectives[33].

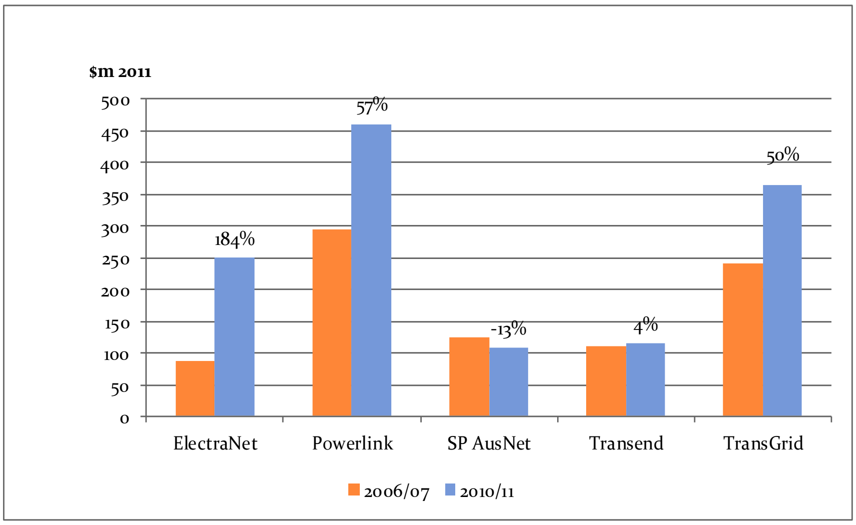
ElectraNet notes that a number of drivers explain why capital expenditure requirements have grown between 2006-07 and 2010-11. In particular key contributors to the increasing levels of forecast capital expenditure are:

- Continuing growth in peak demand over this period and strengthened jurisdictional reliability standards;
- An ageing asset profile has increased levels of asset replacement and refurbishment expenditure based on assessed asset condition and risk'
- Increasing land and easement acquisition requirements to meet emerging network augmentation needs; and

[33] TransGrid, email of 3 June 2013

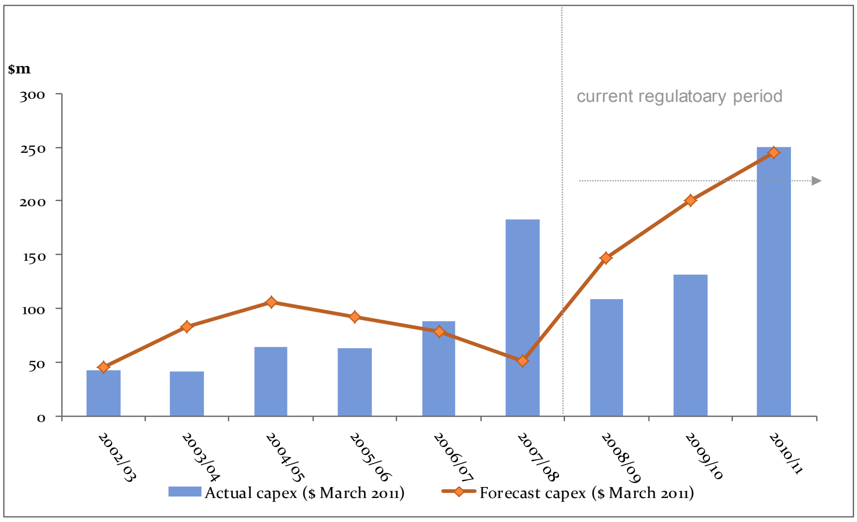
- Real wages and cost growth related to strengthening employment demand in the mining and construction sectors over the period[34].

Figure 7.2 Change in actual capex by TNSP between 2006-07 and 2010-11



Comparisons between actual and forecast capex for each TNSP is set out in figures 7.3 to Figure 7.3 to Figure 7.7

Figure 7.3 ElectraNet actual and forecast capex, 2002-03 to 2010-11



For ElectraNet the significant increase in capital expenditure in 2010-11 is directly attributable to a significant increase in augmentation capital expenditure associated with the Adelaide Central Reinforcement (ACR) contingent project commissioned in December 2011.

[34] ElectraNet, email of 31 May 2013.

Figure 7.4 Powerlink actual and forecast capex, 2002-03 to 2010-11

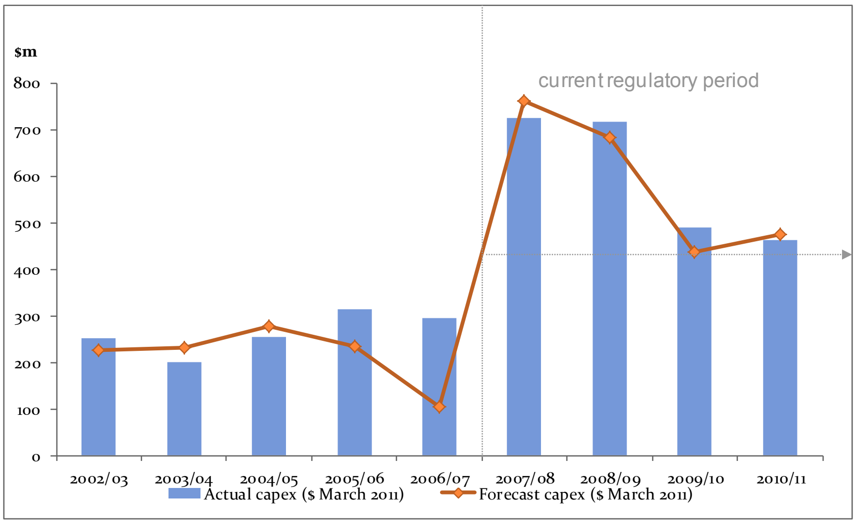
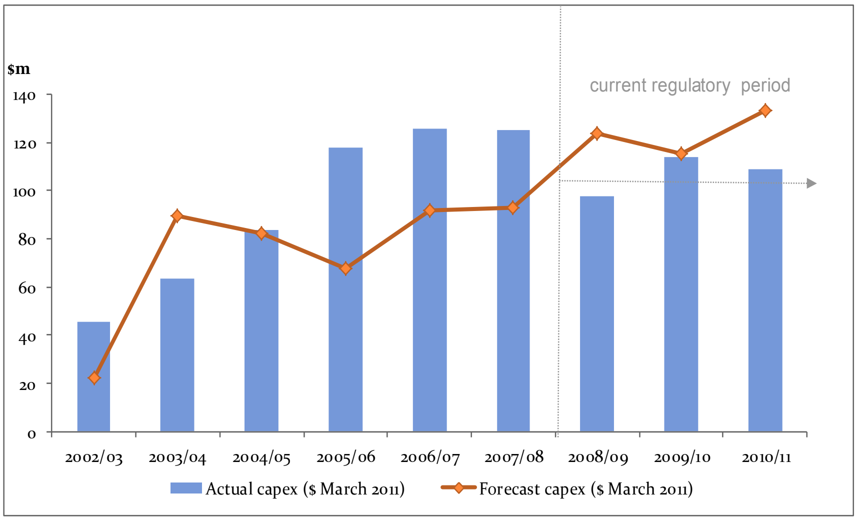


Figure 7.5 SP AusNet actual and forecast capex, 2002-03 to 2010-11

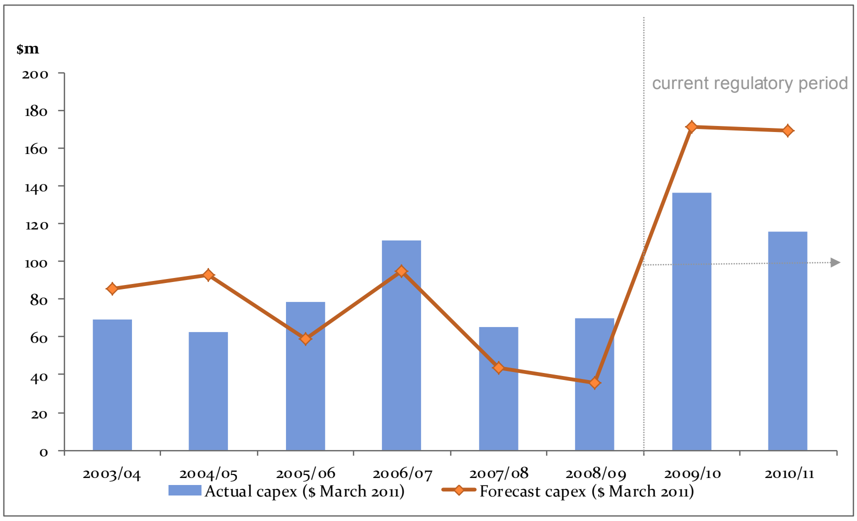


SP AusNet state in its regulatory accounts that in 2010-11 capex was less than the allowance set out in the AER's 2008 Decision. The key drivers of this were:

- The decision to proceed with a targeted individual asset replacement program at Hazelwood Power Station, in lieu of a full rebuild.
- Roll out of a more cost effective fall restraint installation program.
- Deferral of the remote SCADA replacement program; and
- Flow on effects to the revenue capped replacement programs as a result of a major augmentation at Brunswick Terminal Station - works outside the revenue cap[35].

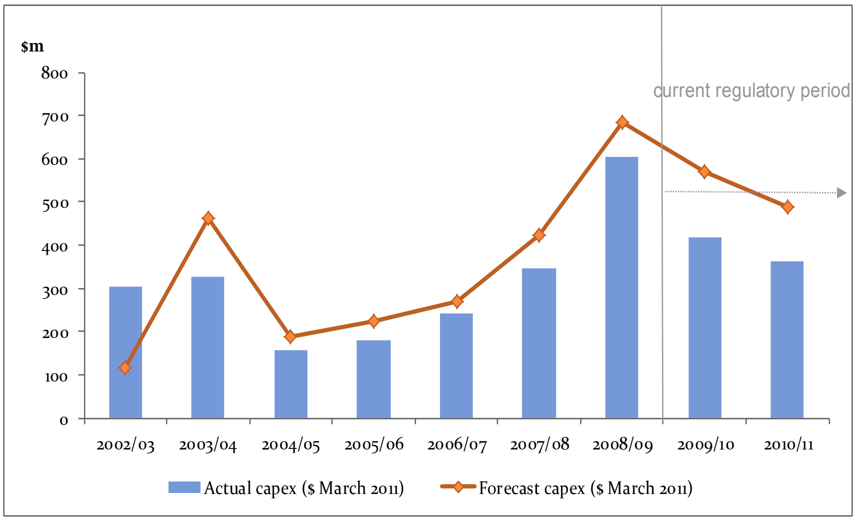
[35] SP AusNet, 29 July 2011 letter with Regulatory accounts year ended 31 March 2011.

Figure 7.6 Transend actual and forecast capex, 2002-03 to 2010-11



Transend comments that the underspend since 2009-10 is largely due to changes in demand for services and efficiencies achieved, particularly in relation to the delivery of the Waddamana to Lindisfarne 220 kV transmission upgrade.[36]

Figure 7.7 TransGrid actual and forecast capex, 2002-03 to 2010-11



TransGrid comments that the difference between forecast and actual capex reflects the prudent deferral of load-driven projects in response to a slowing in peak demand growth since the last revenue proposal. In the current regulatory period several major augmentation projects have been deferred as a result of slower load growth on the network[37].

[36] Transend, 22 July 2013 email response to AER.
[37] TransGrid, 16 July 2013 email response to the AER.

7.3 Main capex cost drivers

In this section, a variety of capex indicators are used to assess the TNSPs' performance in 2010-11.

TNSPs typically undertake capex for three main reasons:

- the replacement or renewal of aging assets
- the upgrade or augmentation of the network to cope with increased demand and load
- to meet legal, environmental and statutory obligations.

Figure 7.8 shows the proportion of aggregate capex for all TNSPs by cost driver from 2008-09 to 2010-11 and Figure 7.9 shows the amount of aggregate capex by TNSP by cost driver.

Figure 7.8 Aggregate capex for all TNSPs by cost driver (excluding interconnectors)

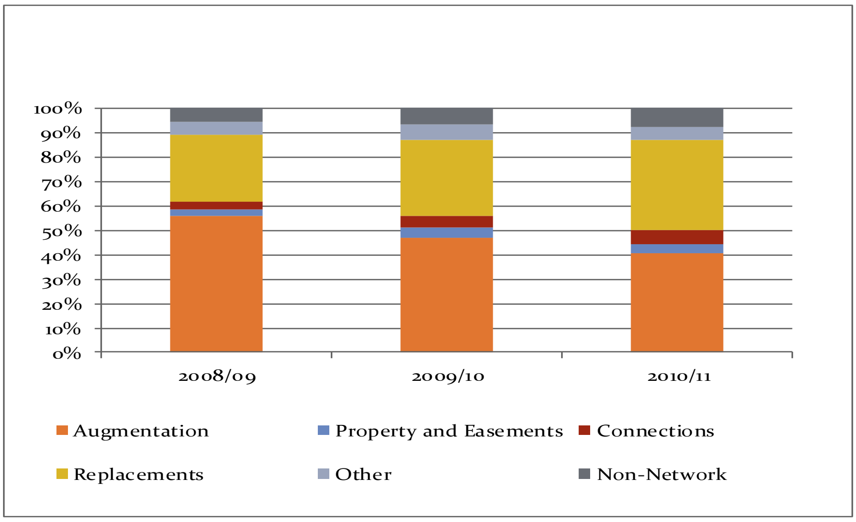
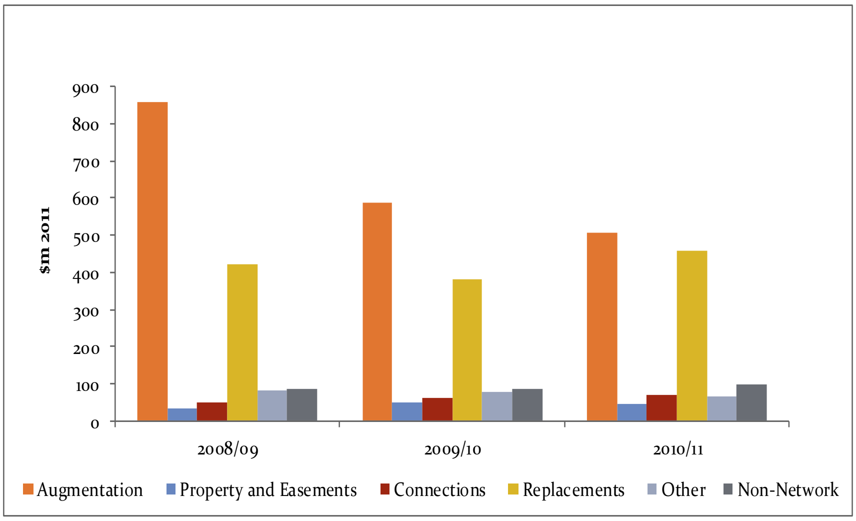
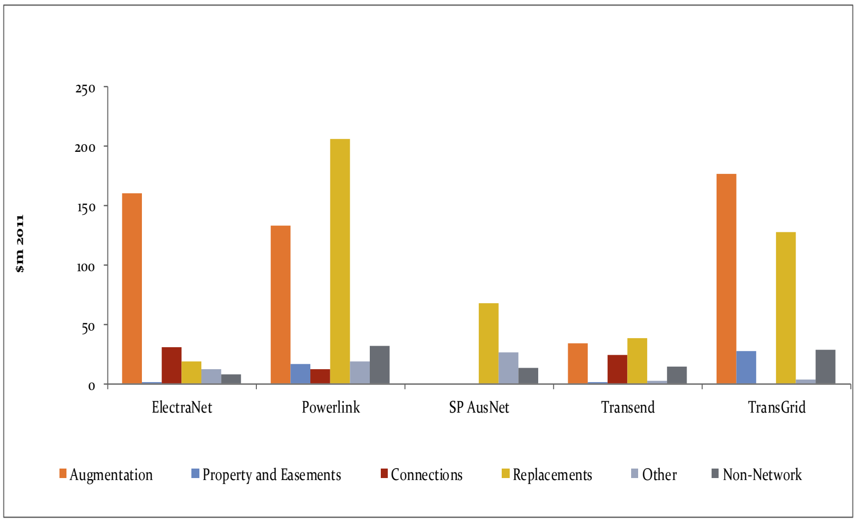


Figure 7.9 Aggregate capex for all TNSPs (excluding interconnectors) by cost driver



The primary driver for capex in 2010-11 for all TNSPs continues to be augmentation expenditure to meet increased demand and load on transmission networks. However, the proportion of capex spent on augmentation in 2010-11 declined to 39 per cent of total capex. This is down from 45 per cent in 2009-10 and 55 per cent in 2008-09. Renewal and replacement capex is the next main capex driver. In 2010-11 renewal and replacement capex accounted for 36 per cent of total capex. This is up from 30 per cent in 2009-10 and 27 per cent in 2008-09. Powerlink, TransGrid and SP AusNet were the main contributors to the increase. In comparison capital expenditure on property and easements, connections on non-network assets has remained relatively steady. These categories of capex represent between four and eight per cent of total capex. Figure 7.10 shows capex for each of the TNSPs in 2010-11.

Figure 7.10 TNSP capex by cost driver 2010-11



Note SP AusNet does not register augmentation capex given the network planning arrangements in Victoria.

A more detailed breakdown of capex by TNSP for 2010-11 and recent years is set out in appendix B.

7.4 Augmentation capex and peak demand

One of the primary drivers of capital expenditure is peak demand (i.e. capex required to enable the network to meet peak demand usage). Electricity demand is generally becoming peakier, requiring assets that can meet this demand. This has implications for network charges as higher capital expenditure on network augmentation to meet peak demand must be recovered from customers. Figure 7.11 to Figure 7.14 show augmentation and peak demand for each of the TNSPs, except SP AusNet given the network planning arrangements in Victoria.

Figure 7.11 shows that between 2008-09 and 2010-11 ElectraNet's expenditure on augmentation capex per MW increased by over 900 per cent from $4,457 per MW to $44,950. During the same time peak demand increased by five per cent. ElectraNet comments that the significant increase in augmentation capital expenditure in 2010-11 is directly attributable to work on the Adelaide Central Reinforcement (ACR) contingent project. The driver of the ACR project was not demand growth, but rather the need to meet new jurisdictional reliability standards requiring N-1 transmission line and substation capacity for at least 100 per cent of agreed maximum demand supplying the Adelaide CBD. As this was a large reliability driven project ElectraNet's augmentation capex as a proportion of

MWs delivered increased significantly in 2010-11. The upgrade of a number of other jurisdictional reliability standards also drove increased augmentation in this period.[38].

Figure 7.11 ElectraNet augmentation capex and peak demand

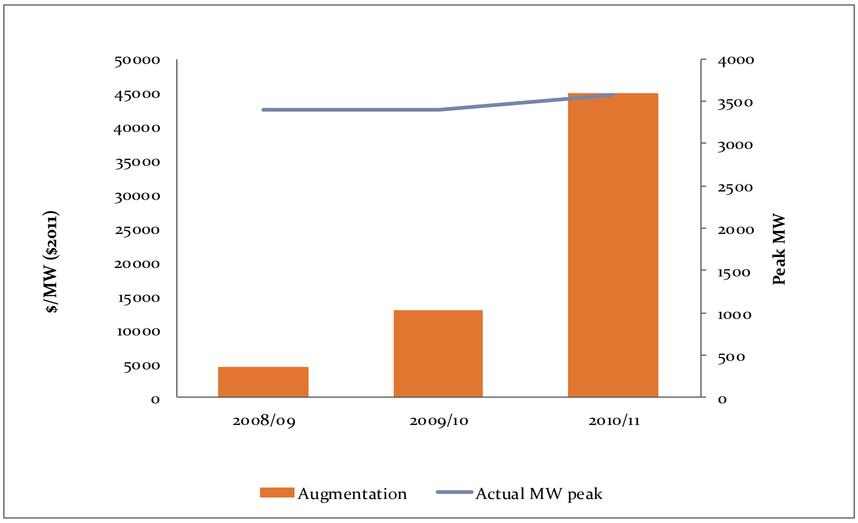


Figure 7.12 show that Powerlink's expenditure on augmentation capex has been generally declining since 2007-08. In 2007-08, Powerlink spent $55,384 per MW on augmentation capex and in 2010-11 Powerlink spent $15,061 per MW. This is a decrease of 73 per cent. Over the same period Powerlink's peak demand increased by 9 per cent from 8,082 MW in 2007-08 to 8,836 MW in 2010-11. In 2010-11 peak demand decreased by 0.6 per cent compared to 2009-10.

Figure 7.12 Powerlink augmentation capex and peak demand

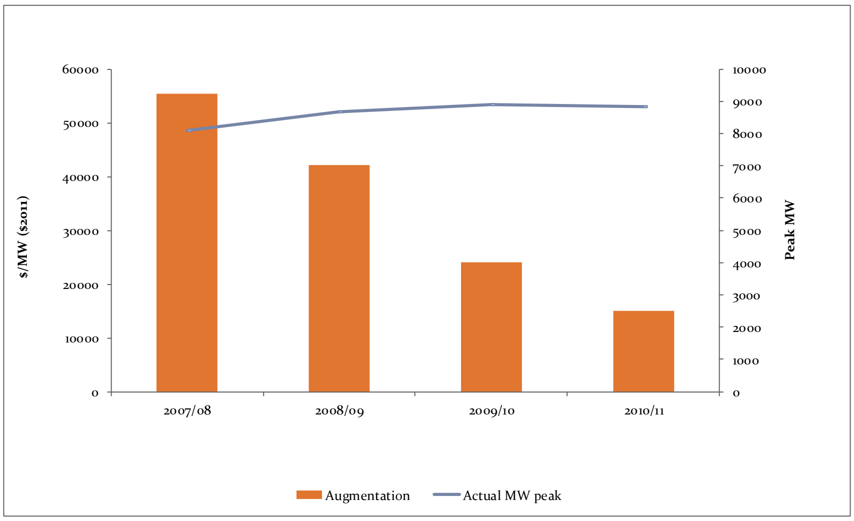


Figure 7.13 shows that Transend's augmentation capex increased from $1,820 per MW in 2007-08 to $19,441 per MW in 2010-11. However, in 2010-11 Transend's augmentation capex was 57 per cent less than in 2009-10. In 2009-10 augmentation capex was at $45,613 per MW. Over the period 2007-08 to 2010-11, Transend's peak demand decreased by two per cent. Transend comment that this ratio is affected by two variables that are not directly related year to year. Transend's augmentation program significantly increased in 2009-10 in response to a range of drivers. As noted in section 5.4

[38] ElectraNet, email of 31 May 2013.

Transend delivered a number of large augmentation projects, including the Waddamana to Lindisfarne 220 kV transmission upgrade augmentation project. Transend also comment the peak MW changes are due to a range of different drivers.

Figure 7.13 Transend augmentation capex and peak demand

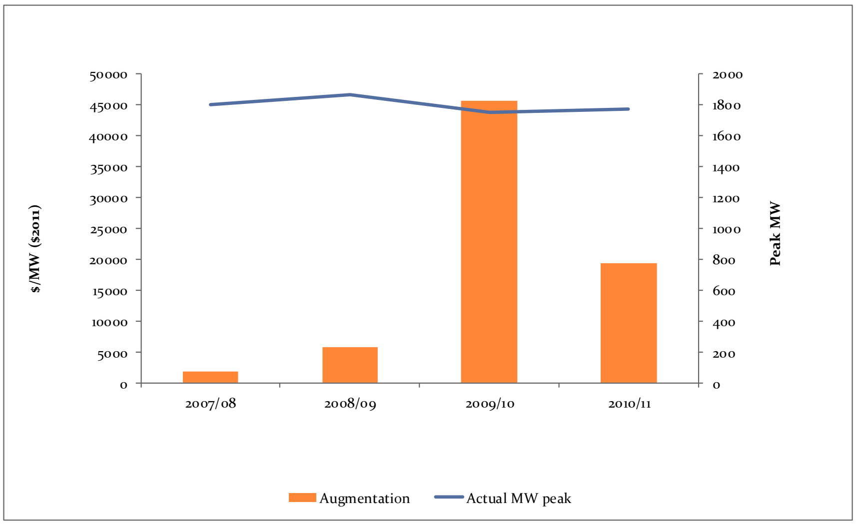
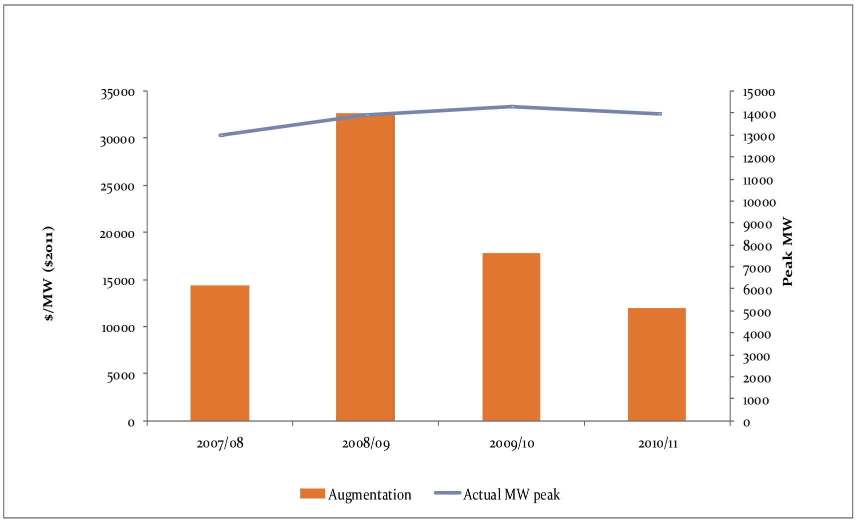


Figure 7.14 shows TransGrid's augmentation capex for the years 2007-08 to 2010-11. TransGrid's expenditure on augmentation capex peaked in 2008-09 at $32,609 per MW. In 2010-11 it was $11,902 per MW. At the same time peak demand has increased by seven per cent over the period. TransGrid comment that the volatility in the capex per MW peak demand measure reflects the lumpy nature of transmission investment and does not of itself imply a trend[39].

Figure 7.14 TransGrid augmentation capex and peak demand



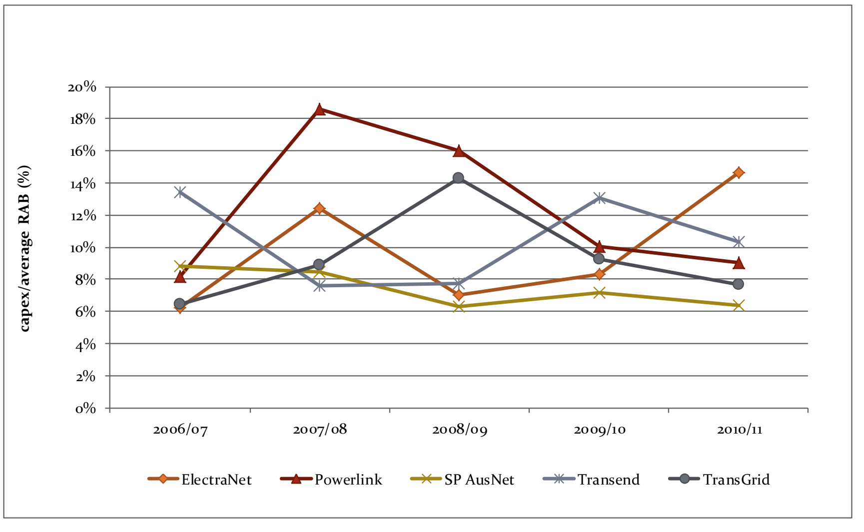
[39] TransGrid, email of 3 June 2013

7.5 Capital expenditure and the RAB

Figure 7.15 shows the capex to average RAB ratio for each of the TNSPs from 2006-07 to 2010-11. Powerlink and Transend have the highest capex to average RAB ratio. Powerlink's five year average ratio is 12.4 per cent. However, on a year to year basis Powerlink's capex to average RAB ratio has fluctuated from 8.2 per cent and 18.6 per cent. This reflects the variability in Powerlink's capex program. Transend's five year capex to average RAB ratio is 10.5 per cent. Transend capex to average RAB ratio has not fluctuated as significantly has Powerlink's on a year to year basis, with fluctuations between 7.6 per cent and 13.4 per cent.

SP AusNet's capex to average RAB ratio has been the lowest of the TNSPs. SP AusNet's five year average capex to average RAB ratio is 7.4 per cent. SP AusNet's lower capex to RAB reflects the network planning arrangements in Victoria where annual capex only includes expenditure to replace existing assets.

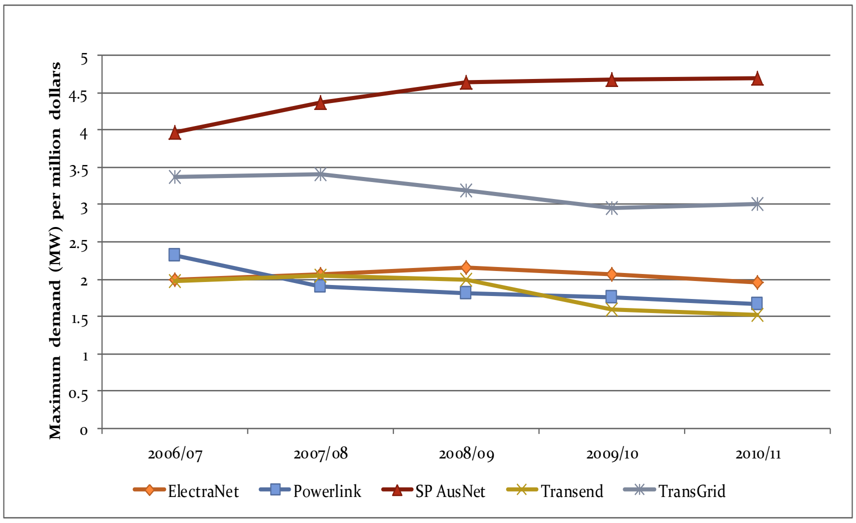
Figure 7.15 Capex as a proportion of average RAB



7.6 RAB and peak demand

This measure provides an indication as to the efficiency of the size of the network in terms of RAB in meeting peak demand. Figure 7.16 shows the closing RAB and peak demand of each TNSP. This shows that for every million dollar of closing RAB, SP AusNet services 4.68 peak MW of capacity followed by TransGrid (3.01 peak MW), ElectraNet (1.96 peak MW), Powerlink (1.66 peak MW) and Transend (1.52 peak MW).

Figure 7.16 Peak demand per million dollar of closing RAB

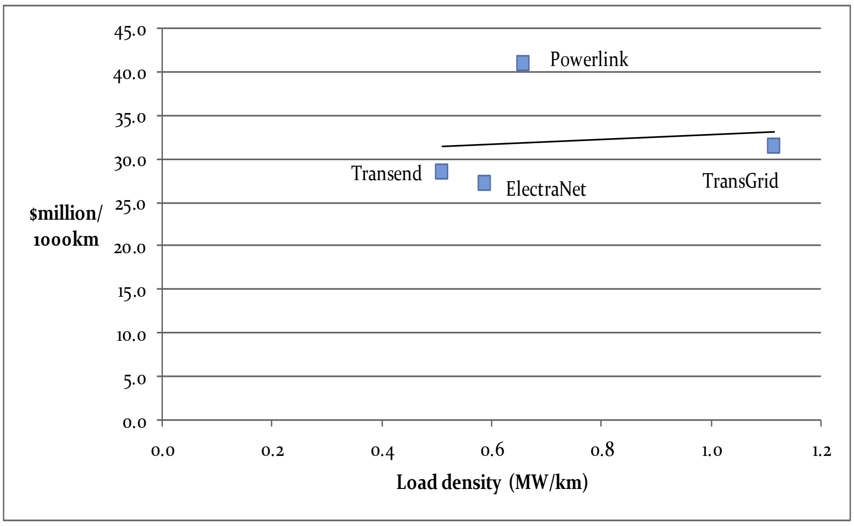


7.7 Capital expenditure and line length

Figure 7.17 to Figure 7.18 present average capex to load density ratios for the TNSPs from 2006-07 to 2010-11. SP AusNet has been excluded from the analysis in Figures 7.17 to 7.19 as the outcomes for SP AusNet are not comparable to the other TNSPs given the planning arrangements in Victoria.

It would be expected that load density would exhibit a negative relationship to the amount spent on total capex per 1000km of the line length. That is TNSPs with a higher load density would be expected to have lower unit costs due to economies of scale. Figure 7.17 shows that Powerlink has the highest unit costs per load density. TransGrid with the highest load density has about the same unit costs as ElectraNet and Transend, which both have less load density.

Figure 7.17 Average Capex ($m) per 1000 km 2006-07 to 2010-11 compared to average load density (MW/km) 2006-07 to 2010-11

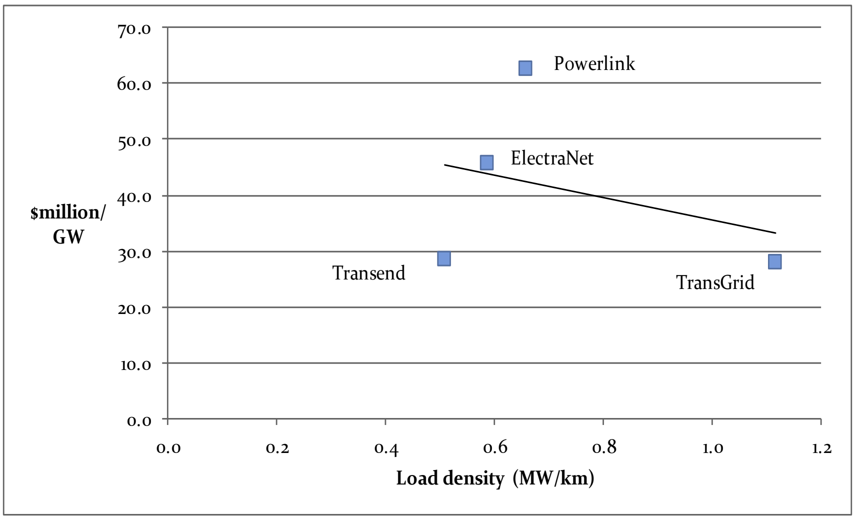


7.8 Capital expenditure and maximum demand

Networks must maintain a level of maximum capacity above maximum demand so as to avoid system outages during peak periods. As such, capex is often incurred to upgrade networks in anticipation of increased future maximum demand.

Figure 7.17 illustrates average capex to maximum demand for all TNSPs from 2006-07 to 2010-11. In the NEM as load density increases, the amount spent on capex as a ratio of maximum demand would be expected to decrease, reflecting economies of scale. When load density is considered, Powerlink and ElectraNet have the highest capital expenditure per unit of maximum demand.

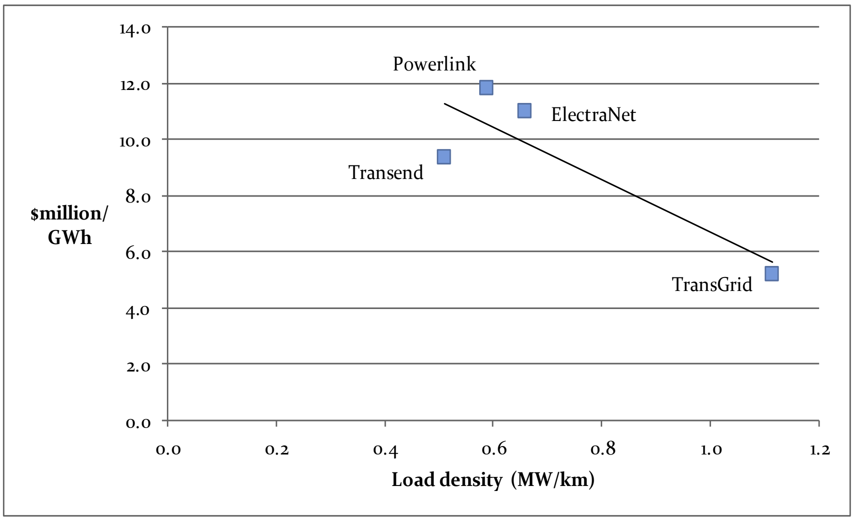
Figure 7.17 Average Capex ($m) per gigawatt 2006-07 to 2010-11 compared to average load density (MW/km) 2006-07 to 2010-11



7.9 Capital expenditure and electricity transmitted

Figure 7.18 illustrates the average capital cost of each unit of electricity transmitted across the TNSPs from 2006-07 to 2010-11. As load density increases, the amount spent on capex per electricity transmitted tends to decrease. When load density is considered, Powerlink and ElectraNet have the highest capital expenditure per unit of energy is transmitted.

Figure 7.18 Average Capex ($m) per gigawatt hour 2006-07 to 2010-11 compared to average load density (MW/km) 2006-07 to 2010-11



8 Operating Expenditure

8.1 Introduction

A transmission network consists of towers and the wires that run between them, underground cables, transformers, switching equipment, reactive power devices, and monitoring and telecommunications equipment. TNSPs incur operating and maintenance expenditure (opex) costs in maintaining the functionality of the transmission network in order to adequately provide transmission services. Opex typically includes wages and salaries, transmission asset maintenance costs, service contract expenses paid to third parties and other input costs related to the provision of prescribed transmission services.

Opex is one of the components of the building block model. The AER makes a determination on the revenue that a transmission business needs to cover its efficient costs while providing for a commercial return to the business. The AER forecasts the amount of opex necessary for each TNSP to operate at an efficient level based on its network requirements. These vary due to different load densities, scale and condition of networks, service reliability and geographical requirements.

The AER also operates an efficiency benefits sharing scheme to provide TNSPs with an incentive to achieve an efficient level of opex in running their networks. This is done by allowing TNSPs to retain a proportion of any opex efficiency gains (losses) made against a benchmark opex target.[40]

This chapter discusses the TNSPs' opex performance for 2010-11, including comparisons to previous years. The interconnectors, Directlink and Murraylink are excluded from the analysis as they require very little opex to function relative to the other TNSPs and do not provide useful comparisons.

8.2 Opex in 2010-11 and recent years

Opex for the TNSPs has been generally increasing over time. The aggregate actual and forecast opex for the five TNSPs from 2006-07 to 2010-11 is provided in Figure 8.1. The TNSPs' aggregate actual opex was 1.4 per cent less than forecast in 2006-07. In 2010-11 actual opex was 8.8 per cent less than forecast. However, these outcomes have varied for individual TNSPs.

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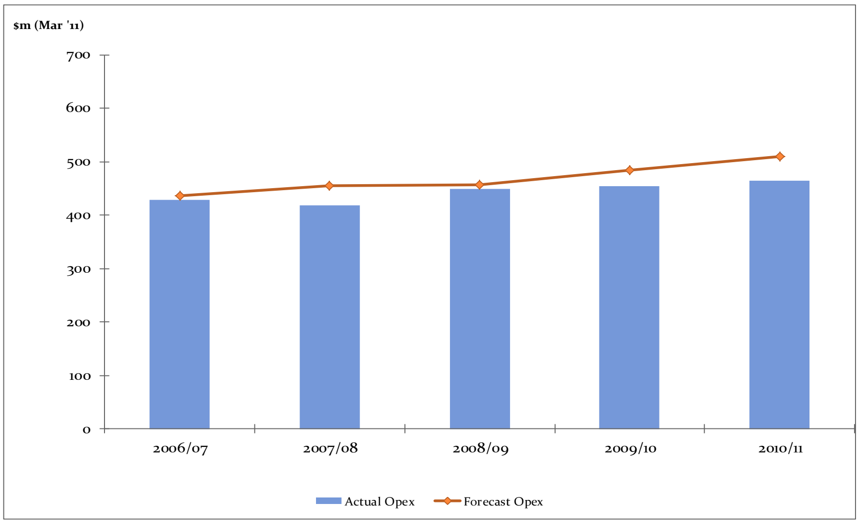
40 Under this incentive scheme, the businesses retain around 30 per cent of efficiency gains or losses against the benchmark, and pass on the remaining 70 per cent to customers through price adjustments. TNSPs can retain efficiency gains (or bear the cost of any efficiency losses) for five years after the gain (loss) is made

Figure 8.1 Comparison of aggregate TNSP forecast and actual opex 2006-07 to 2010-11



Note: excluding Grid support payments

Figure 8.2 shows that opex costs have risen most over time for ElectraNet (22 per cent) and Powerlink (20%). For TransGrid, SP AusNet and Transend opex costs increased between only 0.3 per cent and two per cent. Directlink and Murraylink experienced decreases in opex of 20 per cent and 37 per cent over the period.

ElectraNet comments that a number of drivers explain why operating expenditure requirements have grown. These include:

- continuing growth in peak demand over this period has resulted in an expanding asset base and increasing maintenance requirements
- increased regulatory vegetation clearance requirements
- increased level of routine aerial inspection associated with the implementation of a condition based maintenance approach; increased corrective maintenance effort to manage high priority asset risks identified through the condition assessment program
- an ageing asset profile has increased asset refurbishment and corrective maintenance requirements based on asset condition and risk; and
- real wages and cost growth related to strengthening employment demand in the mining and construction sectors over this period[41].

[41] ElectraNet, email of 31 May 2013.

Figure 8.2 Change in actual opex by TNSP between 2006-07 and 2010-11

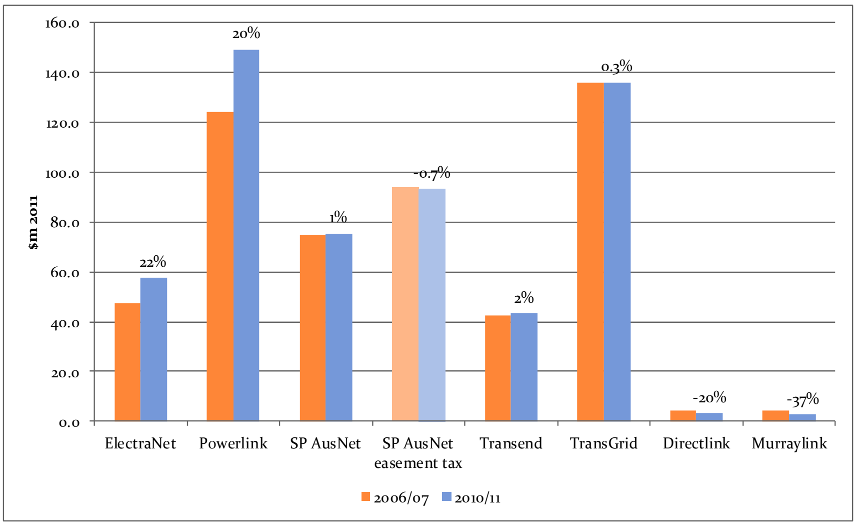
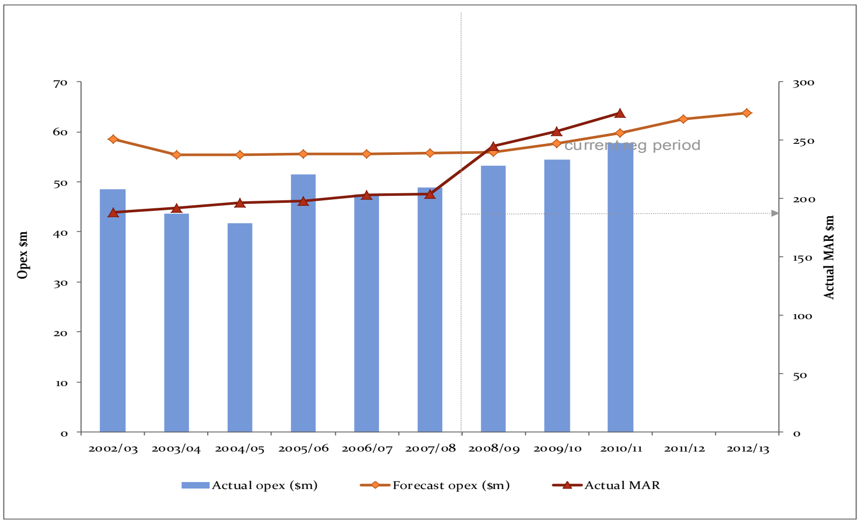


Figure 8.3 to Figure 8.7 show actual opex compared to forecast opex for each TNSP.

Figure 8.3 ElectraNet forecast and actual opex 2002-03 to 2010-11



ElectraNet comments that a number of factors explain why its actual operating expenditure is below the original allowance for the first three years of the current regulatory period. Key drivers of this difference include:

- ElectraNet responded positively to regulatory incentives and was able to achieve overall cost savings in the early years of the regulatory period;
- these savings, primarily in corporate costs, have been achieved through the restructuring of business operations to achieve efficiencies, and a reduction in insurance premiums;

ElectraNet notes, however, the cost savings realised over this period have subsequently been overtaken by cost pressures from increased asset management requirements that emerged during the later years of the period, requiring additional expenditure exceeding the allowance.[42]

[42] ElectraNet, email of 31 May 2013.

Figure 8.4 Powerlink forecast and actual opex 2002-03 to 2010-11

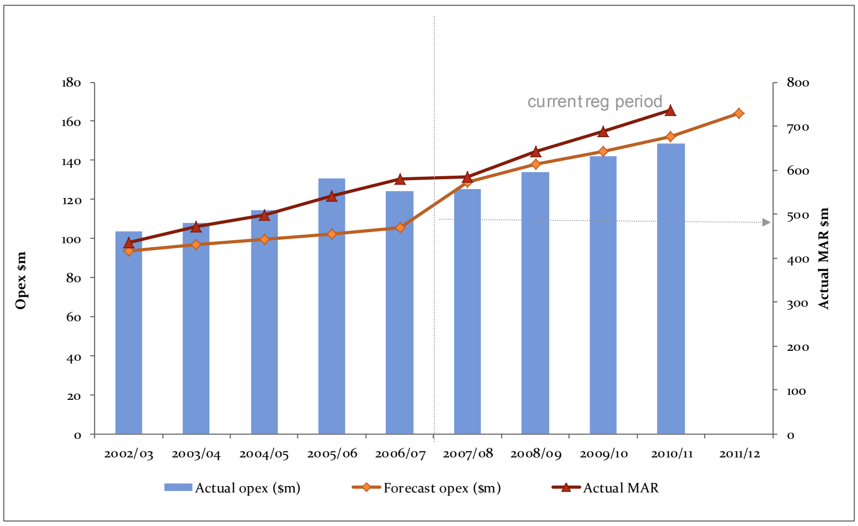


Figure 8.5 SP AusNet forecast and actual opex 2002-03 to 2010-11

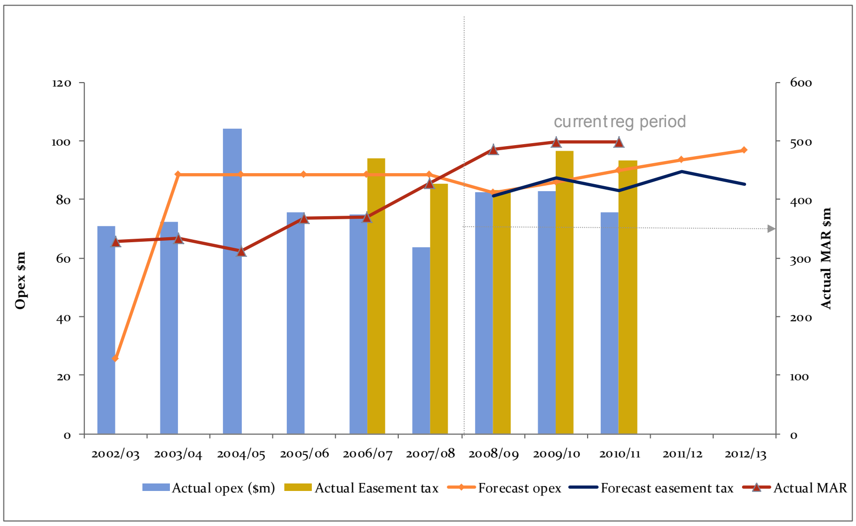


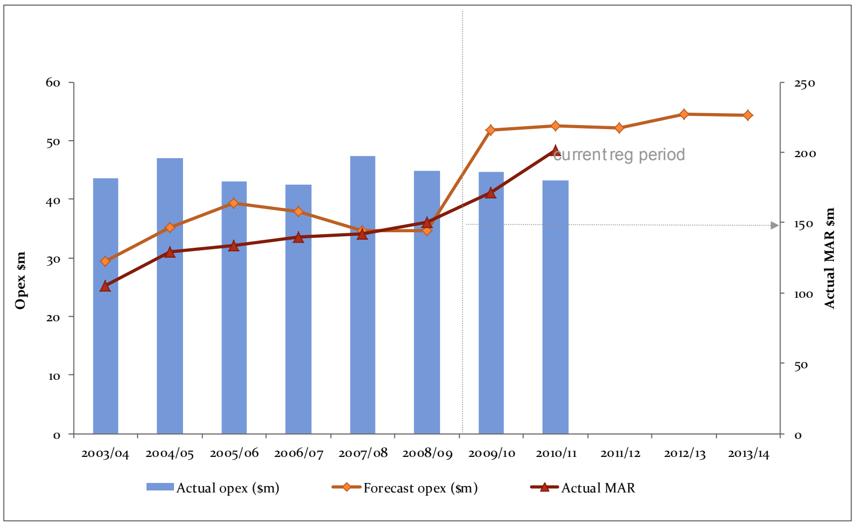
Figure 8.5 shows the easement tax separate from opex. The Easement tax was introduced in response to the Victorian Parliament introducing the Land Tax (Amendment) Act 2004. The effect of this was to extend Victoria's land tax regime to easements held by electricity transmission companies.

The tax was not included in SP AusNet's determination for the years 2004-05, 2005-06, 2006-07 and 2007-08. For these years SP AusNet was granted a full pass through of the easement tax, under the pass through rules.

However, for the regulatory control period 2008-09 to 2013-14 SP AusNet is required to forecast its easement land tax liability as part of the forecast opex component. Where the forecast differs from actual tax paid, SP AusNet will be entitled to apply for a pass through.

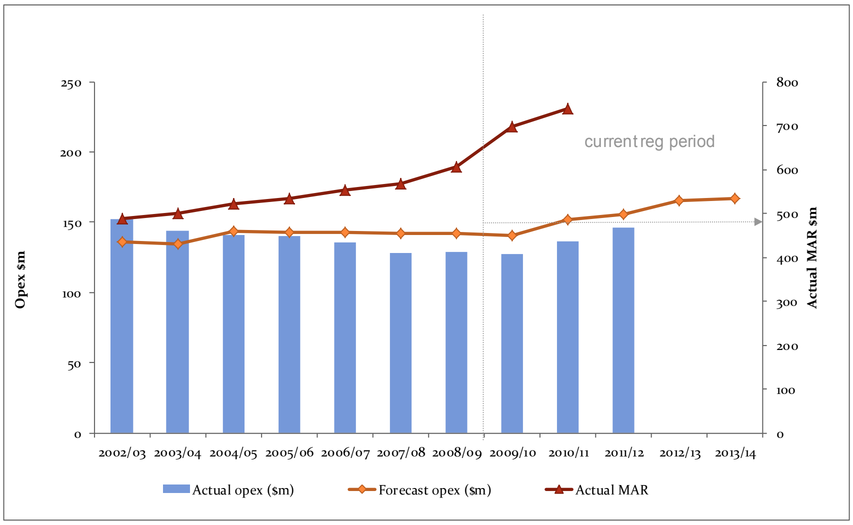
SP AusNet notes in its reporting of regulatory accounts for 2010-11 that opex (net of easement tax and rebates) was lower than the regulatory allowance in the AER's 2008 Decision. This was largely driven by assets work program expenditure being $7.2 million below allowance. Mainly due to prioritisation of the category of maintenance works required[43].

Figure 8.6 Transend forecast and actual opex 2002-03 to 2010-11



Transend comment that the underspend since 2009-10 is due to the implementation of initiatives to reduce ongoing expenditure[44].

Figure 8.7 TransGrid forecast and actual opex 2002-03 to 2010-11



TransGrid comment that the lower actual opex is primarily due to efficiencies achieved in labour cost growth, IT expenses and office accommodation expenses, which demonstrate that TransGrid also comments that it has responded appropriately to the incentives applied in its revenue determination. It also reflects external factors such as favourable market conditions that have led to a downward shift in provisions and lower than expected network growth due to lower than expected peak demand growth.

[43] SP AusNet, letter regarding Regulatory Accounts Year ended 31 March 2011, 29 July 2011.
[44] Transend, 22 July 2013 email to AER

8.3 Opex cost drivers

In this section, a variety of opex indicators are used to assess the TNSPs' performance in 2010-11.

Figure 8.8 shows the proportion of aggregate opex for all TNSPs including the interconnectors by cost driver. This reports only the main opex drivers (maintenance, network operations and corporate support) which are comparable across TNSPs. Maintenance expenditure is the primary driver of opex with over 67 per cent of all opex spent on maintenance followed by corporate support (23 per cent), and network operations (10 per cent).

Figure 8.8 Proportion of aggregate opex for all TNSPs including interconnectors by cost drivers (maintenance, network operations and corporate support only) (%) 2008-09 to 2010-11.

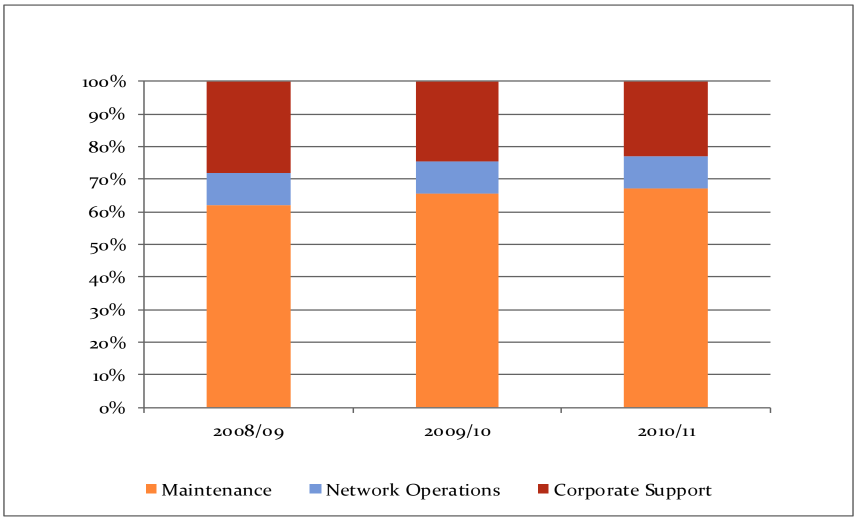


Figure 8.9 and Figure 8.10 below present the breakdown of opex by the main cost drivers (maintenance, network operations and corporate support common across all TNSPs) for the individual TNSPs. Individual TNSPs have more cost drivers than those reported. Powerlink and SP AusNet differ most from the other businesses in the allocation of opex. Powerlink spent only 10 per cent of opex on corporate support compared to SP AusNet of 42 per cent. Powerlink maintenance opex makes up 78 per cent of total opex compared to SP AusNet of 48 per cent.

Figure 8.9 Proportion of opex by cost driver for each TNSP 2010-11

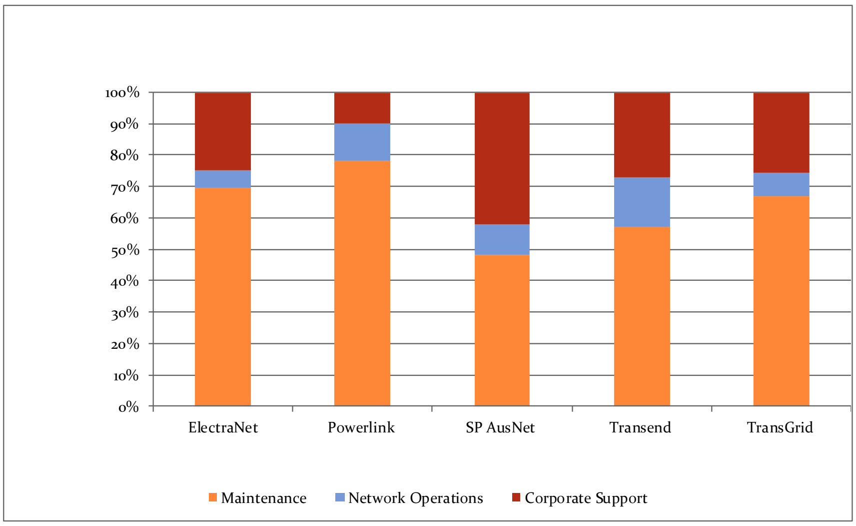
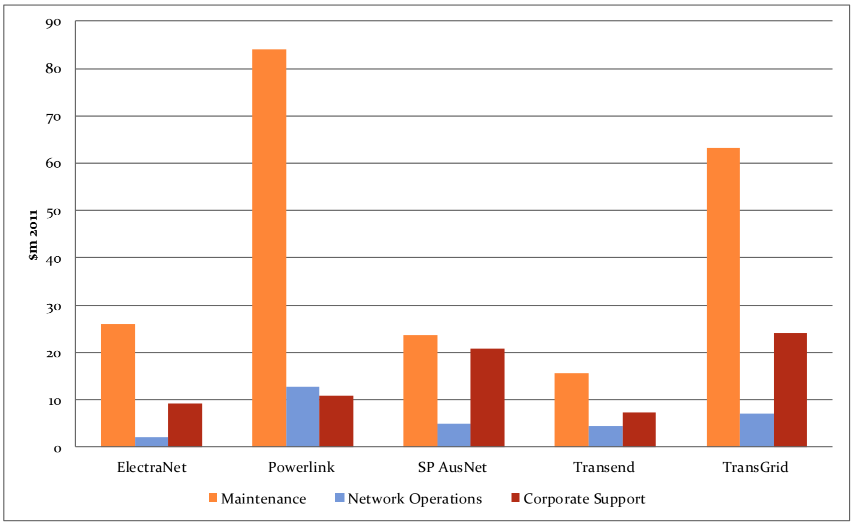


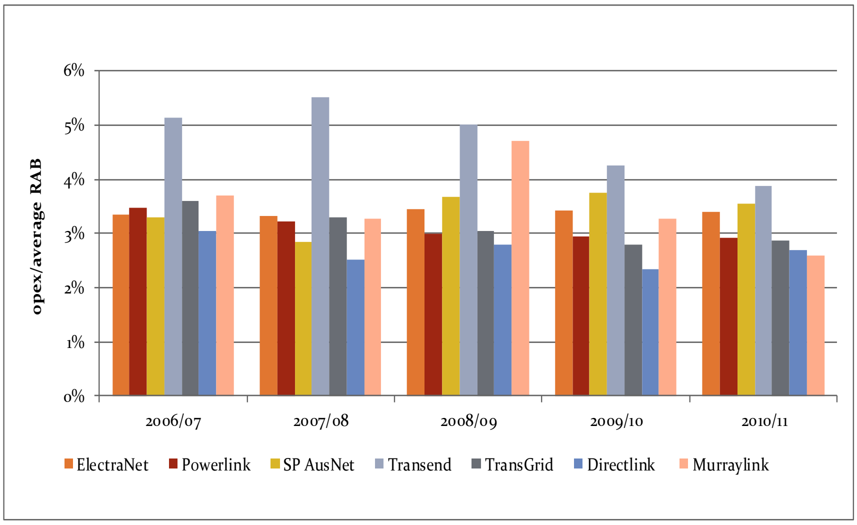
Figure 8.10 Opex by cost driver for each TNSP in 2010-11



8.4 Operating expenditure and the RAB

Figure 8.11 shows the ratio of opex to average RAB for the TNSPs from 2006-07 to 2010-11. The indicative trend is for the opex to average RAB ratio to be lower when the asset base is larger. In other words, the larger TNSPs generally exhibit lower opex to average RAB ratios due to the economies of scale available to larger businesses. As shown in Figure 8.11 TransGrid's and Powerlink's opex to average RAB ratios are the lowest of the TNSPs.

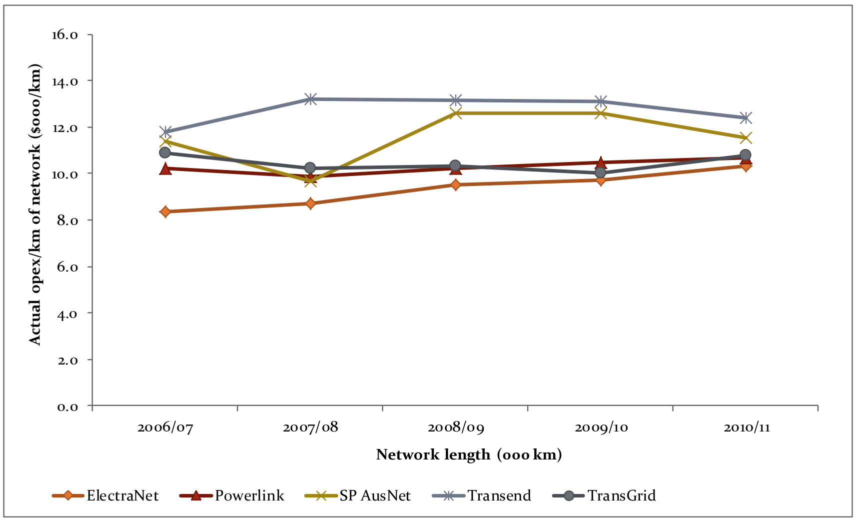
Figure 8.11 Aggregate actual opex as a proportion of average RAB 2006-07 to 2010-11



8.5 Operating expenditure and line length

Figure 8.12 shows opex to line length ratios for the five TNSPs from 2006-07 to 2010-11. It demonstrates that the five TNSPs' opex to line length ratio all move together closely, and is indicative of the level of opex required by the industry at large to maintain a given length of transmission circuit line. Transend and SP AusNet's opex to line length ratio of $12.4 million and 11.5 million are higher than the other TNSPs. The other TNSPs are between $$10.3 and $10.7 million.

Figure 8.12 Actual opex per kilometre line length, all TNSPs, 2006-07 to 2010-11



8.6 Operating expenditure and electricity transmitted

Figure 8.13 illustrates the operating cost of each unit of electricity transmitted across the TNSPs from 2006-07 to 2010-11. ElectraNet and Transend have the highest opex to GWh ratio at $4,427 and $3,966 per gigawatt hour.

The larger TNSPs have a lower opex to electricity transmitted ratio. SP AusNet and TransGrid have the lowest at $1,398 and $1,833 per gigawatt hour. This indicates that larger TNSPs are able to take advantage of economies of scale to reduce their opex relative to smaller TNSPs.

Figure 8.13 Actual opex per gigawatt hour of electricity transmitted 2006-07 to 2010-11

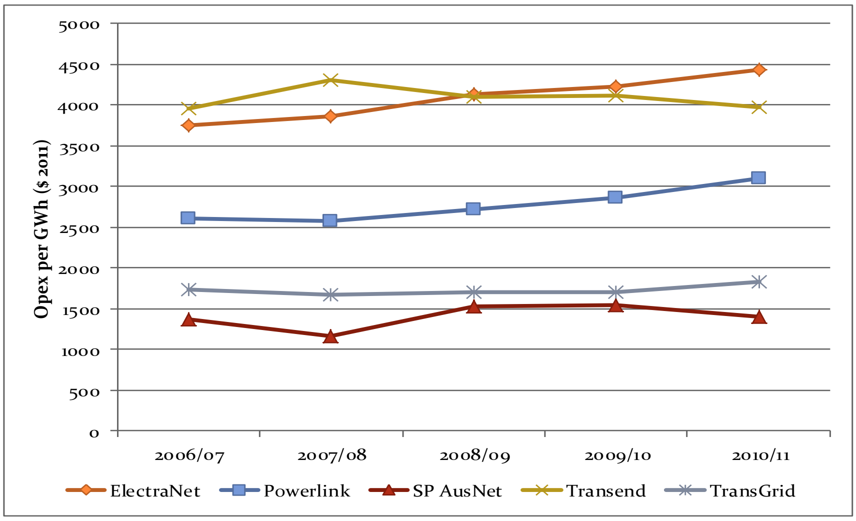
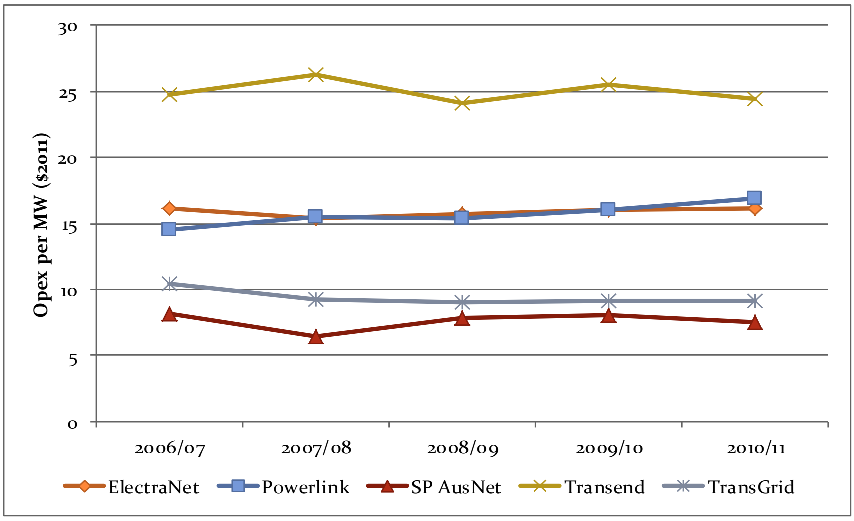


Figure 8.14 shows opex per MW of peak demand. Transend has the highest opex per MW of peak demand. Transend comment that this reflects a number of factors including Transend's smaller scale; and that much of its load is from large, directly connected major industrial customers with a relatively stable load profile, which reduces the 'peakiness' of Tasmanian demand. In contrast, Transend faces 'peaky' generation output, with transmission capacity to support generation output from a relatively large number of small, remote hydro-electric generators with variable output. In addition Basslink acts as both a large load and a large generator in the Tasmanian power system (with MW in figure 8.14 for Tasmanian peak demand only, not Tasmania plus Basslink export).

Figure 8.14 Actual opex per MW of peak demand 2006-07 to 2010-11



9 Service standards

9.1 Introduction

This chapter outlines the performance of TNSPs and interconnectors in 2010-11 with respect to the service standards performance regime.

The service standards performance regime operates by providing financial incentives for TNSPs and interconnectors to meet predefined service performance targets. The regime is implemented through service standards incentive schemes and operates in conjunction with the efficiency Benefit sharing scheme (EBSS) and other capex arrangements to support the revenue cap regulatory framework.

9.1.1 Background

In 2003, the Australian Competition and Consumer Commission (ACCC) was responsible for the regulation of transmission revenues in the NEM. The ACCC exercised its transmission regulatory duties under the Statement of regulatory principles, applying a service standards incentive scheme under the ACCC Service standards guidelines (guidelines).[45] This scheme applied to all TNSPs and interconnectors.

On 1 July 2005, the AER assumed the ACCC's responsibilities for the regulation of transmission revenues in the NEM. The AER continued to apply the ACCC guidelines until a new AER scheme was created.

In January 2007, the AER published its first service target performance incentive scheme (STPIS) for TNSPs and interconnectors.[46] This scheme was to apply to TNSPs and interconnectors whose regulatory control periods commenced on or after April 2008. In 2008, the TNSPs that this scheme applied to were SP AusNet, ElectraNet and AEMO.

In March 2008, the AER published its final decision on the STPIS version 2.[47] This scheme was to apply to TNSPs and interconnectors whose regulatory control periods commenced on or after June 2009. In 2009, the TNSPs that this scheme applied to were Transend and TransGrid.

STPIS version 2 incorporated a market impact of transmission congestion parameter, also known as the market impact parameter (MIP), which targets outages that have an adverse impact on generator dispatch outcomes. This scheme incorporated the MIP based on historical data and provides financial rewards for improvements in performance against the target.

Transend was specifically excluded from the MIP analysis due to a lack of sufficient data.[48]

Powerlink is currently operating under the scheme imposed by the ACCC guidelines. However, due to recent changes in the NER, Powerlink was able to apply for early adoption of the MIP. The AER approved Powerlink's early implementation of the MIP from 13 July 2010.

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45 ACCC, Service standards guidelines, 12 November 2003

46 AER, First proposed electricity transmission network service providers - service target performance incentive scheme, January 2007.

47 AER, Electricity transmission network services providers - servicer target performance incentive scheme (incorporating incentives based on the market impact of transmission congestion), March 2008

48 Ibid.

ElectraNet is currently operating under the AER's first proposed STPIS. ElectraNet too sought early adoption of the MIP on 1 October 2010. The AER approved ElectraNet's early implementation of the MIP from 1 January 2011.[49]

SP AusNet is currently operating under the AER's first proposed STPIS. SP AusNet applied for early adoption of the MIP with an implementation date of 1 August 2011. The application is under consideration.[50]

Table 9.1 provides an overview of the three service standards incentive schemes that apply to TNSPs and interconnectors. The date of application of the MIP to each TNSP is also identified.

Table 9.1 TNSP and interconnectors' service standards incentives schemes

TNSP	Version of scheme currently applied	Current regulatory period	MIP to apply from
ElectraNet (SA)	AER first proposed STPIS, Jan 2007	1 Jul 08-30 Jun 13	1 Jan 2011
Powerlink (Qld)	ACCC Service standard guidelines Decision, 12 Nov 2003	1 Jul 07 -30 Jun 12	13 Jul 2010
SP AusNet (Vic)	AER first proposed STPIS, Jan 2007	1 Apr 08-30 Mar 14	1 Apr 2015
Transend (Tas)	AER STPIS v2, Mar 2008	1 Jul 09-30 Jun 14	n/a
TransGrid (NSW)	AER STPIS v2, March 2008	1 Jul 09-30 Jun 14	1 Jul 2009
Interconnectors			
Directlink (Qld-NSW)	ACCC Service Standards Guidelines Decision, 12 Nov 2003	1 Jul 05-30 Jun 15	1 Jul 2016
Murraylink (Vic - SA)	ACCC Service Standards Guidelines Decision, 12 Nov 2003	1 Oct 03-30 Jun 13	1 Jul 2014

On 20 December 2012, the AER published its final decision on a new electricity transmission service target performance incentive scheme (STPIS). The AER's final decision is to amend the scheme to focus more on lead indicators of reliability, change the way performance against the market impact component is measured to improve consistency of performance and introduce a new network capability component to incentivise TNSPs to identify and implement low cost solutions to network limitations. The STPIS review and the publication of the final decision has been conducted in accordance with clause 6A.7.4 of the Electricity Rules. SP AusNet will be the first TNSP the new STPIS will apply in the forthcoming regulatory determination.

9.2 Service standards performance regime

The AER's objectives in setting service standards incentives schemes within the transmission determination framework are to:

- contribute to the national electricity objective

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49 AER, Early application of the market impact component of the service target performance incentive scheme for ElectraNet - Performance Target, December 2010.

50 www.aer.gov.au/content/index.phtml/itemId/744990

- be consistent with the principles in the NER
- promote transparency in the information provided by a TNSP or interconnector and AER decisions
- promote efficient TNSP and interconnector capex and opex by balancing the incentive to reduce actual expenditure with the need to maintain and improve reliability for customers and minimise the market impact of transmission congestion.

The service standards performance regime is forward looking and uses targets based on historical performance to assess a TNSP's performance within a regulatory control period. The AER also takes into account the impact of planned capex on performance. Each TNSP and interconnector's service performance is compared to their individual targets during the relevant regulatory control period. Service performance exceeding the targets results in a financial bonus, while performance which fails to reach the targets results in a financial penalty. A TNSP or interconnector's maximum allowed revenue (MAR) is then adjusted by including the financial incentive. Therefore, the service standard performance regime provides TNSPs and interconnectors with a financial incentive to improve service performance, and a deterrence against poor performance. There are three core performance parameters applying to TNSPs and interconnectors:

- transmission circuit availability
- loss of supply event frequency
- average outage duration.

The performance targets are set in each revenue determination decision and are constant for the entire regulatory control period. Performance targets and the weighting of performance parameters are based on factors unique to each TNSP and interconnector and therefore, vary between individual TNSPs and interconnectors.

The financial incentive is calculated using the formula set out in the service standards incentives schemes and in each TNSP and interconnector's revenue determination decision. This formula applies a weighting to each performance parameter. The financial incentive for parameters other than the MIP has been limited to one per cent of each TNSP and interconnector's MAR for the relevant calendar year. The financial incentive for the MIP has been set at two per cent.

9.2.1 Implementation of the service standards performance regime

The service standards performance regime for 2010 and 2011 was implemented through the TNSPs revenue determinations set under clause 6.2.4(b) of the NER. In setting a revenue determination, clause 6.2.4(c) requires the AER to take into account the TNSP or interconnector's revenue requirement, with regard to, amongst other things, the service standards applicable to the TNSP or interconnector.

The service standards performance regime measures performance based on calendar years. This results in a four to six month lag between the time at which the service standards performance is measured at the end of the calendar year and the time at which the financial incentive is adjusted from the MAR at the beginning of the next regulatory year.[51] This allows sufficient time for the data

[51] SP AusNet has regulatory years beginning in April rather than July.

submitted by TNSPs to be audited and the resultant financial incentive to be included in the following financial year's MAR.

9.2.2 Exclusions

To maintain the integrity of performance incentives, the services standards incentives schemes permit TNSPs and interconnectors to exclude certain categories of events. The nature and number of excludable events differ between TNSPs and interconnectors. Exclusions are generally granted for events caused by third parties and force majeure events. Each TNSP and interconnector also has company specific exclusions which are generally expansions of the third party exclusion. All TNSPs and interconnectors are permitted to exclude these events from their performance calculations provided that the AER is satisfied that each event satisfies the appropriate definition.

When considering the classification of an event as being force majeure, the AER will consider the following:

- was it foreseeable and its impact extraordinary, uncontrollable and not manageable
- does this event occur frequently and if so how did the impact of the particular event differ
- could the TNSP or interconnector, in practice, have prevented the impact of the event though not necessarily the event itself
- could the TNSP or interconnector have effectively reduced the impact of the event by adopting better practices.

9.3 Annual compliance review

TNSPs and interconnectors are required under their revenue determinations and the service standards performance regime to report their service standards performance each year to the AER. The AER reviews each report to ensure that the reporting of performance, treatment of exclusions and proposed financial incentives comply with the service standards reporting regime and their respective revenue determination decisions. At the conclusion of the review process, the AER notifies the TNSPs and interconnectors of their performance outcomes and subsequent financial incentive for that year.

9.4 2010-11 performance report and service standards

Table 9.2 shows the s-factors used to calculate the financial incentives the TNSPs and interconnectors were subject to under the service standards performance regime from 2006 to 2011.

Table 9.2 S-factors values (%) for TNSPs and interconnectors

TNSP	2006	2007	2008	2009	2010	2011
ElectraNet (SA)	0.59	0.28	0.29 | (0.40)	0.60	0.00	0.84
Powerlink (Qld)	-	0.82	0.53	0.17	2.62	2.37
SP AusNet (Vic)	(0.29)	0.06	0.15 | 0.82	0.51	0.58	0.72
Transend (Tas)	0.06	0.56	0.85	0.88 | 0.11	0.35	(0.41)
TransGrid (NSW)	0.63	0.12	0.31	0.22 | 0.11	1.21	1.25
Interconnectors						
Directlink (Qld-NSW)	(0.54)	(0.62)	(1.00)	(0.98)	(1.00)	(0.87)
Murraylink (Vic-SA)	0.21	(0.32)	0.69	0.87	1.00	0.70

Source: AER's service standards compliance reviews for each TNSP and interconnector from 2006 to 2010, www.aer.gov.au/content/index.phtml/itemId/660322.

Notes: SP AusNet reported separately for the first quarter of 2008 and the remainder of that year. In 2008 SP AusNet transitioned to a new regulatory control period, with the financial incentive capped at +1 per cent of its MAR. Its financial incentive in previous regulatory control periods was capped at +0.5 per cent.
ElectraNet reported separately for the first and second halves of 2008.
TransGrid and Transend reported separately for the first and second halves of 2009.
Energy Australia data for 2009 is for the six months to June.

Table 9.3 summarises the annual financial outcome for the TNSPs and interconnectors under the service standards performance regime. Table 9.3 demonstrates the varied financial outcomes for the TNSPs under the service standards performance regime.

Table 9.3 Financial outcome ($) for TNSPs and interconnectors

TNSP	2006	2007	2008	2009	2010	2011
ElectraNet (SA)	1,028,373	504,036	269,381 | 459,980	1,438,880	0	2,404,555
Powerlink (Qld)	-	2,197,214	3,034,846	1,050,642	11,339,054	18,427,652
SP AusNet (Vic)	(871,150)	195,438	116,715 | 2,793,998	2,408,852	2,845,653	3,658,763
Transend (Tas)	73,499	707,604	1,151,240	617,796 | 95,688	648,863	(827,392)
TransGrid (NSW)	2,966,196	575,067	1,711,790	628,016 | 371,256	8,562,674	9,638,353
Interconnectors						
Directlink (Qld-NSW)	(49,673)	(74,928)	(122,462)	122,128	(126,561)	(112,005)
Murraylink (Vic-SA)	26,762	(40,449)	89,887	116,003	135,786	97,311

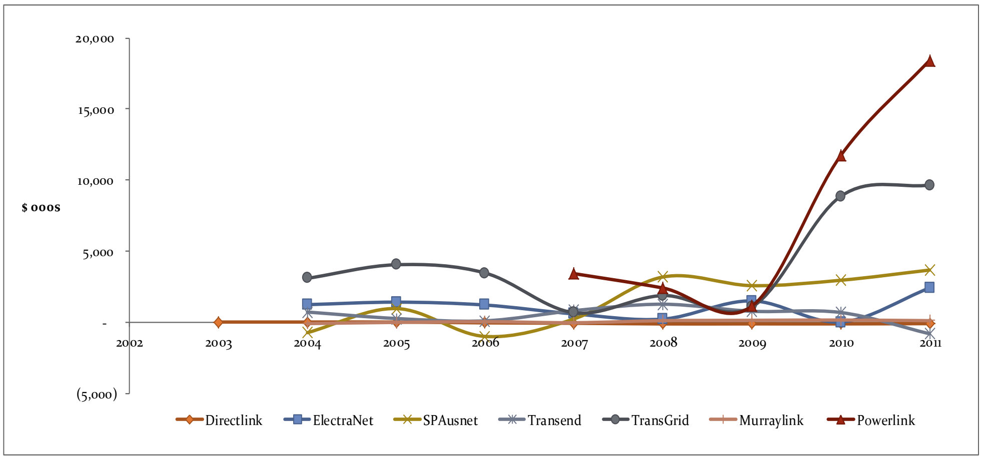
Source: AER's service standards compliance reviews for each TNSP and interconnector from 2006 to 2010, www.aer.gov.au/content/index.phtml/itemId/660322.

In 2011, Powerlink received financial benefits of $18.4 million, followed by TransGrid ($9.6 million), SP AusNet ($3.7 million), ElectraNet ($2.4 million) and Murraylink ($0.01 million). In contrast, Transend and Directlink incurred financial penalties of $0.83 million and $0.1 million, respectively.

Powerlink, TransGrid, SP AusNet, ElectraNet and Murraylink bonuses were largely a result of their MIP performance.

Figure 9.1 shows the financial benefits / penalties earned or paid by each of the TNSPs over time.

Figure 9.1 Financial incentives in $2011 million

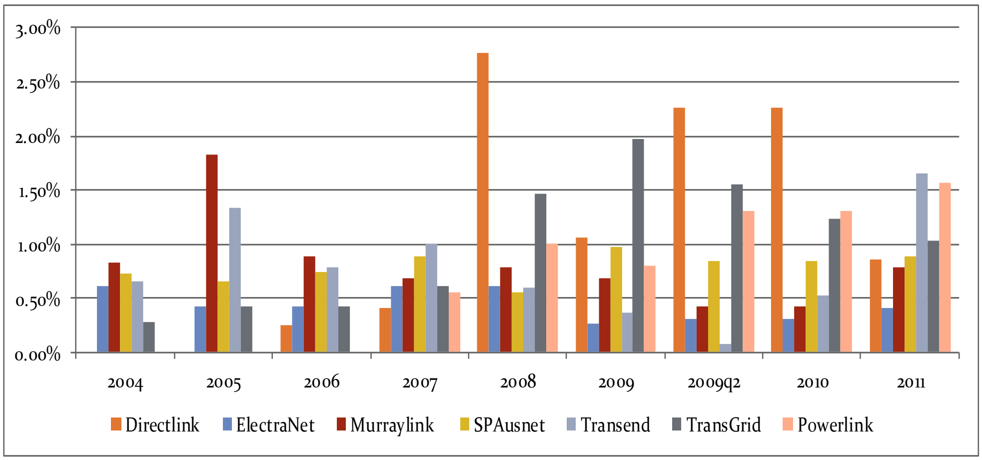


9.4.1 Non-availability of circuit

One measure of service standards which is relatively consistent across the TNSPs and interconnectors is availability of transmission circuit.

Figure 9.2 provides a comparison of circuit non-availability across all TNSPs and interconnectors for the past eight years. Given that each TNSP and interconnector has its own performance targets, a comparatively lower transmission circuit non-availability percentage does not always translate to financial incentives. In addition, this measure may be only one of many performance measures for a TNSP or interconnector and is not indicative of total service standard performance.

Figure 9.2 Non-availability of Circuit - 2004 to 2011



From 2011, Powerlink and Transend have experienced the largest increases in circuit non-availability. Powerlink comment that they would not see this specific increase as significant given Powerlink's overall performance against the service standards has been positive[52].

9.5 TNSP's individual service standards performance

This section provides each TNSP's historical service standard performance. Appendix C provides each TNSP's performance against its measures and the resulting financial incentives outcomes for 2010 and 2011.

9.5.1 ElectraNet

ElectraNet's annual performance report for 2011 reported an s-factor of 0.844. ElectraNet's performance measures are set out below.

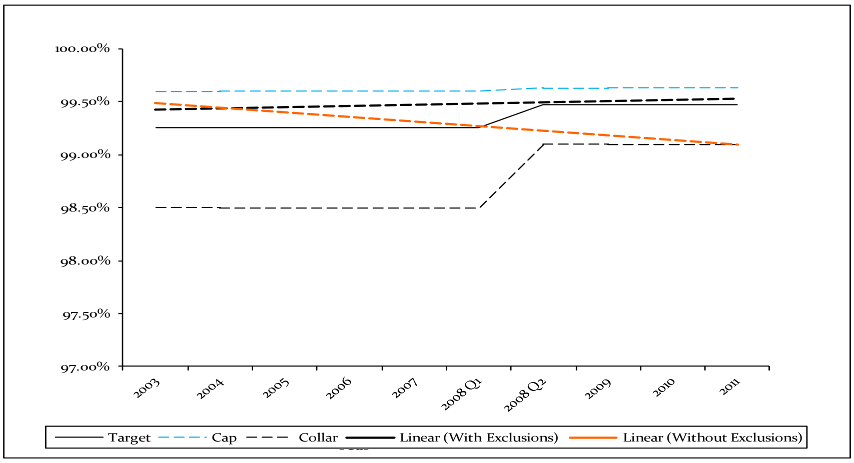
Performance measures

The performance measures applying to ElectraNet under its current revenue determination decision are:

- total transmission circuit availability
- critical transmission circuit – peak
- critical transmission circuit – non-peak
- loss of supply event frequency (events > 0.05 system minutes)
- loss of supply event frequency (events > 0.2 system minutes)
- average outage duration (minutes).

The MIP was added to this list of measures and applied from 1 January 2011.

Figure 9.3 ElectraNet Transmission Circuit Availability



[52] Powerlink, letter of 30 May 2013.

Figure 9.4 ElectraNet Critical Circuit Availability - Peak

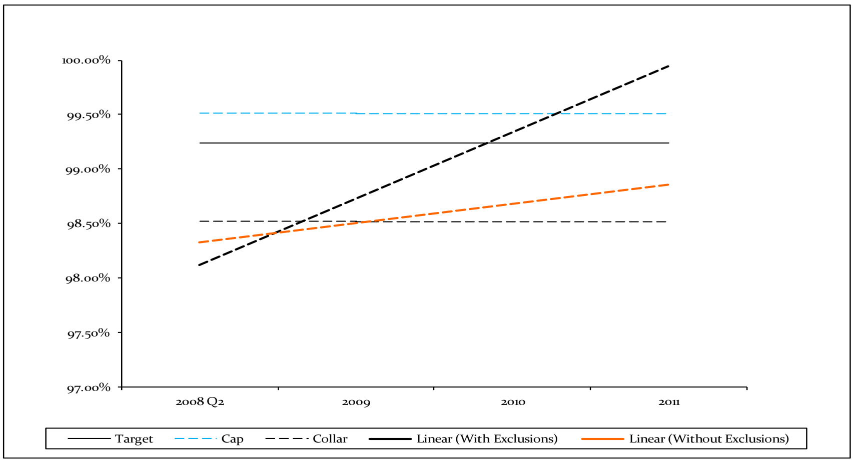


Figure 9.5 ElectraNet Loss of Supply Event Frequency > 0.20 System Minutes

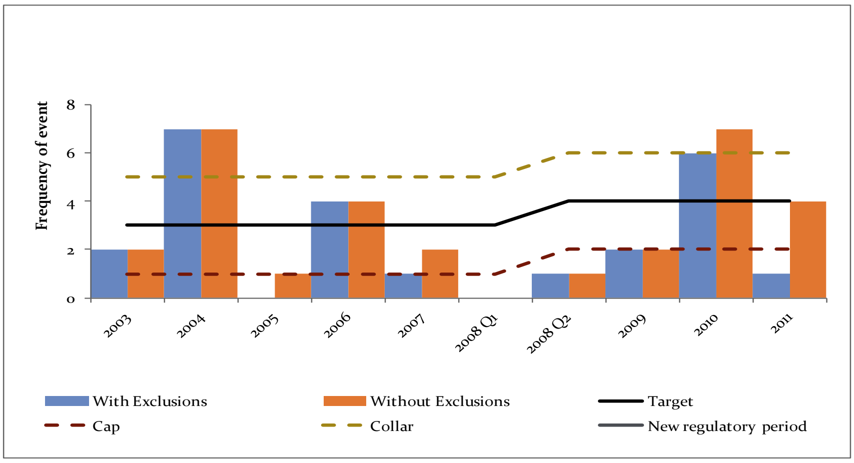


Figure 9.6 ElectraNet Loss of Supply Event Frequency > 0.05 System Minutes

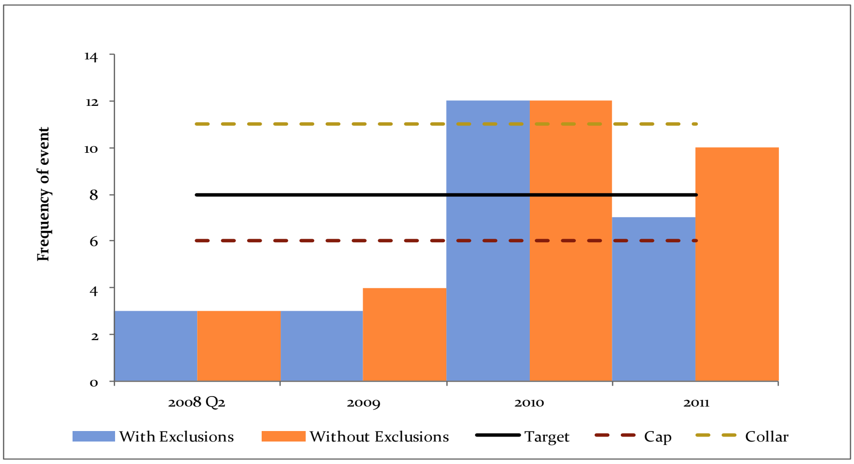
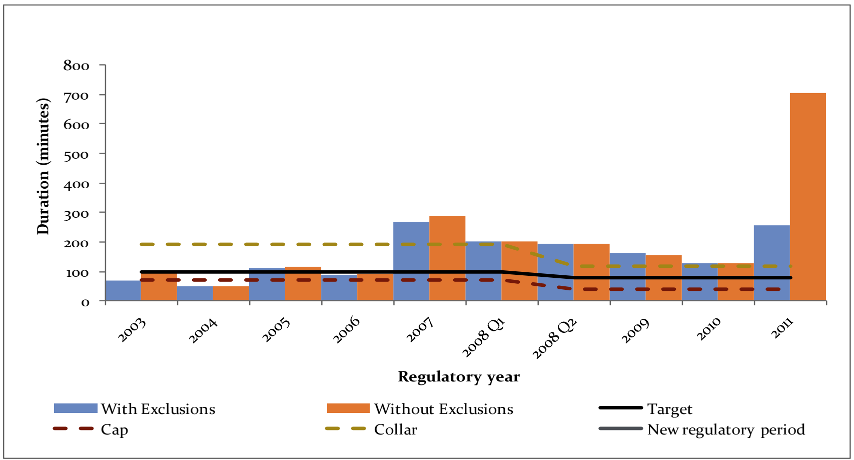


Figure 9.7 ElectraNet Average Outage Duration (Minutes)



The average outage duration exceeded the collar in 2011 due to a number of low probability high impact outages on the radial network. These extended outages were experienced due to:

- Extreme weather events (severe wind storms) which resulted in major outages; and
- The radial nature and geographical spread of the network[53].

Exclusions

For 2011, ElectraNet proposed that a number of exclusions related to capped outages (outage capped at 14 days), 3rd party outage requests and force majeure (severe storms).

Major project outages of more than 14 days were associated with a number of major capital projects and were previously approved as exclusions by the ACCC and incorporated by the AER into the service standards incentives scheme for ElectraNet. The 3rd party outage requests were related to a number of transmission line outages that were required to enable access by third parties to the transmission network. The proposed force majeure events were associated to extreme weather event.

AER's conclusions

The AER reviewed ElectraNet's performance in 2011, and approved an s-factor of 0.844%. This resulted in a net financial incentive for ElectraNet in 2012-13 of $2.4 million.

In reaching these conclusions, the AER considered ElectraNet's revenue determination decision, annual performance reports and service standards incentives scheme.

9.5.2 Powerlink

Powerlink's annual performance report for 2011 reported an s-factor of 2.37 per cent. Powerlink's performance measures are set out below.

Performance measures

The performance measures which apply to Powerlink are outlined in the AER's revenue determination for Powerlink. These are:

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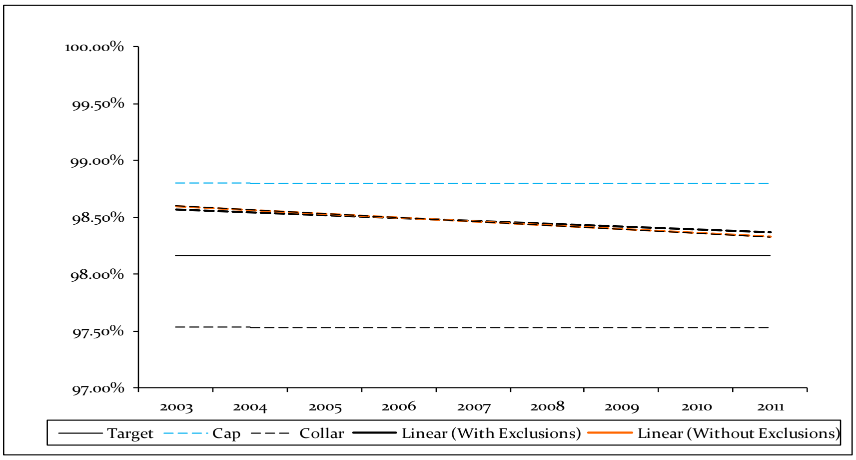
[53] ElectraNet, email of 31 May 2013.

- transmission circuit availability – critical elements
- transmission circuit availability – non-critical elements
- transmission circuit availability – peak hours
- loss of supply frequency events
- greater than 0.2 system minutes
- greater than 1.0 system minute
- average outage duration

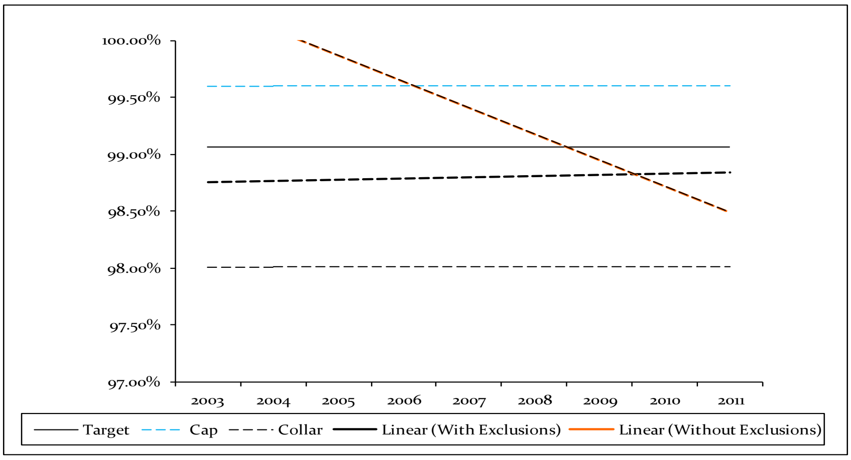
The MIP was added to this list of measures and applied from 13 July 2010.

Figure 9.8 Powerlink Transmission Circuit Availability



Note: no data for 'without exclusions' for the years 2003-2006

Figure 9.9 Powerlink Critical Circuit Availability - Peak



Note: no data for 'without exclusions' for the years 2003-2006

Figure 9.10 Powerlink Loss of Supply Event Frequency > 1.0 System Minutes

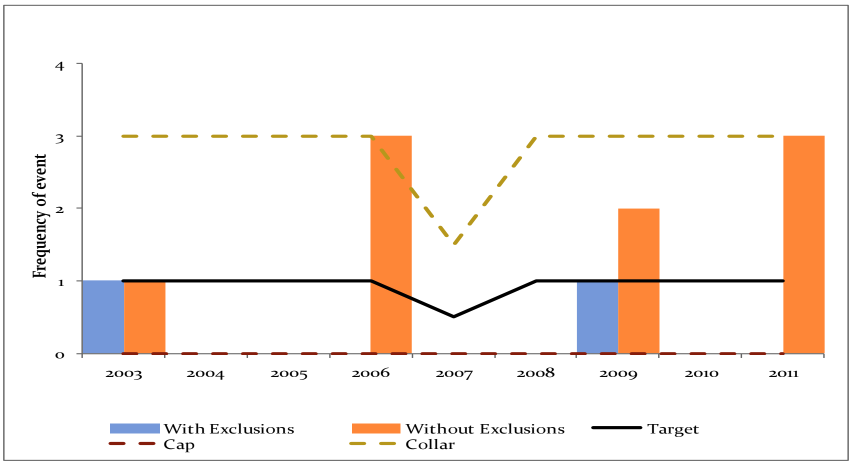


Figure 9.11 Powerlink Loss of Supply Event Frequency > 0.20 System Minutes

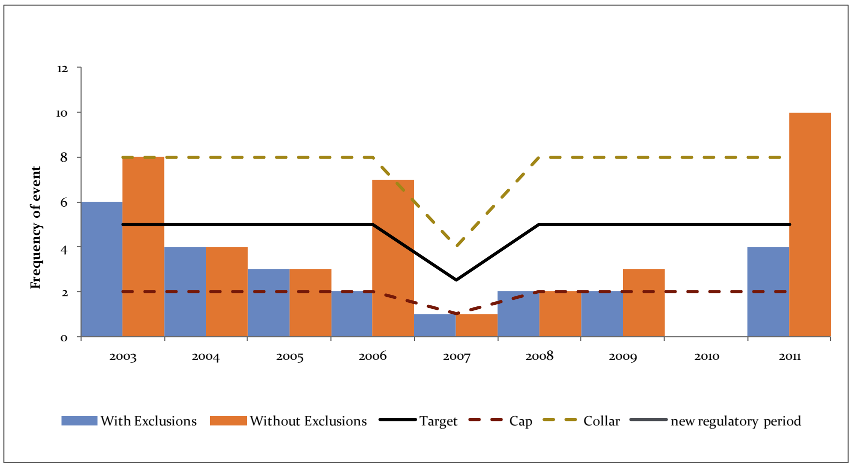


Figure 9.12 Powerlink Average Outage Duration (Minutes)

Exclusions

Powerlink proposed exclusion events related to actions of third parties (customers, generators and distributors), and in particular a high level of force majeure events as a result of Cyclone Yasi, which forced the outage of multiple transmission circuits. The proposed exclusions affected the measures of:

- peak circuit availability
- critical circuit availability
- non-critical circuit availability
- loss of supply event frequency
- average outage duration

AER's conclusions

Based on its 2011 performance, the AER endorsed an s-factor of 2.37 per cent, resulting in a financial bonus of approximately $18.43 million in 2012-2013.

9.5.3 SP AusNet

SP AusNet's annual performance report for 2011 reported an s-factor of 0.724 per cent. SP AusNet's performance measures are set out below.

Performance measures

The performance measures which apply to SP AusNet are outlined in the AER's revenue determination for SP AusNet. These are:

- total transmission circuit availability
- peak critical transmission circuit availability
- peak non-critical transmission circuit availability
- intermediate critical transmission circuit availability
- intermediate non-critical transmission circuit availability
- loss of supply frequency (events > 0.05 system minutes)
- loss of supply frequency (events > 0.3 system minutes)
- average outage duration – lines (hours)
- average outage duration – transformers (hours)

The MIP was added to this list of measures and applied from 1 April 2015.

Figure 9.13 SP AusNet Transmission Circuit Availability

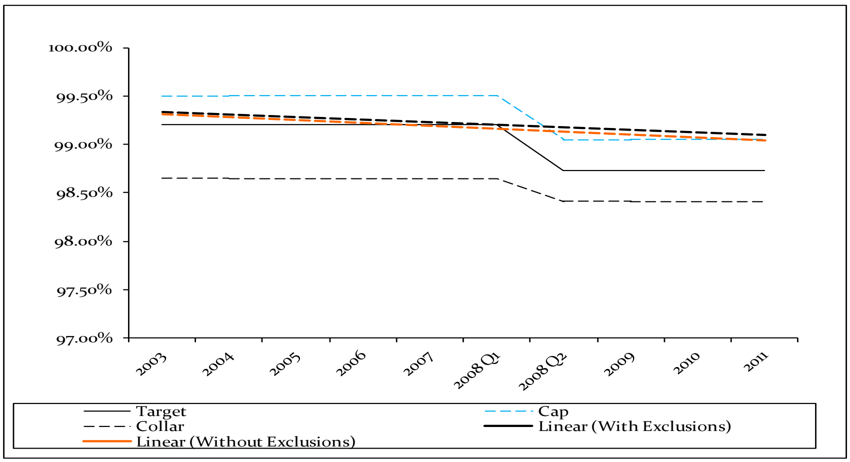


Figure 9.14 SP AusNet Critical Transmission Circuit Availability

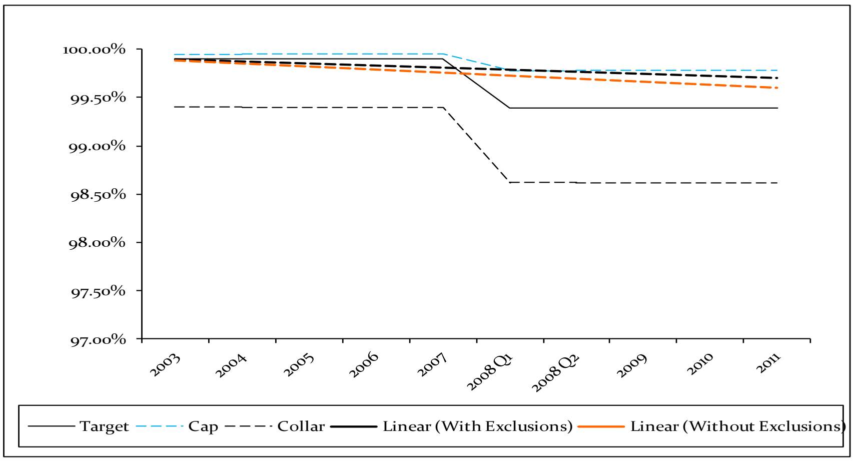


Figure 9.15 SP AusNet Loss of Supply Event Frequency > 0.05 System Minutes

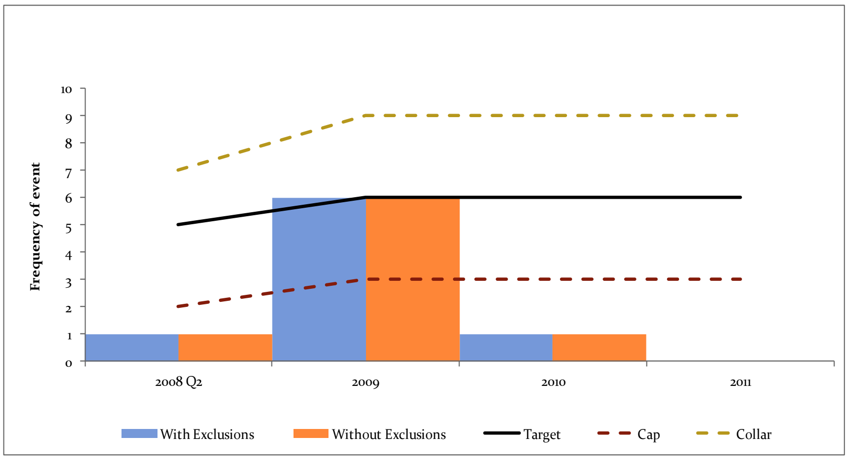


Figure 9.16 SP AusNet Loss of Supply Event Frequency > 0.30 System Minutes

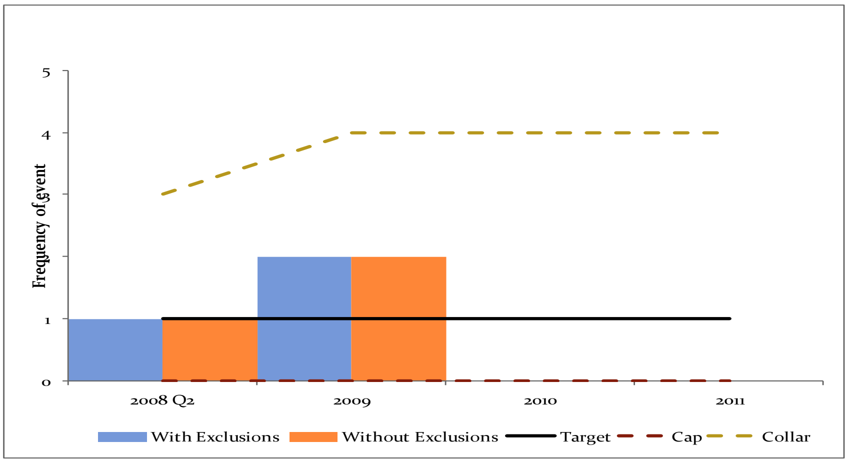


Figure 9.17 SP AusNet Average Outage Duration - Transformers (Minutes)

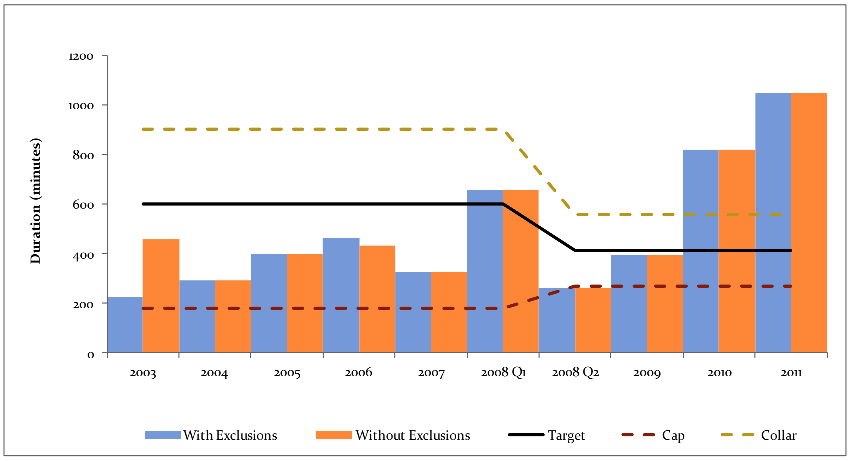
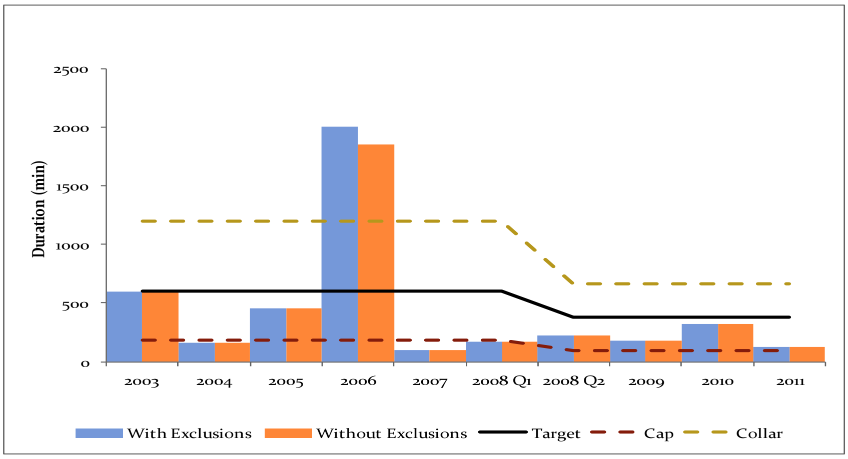


Figure 9.18 SP AusNet Average Outage Duration - Lines (Minutes)



Exclusions

In their 2011 performance report SP AusNet proposed to exclude a number of events mainly related to connection assets and in particular 3rd party outage request, which are generally from generators or distributors who request a line to be made inactive to allow work on a generator or distributor's equipment.

AER's conclusions

For 2011, the AER endorsed an s-factor of 0.72 per cent for 2011 resulting in a financial bonus of approximately $3.66 million in 2012–2013.

In reaching these conclusions, the AER considered SP AusNet's revenue determination, annual performance reports and service standards incentives scheme.

9.5.4 Transend

For 2011, Transend's reported an s-factor of -0.41 per cent. Transend's performance measures are set out below.

Performance measures

The following performance measures apply to Transend under its revenue determination decision. These are:

- transmission circuit availability (critical)
- transmission circuit availability (non-critical)
- transformer availability
- loss of supply event frequency (> 0.1 system minutes)
- loss of supply event frequency (> 1.0 system minutes)
- average outage duration - transmission lines (no revenue attached)
- average outage duration - transformers (no revenue attached).

Figure 9.19 Transend Transmission Circuit Availability

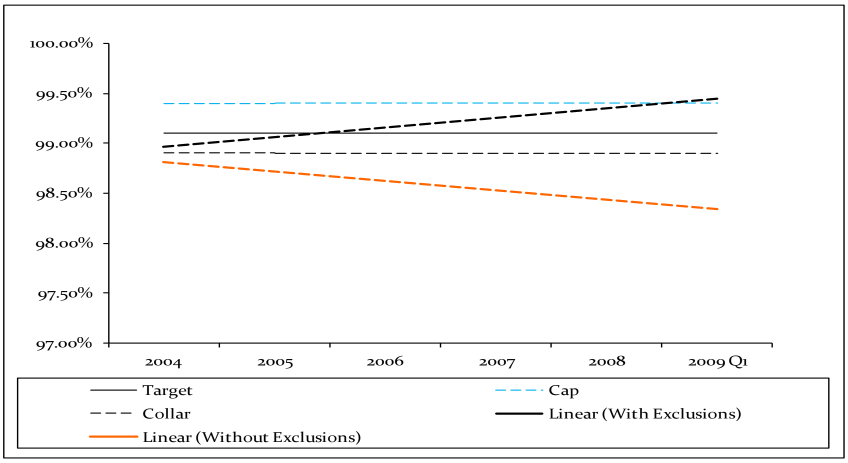
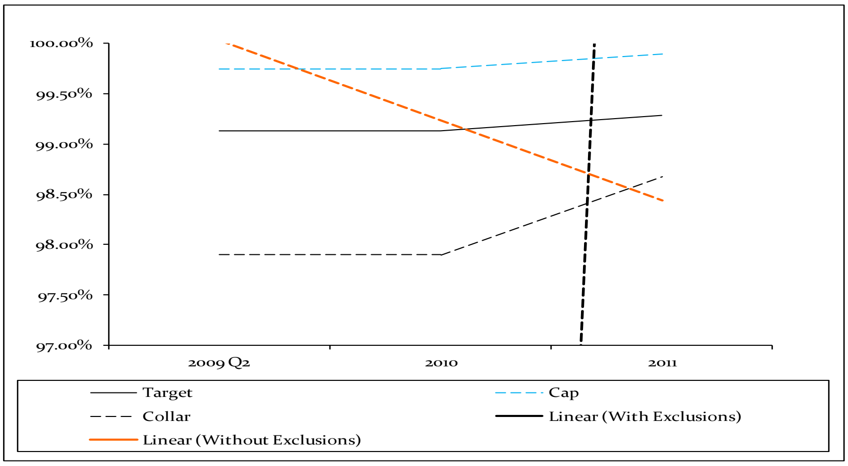


Figure 9.20 Transend Transmission Circuit Availability (critical)



Note: after 2009Q1 transmission circuit availability was reported as critical and non-critical

Figure 9.21 Transend Transformer Availability

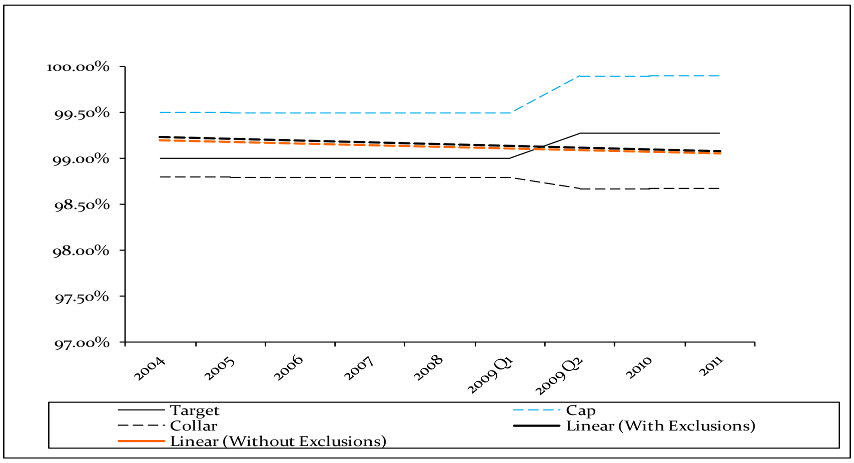


Figure 9.22 Transend Loss of Supply Event Frequency >0.1 system minutes

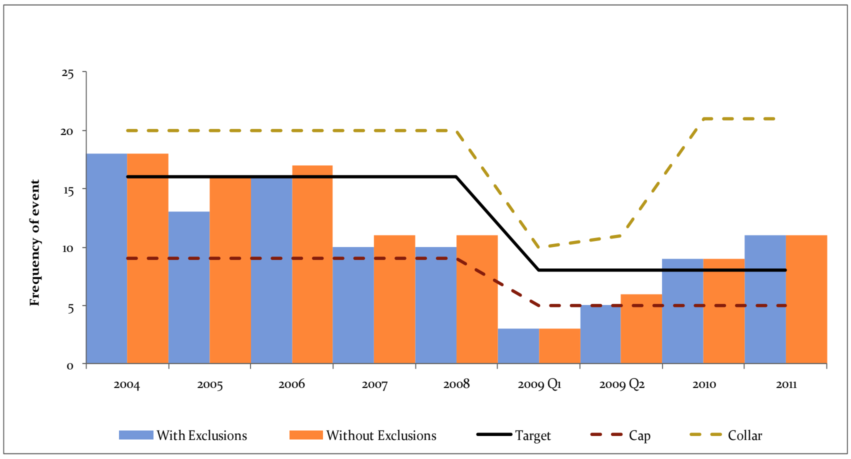
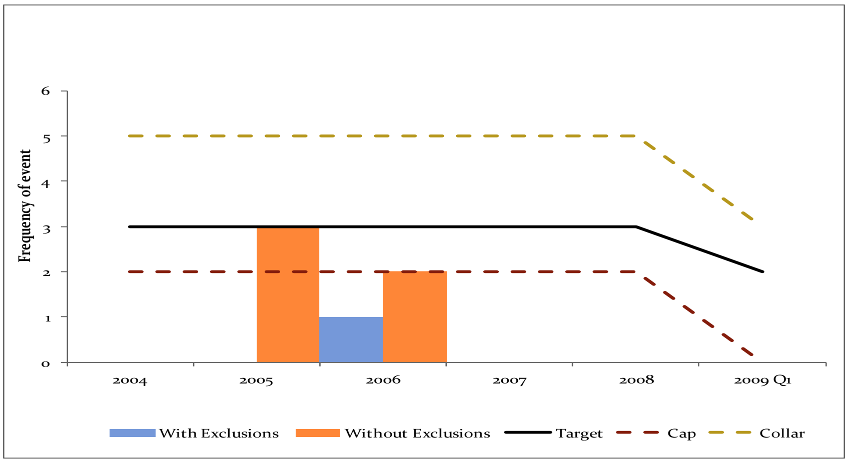


Figure 9.23 Transend Loss of supply event frequency >1.0 system minutes



Note: Loss of supply event frequency >2.0 system minutes was not reported after 2009 Q1

Figure 9.24 Transend Average Outage Duration (transmission lines)

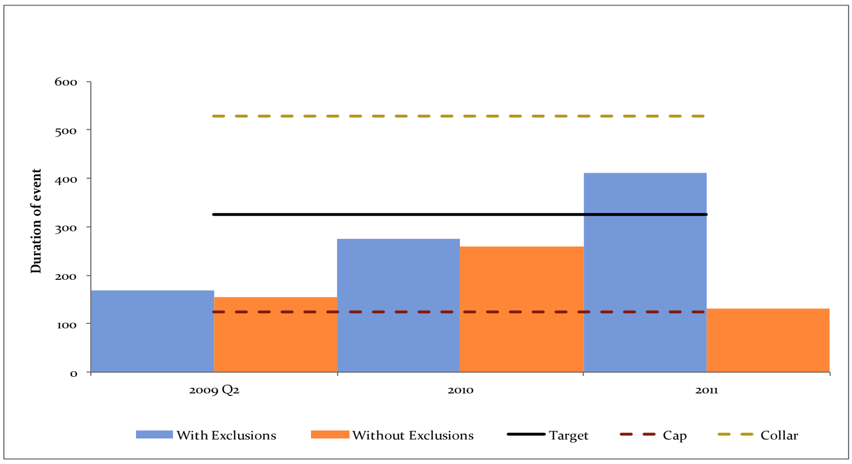
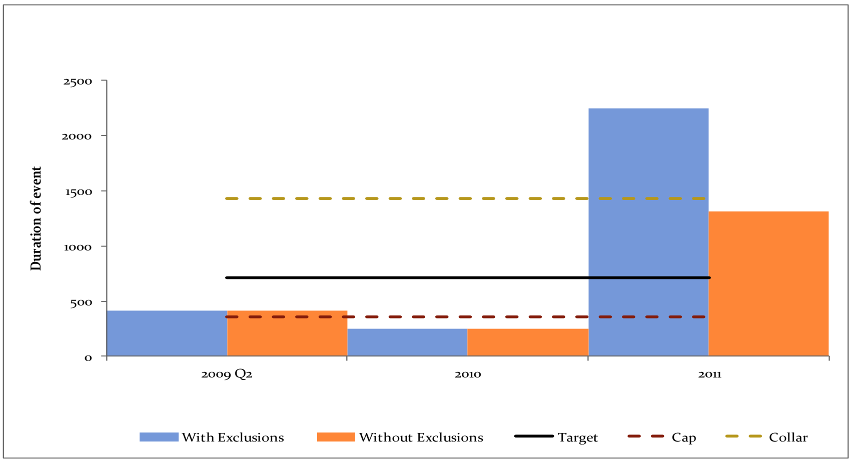


Figure 9.25 Transend Average Outage Duration (transformers)



Exclusions

Transend sought to exclude a number of events from its 2011 performance measures. These exclusion events related to actions of third parties (either generator or distributor). The proposed exclusions affected the following parameters:

- transmission circuit availability (critical)
- transmission circuit availability (non-critical)
- transformer availability.
- loss of supply event frequency
- average outage duration (transformers)
- average outage duration (transmission lines)

AER's conclusions

For 2011, the AER endorsed an s-factor of -0.41 per cent, resulting in a financial loss of $0.83 million in 2012-13.

In reaching these conclusions, the AER considered Transend's revenue determination decision, annual performance reports and service standards incentives scheme.

9.5.5 TransGrid

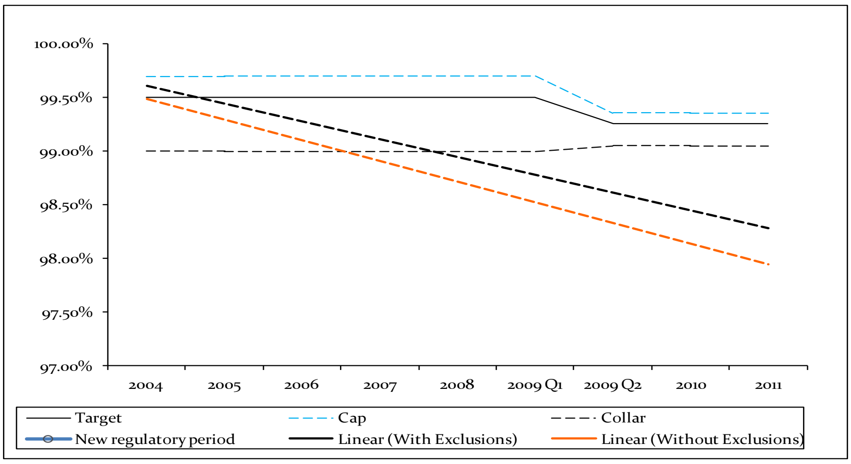
TransGrid's annual performance report for 2011 reported a total s-factor of 1.25 per cent. TransGrid's performance measures are set out below.

Performance measures

The performance measures which apply to TransGrid are outlined in its revenue determination decision. These are:

- transmission line availability
- transformer availability
- reactive plant availability
- loss of supply > 0.05 system minutes
- loss of supply > 0.25 system minutes
- average outage restoration time
- MIP.

Figure 9.26 TransGrid Transmission Line Availability



note - no data for 'without exclusions' for the year 2004

Figure 9.27 TransGrid Transformer Availability

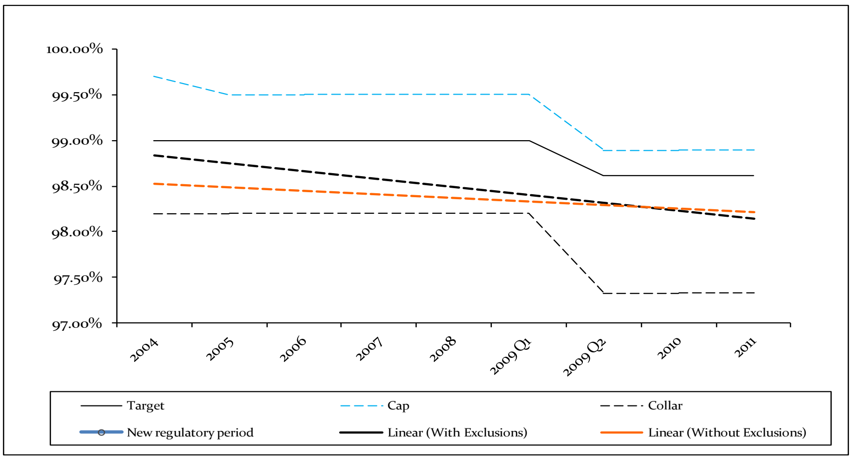


Figure 9.28 TransGrid Loss of supply event frequency >0.05 system minutes

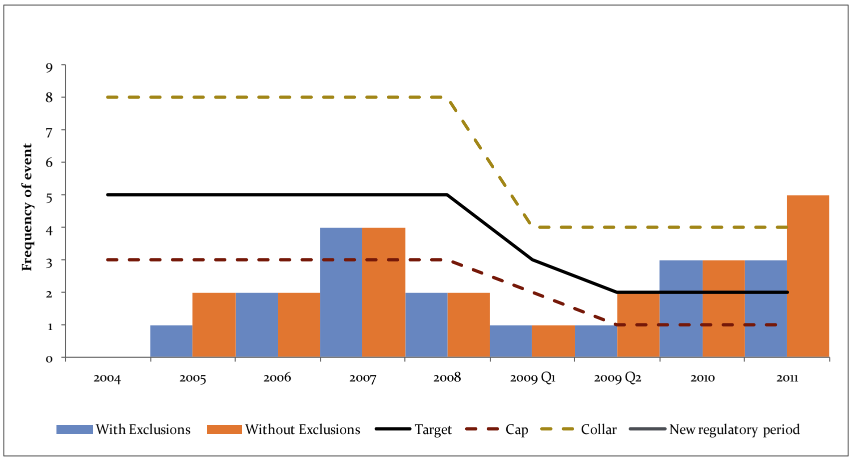


Figure 9.29 TransGrid Loss of supply event frequency >0.25 system minutes

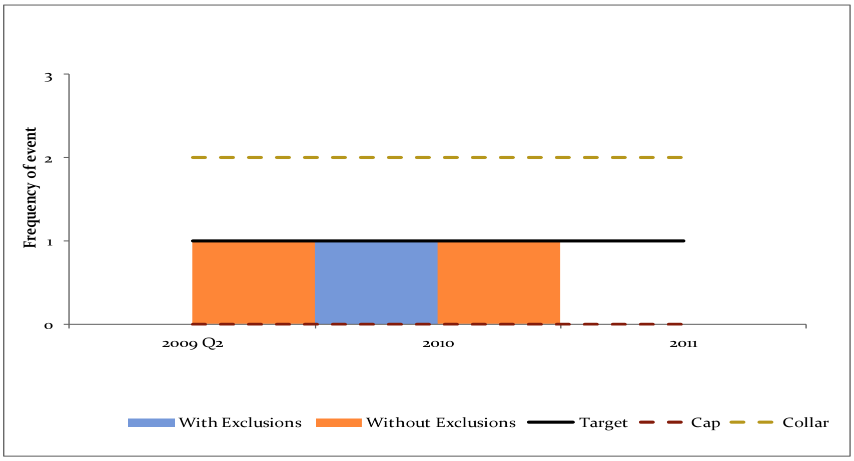
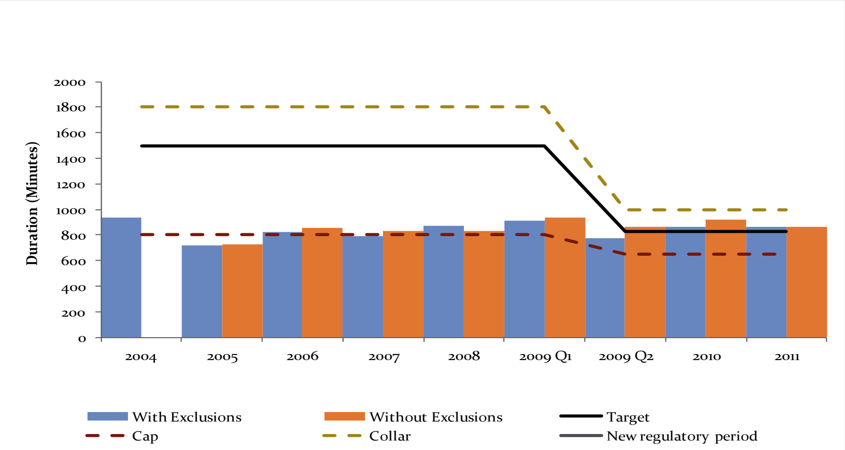


Figure 9.30 TransGrid Average Outage Duration (Minutes)



Exclusions

TransGrid proposed exclusions from its 2011 performance that were largely caused by 3rd party outage requests. These requests are generally from generators or distributors who request a line to be made inactive to allow work on a generator or distributor’s equipment.

AER’s conclusions

Overall, the net s-factor for TransGrid for 2011-2012 is 1.25 per cent resulting in an adjustment to TransGrid's MAR for 2012-13 of approximately $9.64 million.

In reaching these conclusions, the AER considered TransGrid’s revenue determination, annual performance reports and service standards incentives scheme.

9.5.6 Directlink

Directlink's annual performance report for 2011 reported an s-factor of -0.87 per cent. Directlink's performance measures are set out below.

Performance measures

The performance measures which apply to Directlink are outlined in its revenue determination decision. These are:

- scheduled circuit availability
- forced peak circuit availability
- forced off-peak circuit availability.

Figure 9.31 Directlink Planned Circuit Energy Availability

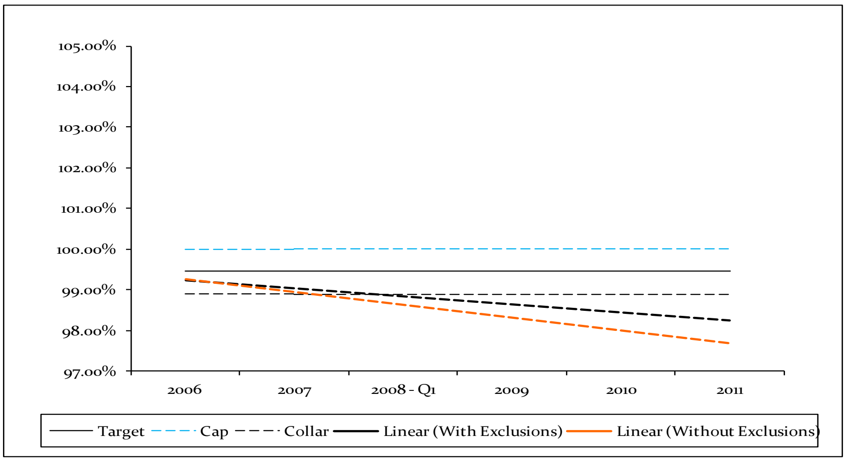


Figure 9.32 Directlink Forced Peak Circuit Energy Availability

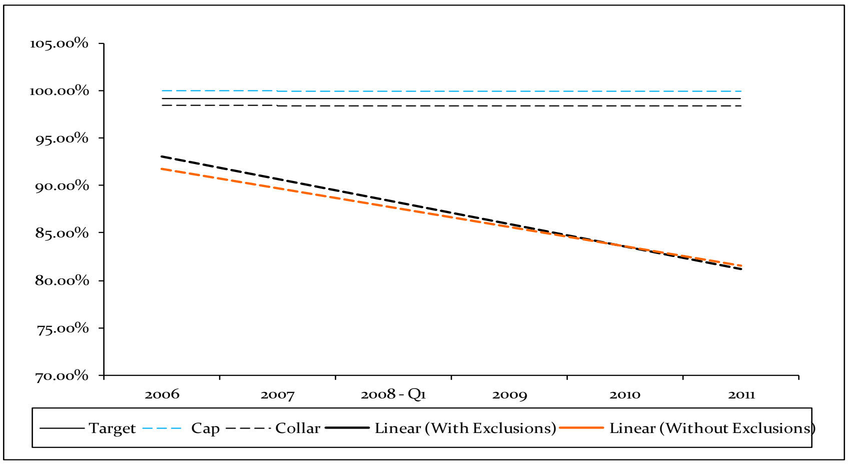
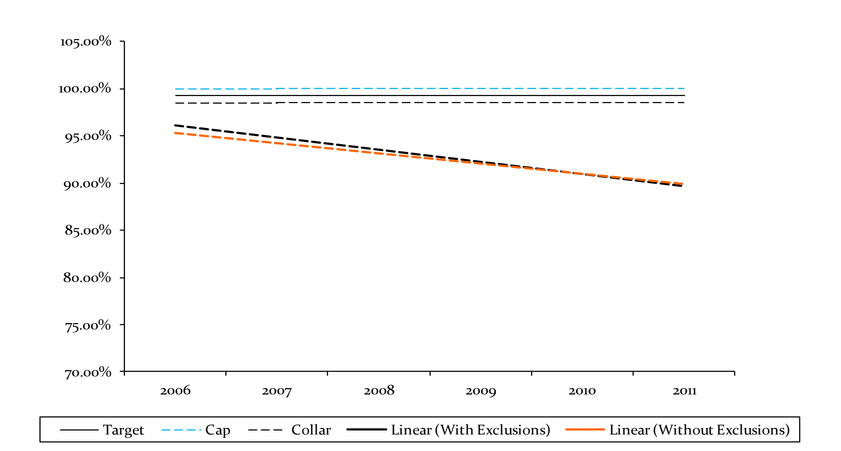


Figure 9.33 Directlink Forced Non-Peak Circuit Energy Availability



Exclusions

Directlink proposed nine 3rd party outage exclusions from its 2011 performance data. All proposed exclusions were forced outages for planned work by distributors.

AER's conclusions

In 2011, the AER endorsed an s-factor of -0.87 per cent resulting in a financial penalty of approximately $0.11 million to be applied in the 2012-13 financial year.

In reaching these conclusions, the AER considered Directlink's revenue determination decision, annual performance reports and the ACCC guidelines.

9.5.7 Murraylink

Murraylink's annual performance report for 2010 reported an s-factor of 0.7 per cent.

Performance measures

The performance measures which apply to Murraylink are outlined in its revenue determination decision. These are:

- planned circuit availability
- forced peak circuit availability
- forced off-peak circuit availability.

Figure 9.34 Murraylink Planned Circuit Energy Availability

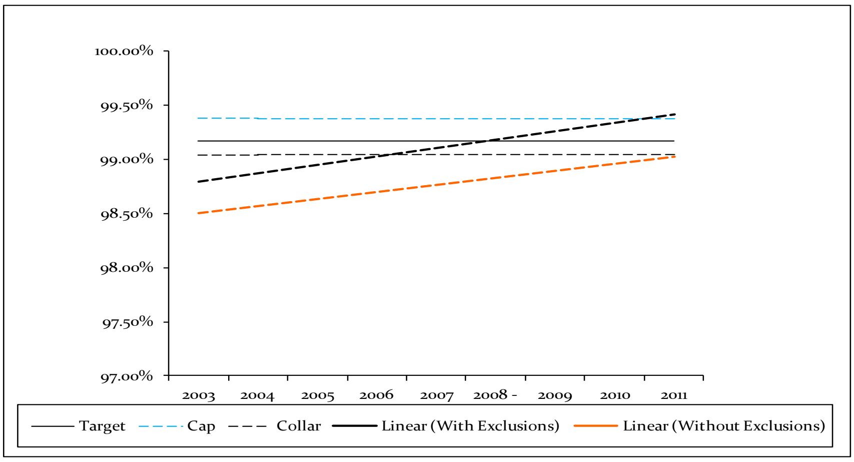


Figure 9.35 Murraylink Planned Circuit Energy Availability

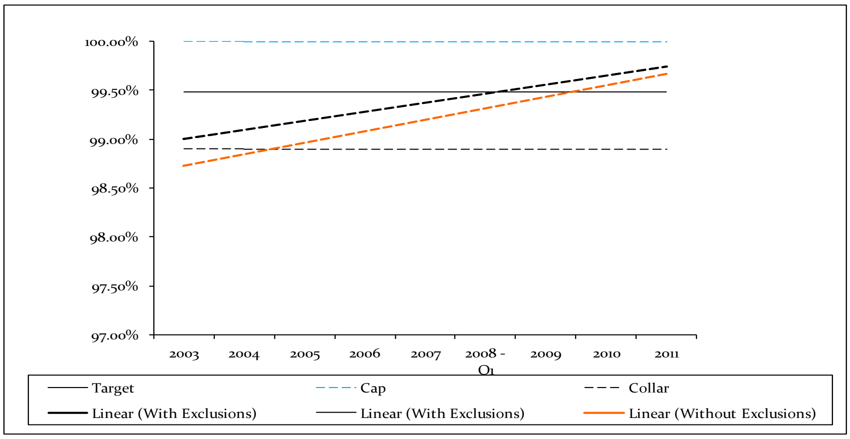
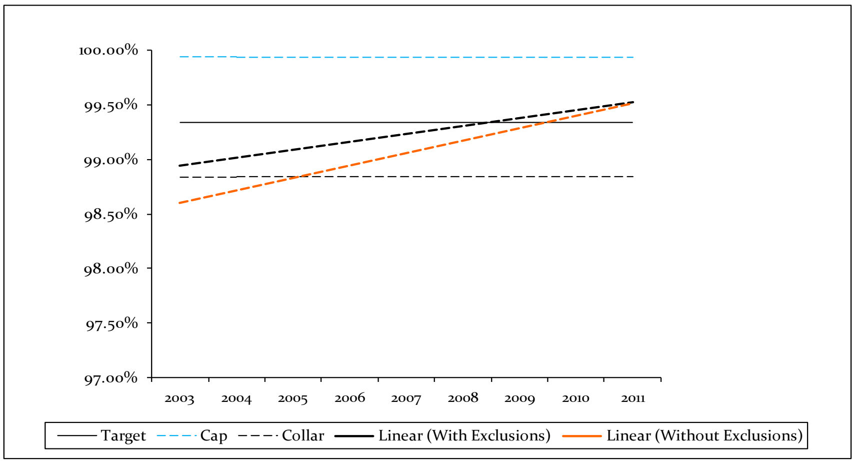


Figure 9.36 Murraylink Forced Non-Peak Circuit Energy Availability



Exclusions

For 2011, Murraylink proposed to exclude approximately less than two hours of third party outage relating to a request from ElectraNet. It also proposed to exclude five force majeure events related to storm.

AER's conclusions

Based on its performance in 2011, the AER endorsed an s-factor of 0.7 per cent resulting in a financial bonus of approximately $0.097 million to be applied in 2012-13.

In reaching these conclusions, the AER considered Murraylink's revenue determination decision, annual performance reports and the ACCC guidelines.

A The Transmission Network Service Providers

A.1 Key features of the NEM

TNSP	Line Length (km)	Electricity Transmitted (GWh)	Maximum Demand (MW)	Closing RAB ($m 2011)	Revenue Prescribed Services $m 11
ElectraNet (SA)	5,591	13,045	3,570	1,818	273.4
Powerlink (Qld)	13,986	48,020	8,836	5,313	736.2
SP AusNet (Vic)	6,553	52,352	9,982	2,131	497.4
Transend (Tas)	3,494	10,913	1,770	1,161	201.2
TransGrid (NSW)	12,657	74,282	14,863	4,930	739.3
Interconnectors					
Murraylink	63	-	180	121.2	13.0
Directlink	180	-	220	102.8	14.0

Source: 2010-11 TNSP regulatory reports.

A.2 Key TNSP Network Statistics

	2006-07	2007-08	2008-09	2009-10	2010-11
Regulatory Asset Base - Closing ($m real 2011)					
ElectraNet	1,468	1,540	1,581	1,642	1,818
Powerlink	3,701	4,253	4,783	5,069	5,313
SP AusNet	2,308	2,261	2,272	2,196	2,131
Transend	872	880	938	1,105	1,161
TransGrid	3,859	4,069	4,484	4,733	4,930
Revenue - PS Actual ($m 2011)					
ElectraNet	203.3	203.5	245.1	257.8	273.4
Powerlink	579.8	584.8	642.5	689.3	736.2
SP AusNet	369.7	426.7	485.0	498.6	497.4
Transend	140.0	141.8	150.3	171.4	201.2
TransGrid	552.5	567.0	606.7	697.5	739.3
Line Length (km)					
ElectraNet	5,676	5,620	5,589	5,591	5,591
Powerlink	12,132	12,671	13,106	13,569	13,986
SP AusNet	6,553	6,553	6,553	6,553	6,553
Transend	3,594	3,591	3,408	3,408	3,494
TransGrid	12,489	12,486	12,492	12,656	12,657
Maximum Demand (MW)					
ElectraNet	2,934	3,172	3,397	3,397	3,570
Powerlink	8,589	8,082	8,677	8,891	8,836
SP AusNet	9,164	9,878	10,554	10,282	9,982
Transend (Winter max, demand)	1,716	1,803	1,861	1,753	1,770
TransGrid	13,008	13,890	14,316	13,969	14,863
Electricity Transmitted (GWh)					
ElectraNet	12,679	12,676	12,922	12,893	13,045
Powerlink	47,750	48,576	49,104	49,593	48,020
SP AusNet	51,978	52,778	52,209	52,303	52,352
Transend	10,739	11,008	10,964	10,847	10,913
TransGrid	78,226	76,359	75,744	74,358	74,282

Source: TNSP regulatory reports

A.3 Actual revenue from prescribed services ($ million 2011)

TNSP	2006-07	2007-08	2008-09	2009-10	2010-11
Directlink	13.2	12.7	12.8	12.8	13.0
ElectraNet	203.3	203.5	245.1	257.8	273.4
Murraylink	14.3	14.3	14.7	14.1	13.9
Powerlink	579.8	584.8	642.5	689.3	736.2
SP AusNet	369.7	426.7	485.0	498.6	497.4
Transend	140.0	141.8	150.3	171.4	201.2
TransGrid	552.5	567.0	606.7	697.5	739.3
Total	1,872.7	1,950.8	2,157.1	2,341.5	2,474.4

Source: AER calculations based on TNSPs regulatory accounts.

A.4 Change in the actual revenue of prescribed transmission services, per cent

TNSP	2009-10 to 2010-11	5-year average	2010-11 variation from 5-year average
ElectraNet	6.1	6.9	0.8
Powerlink	6.8	6.4	-0.5
SP AusNet	(0.2)	6.4	6.7
Transend	17.4	8.7	-8.7
TransGrid	6.0	6.8	(0.8)

Source: AER calculations based on TNSPs regulatory accounts.

B Expenditure by TNSP

B.1 Forecast and actual capex ($ million 2011)

TNSP	2006-07	2007-08	2008-09	2009-10	2010-11
ElectraNet					
Forecast capex	79.0	51.2	146.6	200.00	245.3
Actual capex	88.0	182.8	108.6	131.6	249.8
Powerlink					
Forecast capex	105.0	761.9	682.8	436.3	474.0
Actual capex	294.0	724.6	716.4	488.9	461.0
SP AusNet					
Forecast capex	92.0	93.1	123.7	115.4	133.1
Actual capex	125.6	124.8	97.4	114.0	109.0
Transend					
Forecast capex	94.9	43.7	35.8	171.6	169.7
Actual capex	111.1	65.0	69.8	136.8	115.5
TransGrid					
Forecast capex	268.0	423.4	683.1	570.1	487.1
Actual capex	242.3	345.7	602.8	418.6	363.9

Source: AER calculations based on TNSPs regulatory accounts.

B.2 Forecast and actual opex ($ million 2011)

TNSP	2006-07	2007-08	2008-09	2009-10	2010-11
ElectraNet					
Forecast opex	55.6	55.7	55.9	57.7	59.7
Actual opex	47.5	48.9	53.3	54.5	57.8
Powerlink					
Forecast opex	105.3	128.9	138.2	144.3	152.1
Actual opex	124.4	125.3	133.8	141.9	148.7
SP AusNet					
Forecast opex	88.3	88.3	82.2	85.9	89.7
Actual opex	71.0	61.4	80.2	80.4	73.2
Forecast easement tax			81.2	87.4	83.1
Actual easement tax	93.9	85.4	83.3	96.4	93.3
Transend					
Forecast opex	37.9	34.7	34.6	51.8	52.5
Actual opex	42.5	47.4	44.9	44.6	43.3
TransGrid					
Forecast opex	142.4	142.0	141.8	140.9	151.9
Actual opex	135.8	127.9	128.8	127.0	136.2

Source: AER calculations based on TNSPs regulatory accounts, excludes grid support and self-insurance

C TNSP's individual service standards performance

C.1 Measures, results and incentives for ElectraNet

ElectraNet		**2010**		**2011**	
Parameter	Target	Performance with exclusions	s-factor (%)	Performance with exclusions	s-factor (%)
Total transmission circuit availability (%)	99.47	99.69	0.30	99.59	0.23
Critical circuit availability - peak (%)	99.24	99.75	0.20	99.30	0.04
Critical circuit availability - non-peak (%)	99.62	99.49	0.00	99.41	0
Loss of supply event frequency (>0.05 system minutes)	8	12	(0.10)	7	0.05
Loss of supply event frequency (>0.2 system minutes)	4	6	(0.20)	1	0.20
Average outage duration (lines)	78	128	(0.20)	256	(0.20)
Market impact parameter	1862	n.a	n.a	1375	0.523
Net s-factor (%)			**0.00**		**0.844**
Net financial incentive ($m)			**0**		**2.40**

Source: AER's service standards compliance reviews for ElectraNet for 2010 and 2011.

C.2 Measures, results and incentives for Powerlink

Powerlink		2010		2011	
Parameter	**Target**	**Performance with exclusions**	**s-factor (%)**	**Performance with exclusions**	**s-factor (%)**
Transmission circuit availability - critical elements (%)	99.07	98.69	(0.06)	98.51	(0.08)
Transmission circuit availability - non critical elements (%)	98.40	98.85	0.06	98.601	0.029
Transmission circuit availability -peak periods (%)	98.16	98.64	0.12	98.39	0.06
Loss of supply event frequency (>0.20 system minutes)	5	0	0.16	4	0.052
Loss of supply frequency (>1.0 system minutes)	1	0	0.30	0	0.30
Average outage duration (minutes)	1033	779	0.06	765	0.068
Market impact parameter	740	11	1.97	37	1.953
Net s-factor (%)			**2.62**		**2.37**
Net financial incentive ($m)			**11.34**		**18.427**

Source: AER's service standards compliance reviews for Powerlink for 2009 and 2010, www.aer.gov.au/content/index.phtml/itemId/745427 and www.aer.gov.au/content/index.phtml/itemId/736456

Notes: Data is for performance with exclusions. The market impact parameter for 2010 applied from 13 July 2010 to 31 December 2010 and the annual target is 1570 dispatch intervals.

C.3 Measures, results and incentives for SP AusNet

SP AusNet		2010		2011	
Parameter	Target	Performance with exclusions	s-factor (%)	Performance with exclusions	s-factor (%)
Total circuit availability (%)	98.73	99.15	0.20	99.11	0.20
Peak critical circuit availability - (%)	99.39	99.67	0.14	99.80	0.20
Peak non-critical circuit availability (%)	99.40	99.81	0.05	99.89	0.05
Intermediate critical circuit availability (%)	98.67	99.82	0.03	99.29	0.02
Intermediate non critical circuit availability (%)	98.73	99.01	0.01	99.09	0.02
Loss of supply event frequency (>0.05 minutes)	6	1	0.13	0	0.13
Loss of supply event frequency (>0.3 minutes)	1	0	0.13	0	0.13
Average outage duration - lines (minutes)	382	319	0.03	129	0.11
Average outage duration - transformers (minutes)	412	818	-0.13	1048	(0.13)
Market impact parameter	869			1588	0
Net s-factor (%)			**0.58**		**0.72**
Net financial incentive ($m)			**2.85**		**3.66**

Source: AER's service standards compliance reviews for SP AusNet for 2009 and 2010, www.aer.gov.au/content/index.phtml/itemId/737142 and www.aer.gov.au/content/index.phtml/itemId/745466

Notes: Data is for performance with exclusions.

C.4 Measures, results and incentives for Transend

Transend		2010		2011	
Parameter	Target	Performance with exclusions	s-factor (%)	Performance with exclusions	s-factor (%)
Total transmission circuit availability - critical (%)	99.13	99.47	0.11	98.34	(0.13)
Critical circuit availability - non critical (%)	98.97	99.38	0.08	99.04	0.02
Transformer availability (%)	99.28	99.11	(0.04)	99.95	(0.08)
Loss of supply event frequency (>0.01 system minutes)	8	9	0.20	11	0.133
Loss of supply event frequency (>1.0 system minutes)	1	2	0.00	6	(0.35)
Average outage duration - transmission lines (minutes)	326	275	0.00	412	0.0
Average outage duration - transformers (minutes)	712	247	0.00	2249	0.0
Market impact parameter					
Net s-factor (%)			**0.35**		**(0.41)**
Net financial incentive ($m)			**0.65**		**(0.83)**

Source: AER's service standards compliance reviews for Transend for Jul-Dec 2009 and 2010, www.aer.gov.au/content/index.phtml/itemId/737271 and www.aer.gov.au/content/index.phtml/itemId/745423

Notes: Data is for performance with exclusions. Average outage duration - transmission lines (minutes) and Average outage duration - transformers (minutes) have zero weighting do not contribute to the calculation of the financial incentives.

C.5 Measures, results and incentives for TransGrid

TransGrid		2010		2011	
Parameter	Target	Performance with exclusions	s-factor (%)	Performance with exclusions	s-factor (%)
Transmission line availability (%)	99.26	98.76	(0.20)	98.97	(0.20)
Transformer availability (%)	98.61	98.38	(0.03)	98.45	(0.02)
Reactive plant availability (%)	99.12	95.44	(0.10)	96.32	(0.10)
Loss of supply (>0.05 system minutes)	4	3	0.13	3	0.13
Loss of supply (>0.25 system minutes)	1	1	0.00	0	0.10
Average outage restoration time (minutes)	824	861	(0.04)	864	(0.05)
Market impact parameter	2857	780	1.45	872	1.38
Net s-factor (%)			**1.21**		**1.25**
Net financial incentive ($m)			**8.56**		**9.64**

Source: AER's service standards compliance reviews for TransGrid for Jul-Dec 2009 and 2010, www.aer.gov.au/content/index.phtml/itemId/736457 and www.aer.gov.au/content/index.phtml/itemId/745422

Notes: Data is for performance with exclusions.

C.6 Measures, results and incentives for Directlink

Directlink		2010		2011	
Parameter	Target	Performance with exclusions	s-factor (%)	Performance with exclusions	s-factor (%)
Scheduled circuit availability (%)	99.45	97.74	(0.30)	99.14	(0.17)
Forced peak circuit availability (%)	99.23	78.64	(0.35)	82.62	(0.35)
Forced off peak circuit availability	99.23	87.97	(0.35)	90.83	(0.35)
Market impact parameter					
Net s-factor (%)			**(1.00)**		**(0.87)**
Net financial incentive ($m)			**(0.13)**		**(0.11)**

Source: AER's service standards compliance reviews for Directlink for 2009 and 2010, www.aer.gov.au/content/index.phtml/itemId/736452 and www.aer.gov.au/content/index.phtml/itemId/745467

Notes: Data is for performance with exclusions.

C.7 Measures, results and incentives for Murraylink

Murraylink		2010		2011	
Parameter	Target	Performance with exclusions	s-factor (%)	Performance with exclusions	s-factor (%)
Planned circuit energy availability (%)	99.17	99.58	0.40	99.22	0.10
Peak forced outage availability (%)	99.48	100.00	0.40	100.00	0.40
Off peak forced outage availability	99.34	100.00	0.20	100.00	0.20
Market impact parameter					
Net s-factor (%)			**1.00**		**0.7**
Net financial incentive ($m)			**0.14**		**0.097**

Source: AER's service standards compliance reviews for Murraylink for 2009 and 2010, www.aer.gov.au/content/index.phtml/itemId/737274 and www.aer.gov.au/content/index.phtml/itemId/745468.

Notes: Data is for performance with exclusions.

C.8 Financial penalties/rewards based on performance with exclusions

TNSP	2006	2007	2008	2009	2010	2011
ElectraNet (SA)	1,028,373	504,036	269,381 | 459,980	1,438,880	0	2,404,555
Powerlink (Qld)	-	2,197,214	3,034,846	1,050,642	11,339,054	18,426,790
SP AusNet (Vic)	(871,150)	195,438	116,715 | 2,793,998	2,408,852	2,845,653	0
Transend (Tas)	73,499	707,604	1,151,240	617,796 | 95,688	648,863	(827,392)
TransGrid (NSW)	2,956,432	575,067	1,711,790	628,016 | 371,256	8,562,674	9,638,353
Interconnectors						
Directlink (Qld-NSW)	(49,673)	(74,928)	(122,462)	122,128	(126,561)	(112,005)
Murraylink (Vic-SA)	26,762	(40,449)	89,887	116,003	135,786	97,311

WILSON TRANSFORMER

The proven power performer

Greetings

Transformer engineering and manufacturing has been the business of Wilson Transformer Company since it was founded by my father, the late Jack Wilson, in 1933. From the beginning, the Company has been dedicated to understanding its customers' needs. We have earned an enviable international reputation for quality, reliability and service. We are continually enhancing our products to achieve superior lifetime performance and competitiveness. The reliability of our products is legendary and we guard this reputation fiercely.

Members of the Company are determined, as was its founder, to satisfy our customers' needs by combining excellence in service, engineering and manufacturing with sound business practice and community responsibility. These qualities are at the core of our culture.

Wilson Transformer Company is Australian owned and controlled, and a tough competitor in local and international markets. We strive constantly to exceed our customers' expectations for quality, value, delivery and service.

I invite you to contact the Company or me about your transformer needs or the performance of our products.

Robert Wilson
Managing Director

Internals of power transformer

315 kVA 22 kV pole-mounted transformer with galvanised tank

Wilson Transformer Company — The Independent Australian

Customer-focused, innovative, committed to engineering and manufacturing excellence — Wilson Transformer Company is all this and more. The largest Australian-owned manufacturer of power and distribution transformers, Wilson is renowned for its superior quality, value, on-time delivery and service.

We run efficient, specialised manufacturing operations at two locations in Australia, which produce a comprehensive range of distribution transformers, compact substations and power transformers, to standard designs as well as custom designs, from 100 kVA to 250 MVA.

We also manufacture offshore — our joint venture in Malaysia, EPE Wilson Transformer Sdn Bhd, has been in commercial production since 1994 making high quality distribution transformers and compact substations.

Pad-mounted substation

220 kV generator transformers

Customer Focus

By working collaboratively with our customers, using our unique experience and know-how in engineering, manufacturing and logistics, we innovate and propose original solutions to satisfy transformer and compact substation needs. As a transformer supplier, advisor and problem solver, we are an invaluable resource for our customers.

Wilson provides total solutions designed for today's business environment, which increasingly requires supply chain management, predictive management and condition-based maintenance.

No Wilson power transformer above 10 MVA delivered since 1970 has had a core or winding failure in service.

We are flexible in our approach. Our transformers are designed to comply with our customers' needs and the appropriate standard, including AS2374, IEC 76, BS171 or ANSI/IEEE C57, as well as our own stringent design rules.

Long-term supply alliances can be of great benefit to companies in the power industry. Alliances ensure that our customers receive even more value from our decades of experience and technical knowledge. Supply alliances enable the participants to focus on performance and improvement and eliminate the costs associated with multiple contracting.

Fitting conservator oil preservation system

Stock of finished distribution transformers

Key performance indicators (KPIs) for measures such as quality, value and delivery performance demonstrate that we bring value to not just our alliance partners, but all our customers.

Our People

People remain Wilson's greatest strength. Our outstanding technical abilities rely on the collective knowledge and dedication of our people. Wilson staff are leaders in their fields, and include 20 professional engineers. Training, multi-skilling, and the recruitment of skilled personnel ensure that we continue to improve the competitiveness of our business. Wilson people go the extra distance.

Quality

Wilson built its reputation on quality and reliability — and we do whatever it takes to protect this hard-won record. Our Quality Management System has been accredited to AS/NZS ISO 9001 since 1990 and is an integral part of the operations of the business, aimed at achieving customer satisfaction, continuous improvement and the prevention of non-conformity. Maintaining a strict quality system, including requirements to protect the environment, also enables us to offer a comprehensive warranty on all our products.

Development and Continuous Improvement

Our production methods and procedures evolve continuously as we strive to improve every aspect of our operations, using techniques such as Kaizen Blitz with cross-functional teams to drive the continuous, rapid improvement process. This dynamic approach develops involvement and commitment to improvement.

100 MVA 220 kV power transformer

35 MVA 132 kV rapid response transformer

Georg cutting line

60 MVA 132 kV power transformer

Development and continuous improvement are assisted by extensive use of computer modelling, product testing, process re-engineering and collaboration with customers, suppliers, and organisations such as the Centre for Electric Power Engineering at Monash University.

One of Wilson's many strengths is conservative financial management.

We invest significant resources in information technology to facilitate Computer-Aided Engineering (CAE) and Enterprise Resources Planning (ERP). This enables engineering, logistics and manufacturing to operate with precision and improve the supply chain process.

Our world class facilities and dedicated personnel reinforce the commitment to meeting customers' needs and improving competitiveness.

Power Transformers

Our head office and power transformer manufacturing plant is located on a four-hectare site in Glen Waverley, 20 km east of Melbourne's CBD. Power transformers are designed and manufactured here, from 4 to 250 MVA at up to 362 kV — see page 6 for details.

Distribution Transformers and Compact Substations

Our plant at Wodonga, on the Victoria/New South Wales border, is a self-contained manufacturing operation using the latest technology and advanced manufacturing methods to produce standard and customised distribution transformers and compact substations from 100 to 4000 kVA — see page 10 for details.

Transformer Management

The Wilson Transformer DRMCC (Dynamic Rating, Monitoring, Control and Communications) system is an integrated microprocessor-based monitoring and control system for power transformers — see page 9 for details.

Service and Repair

Our dedicated service and repair unit offers a variety of services, including condition assessment and reporting, field service, rating increase, installation of plant life extension equipment and repairs — see page 15 for details.

Six Decades of Achievement

Jack Wilson founded Wilson Electrical Products in 1933. The "Chief", as he was known to most of his early employees, was a man of vision, with the ability to turn ideas into reality — a difficult task in those days, when technical experience, equipment and capital were limited. Despite these difficulties, the Company grew steadily — by reinvesting its profits in people, technology and assets — and moved to successively larger premises.

Today we are an international Company generating a significant proportion of our revenue from sales outside Australia. Wilson transformers are giving consistent, reliable service throughout the world — many units for more than 50 years.

Some of our major achievements and milestones include:

1933 Wilson Electric Products began manufacturing in South Melbourne.

1950 Building work began in Glen Waverley.

1960 First 10 MVA 132 kV transformer produced for Woomera.

1969 Large expansion to factory and offices at Glen Waverley.

1970 Robert Wilson joined the Company.

1970 First 3 x 33 MVA 220 kV transformer despatched.

1972 Jack Wilson, the Company's founder, died.

1979 Robert Wilson appointed Managing Director.

1981 Wodonga plant opened — highly commended in Victorian Engineering Excellence Awards.

1983 150 MVA 220 kV and 75 MVA 330 kV transformers produced.

1990 Quality accreditation to AS/NZS ISO 9001.

1993 Governor of Victoria Export Award Certificate of Commendation for Large Manufacturers.

1994 EPE Wilson Transformer Sdn Bhd joint venture factory in Malaysia opened.

1997 Winner of Austenergy Exporter of the Year Award for energy systems over $25m.

1998 240 MVA 275 kV transformers exported to Malaysia.

1998 Wodonga plant expanded and upgraded.

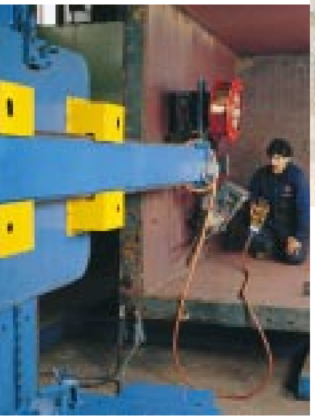
1998 Output for year from Australian operations exceeded 3000 MVA.

1998 UK office opened.

1999 First rapid response 35 MVA 132 kV trailer-mounted transformer despatched.

1999 New transformer DRMCC product launched.

Power Business Unit



Submerged arc welding

140 MVA 132 kV generator transformer

Wilson is recognised internationally as a manufacturer of superior power transformers, designed and manufactured to run reliably for many decades. Typical applications for our power transformers include power stations, transmission and distribution substations, large manufacturing plants, refineries and mines.

Mechanical design analysis

Power Products

We design and manufacture:

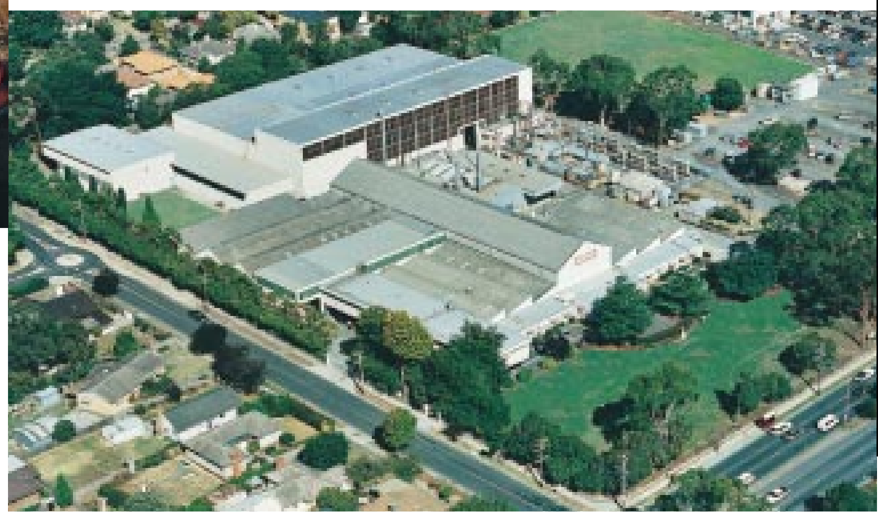
- generator, substation and auto transformers up to 250 MVA 362 kV
- mobile transformers and substations
- rectifier and furnace transformers
- traction transformers (both track-side and on-board locomotive)
- other specialty transformers.

Each transformer can be fitted with a conventional relay-based control and monitoring system or alternatively, with our Wilson Transformer DRMCC System (see page 9).

Engineering a Power Transformer

The electrical design is completed using software ranging from the tender optimisation program to sophisticated finite element modelling (FEM) computer programs. The programs optimise the design and calculate electrical impedance and losses, dielectric strength during impulse, induced and partial discharge tests and service conditions, short circuit withstand strength, cooling performance including winding hot spot temperatures and sound levels.

Our mechanical designers complete the internal and external design of a transformer.



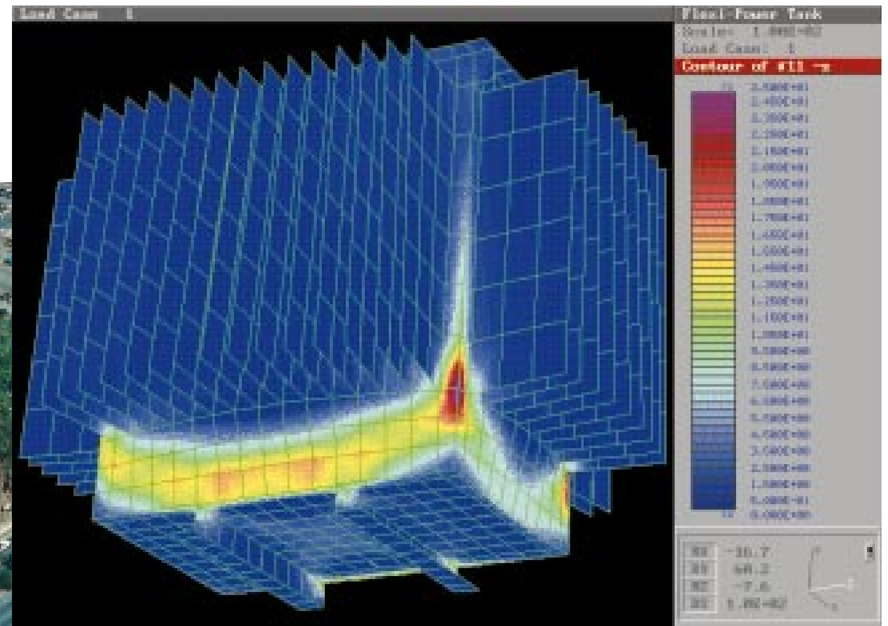
Glen Waverley power transformer plant

Issues addressed include clearances for test voltages, mechanical strength for lifting, short circuit strength, transport and earthquake conditions, vacuum and pressure withstand, transport and site mass and dimension constraints, and customer fitting requirements. 3D solid modelling, FEM of critical components and other linked programs are used to complete the mechanical design.

The oil preservation system is the key to long transformer life. Preventing entry of moisture and oxygen into the oil greatly reduces the insulation ageing and oil degradation process. The options we recommend for power transformers are:

- conservator with a silica gel drying breather
- synthetic rubber bag in a conservator to separate the air and oil for harsh conditions
- Dry-Keep™ system to maintain a transformer in a dry condition.

Standard protective devices include a Buchholz gas collection/oil surge relay, a pressure relief/resealing device, and oil and winding temperature indicators.



Finite element modelling

Other equipment can include current and voltage transformers, gas impulse relays, oil flow monitors (pumped units), remote oil level indicators, fibre optic temperature probes and dissolved gas-in-oil detection probes.

Voltage control is offered either by means of off-circuit tap selection or on-load tap-changing. We provide a wide range of paralleling control schemes to interface with existing schemes. Both local and/or remote control schemes can be provided with either manual and/or automatic operation.

All design work is done in accordance with our quality management system.

Winding former stand-up device

Power transformer core

Power winding

50 MVA rectifier transformers

Tanking a power transformer

Manufacturing a Power Transformer

The Glen Waverley plant incorporates two major workshop areas: one for the electrical operations of core cutting, insulation preparation, coil winding, control wiring, transformer assembly, processing and testing; and the other to handle the mechanical side, which includes fabrication, welding and painting.

Cores

Three phase cores are cut from high grade silicon steel and incorporate notched, mitred and step-lap designs with a cruciform leg profile. Completed cores are coated with epoxy resin to add strength and minimise vibration. Solid steel top and bottom frames support the core and windings. The resultant rugged structure has low loss, low magnetisation current and low sound level.

200 MVA 275 kV transformer under test

Windings

Coils are wound on modern coil-winding machines and normally incorporate single- and multi-layer helix, disc and series loop helical construction techniques.

The winding insulation structure is designed and constructed to principles proven by recurrent surge tests. Shielding, interstrand and partial and full interleaving techniques are used to control impulse voltages on higher voltage windings. Continuously transposed conductors are used where necessary to reduce eddy current losses in heavy current windings. Pressboard spacers, sometimes assisted by oil flow washers, maintain axial and radial cooling ducts.

1600 kV impulse generator

Before assembly onto the core, windings are pre-shrunk and compressed to their correct axial dimensions to ensure short circuit strength.

Tanks

Tanks are produced from heavy section structural steel plate to withstand full vacuum and the required pressure. Submerged arc is used for 90% of welding, enabling long runs, excellent penetration, leak-free welds and high mechanical strength. All transformer tanks are fully welded and leak tested. Power transformers are normally provided with bolted removable lids and appropriate hand hole access, although welded-on lids can be provided.

Surface Treatment

High performance external coating systems for tanks and metal components have been developed in collaboration with a leading paint manufacturer.

Our preferred colour is Storm Grey. The standard system is recommended for severe, long-term industrial/coastal-marine environments in accordance with AS/NZS 2312-1994.

Assembly and Processing

A dedicated structure facilitates short cycle assembly. Dry-out of the core and coil assembly is done in a vacuum chamber or the transformer tank. Computerised systems monitor, control and optimise the drying process. The core and coil assembly is then removed for lift lock and inspection before being replaced in the tank for further vacuum and oil impregnation. Assembly and processing are aided by 40 and 100 tonne cranes, high capacity vacuum equipment, and excellent oil processing equipment.

Coolers

Wilson's standard cooler bank is a pressed steel, bolt-on construction with a hot-dip galvanised finish.

Testing

All Wilson power transformers undergo comprehensive routine tests and appropriate type tests in accordance with the customer's requirements, the appropriate standards and Company procedures. Test equipment includes an impulse generator rated at 1.6 million volts 120 kJ for full and chopped wave impulse tests, partial discharge measurement equipment and precise digital instrumentation for accurate measurement of losses.

Installation and Commissioning

Complete installation and commissioning or site supervision only can be provided anywhere in the world. Unique design features reduce site installation time.

Transformer Management: Wilson DRMCC Products

Wilson's microprocessor-based Dynamic Rating, Monitoring, Control and Communications systems are mechanically robust, being built and tested to rugged design specifications for insulation strength, EMC capability and environmental temperature range, with self-testing and diagnosis capabilities.

Dynamic Rating allows users to work their assets harder by operating transformers safely closer to their thermal limits, thereby delaying capital investments.

Monitoring includes features such as data logging, event recording and trending. Condition monitoring features such as dissolved gas analysis, water in oil and insulation, bushing insulation and OLTC condition are being added. Improved ability to assess transformer condition will potentially lead to cost savings from reduced risk of failure even during emergency loading, and the use of condition-based maintenance.

Control capabilities extend beyond the conventional control, alarm and trip schemes. Intelligent cooler controls increase emergency loading capability by anticipating rises in oil and winding temperatures and switching on cooling earlier. Automatic voltage control now includes more options for parallel control and a wider choice of setting options.

Communication via serial data links allows monitoring and control, including verification and adjustment of settings if required, from remote control locations. Compatibility with most modern SCADA systems is assured by use of protocols such as Modbus, DNP and others.

Distribution Business Unit

315 kVA 22 kV pole-mounted transformer

We produce standard and customised distribution transformers and compact substations at our Wodonga plant from 100 kVA to 4000 kVA, at voltages up to 72 kV. Manufacturing at Wodonga is highly focussed on meeting and exceeding the needs of our customers. The plant operates as a well-tuned production facility and is a world class operation concentrating on supplying technically excellent, low total cost products, on short delivery, utilising our excellent capabilities in ERP and supply chain management.

Standard, Pre-Engineered and Customised Solutions

Our distribution products can be categorised as:

Standard products — normally produced to forecast demand, and often available ex-stock.

Wodonga distribution transformer plant

Pole-mounted transformers

Pre-engineered products — subject to availability of materials, can be manufactured and delivered on short lead times.

3500 kVA customised transformer

Customised products — custom engineered after order to meet customer needs and therefore subject to longer lead times.

Pole-Mounted Distribution Transformers

Wilson is pleased to offer advice on the selection, use and application issues of distribution transformers and compact substations.

Pole-mounted distribution transformers are manufactured to standard designs, primarily for power distribution companies.

Our standard range includes transformers from 100 kVA to 500 kVA, with primary voltages of 11, 22 and 33 kV. The standard range complies with the AEEMA/ESAA specification for 'Polemounting Distribution Transformers'. All the standard designs have been proven by type testing, including impulse, temperature rise, sound level and short circuit tests. Wilson pole-mounted distribution transformers share the following features:

- compact design
- sealed construction to prevent the entry of moisture
- overload capability in accordance with the standard
- pole hanging arrangements in accordance with the standard
- extended creepage HV bushings as standard
- standard galvanised tanks for rugged long life protection.

Ground-Mounted Distribution Transformers

Standard and pre-engineered designs are also available for ground-mounted distribution transformers. Three pre-engineered arrangements are available, with HV and LV terminals either in the lid, at opposite ends of the tank, or on

1000 kVA flexi-power transformer

one side of the tank. Features of Wilson ground-mounted distribution transformers include:

- compact design
- sealed construction to prevent the entry of moisture
- robust construction to suit transport to the most inaccessible locations
- fin cooling to minimise internal pressures and facilitate easy cleaning
- Wilson's standard proven surface treatment system of grit blasting, zinc-rich primer and polyester powder coating.

Low voltage sheet winding

Options available, depending on the type of transformer, include:

- cable boxes or screens to pre-vent access to the terminations
- wheels
- Automation 2000 DGPT protective device (gas, pressure, temperature)
- oil and winding temperature indicators
- pressure relief device
- over-pressure protection switch.

Compact Substations

Compact substations are widely used in areas where underground power reticulation is required, such as in residential, commercial and industrial developments. Compact substations fully enclose a transformer and HV and LV connections or switchgear, and are shipped to site fully assembled. A compact substation is a cost-effective and aesthetically pleasing solution.

Many standard and pre-engineered compact substation arrangements are available. All styles are fully rated in their enclosures, which are:

- in line kiosk (HV, transformer, LV) with oil containment
- in line kiosk (HV, transformer, LV) without oil containment
- pad mount style (HV and LV on one side of transformer) without oil containment.

1500 kVA compact kiosk substation

Enclosures vary depending on the application, but are made from mild steel, Galvabond, marine grade aluminium, stainless steel or fibre glass. Stainless steel and fibre glass are recommended to avoid corrosion and early maintenance costs. The base arrangement varies depending on the application and whether oil containment is required. Many

High voltage winding

HV and LV connection and switchgear arrangements are available and include:

- HV direct or loop connected with and without fusing on the transformer
- various types of air, oil and SF6 HV switchgear configurations
- LV direct connect
- fused LV boards with transformer isolators and DIN or BS fusing
- circuit breakers and/or or isolator boards for heavier current applications.

Other Products

A range of other special transformers are also manufactured at Wodonga, including:

- SWER isolating transformers
- rectifier transformers
- neutral earthing transformers
- precipitator transformers
- motor starting transformers
- high fire point liquid filled transformers.

Development and Engineering

We aim to develop, manufacture and supply technically excellent solutions which offer exceptional value to our customers and provide a competitive edge in our markets. Engineers committed to product development work closely with our customers, suppliers and manufacturing to develop optimum solutions.

Compact substation fit-out

Corrugated wall manufacture and welding

Design

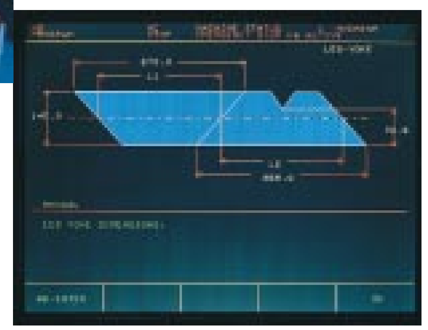
Wilson distribution transformers are manufactured with rectangular, step-lap, fully notched and mitred cores. In most cases, LV windings are made with sheet aluminium and HV windings are layer wound with enamel-coated conductors. Insulation throughout is double-sided diamond dot coated. This arrangement, when cured and combined with a suitable clamping structure, results in a very strong, short-circuit proof distribution transformer.

The core and coil assembly is integrated into a fin-cooled tank in the most economical manner to provide appropriate interface connections to the customer's system.

Computerised Engineering

We have developed powerful computer programs to optimise the electrical and mechanical design, based upon the customer's loss costs. Our standard products have also been electronically defined to enable improvements to be implemented rapidly across the full product range.

Core building



Core lamination shape

Oil Preservation

The design philosophy used in Wilson distribution transformers is to seal the transformer from the external environment, thereby preventing the entry of moisture and air. Extensive development testing has determined the acceptable safe pressure in transformer tanks under full load and overload conditions.

Compact Substations

Our range of kiosk substations and padmounted substations is continuing to evolve to meet the changing needs of our customers. We offer low cost, reliable solutions which retain a degree of flexibility.

In-Service Performance

Wilson distribution transformers and compact substations continue to give reliable service, in some cases for more than 50 years. The current range and evolving products are a further enhancement of earlier designs.

Tanking and test line

Manufacturing

The Wodonga plant was extensively upgraded in 1998 and now incorporates one-direction external transport around the site, and extensive storage capability for finished products. We can now:

- provide extensive storage for stock transformers, thereby almost eliminating the need for customers' transformer stores

MIG tank welding

Compact substation fit-out

- use our ERP/MRPII systems and forecasting from customers to replenish stock at short notice
- provide reliable on time deliveries of products to our customers.

Internal assembly line

Our upgraded Wodonga and component manufacturing facilities now incorporate the following:

- air conditioning and humidity control where internal transformer components are stored and processed
- a separate enhanced mechanical bay
- an enhanced tanking, testing, finishing and compact substation assembly bay
- extensive use of conveyor lines and dedicated material handling equipment
- high capability and accurate PLC-controlled LV and HV winding machines
- pressing and DC curing of windings before assembly
- high speed accurate GEORG core cutting facilities
- low frequency vacuum dryout for all transformers
- CNC-controlled metal processing equipment
- PLC-controlled press brake for tank and substation enclosure parts folding
- PLC-controlled fin folding and plasma welding equipment
- dedicated work stations for tank welding and testing
- proven grit blasting, zinc-rich primer and powder coating facilities
- filtering, dehydrating and de-gassing oil immediately before transformer filling
- filling all transformers under vacuum to maintain consistent quality
- two well equipped test facilities
- excellent office and training facilities for employees.

Low frequency drying chambers

Service and Repair

Transformers are our business. Consequently, we specialise in the management and service of transformers from design and manufacture, right through service life. Our focus is on innovative approaches to maintenance that minimise future maintenance costs, and optimise transformer life. To reinforce this focus, we have developed products and formed partnerships to provide specialist services, including:

- new transformer installation and commissioning
- transformer removal and relocation
- testing
- condition assessment and reporting
- field service
- refurbishment

Refurbishing OLTC

Re-processing old transformer

- repair
- rating upgrade — design, supply and installation of fans, radiators, etc
- replacement of windings, OLTCs, bushings and other major components
- OLTC service, maintenance or replacement including motor drives, filter and control systems
- supply and installation of the Wilson DRMCC system.

In recent years we have provided these services to customers in all Australian states, Indonesia, Malaysia, New Zealand, People's Republic of China, and the United Kingdom.

To broaden our product base and enhance customer services, we have formed alliances for the provision of comprehensive condition management and condition assessment services.

These include:

- Dry-Keep™ transformer drying system — on line, low maintenance and reclaimable moisture control, reducing and maintaining moisture in insulation at 1% and moisture in oil at 10 ppm.
- Conservator oil preservation systems (COPS) — to isolate your transformer from the damaging influence of moisture and oxygen.
- Diagnostic services in partnership with TJ/H_2b for transformers, circuit breakers and on-load tap changers.
- Tailored, efficient and economic transformer service arrangements. We are at your service.

Site refurbishment and upgrade

Wilson Transformer Company Pty Ltd
ACN 004 216 979

Head Office, Sales, Service and Power Transformer Manufacturing:

Wilson Road, Glen Waverley
(PO Box 5, Glen Waverley)
Victoria 3150 Australia

Telephone: +61 3 9560 0411

Facsimile:
- Sales & General: +61 3 9560 0599
- Service: +61 3 9560 0793
- Corporate: +61 3 9560 0499

E-mail: sales@wtc.com.au

Web site: www.wtc.com.au

After hours toll free telephone support
1800 815 815

Distribution Transformer Manufacturing:

10 Maloney Drive, Wodonga
Victoria 3690 Australia

Telephone: +61 2 6024 5944

Facsimile: +61 2 6024 7981