SPI PowerNet Pty Ltd

Electricity Transmission Revenue Proposal 2014/15 – 2016/17

28 February 2013

SP AusNet
A member of Singapore Power Group

About SP AusNet

SP AusNet is a major energy network business that owns and operates key regulated electricity transmission and electricity and gas distribution assets located in Victoria, Australia. These assets include:

- A 6,574 kilometre electricity transmission network that services all electricity consumers across Victoria;
- An electricity distribution network delivering electricity to approximately 620,000 customer connection points in an area of more than 80,000 square kilometres of eastern Victoria; and
- A gas distribution network delivering gas to approximately 572,000 customer supply points in an area of more than 60,000 square kilometres in central and western Victoria.

SP AusNet's purpose is 'to provide our customers with superior network and energy solutions.' The SP AusNet company values are:

- Safety: to work together safely. Protect and respect our community and our people.
- Passion: to bring energy and excitement to what we do. Be innovative by continually applying creative solutions to problems.
- Teamwork: to support, respect and trust each other. Continually learn and share ideas and knowledge.
- Integrity: to act with honesty and to practise the highest ethical standards.
- Excellence: to take pride and ownership in what we do. Deliver results and continually strive for the highest quality.

For more information visit: www.sp-ausnet.com.au

Contact

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Glossary

Abbreviation	Full Name
AARR	Aggregate Annual Revenue Requirement
ACG	Allen Consulting Group
AEMO	Australian Energy Market Operator
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
AIS	Availability Incentive Scheme
AIS	Air-insulated Switchgear
AMI	Advanced Metering Infrastructure
AMS	Asset Management Strategy
APD	Alcoa Portland Smelter
ASRR	Annual Service Revenue Requirement
ATS	Altona Terminal Station
AWOTE	Average Weekly Ordinary Time Earnings
B2B	Business to Business
BLTS	Brooklyn Terminal Station
Capex	Capital Expenditure
CAM	Cost Allocation Methodology
CBs	Circuit Breakers
CBD	Central Business District
CTs	Current Transformers
CUAC	Consumer Utilities Advocacy Centre
CVT	Capacitive Voltage Transformers
DBs	Distribution Businesses

Abbreviation	Full Name
DGA	Dissolved Gas Analysis
DIs	Dispatch Intervals
DRP	Debt Risk Premium
EAI	Enterprise Asset Integration
EAM	Enterprise Asset and Works Management
EBSS	Efficiency Benefit Sharing Scheme
EDPR	Electricity Distribution Price Review
EGW	Electricity, Gas and Water
EGWWS	Electricity, Gas, Water and Waste Services
EHV	Extra High Voltage
ELT	Easement Land Tax
EMFs	Electric and Magnetic Fields
EMS	Energy Management System
EPA	Environment Protection Authority
EPM	Enterprise Project Management
ERP	Enterprise Resource Planning Platform
ESAA	Energy Supply Association of Australia
ESC	Essential Services Commission
ESMS	Electricity Safety Management Scheme
ESV	Energy Safe Victoria
EUAA	Energy Users Association of Australia
EURCC	Energy Users' Rule Change Committee
FBTS	Fisherman's Bend Terminal Station
FMECA	Failure Mode Effect Criticality Analysis
FTE	Full-Time Equivalent

Abbreviation	Full Name
GAAR	Gas Access Arrangements Review
GIS	Gas-insulated Switchgear
GRC	Governance, Risk and Compliance
GST	Goods and Services Tax
GTS	Geelong Terminal Station
GWh	Gigawatt Hours
HTS	Heatherton Terminal Station
HOTS	Horsham Terminal Station
HR	Human Resources
HWPS	Hazelwood Power Station
HWTS	Hazelwood Terminal Station
HYTS	Heywood Terminal Station
ICT	Information and Communication Technology
IT	Information Technology
ITIL	Information Technology Infrastructure Library
ITOMS	International Transmission Operations and Maintenance Study
KTS	Keilor Terminal Station
kV	Kilovolt
LIDAR	Light Detection and Ranging
LPI	Labour Price Index
MAR	Maximum Allowed Revenue
MIC	Market Impact Component
MLTS	Moorabool Terminal Station
MMS	Market Management System
MRP	Market Risk Premium

Abbreviation	Full Name
MWh	Megawatt Hours
MVA	Megavolt ampere
NCIPAP	Network Capability Incentive Parameter Action Plan
NEL	National Electricity Law
NEM	National Electricity Market
NEO	National Electricity Objective
NER	National Electricity Rule
NOS	Network Outage Schedule
NPSD	Newport Power Station
NPV	Net Present Value
OH&S	Occupational Health and Safety
Opex	Operating and Maintenance Expenditure
OPGW	Optic Fibre Ground Wire
PAS	Publicly Available Specification
PC	Productivity Commission
PCRs	Protection and Control Requirements
PMO	Program Management Office
PTRM	Post-Tax Revenue Model
PV	Present Value
PwC	PriceWaterhouseCoopers
RAB	Regulated Asset Base
RCM	Reliability Centred Maintenance
RIFR	Recordable Injury Frequency Rate
RFM	Roll Forward Model
RIT-T	Regulatory Investment Test for Transmission

Abbreviation	Full Name
RTS	Richmond Terminal Station
RTU	Remote Terminal Unit
RWTS	Ringwood Terminal Station
SCADA	Supervisory Control and Data Acquisition
SCER	Standing Council on Energy and Resources
SF_6	Sulphur Hexafluoride
SKM	Sinclair Knight Mertz
SMTS	South Morang Terminal Station
SPIMS	SPI Management Services
STPIS	Service Target Performance Incentive Scheme
SVTS	Springvale Terminal Station
SYTS	Sydenham Terminal Station
TNSPs	Transmission Network Service Providers
TRR	Transmission Revenue Reset
TSTS	Templestowe Terminal Station
TTS	Thomastown Terminal Station
TUOS	Transmission Use of System
VCR	Value of Customer Reliability
YPS	Yallourn Power Station
VPX	Victorian Power Exchange
VTs	Voltage Transformers
WACC	Weighted Average Cost of Capital
WARL	Weighted Average Remaining Life
WOTS	Wodonga Terminal Station
WMTS	West Melbourne Terminal Station

Abbreviation	Full Name
WS	Waste Services
WSN	Wireless Sensor Network

Executive Summary

Highlights

Providing Victorian customers with efficient and low cost transmission services	This Revenue Proposal, if approved, will provide efficient transmission network services in Victoria and good value to customers in the NEM, per unit of energy transmitted. The expectations of customers will be met by maintaining high levels of reliability and delivering real price cuts.
Targeted asset replacement based on asset condition and an evaluation of the expected cost of failure and risk, rather than age.	The forecast capital investment in the transmission system is driven largely by the need to replace assets that pose a risk of failure where the potential cost resulting from that failure exceeds the cost to replace them. Investment decisions are based on rigorous asset management, which analyses asset condition and risk of failure, and economically evaluates the impact of asset failure on customers, safety and environment. The resulting capital investment is efficient, providing a safe, reliable and secure network for customers that comply with statutory and other regulatory obligations.
Increased capex due to major terminal station redevelopments	SP AusNet is proposing an increase in capex levels to deliver the redevelopment of Richmond and West Melbourne Terminal Stations (the CBD Rebuilds). These are critical committed projects to secure supply to the CBD and inner Melbourne and are underway. These projects comprise one third of the 3 year capital program.
Lower rate of return	The proposal forecasts a significantly lower rate of return than currently applies, consistent with changed market conditions. The nominal vanilla WACC applied is 7.19% (post-tax real WACC of 4.09%).
Service standards reforms	SP AusNet strongly supports incentive-based regulation and has formulated service targets and parameters in response to the AER's new incentive scheme which places emphasis on unplanned outages, the impact of service interruption to the wholesale market, and maximising network capability. The proposal sets appropriate targets for further service performance improvements and efficient market outcomes.

SP AusNet's Revenue Proposal

SP AusNet owns and operates the Victorian electricity transmission network. The network is a key strategic asset servicing the Victorian economy and the National Electricity Market (NEM). The network, at more than 6,500 kilometres, serves in excess of 2.2 million households and businesses transferring over 48 million megawatt hours of energy annually.

Under the Victorian transmission planning and procurement arrangements, SP AusNet is responsible for planning and investing in asset replacement, and the Australian Energy Market Operator (AEMO) is responsible for planning and procuring network augmentations (expansions). As such, the capital expenditure forecasts in this Revenue Proposal only relate to asset replacement.

This is SP AusNet's Transmission Revenue Proposal for 1 April 2014 to 31 March 17[1], consistent with National Electricity Rule (NER) 11.59.3(b) which requires SP AusNet to be subject to a three year regulatory control period.

This document is SP AusNet's Transmission Revenue Proposal and accordingly, throughout this document, references to SP AusNet are to SP AusNet's transmission network business, as owned and operated by SPI PowerNet, unless expressly stated to the contrary.

SP AusNet's Revenue Proposal forecasts:

- Real price reductions;
- Network reliability meeting customers' expectations; and
- Targeted capital investment to maintain network condition.

A key consideration in the development of this Revenue Proposal has been to minimise the contribution of network charges to electricity prices and the wider cost of living. While customers continue to have high expectations of continuous electricity supply, there is now a strong emphasis on network businesses demonstrating service value through efficient asset management and long-run lowest cost solutions. SP AusNet has developed a proposal which balances the reliable and safe supply of electricity, the risks associated with asset failure and cost impacts to customers.

Investment in the transmission system continues to be driven largely by the need to replace assets which are in poor condition to stabilise the total level of risk resulting from asset failure. Risks such as supply outage and injury have been assessed for each major asset based on the probability of asset failure. Rigorous asset replacement planning – based on economic evaluation – is used to ensure the efficient timing of network investment. SP AusNet's prudent investment decision-making practices are supported by a robust project governance framework which incorporates continuous improvement to ensure projects are delivered at efficient cost.

Two major terminal station developments at Richmond and West Melbourne carry over from the current period. These major projects are significant in nature due to the magnitude of investment required and their crucial role in servicing metropolitan Melbourne. The projects have already commenced and must be delivered in response to customer growth and security of supply priorities.

The Revenue Proposal includes capital expenditure which totals $575 million (real 2013-14) over the three-year period, of which over one third is for the Richmond and West Melbourne terminal station redevelopments.

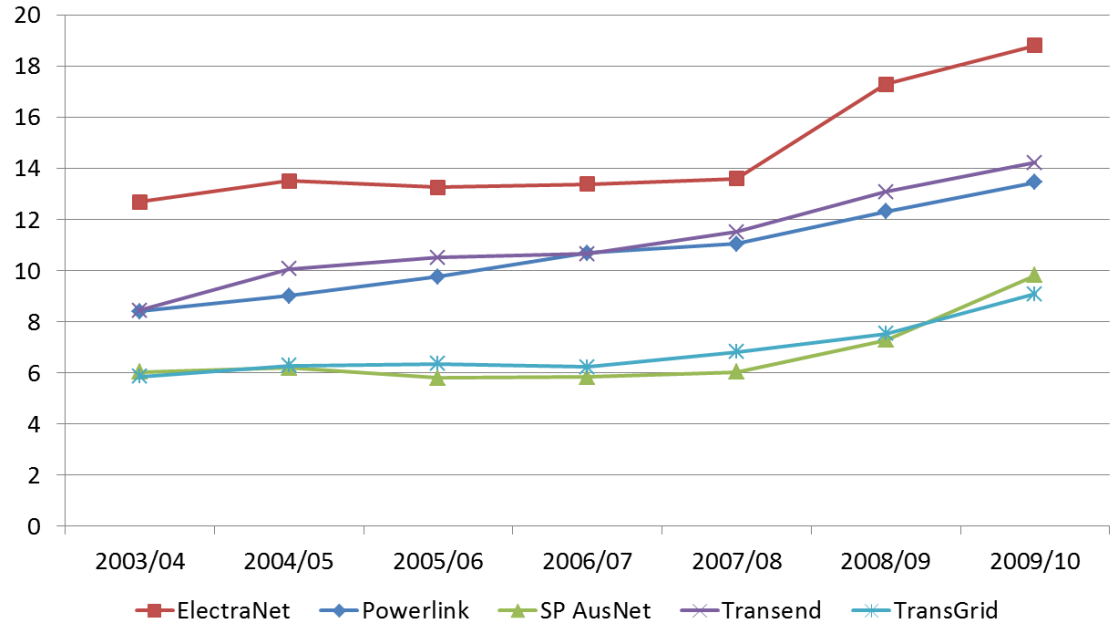
[1] For the remainder of this document, this period is referred to as the forthcoming, next or forecast regulatory period, and is shortened to 2014-17.

Despite the significant amount of capital expenditure forecast, the overall Revenue Proposal results in modest price decreases over the 2014-17 regulatory control period, largely due to a low rate of return forecast.

The Revenue Proposal is efficient and consistent with delivering appropriate compliance and service outcomes, ensuring that the operation and maintenance of SP AusNet's transmission system contributes to the achievement of the National Electricity Objective (NEO).

SP AusNet's historic level of revenues against energy transmitted through the network is illustrated in the chart below. It shows that SP AusNet has maintained, along with TransGrid, the lowest revenues per unit of electricity transmitted in the NEM.

Figure ES1: Revenues ($m) per MWh energy transmitted



Source: AER Regulatory Report 2009-10.

Notes –

(1) AER data is based on energy transmitted.

(2) From 2008/09 the above revenue for SP AusNet includes the Victorian easement land tax.

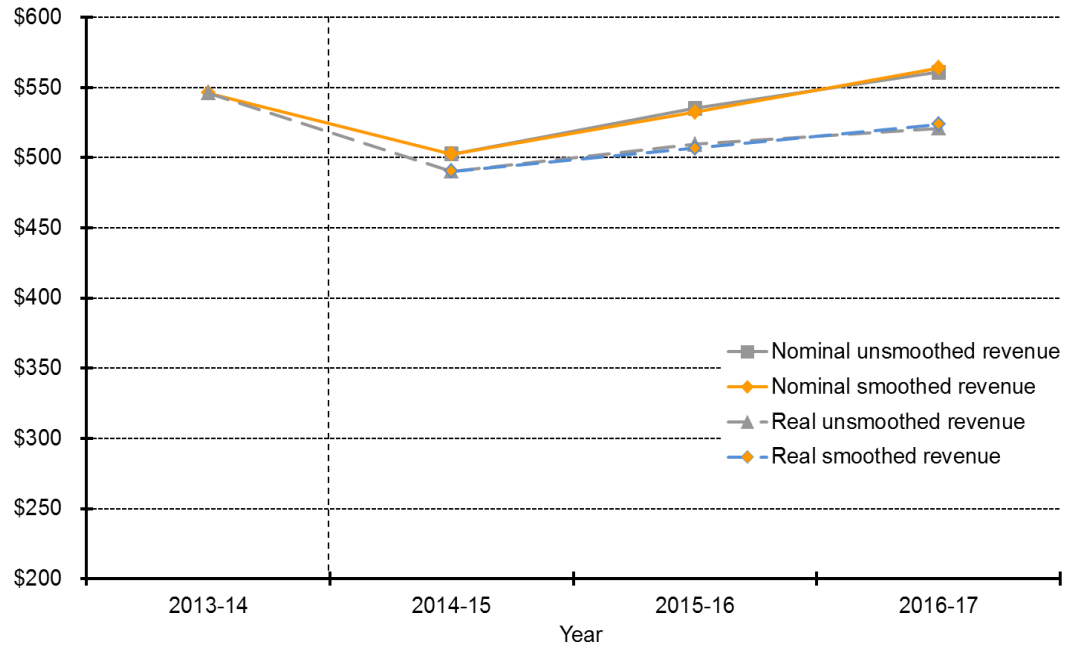
This proposal, which forecasts revenues falling at the start of the next period from current levels, would continue the historic trend.

Forecast Revenues and Prices

This proposal if approved will deliver real price reductions over the forthcoming period and continue to provide Victorian customers with current levels of network reliability and performance.

The forecast revenue path will see real smoothed revenues fall marginally initially and then stay relatively flat throughout the forthcoming regulatory control period, as illustrated in Figure ES2.

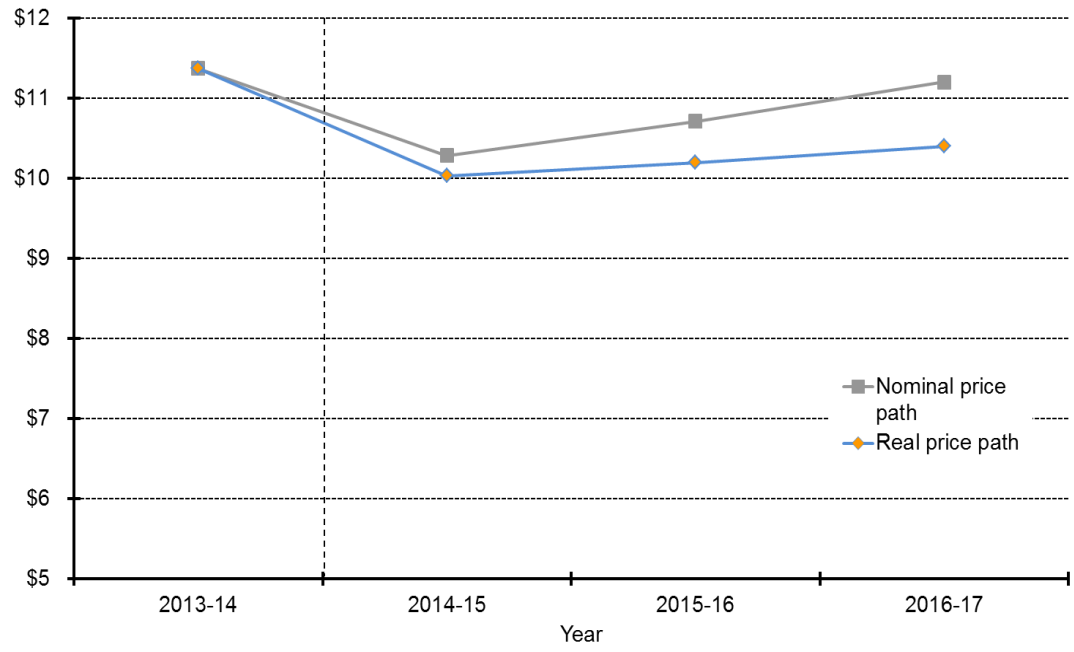
Figure ES2: Forecast revenue path ($m)



Source: SP AusNet PTRM

Figure ES3 illustrates the forecast price impacts of the Revenue Proposal. The Proposal forecasts prices falling by 11.8% at the start of the forthcoming regulatory control period, and increasing by 1.6% and 2.0% in the following years.

Figure ES3: Forecast Price Path ($/MWh)



Source: SP AusNet PTRM

Meeting Customer Needs with Efficient Network Services

The purpose of this proposal is to allow SP AusNet to continue to provide transmission services in an efficient, safe, reliable and secure manner for its customers and the NEM, thus contributing to the achievement of the NEO, while complying with applicable statutory and regulatory obligations (such as safety and environmental legislation).

The Revenue Proposal maintains current network performance and reliability which, following completed customer consultation, SP AusNet considers best meet the needs of customers.

SP AusNet's Asset Management Strategy (AMS) supports the delivery of the following key outcomes for the customers of the Victorian Transmission Network:

- maintaining a stable and sustainable network asset failure risk profile to ensure the maintenance of supply reliability in accordance with customers' needs and preferences;
- meeting operational performance targets for network reliability and availability;
- complying with occupational health and safety (OH&S), environmental and security legislation, codes and regulations and with operational codes and regulations; and
- optimising total capital, operating and maintenance costs over the asset life cycle.

As indicated above, this strategy has been rigorously analysed and tested to ensure that it is consistent with the achievement of the NEO. This involves a balancing of risk, cost and performance, and this proposal delivers the optimal balance of all three.

To produce these outcomes, the AMS explains how SP AusNet will manage its most significant challenge in controlling risk and maintaining performance levels – poor condition assets which carry a high risk of failure and high cost of failure consequence. SP AusNet monitors the condition of key assets and the AMS highlights the assets that require replacement before failures occur based on a rigorous risk and asset condition assessment process. Modelling of failure risk is used to identify replacement requirements in order to limit asset failure risk to within an economic band. This modelling supports continued investment for the replacement of assets in the forthcoming regulatory control period.

SP AusNet's quality asset management processes enable the company to perform well in terms of capital expenditure delivery and operational efficiency. The efficiency and robustness of the company's AMS and related systems and processes have been confirmed by an independent audit leading to SP AusNet's certification against the international standard Publicly Available Specification (PAS) 55 which sets the benchmark for asset management practice. SP AusNet is the only energy network business to be accredited in Australia.

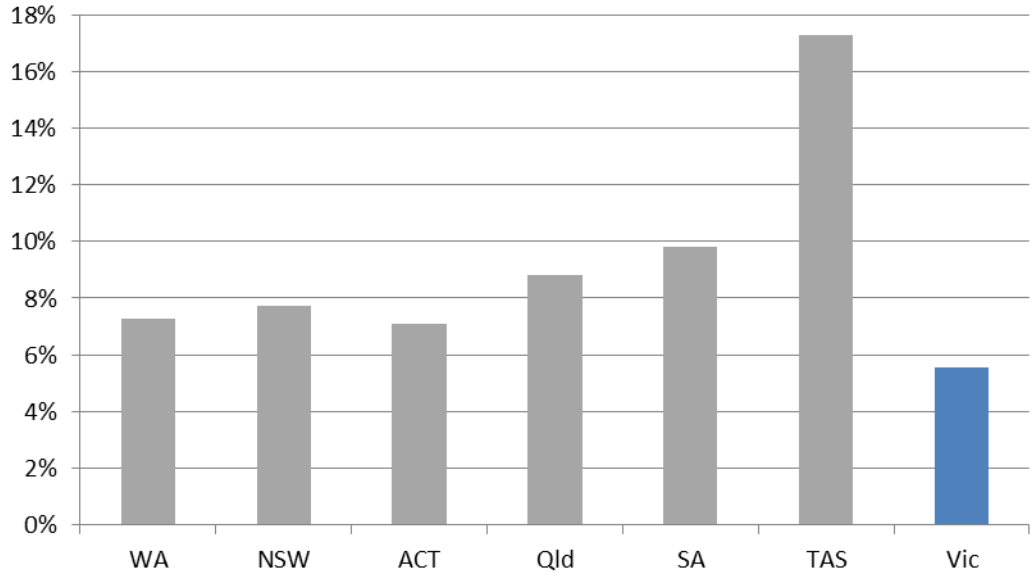
SP AusNet's asset management practice has enabled the company to deliver its prioritised capital program over the 2008-14 regulatory control period at 13% less than the allowance set at the last revenue determination. As this avoided capital expenditure will not now roll into the regulated asset base (RAB), customers will face lower prices than if SP AusNet had spent to, or over, the allowance.

Over the current regulatory period (2008-14), SP AusNet will have invested $789 million (real) to maintain the transmission network's performance at the high levels required. This continued the increased level of investment that began in the 2002-07 regulatory period.

While significant investment has been made, SP AusNet's transmission network services are expected to continue to deliver sound value to customers. The figure below, based on data

compiled by the AEMC, shows that in 2010/11 the transmission component of the average residential user's bill was lowest in Victoria (about 5.5%).[2]

Figure ES4: 2010/11 Transmission Component of Average Residential Bill



Source: AEMC, Final Report Possible Future Retail Electricity Price Movements: 1 July 2011 to 30 June 2014, November 2011.

Note – Values are in nominal dollars, exclude GST and are based on the average annual consumption in each jurisdiction across the distribution areas. See AEMC Report for methodology used to derive values.

SP AusNet estimates that transmission costs currently form approximately 4% of a typical Victorian residential end users' annual bill.

SP AusNet expects this Proposal to maintain Victorian transmission costs as the lowest transmission component of a typical end user's bill in the NEM. It is forecast that the transmission component of a typical residential user's $1,300 bill will fall (in real terms) from 4% ($52) to 3.5% ($46) in 2014/15 and remain at that level over the forecast period.

The effects on commercial and industrial customers' bills are difficult to estimate as they are highly dependent on a business's individual consumption patterns and the distribution area in which they are located. Nonetheless, SP AusNet has calculated some high level estimates of the range of expected savings for particular types of commercial and industrial customers using information from its associated electricity distribution company.

- Small to medium commercial customers (with annual consumption up to a maximum of 400MWh) could expect annual savings in the range of $30 to $100;
- Large industrial customers (with annual consumption greater than 400MWh) could expect to see annual savings in the range of $1000 to $9000; and
- The largest industrial customers (a class with average annual consumption of 12GWh) connected to the high voltage and extra high voltage systems could expect to see annual savings up to $300,000 (although savings of $20-60,000 would be more typical).

The above are indicative of the transmission component of a bill only and should not be taken as representing a realised saving for any individual customer as retail and distribution charges will also change from year to year.

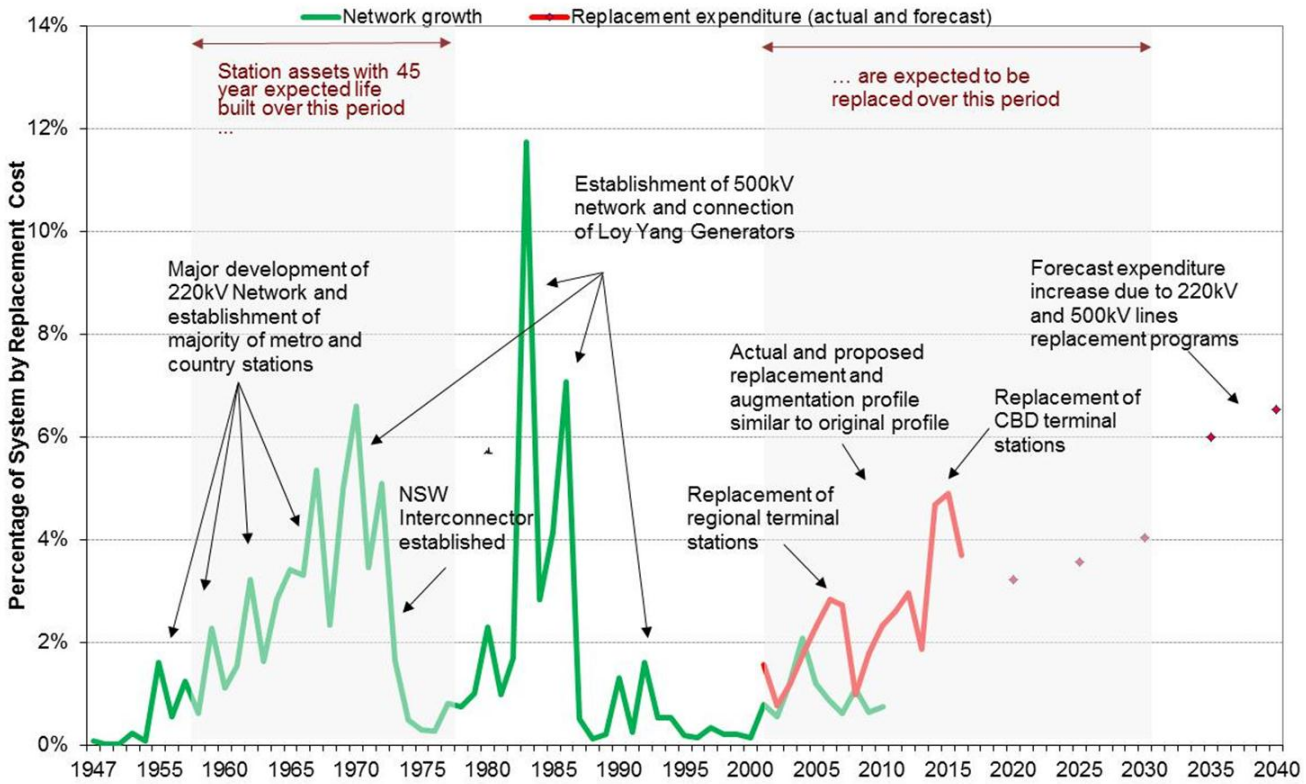
[2] AEMC, Final Report Possible Future Retail Electricity Price Movements: 1 July 2011 to 30 June 2014, November 2011.

Capital Expenditure Requirements

The capital expenditure program is aimed at ensuring the ongoing maintenance of network reliability and service in accordance with customers' needs, whilst minimising the total life cycle cost of service. In other words, it represents an optimal balance of the costs of asset replacement and maintenance on one hand, and the risk and costs of deteriorating reliability and asset performance on the other. Compromising on any one of these elements will undermine the capability of SP AusNet's transmission system to contribute to the achievement of the NEO.

The proposed capital expenditure builds on the successfully completed capex program for the current regulatory control period and is consistent with the company's previous statements which foreshadowed the need for increasing levels of capital expenditure in future regulatory control periods consistent with the historical system development profile. Figure ES5 highlights the increasing need for the replacement of aged and unreliable assets based on the initial service dates of the key transmission stations and lines that make up the Victorian transmission network.

Figure ES5: Relationship between System Development and Replacement



Source: SP AusNet

Note – The period before 2000 refers to all investment, including network augmentations, while the period post-2000 includes all non-contestable augmentations, but excludes the value of contestable augmentations which are not made public.

A total of $575 million (real 2013-14) in capex is forecast for the forthcoming regulatory control period. Nearly one third (32%) of the capital expenditure proposal is the redevelopment of Richmond and West Melbourne Terminal Stations (the CBD Rebuilds), forecast to cost $186 million in the next period. These projects are critical to securing supply to the CBD and inner Melbourne. Moreover, the expenditure for these projects is committed and the projects have commenced. Consistent with the lumpy nature of transmission investment, the CBD Rebuilds are particularly significant to the overall capital works program due to a number of factors:

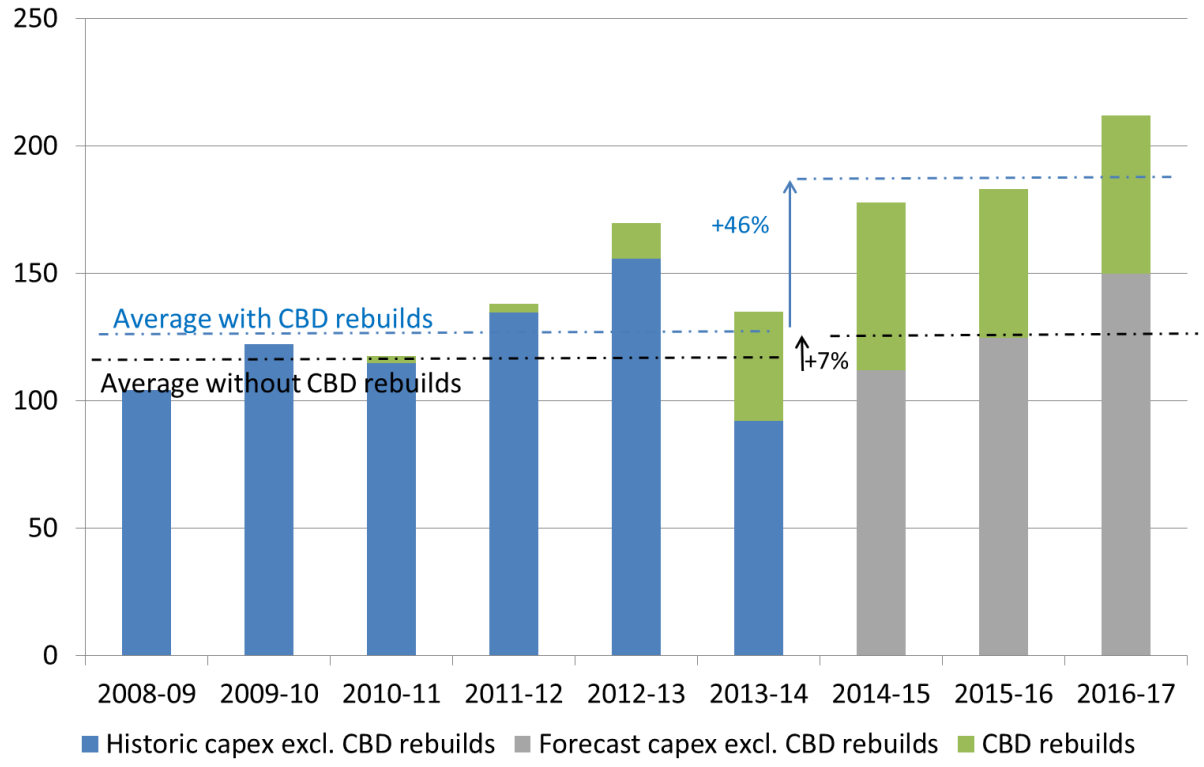
- the magnitude of the load at risk and the critical roles these assets play in the wider network;
- the confined space at these sites and their location in the inner city (originally industrial now residential) means that like for like replacement is not possible and makes these projects highly complex;
- the magnitude of the required investment; and
- the coincidence in timing.

The timing of the CBD Rebuilds is consistent with their original construction in the 1960s and the overall development of the Victorian transmission network illustrated in the figure above.

The significance of these projects does not mean risks on other parts of the network can go ignored. SP AusNet is currently in the phase of the network's life cycle which sees capital requirements increasing as major terminal stations need to be redeveloped and key plant replaced.

The following figure shows the forecast and the proposed overall increase in capex from current period with the CBD Rebuilds highlighted.

Figure ES6: Capital Expenditure 2014-17 ($m, real 2013-14)



Source: SP AusNet

Note – as incurred

The above perspective shows a 46% increase in capex from the historical average. When the CBD Rebuilds are excluded from the comparison, the forecast is a 7% increase from the historical average. The timing of the CBD Rebuilds and the three-year regulatory control period serves to illustrate the highly lumpy nature of transmission capital expenditure requirements.

Other factors maintaining upward pressure on capex requirements are:

- an increase in the volume of assets in poor condition (consistent with the age profile of SP AusNet's asset stock) which gives rise to an increase in asset replacement expenditure requirements;
- continued investment in transformer replacements over the period; and
- independent expert forecasts of real cost increases in labour, materials and equipment.

The remaining major stations projects and asset replacement programs are strategically targeted at addressing critical areas of reliability and safety risk on the network, under SP AusNet's condition-based replacement approach.

The forecast capex program is expected to result in the stabilisation of risk resulting from asset failure. Risks such as supply outage and injury have been assessed for each major asset based on the probability of asset failure. The sum of these risks reduces marginally over the forecast period. This is driven by the replacement of transformers at Richmond and West Melbourne Terminal Stations and other high-risk assets such as oil-filled circuit breakers. This reduction is offset by an increase in the risk related to transmission lines.

In the current regulatory period, SP AusNet has delivered improvements in its capital project management capability and governance, which has resulted in efficiency gains. An achieved efficiency gain of 1.44% has been quantified by comparing actual capex costs against planning estimates at the portfolio level. SP AusNet's overall capex forecast for the forthcoming regulatory control period incorporates this achieved efficiency saving. In effect, SP AusNet is passing on the achieved efficiency savings to customers in accordance with the incentives provided by the regulatory framework.

In the longer term, and against a backdrop of an ageing asset base, it is expected that SP AusNet will continue to require capex at the forecast level or higher over the coming decades. This is largely driven by expected replacements in lines and major stations projects, consistent with the overall transmission system life cycle shown in Figure ES5.

Operating Expenditure Requirements

SP AusNet has delivered efficiency savings during the current regulatory control period, which will flow to consumers during the forthcoming period. SP AusNet's operating expenditure (opex) from the current regulatory control period averaged 3% below the AER benchmark. The underspend largely stems from reduced expenditure in asset works where a number of projects have been incorporated into capital works to deliver efficiencies, or delivered at lower cost than expected, re-scoped or re-prioritised. The efficiency savings achieved have been more modest than in the previous period as those were driven by one-off synergy benefits from the merger of SP AusNet's transmission and distribution businesses in 2005.

While a reduction in non-recurrent operating costs will result in SP AusNet underspending the overall regulatory allowance, unexpected cost increases have been experienced in recurrent costs associated with routine maintenance, consistent with an ageing asset base which requires more work to monitor, operate and maintain. This trend is forecast to continue, with increasing costs expected in network operation, condition monitoring, IT, insurance and labour. Independent expert evidence is provided to support labour cost increases.

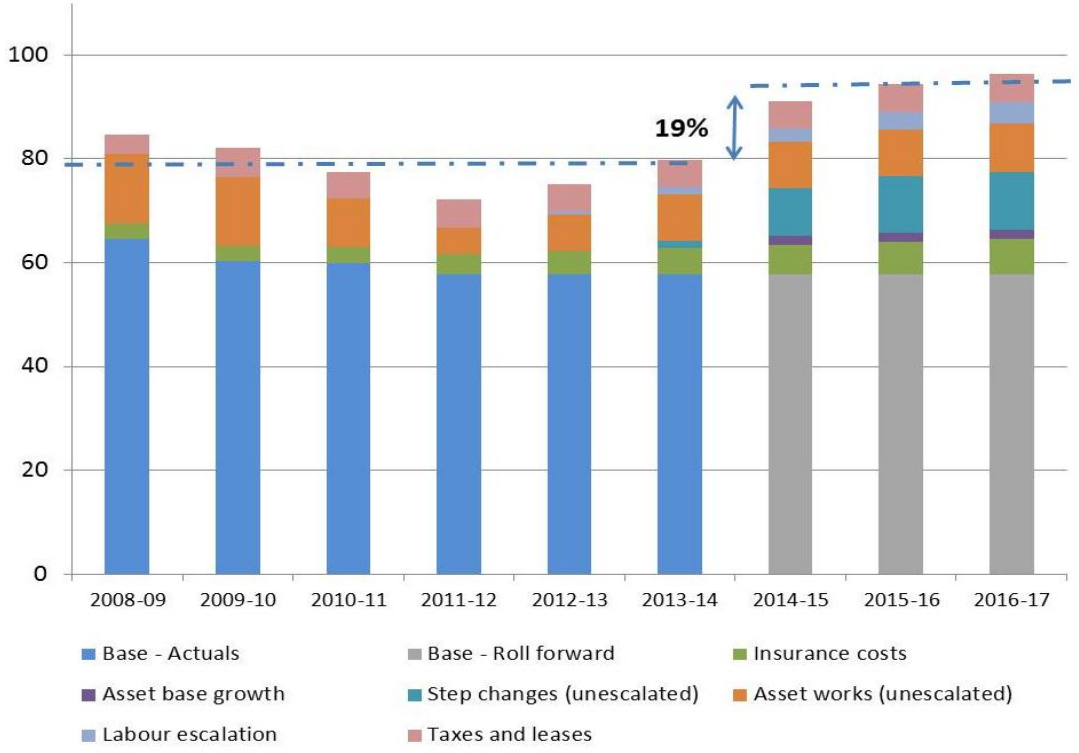
SP AusNet is forecasting a total of $658 million (real 2013-14) for operating and maintenance expenditure over the forthcoming regulatory control period. Of this total opex forecast, 46% is the expected cost of the Victorian Easement Land Tax which is a state levy passed through electricity transmission charges.

Controllable operating costs form approximately half of the total opex forecast. A range of step changes driven by new regulatory requirements and obligations, an ageing asset base and linked capex projects are included in the opex proposal. Base opex has been escalated by forecast growth in the price of skilled labour in the energy and construction industry which is expected to remain above inflation.

In addition to routine opex, a number of asset works have been identified as necessary in the forthcoming period. SP AusNet has been careful to test, analyse and ensure that these asset works are necessary to the delivery of safe, secure and reliable electricity supply, thus contributing to the achievement of the NEO. As these asset works are not recurrent in nature, they cannot be benchmarked against the previous period, and have therefore been costed using a "bottom-up" approach.

In light of the cost drivers outlined, expenditure for the forthcoming regulatory control period, while efficient, is expected to increase by 19% in real terms. Figure ES7 illustrates the controllable opex profile over the current and future regulatory control period.

Figure ES7: Total Controllable Operating Expenditure 2014-17 ($m, real 2013-14)



Source: SP AusNet

Note – Actual to 2011-12, forecast to 2016/17, excluding self-insurance, easement tax, debt and equity raising costs, and incentive scheme payments.

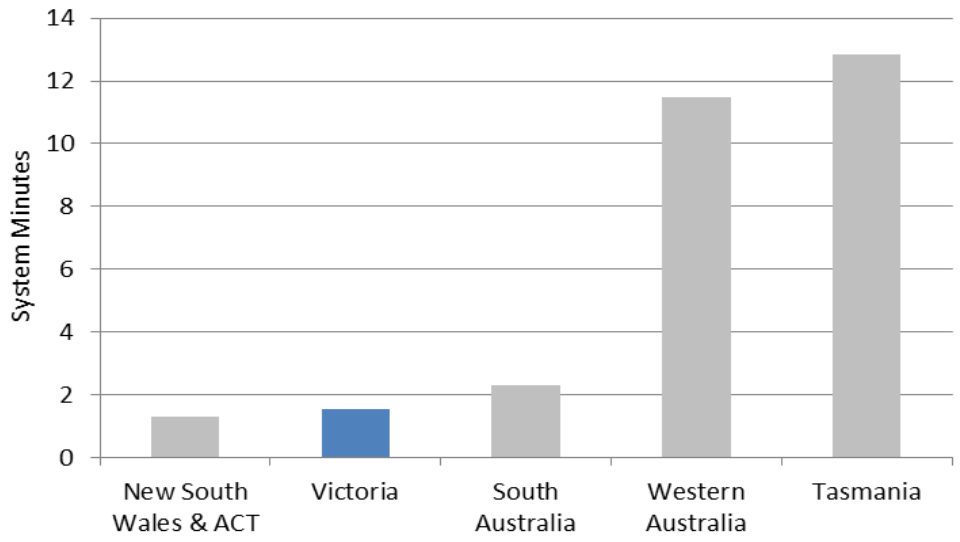
Service Standards Proposals

SP AusNet is proposing service standards parameters and targets in response to the AER's latest service standards incentive scheme which focuses on unplanned outages and the impact of service interruption to the wholesale market. The proposal also addresses the new network capability incentive which is designed to enhance asset capability. The proposed targets will appropriately drive and reward further service performance improvements and efficient market outcomes, and penalise poor performance while allowing the necessary construction and maintenance activities to be carried out. This proposal is put forward against a backdrop of

analysis which shows these activities are critical to SP AusNet's capability to contribute to the achievement of the NEO. This proposal demonstrates and supports this conclusion.

In addition, the service standards proposal will allow SP AusNet to continue to deliver the benefits that customers are currently provided, achieved through ensuring a high level of transmission equipment availability in peak periods. SP AusNet has achieved a consistently sound level of network performance over the past decade. This is illustrated in the figure below.

Figure ES8: Average system minutes unsupplied (mins) 2000-01 – 2010/11



Source: Survey data from ESAA, which does not include data for Queensland since 2005-06. To SP AusNet's knowledge, data for Queensland is not otherwise publically available.

Note – System minutes unsupplied is used as a measure of the service level of the transmission network as perceived by network customers. It is calculated as energy unsupplied in MWh divided by MW annual peak demand (divided by 60 to convert to system minutes) using sent-out peak demand. Energy not supplied to customers as a result of forced and fault unplanned outages is included.

Figure ES8 illustrates that Victoria has the second-lowest average system minutes unsupplied in comparison to other NEM states from 2000 to 2011.

Return on Capital

The importance of the rate of return, or Weighted Average Cost of Capital (WACC), for a capital-intensive business with long-lived assets underpins the application of a conservative approach where there is uncertainty surrounding the estimation of the rate of return. In the longer term, consumers' interests are protected by ensuring adequacy and consistency in the rate of return available to investors in Australian energy infrastructure.

Due to changes in market conditions, the forecast rate of return for the forecast period is lower than that which applied in the current period. The nominal vanilla WACC used for the proposal is 7.19 %. The post-tax real WACC is 4.09 %. These values will be updated to reflect prevailing capital market conditions at the time of the AER's Final Decision.

The WACC is calculated according to the methodology and parameters prescribed in Chapter 6A of the NER (version 52).

Return of Capital (Depreciation)

Under NER 6A.6.3, depreciation schedules must use a profile that reflects the nature of the category of assets over the economic life of that category of assets.

SP AusNet has depreciated each asset category in the RAB on a straight-line basis over the economic life proposed. SP AusNet has followed standard practice by assigning a regulatory life to assets that equate to their expected economic or technical life. In general, the regulatory, economic and technical lives of an asset coincide.

SP AusNet continues to employ the same standard asset lives to determine depreciation as used in the previous regulatory control period.

Conclusion

This proposal forecasts a total revenue requirement of $1,598 million for SP AusNet to provide its transmission services to customers over the forthcoming regulatory control period. The revenue requirement has been carefully determined to ensure continuing high levels of asset performance and reliability, whilst optimising the mix and timing of expenditure to ensure that costs are as low as possible.

The forecast for each of the revenue components is presented in Table ES1, together with the CPI - X total and smoothed revenue requirement.

Table ES1: Annual building block revenue requirement from 2014-17 (Nominal $m)

	2014-15	2015-16	2016-17	Total
Return on capital	206.0	214.1	222.6	642.7
Regulatory depreciation	73.9	79.3	85.9	239.1
Operating expenditure	111.1	125.2	134.4	370.7
Easement Land Tax	103.4	108.7	108.7	320.8
Net tax allowance	8.1	7.9	8.6	24.6
Annual building block revenue requirement (unsmoothed)	**502.5**	**535.1**	**560.1**	**1,597.8**

Source: SP AusNet PTRM.

The annual revenue requirement has been constructed using the post-tax nominal building block approach in accordance with Chapter 6A of the NER and the relevant AER Guidelines and Models.

Behind this is SP AusNet's approach to contributing to the achievement of the NEO and the ongoing efficient operation of Victorian and NEM infrastructure.

1 Introduction

1.1 Purpose of this Document

This document, including the accompanying appendices, sets out the Revenue Proposal for prescribed transmission services provided by means of, or in connection with, the Victorian electricity transmission system owned and operated by SPI PowerNet Pty Ltd ACN 079 798 173 (SP AusNet). The prescribed transmission services provided by SP AusNet comprise prescribed transmission use of system (TUOS) services and prescribed common services (both of which are provided "in bulk" to AEMO), prescribed entry (connection) services, and prescribed exit (connection) services.

This Revenue Proposal covers the period from 1 April 2014 to 31 March 2017.

The Revenue Proposal is submitted in accordance with the National Electricity Law (NEL), National Electricity Rules (NER) and the associated Submission Guidelines issued by the Australian Energy Regulator (AER). This is set out in more detail in the *Compliance Checklist* (Appendix 1A). A signed *Directors' Responsibility Statement* (Appendix 1B) accompanies this Proposal in accordance with section 2.10 of the Submission Guidelines.

Under the Victorian transmission planning arrangements, SP AusNet does not have responsibility for planning augmentations to the Victorian transmission system. Therefore, in contrast to the Revenue Proposals of other Transmission Network Service Providers (TNSPs) regulated under the NER, this Revenue Proposal does not consider future transmission network and transmission connection augmentations.

1.2 Recent Rule changes and AEMC reviews

In September 2011, the AER lodged a proposal to the Australian Energy Market Commission (AEMC) to amend the rules relating to the economic regulation of energy networks, including electricity transmission networks. At about the same time, the Energy Users' Rule Change Committee (EURCC) also submitted a rule change proposal that focused principally on amending the regulatory arrangements relating to the cost of debt.

On 29 November 2012, the AEMC published its final rule determination, which included a number of amendments to address the matters raised by the AER and EURCC. The AEMC's amendments specify a number of new regulatory arrangements and guidelines that must be developed by the AER during 2013. The implementation of the new rules creates a number of transitional issues for regulatory determinations that are scheduled to commence in 2013 and 2014. The transitional arrangements applying to SP AusNet are set out in Division 4 of Part ZW of Chapter 11 of the NER (v. 54).

Given the timing of SP AusNet's transmission review, NER 11.59.3 provides that Chapters 6A and 10 of the NER in force immediately before the 29 November 2012 (v. 52) should apply for the purpose of this revenue determination. That clause also provides for a 3 year regulatory control period, commencing on 1 April 2014 and ending on 31 March 2017. For SP AusNet's transmission network, the new rules will therefore apply for the first time in the subsequent revenue determination, which relates to the regulatory control period commencing on 1 April 2017.

Pursuant to these transitional arrangements, this Revenue Proposal has been prepared in accordance with version 52 of Chapters 6A and 10 of the NER and all NER references are to this version, unless specified otherwise. The Revenue Proposal has also been prepared in accordance with the requirements of the Submission Guidelines published by the AER on 28 September 2007, pursuant to NER 6A.10.2.

In the course of considering the rule change proposals relating to the economic regulation of networks, the AEMC noted the importance of improving consumer engagement and participation[3]. The NER therefore includes a number of new provisions that aim to facilitate more effective consumer engagement and participation. These amendments include:

- requiring the Network Service Provider to indicate in its Revenue Proposal the extent to which it has engaged with consumer representatives; and
- requiring the Network Service Provider to include a consumer-focused overview paper in its Revenue Proposal, to assist consumers to understand the key elements of the Revenue Proposal, and the basis of the Revenue Proposal.

SP AusNet strongly supports these amendments in promoting more effective engagement between Network Service Providers and electricity consumers early in the regulatory review process. Better engagement with consumers will ultimately deliver better, more efficient outcomes that are consistent with the National Electricity Objective (NEO). Although these new rules do not apply to this Revenue Proposal, SP AusNet has undertaken consumer engagement, as far as possible in the time available. A summary of this engagement is provided at section 2.4 of this Proposal.

In addition to the rule changes promulgated by the AEMC on 29 November 2012 there are a number of other reviews that have a bearing on this Revenue Proposal. These reviews include:

- the AEMC's Transmission Frameworks Review; and
- the Productivity Commission's (PC) Review of Electricity Network Regulation.

The implications of these reviews for SP AusNet for the forthcoming regulatory control period are noted in the relevant chapters of this Revenue Proposal.

1.3 Structure of this submission

The remainder of this document is structured as follows:

- Chapter 2 provides context for this Revenue Proposal by describing SP AusNet's operating environment and its key challenges for the forthcoming regulatory control period.
- Chapter 3 describes SP AusNet's cost and service performance over the current 2008 to 2014 regulatory control period, with reference to national and international benchmarks.
- Chapters 4 and 5 explain SP AusNet's capital and operating expenditure proposals, respectively.
- Chapter 6 presents the service target performance incentive scheme that will apply over the forthcoming regulatory control period.
- Chapter 7 calculates the regulated asset base for the forthcoming regulatory control period.
- Chapter 8 sets out the depreciation allowance for the forthcoming regulatory control period.
- Chapter 9 explains SP AusNet's proposed allowances for capital financing costs and taxation.

[3] AEMC, Economic Regulation of Network Service Providers, and Price and Revenue Regulation of Gas Services, Final Position Paper, 15 November 2012, p. ix.

- Chapter 10 addresses the efficiency incentive payments that result from the operation of the Efficiency Benefit Sharing Scheme (EBSS) during the current regulatory control period. The arrangement for the operation of the scheme over the forthcoming regulatory control period is also explained.
- Chapter 11 sets out SP AusNet's proposed cost pass through arrangements for the forthcoming regulatory control period.
- Chapter 12 presents SP AusNet's total revenue requirement for the forthcoming regulatory control period and the resulting average price path.
- Chapter 13 sets out SP AusNet's proposed pricing methodology for the forthcoming regulatory control period.
- Chapter 14 describes and explains SP AusNet's proposed negotiating framework for the forthcoming regulatory control period.

All monetary values presented in this proposal are expressed on a GST exclusive basis. Unless otherwise stated, all monetary values are expressed in December 2013 Australian dollars.

2 Operating Environment

2.1 Introduction and Overview

This network serves Victoria, covering an area of approximately 227,600 square kilometres and serving a population of over 5.5 million people, or more than 2.2 million households and businesses. SP AusNet's electricity transmission network connects generators, distributors, high voltage customers and the transmission systems of the neighbouring states of New South Wales, South Australia and Tasmania.

SP AusNet's organisational structure, internal processes and governance arrangements are all focused on delivering safe and reliable network services to transmission customers at an efficient cost, consistent with the elements of the NEO.

This chapter provides important background information on SP AusNet's operating environment and the processes that the company has put in place to deliver efficient, safe and reliable outcomes for our customers. It is structured as follows:

- Section 2.2 describes electricity transmission arrangements and divisions of responsibility in Victoria;
- Section 2.3 outlines the responsibilities of connected parties;
- Section 2.4 describes SP AusNet's customer engagement for this revenue reset;
- Section 2.5 describes SP AusNet's role and reliability obligations;
- Section 2.6 provides an overview of SP AusNet's transmission network;
- Section 2.7 provides an overview of SP AusNet's approach to asset management;
- Section 2.8 highlights the major achievements in the current regulatory control period, and the key challenges to be addressed in the forthcoming period; and
- Section 2.9 describes SP AusNet's organisational arrangements.

2.2 Transmission Arrangements in Victoria

After the disaggregation and privatisation of the Victorian electricity industry during the 1990s, responsibility for Victoria's transmission network was split between:

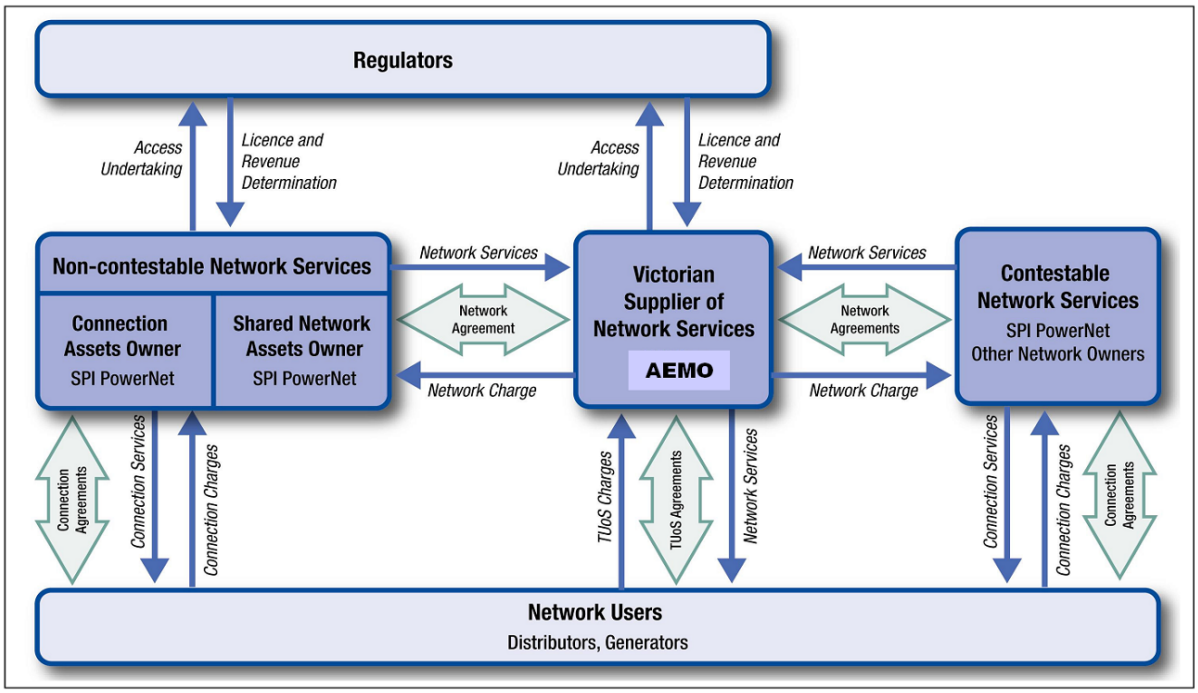
- Australian Energy Market Operator (AEMO) (then the Victorian Power Exchange (VPX)) – responsible for planning the shared network and procuring network support and shared network augmentations;
- SPI PowerNet (then PowerNet Victoria, and referred to in this document as SP AusNet) – the asset owner, responsible for operating and maintaining the network; and
- Transmission customers[4] – responsible for planning and directing the augmentation of their respective transmission connection facilities.

In Victoria, the transmission network planning functions are separated from network ownership and operation. These arrangements differ from other NEM jurisdictions, where planning and responsibility for augmentation is not separated from the incumbent transmission company (although independent planning oversight occurs in South Australia). The relationships between these parties and the regulators are shown in Figure 2.1 below. These arrangements have

[4] Distribution companies, generation companies and directly-connected industrial customers.

implications for the definition of SP AusNet's prescribed services, which are subject to the revenue cap proposed in this document.

Figure 2.1: Institutional Arrangements for Victorian Transmission



Source: SP AusNet

Note – AEMO's revenue determination expires 1 July 2014 and no determination will apply beyond that date.

The responsibilities of the parties within the Victorian arrangements for electricity supply are set out in Victorian legislation, the licences, guidelines and codes administered by the Essential Services Commission (ESC) and Victorian derogations in Chapter 9 of the NER. Together these describe the model for the procurement and provision of transmission services in Victoria.

The planning roles of AEMO and connected parties are summarised below.

2.2.1 Australian Energy Market Operator as planner and procurer of augmentations

Established on 1 July 2009, following the merger of VENCorp and NEMMCO, AEMO is a non-profit organisation responsible for planning and procuring augmentations on the shared transmission network. Its responsibilities include:

- procuring bulk shared network services from SP AusNet and other providers;
- providing transmission use of system services to transmission customers (including administering transmission pricing); and
- planning and requisitioning augmentation to the shared transmission network, to ensure existing and expected demand is met.

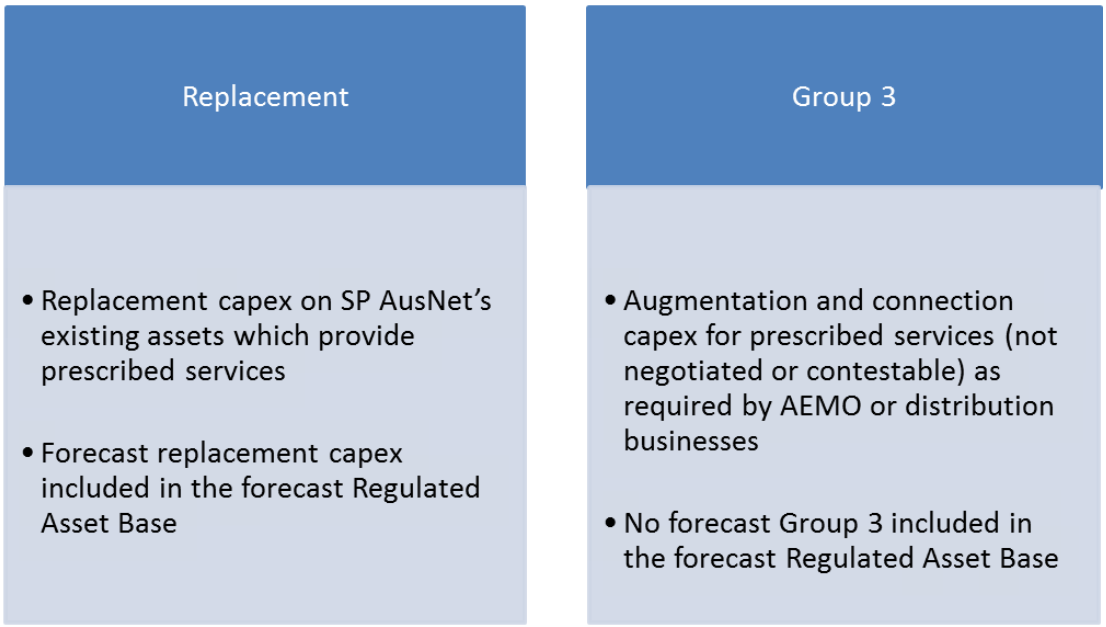
AEMO applies a probabilistic planning approach to reliability, whereby the costs of an improvement in reliability are compared with the assessed benefits of that improvement under different scenarios. In this way, every investment decision is made with regard to the degree of reliability that should be provided. An explicit value of customer reliability is a key input into this process.

2.2.2 Group 3 Assets

During a regulatory control period AEMO or a distribution business will request that SP AusNet provide augmentations to the transmission network or distribution connection service. These assets provide prescribed transmission services, but because SP AusNet is not responsible for their planning, the forecast capex associated with them sit outside of the revenue determination. SP AusNet refers to these services as "excluded prescribed" services, and the assets which provide them are referred to as "Group 3" assets. Group 3 assets sit outside of the regulated asset base and are governed by commercial contracts until such time as they are rolled into the regulated asset base, usually at the next revenue reset.

The figure below shows the general split between the two types of capex included in SP AusNet's regulated asset base.

Figure 2.2: Capex included in the regulated asset base



At each revenue reset, a number of Group 3 assets completed since the last revenue reset are rolled into the regulated asset base for the first time. The purpose of this process is to recognise those investments undertaken in the previous regulatory control period that provide prescribed transmission services and provide an appropriate regulated return on them. These new additions to the regulated asset base are subject to the same rules regarding depreciation and escalation as other assets that provide prescribed transmission services. The regulatory arrangements governing the roll-in of these assets are set out in NER 11.6.21(c).

Given the above, this Revenue Proposal relates only to the provision of prescribed services at the level being provided on 30 June 2012, the cut-off date for the roll-in of Group 3 assets. Accordingly, the expected costs and revenues associated with the provision of any prescribed services above the level being provided as at 1 July 2012 are excluded from the asset base proposed in this document.

Operating expenditure associated with the growth of the asset base due to Group 3 roll-ins is forecast as part of this Revenue Proposal (see Chapter 5). This adjustment does not result in an increase in overall network costs borne by customers as it is simply a transfer of cost from AEMO or the relevant distribution businesses (DBs) to the transmission network.

2.3 Connected Parties

In Victoria, parties connected to the transmission network are responsible for the planning and augmentation of their connection assets. Therefore, the five Victorian distribution businesses (DBs) are responsible for planning and directing the augmentation of those facilities that connect their distribution systems to the shared transmission network. DBs plan and direct the augmentation in a way that minimises costs to customers, taking into account distribution and transmission losses that occur within the transmission connection facilities.

Other connected parties (major consumers or generators) are responsible for their own connection planning, although they can choose to delegate this task to a DB.

In the event that a new connection or an augmentation of an existing connection is required, the connected parties must consult with and meet the reasonable technical requirements of AEMO, SP AusNet and other affected parties.

Each year the DBs publish the Transmission Connection Planning Report that assesses the network planning criteria, the risks of lost load and options for meeting forecast demand.

2.4 Customer Engagement

SP AusNet has a limited number of direct transmission customers with whom it has direct commercial relationships. SP AusNet liaises regularly with its customers on matters such as service performance, new works, and operational matters including issues relating to planned and unplanned outages. SP AusNet recognises that the cost and quality of electricity transmission services are of increasing importance to end consumers of electricity, and the company is now taking steps to engage more effectively with this important group of stakeholders.

2.4.1 Direct Transmission Customers

As a transmission business, SP AusNet's direct customers are those parties whose facilities are connected to the shared transmission network – namely, generators, DBs and large users directly connected to the transmission system. SP AusNet also works collaboratively with AEMO, as AEMO acts as the provider of transmission use of system services in Victoria, and is responsible for planning and procuring new shared transmission network capacity, as well as connecting generators and customers to the shared transmission network. The table below outlines SP AusNet's engagement with these groups.

Table 2.1: Summary of engagement with transmission customers

Customer	Issues for engagement	Engagement method
Victorian distribution businesses	New connections. Major connection augmentation projects. Community and stakeholder plans to manage delivery of projects.	Meetings on major projects (as required).
Generators	Connection to SP AusNet's transmission network. Connection charging. Outage planning for works at connection points.	Liaising in relation to charges, connection agreements and outages.
Directly connected consumers	Connection to SP AusNet's transmission network. Connection charging. Outage planning for works at connection points.	Liaising in relation to charges, connection agreements and outages.
AEMO	Connection to SP AusNet's transmission network. Shared network augmentation planning and projects. Planned and unplanned disruption issues.	Liaising in relation to connection agreements, system operation, outages and transmission augmentations. Quarterly transmission planning meetings. Meetings on major projects (as required).

2.4.2 End Consumers

To date, SP AusNet has had limited interaction with end use consumers (those who are connected to the distribution network) as the company does not have any direct commercial relationships with end use customers. However, in light of widespread community concern over recent electricity prices increases, SP AusNet recognises the importance of better understanding the needs, preferences and priorities of end use consumers.

Recent rule changes to the NER include provisions that aim to facilitate more effective consumer engagement and participation, as highlighted in Chapter 1. While these new rules do not apply to this Revenue Proposal, SP AusNet has undertaken some consumer engagement to the extent possible in the time available since the rule change was made. This includes meeting with the Energy Users Association of Australia (EUAA) and Consumer Utilities Advocacy Centre (CUAC) to discuss and inform these stakeholders of SP AusNet's Revenue Proposal. SP AusNet has also sought to improve its understanding of the practical issues involved in developing methods to enable meaningful engagement with consumers.

The EUAA represents commercial and industrial electricity and gas users on a range of national and jurisdictional energy issues. The EUAA provided feedback that it is interested in seeing more information that is relevant to industrial customers included in regulatory information and

processes. SP AusNet recognises this information gap and has endeavoured to provide bill impact information relevant to larger industrial customers in this Proposal.

CUAC represents a broader base of Victorian energy and water consumers in policy and regulatory processes, including the interests of low-income, disadvantaged and rural and regional consumers. CUAC provided feedback that it would be useful for consumers to see what community consultation SP AusNet had conducted in relation to the CBD rebuilds, and how this had been taken into account. In response to this request, SP AusNet has summarised community consultation processes in section 2.8 of this chapter. CUAC also indicated it is important for SP AusNet to consider the tension between meeting the expectations of the local communities located at its major CBD rebuilds and the impacts that its choices have on the wider consumer base in terms of potentially higher transmission costs. SP AusNet recognises this latter issue and will endeavour to explore it further during the regulatory process.

Both consumer groups were keen to engage with SP AusNet as part of the revenue reset process to better understand the impacts of the Revenue Proposal, and to identify issues of concern. SP AusNet will therefore continue to liaise with both the EUAA and CUAC throughout the transmission revenue reset with a view to further developing its engagement methods to enable more effective participation of consumer representatives in the regulatory process. SP AusNet recognises that better engagement with consumers will ultimately deliver better, more efficient outcomes that are consistent with the NEO.

2.5 SP AusNet's Role and Reliability and Safety Obligations

SP AusNet owns and maintains Victoria's transmission system, with a few exceptions where contestable services are awarded to other providers. SP AusNet holds a licence issued by the Victorian ESC, permitting the transmission and supply of electricity using its electricity transmission network.

The conditions of the licence:

- obligate SP AusNet to provide connection to certain parties including generators and distributors;
- reference the codes and laws that SP AusNet must comply with; and
- outline the requirements for undertaking operational and compliance audits.

In addition to its licence conditions, SP AusNet must comply with a suite of legal and regulatory obligations, including those key operational requirements outlined in the figure below.

Figure 2.3: Key Operational Legal and Regulatory Obligations

Electricity System Code	Australian Standards	Electricity Safety Management Plan	National Electricity Rules (NER)
• System performance obligations	• AS/NZS 7000 • AS 62053	• Approved by ESV • Safety system operation	• System security obligations • Connection obligations • Metering obligations • Economic regulation

2.5.1 Reliability Obligations

SP AusNet is responsible for ensuring that the reliability of its transmission network is maintained, subject to the planning decisions made by AEMO. Reliability obligations are set out in:

- The Victorian Electricity System Code (October 2000) which requires SP AusNet to undertake its activities as a Victorian transmission network service provider in a safe, efficient and reliable manner;
- Chapter 4 of the NER which applies to system security obligations; and
- Chapter 5 of the NER which prescribes connection obligations.

A range of other requirements also apply, including AEMO's system operation procedures for transmission businesses.

2.5.1.1 Service Target Performance Incentive Scheme

The AER has recently reviewed the Service Target Performance Incentive Scheme (STPIS) and published the final version in December 2012. This version will apply to SP AusNet in the forthcoming period and contains some significant changes from the current version. The new STPIS consists of the following three components:

- Service Component – provides an incentive to reduce the occurrence of unplanned outages and to return the network to service promptly after unplanned outages that lead to an interruption to supply.
- Market Impact Component – provides an incentive to reduce the impact of planned and unplanned outages on wholesale market outcomes.
- Network Capability Component (commencing April 2014) – provides an incentive to deliver benefits through increased network capability, availability or reliability through one-off projects.

Major changes reflected in the December 2012 version of the STPIS include:

- Service Component:
  - The 'Transmission Circuit Availability' parameter has been replaced by an 'Average Circuit Outage Rate' parameter, which considers forced and fault outages only.
  - The 'Average Outage Duration' parameter only considers events with a loss of supply.
  - Exclusions and weightings are standardised across TNSPs.
- Market Impact Component – the performance target and measure are calculated using a rolling average of historic performance.
- Network Capability Component – has been introduced to promote efficient levels of network utilisation from existing assets.

2.5.1.2 Availability Incentive Scheme

In 2002, SP AusNet and AEMO (then VENCorp) entered into an agreement forming the current Availability Incentive Scheme (AIS). The AIS is a Victorian jurisdictional scheme focussed on securing Victorian load and therefore SP AusNet is currently the only TNSP in the NEM subject to its application.

SP AusNet receives revenue through its revenue determinations to fund its participation in the AIS. The scheme operates through SP AusNet paying AEMO a rebate each month which is based on prescribed outages that have occurred.

The total rebate amount is calculated using specified hourly outage rates assigned to individual assets. These hourly rates differ for specified peak, intermediate and off-peak periods, and are calculated based on the cost of an outage to network users in the event of a second contingency event occurring. The rebate reflects the potential impact faced by network users whenever SP AusNet removes a network element from service, and accounts for the following potential impacts:

- Loss of load to customers (costed at the value of loss of load); and
- Loss of generator access to market (costed at marginal cost of generator rescheduling).

This rebate ranges from $0 per hour to $13,491 per hour for the 2012-13 financial year.

However, as the AER's scheme has evolved and matured, the AIS has been found to both duplicate and conflict with the incentives provided by the STPIS. Therefore, the reliability incentives faced by SP AusNet are particularly complex. This is discussed further in Chapter 6.

In addition, revenue received to fund the AIS has reduced since its introduction to reflect improved performance. However, the rebate rates have remained constant in real teams. As a result, the AIS has become a severely asymmetric scheme with annual profit set between – $15m and $3m.

2.5.2 Safety Obligations

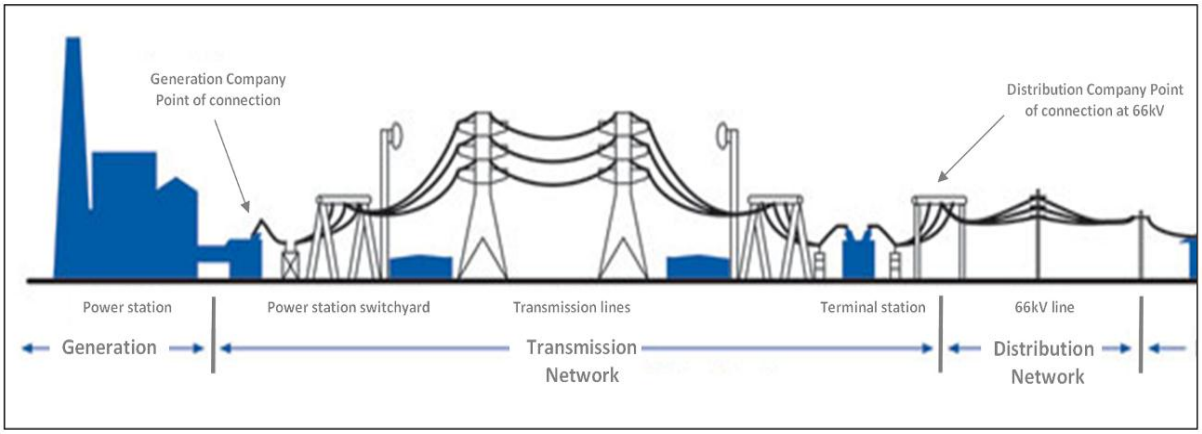
SP AusNet must comply with legal requirements to maintain a safe working environment for employees and minimise any risk to public safety presented by its operations. These requirements are set out in the following Acts:

- Occupational Health and Safety Act (2004) – this sets out requirements to protects the health and safety of SP AusNet's staff.
- Electricity Safety Act (1998) – this sets out SP AusNet's legal responsibilities to safeguard public safety. The requirements of this Act are addressed in SP AusNet's Electricity Safety Management Scheme (ESMS) for its electricity transmission network.

2.6 Overview of SP AusNet's Transmission Network

SP AusNet's transmission network operates at 500kV, 330kV, 275kV, 220kV and 66kV and includes those assets between the 'point of connection' with generators and distribution companies illustrated in Figure 2.3.

Figure 2.4: Facilities and Assets in the Victorian Electricity Transmission Network



SP AusNet's electricity transmission network includes more than 6,500 kilometres of transmission lines that transport electricity from power stations to electricity distributors and large customers. The network transferred over 50,261GW hours of energy in 2011/12 and serviced a peak demand of 9,190MW.

The network is centrally located among Australia's five eastern states that form the National Energy Market (NEM), and provides key connections between South Australia, New South Wales and Tasmania's electricity transmission networks. The NEM interconnections on SP AusNet's transmission network include:

- Two 330 kV lines from Dederang Terminal Station, to the Murray Switching Station (NSW);
- One 330 kV line from Wodonga Terminal Station to Jindera (NSW);
- One 220 kV line from Red Cliffs Terminal Station to Buronga (NSW);
- Two 275 kV lines from Heywood Terminal Station to South East Substation (SA);
- One 220 kV circuit from Red Cliffs Terminal Station to Berri (SA); and
- One 300 kV circuit from Loy Yang to Bell Bay (TAS).

The transmission network consists of a 500kV backbone, running from the Latrobe Valley, through Melbourne and across south-west Victoria to Heywood. The backbone serves the major load centres and is reinforced by:

- A 220 kV ring around Melbourne supplying 220 kV / 66 kV / 22 kV terminal stations;
- Inner and outer rings of 220 kV / 66 kV / 22 kV terminal stations in country Victoria supplying the regional centres; and
- Interconnections with New South Wales, South Australia and Tasmania.

The transmission network location, configuration and voltages are illustrated in Figure 2.4 below.

Figure 2.5: Victorian Electricity Transmission Network

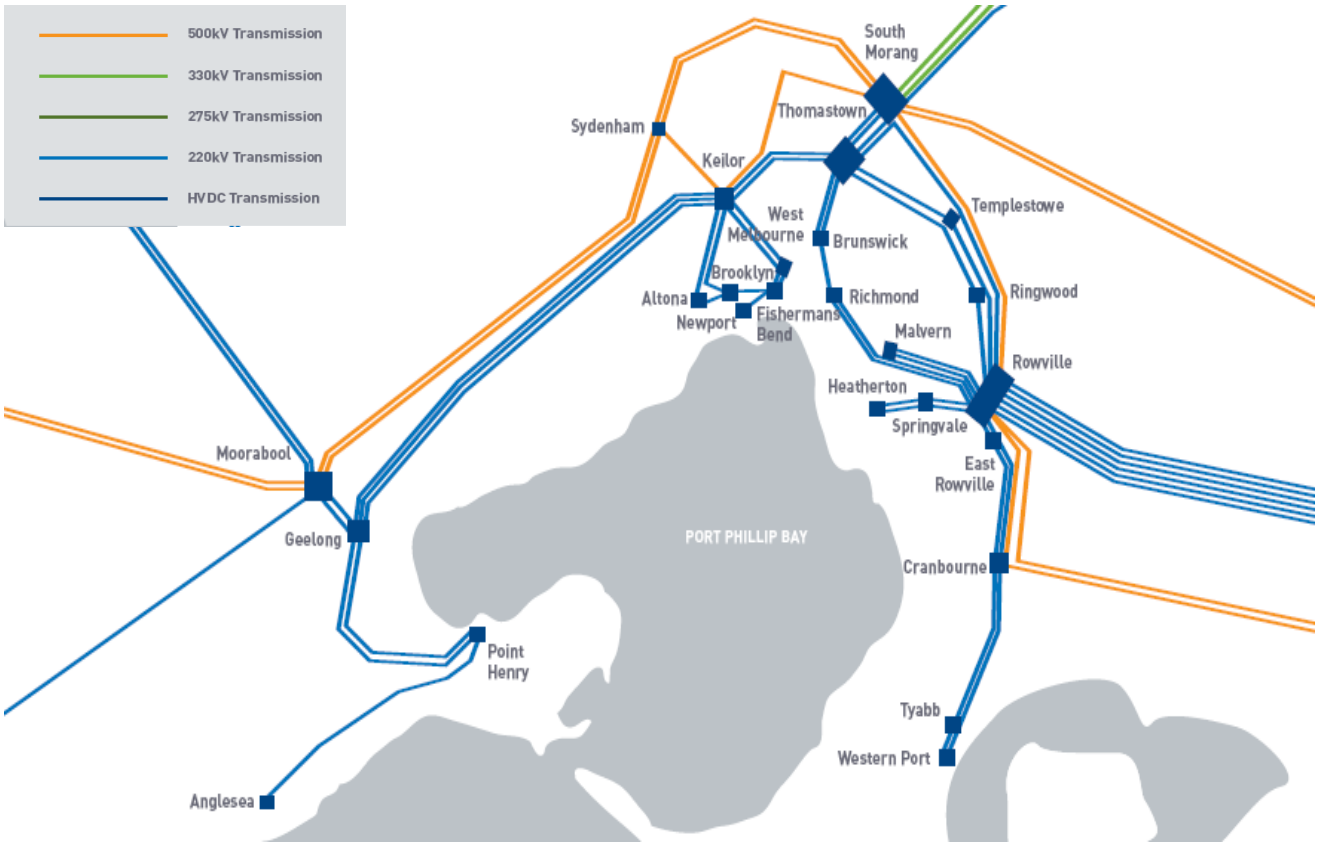
Source: SP AusNet

Metropolitan Melbourne is served by 500 kV and 220 kV networks which receive power from major generators in the Latrobe Valley, the Victorian hydro-electric power stations, the gas-fired Newport power station and the interstate links.

The configuration of the metropolitan transmission network is shown in Figure 2.5 below.[5]

[5] Section 4.3.23 of the Submission Guidelines requires a revenue proposal to contain a forecast map of the transmission system for the relevant regulatory control period, together with any appropriate accompanying notes, which indicate the location of new major network assets proposed to be constructed over the regulatory control period. The information provided in the figures above, and in section 4.6 (which describes and identifies the locations of the major projects that comprise the Station Rebuilding and Refurbishment Program) accords with these requirements.

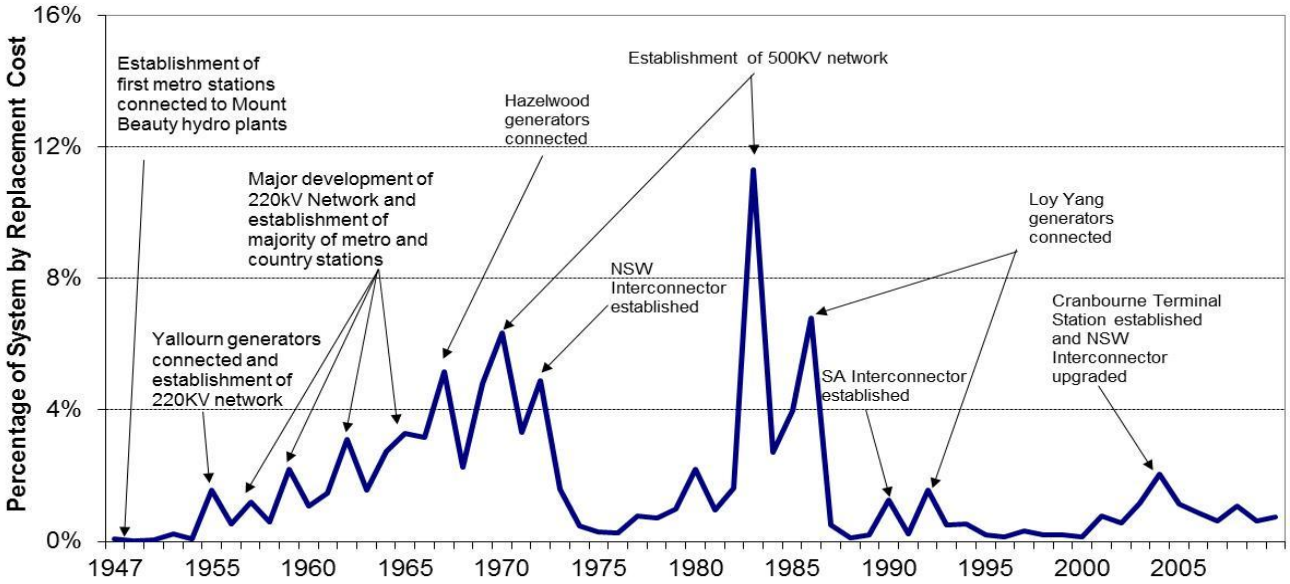
Figure 2.6: Metropolitan Melbourne Electricity Transmission Network



Source: SP AusNet

The historic development of SP AusNet's transmission network is shown in Figure 2.6. The major development milestones are highlighted. The figure below shows the relatively large amount of network development and investment that took place in the 1960s through to the early 1970s. Not surprisingly, many of these assets installed over this period are displaying signs of deterioration as they approach the end of their technical lives. This has led to an increasing requirement for asset replacement expenditure which will continue over the next decade and beyond. Without this prudent asset replacement program, there is a risk that the Victorian transmission network may not contribute to the achievement of the NEO.

Figure 2.7: Historic Development of SP AusNet's Transmission Network



Source: SP AusNet

The introduction of the carbon price in July 2012 is predicted to have long terms impacts on the future of brown coal generation in the La Trobe Valley and load which may be heavily impacted by carbon pricing.

SP AusNet has considered potential flow on effects of this on transmission assets but at this stage, has not found it necessary to propose any changes to the depreciation of generation connection assets as part of this Revenue Proposal.

2.7 Overview of SP AusNet's Approach to Asset Management

2.7.1 Background

The reliable operation of SP AusNet's transmission network is determined by the individual transmission assets that contribute to the efficient, safe, reliable and secure operation of the transmission system. The design of the transmission system generally allows an outage to be taken on a single item of plant without any impact on reliability. However, if such an outage occurs, this will impact on the ability of the system to withstand further events.

In addition to planned outages for the purpose of carrying out maintenance or capital expenditure projects, unexpected outages can be caused by asset failures. If such failures occur during periods of system stress, or when planned outages are taken, they can reduce system security, and even lead to interruptions in customer supply. In addition, an asset failure which results in an explosion or other destruction of componentry presents a significant health and safety risk, and may result in the equipment being out of service for a long period of time.

For these reasons, SP AusNet's *Asset Management Strategy* (AMS 10-01) (Appendix 2A) aims to identify necessary equipment replacement actions before failures that may arise due to normal deployment of these assets over time occur. This is achieved through a careful assessment of the potential risk of failure for each plant item, and repairing or replacing deteriorating equipment accordingly. It is noted, however, that transmission assets may nevertheless deteriorate or fail due to events and external forces that occur in an unexpected or uncontrolled manner – it is

largely impossible to plan for contingencies that may address these events, although SP AusNet does make provision to some extent for such occurrences.

2.7.2 SP AusNet's Asset Management Strategy

SP AusNet's Asset Management Strategy (AMS) includes the following objectives:

- enhance network safety;
- comply with regulatory obligations;
- meet energy and maximum demand growth; and
- improve network reliability commensurate with risk and cost.

The AMS is designed to balance the need for safety, reliability, quality and security of electricity supply against price and the long term interests of consumers of electricity. It recognises that customers want and need continuous power supply, but do not want so-called "gold-plating" of the network.

2.7.3 Efficient Asset Risk Management

The AMS is underpinned by regulatory and commercial imperatives to deliver efficient cost and service performance. Recent widespread concern expressed over rising electricity prices emphasises the importance of striking the right balance between cost and reliability. The AMS recognises that cost and service efficiency does not mean lowest possible cost, nor does it mean guaranteed reliability. Instead, efficiency requires that a cost benefit analysis is undertaken for all expenditure decisions.

SP AusNet has identified the following drivers of expenditure for the Victorian transmission network over the next twenty years:

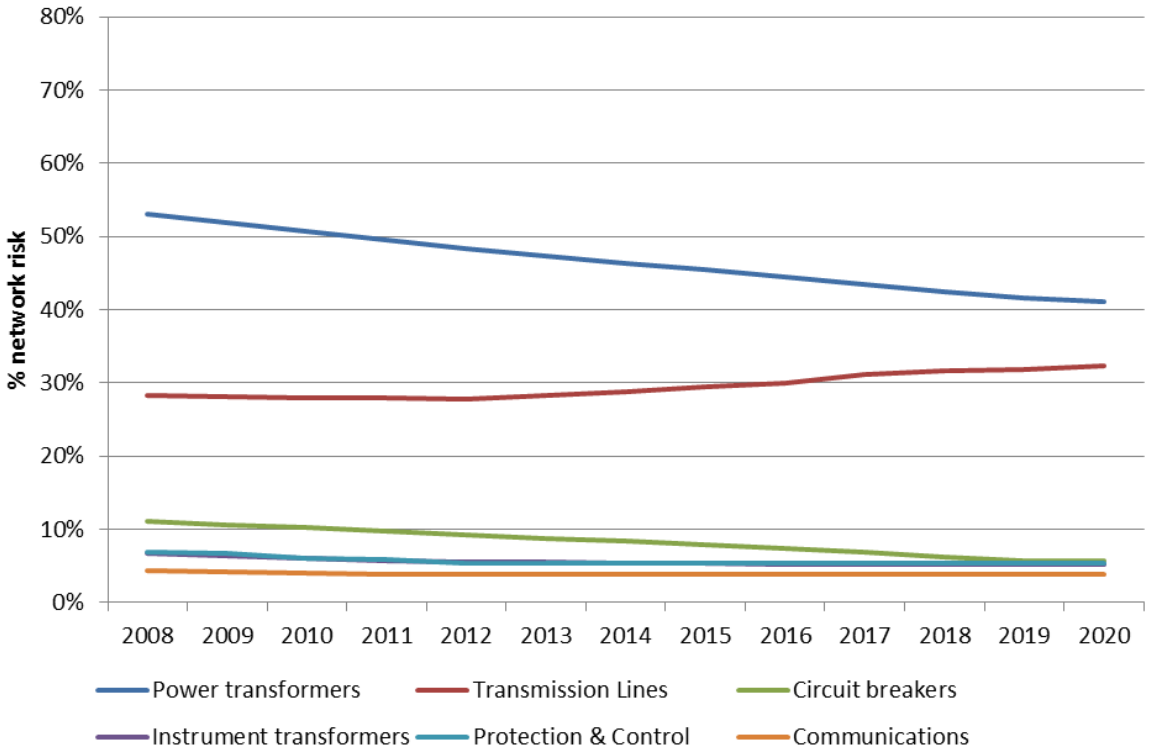
- asset performance and failure risk;
- increasing fault levels;
- meeting peak demand;
- operational availability and reliability performance;
- compliance with legislation, rules, standards and regulations; and
- technological change.

Many of the drivers flow directly from the aims and outcomes of the AMS 10-01 (Appendix 2A), or are challenges and obstacles that must be taken into account to achieve them. The implementation of the AMS results in the development of detailed projects and work plans which are the basis of SP AusNet's capital and operating expenditure proposals, outlined in Chapters 4 and 5 respectively.

2.7.4 Network Risk – Asset Condition and the Probability of Failure

SP AusNet's AMS aims to stabilise the risks associated with the electricity transmission network. Asset risk relates to the probability of asset failure (determined using asset condition data) multiplied by the impact of that failure on network safety, reliability and availability. The trend in failure risk for major asset classes is displayed in the figure below and is based on proposed programs and associated planned expenditure.

Figure 2.8: Transmission Network Asset Risk (Risk Cost)



Source: SP AusNet

Note – This graph shows the total risk of each asset category, indexed to the base year 2012. The total risk of all asset categories adds to 100%.

Figure 2.7 shows that a reduction in aggregate transmission network risk has been achieved over the current regulatory control period, and will continue over the forthcoming regulatory control period. This is primarily due to transformer replacements related to the CBD station rebuild projects. All other asset classes display a relatively flat risk profile with the exception of transmission lines, which have an increasing risk profile due to ageing and deteriorating condition.

SP AusNet has adopted a rigorous approach to identifying necessary asset replacement. This recognises that while age is an important indicator of the need for replacement, the key determinant is the condition of the asset. While this deteriorates with age, it also depends on a range of additional factors, including the location of the assets (for example, the condition of assets in corrosive environments is likely to deteriorate at an accelerated rate) and specific operating requirements or duty cycles that differ from normal.

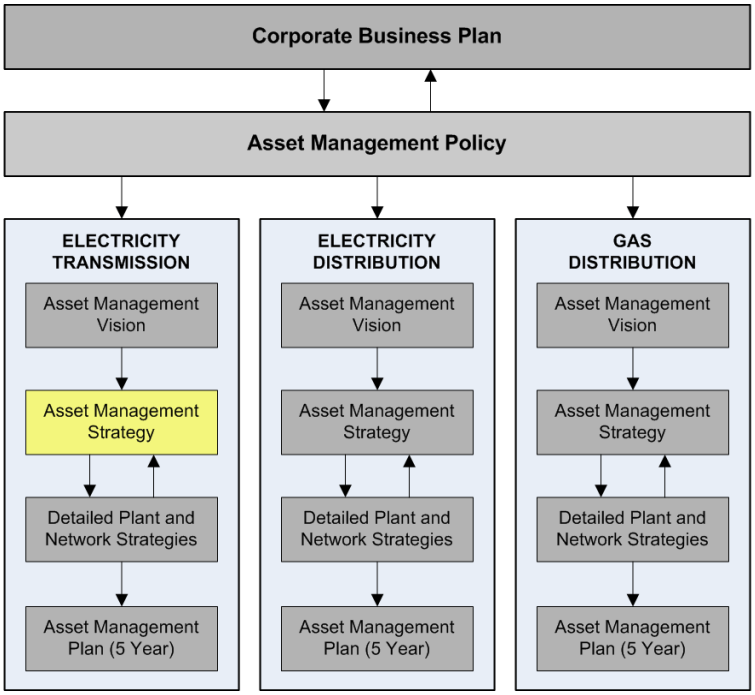
The development of the asset replacement program takes into account both the condition of the asset, and the implications of failure. More details on this assessment process are provided in Chapter 5.

The approach seeks to deliver optimal electricity transmission network performance at efficient cost by ensuring that all decisions to replace or maintain network assets are economically justified and appropriately consider all relevant criteria. These include safety, demand for network services, performance and condition of network assets, reliability and security of supply, technological advancements, the changing nature of generation and demand and the impacts on climate change on network assets.

2.7.5 Asset Management Documentation and Process

The AMS is one of a number of asset management related documents developed and published by SP AusNet in relation to its transmission network. This presents an all-encompassing strategy for the transmission network and is supported by more detailed plant-specific strategies as depicted in the figure below.

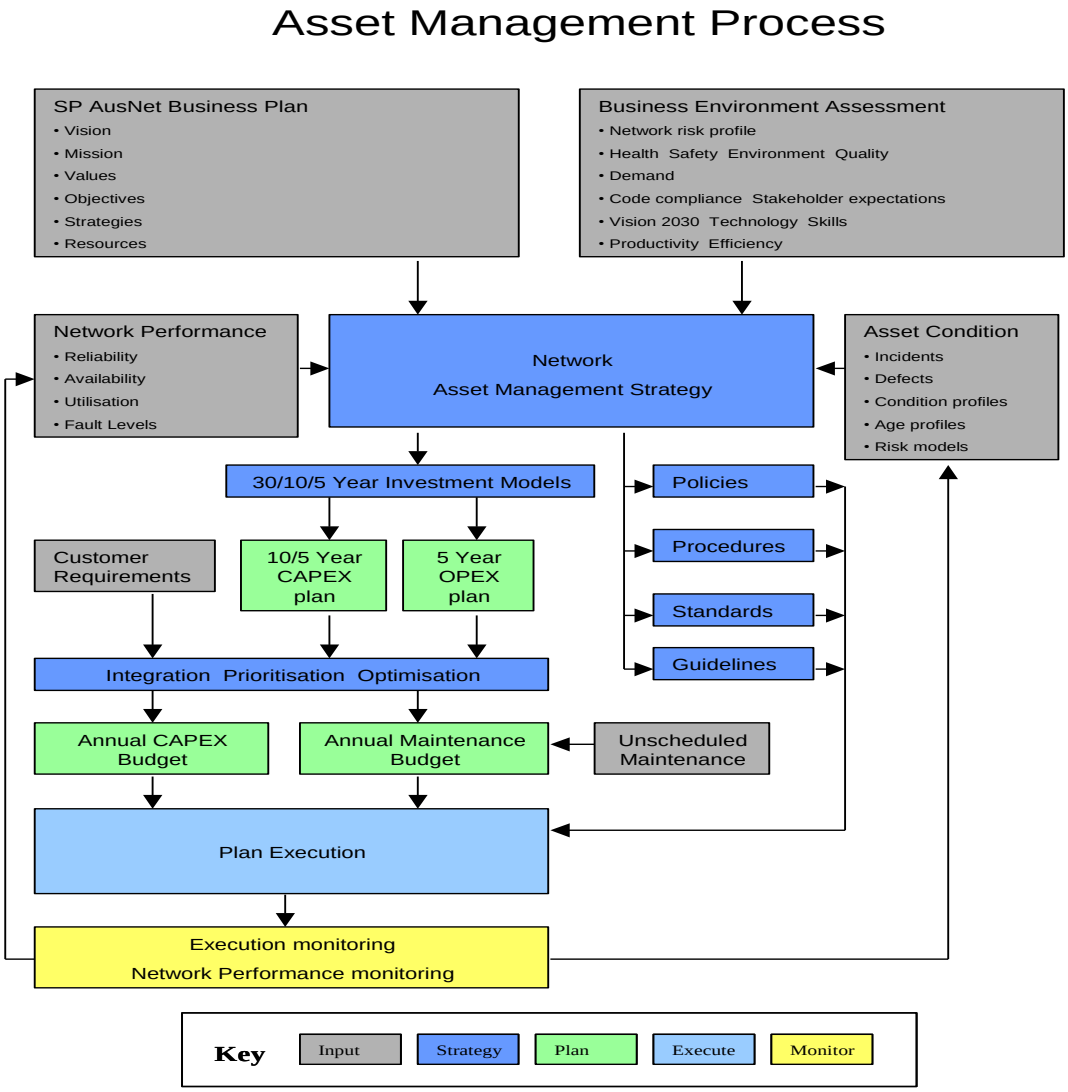
Figure 2.9: Asset Management Documentation



The asset management process is informed by corporate vision, business plans and an assessment of the external business environment. It is an iterative process that involves regularly updating the AMS and associated documents when conditions and information changes. The process forms a critical guide for the development of longer-term asset management plans as well as more immediate work programs for enhanced performance and efficiency.

As illustrated in the figure below, the AMS is a pivotal element of the asset management process.

Figure 2.10: Asset Management Process Flow Chart



2.8 Achievements and Key Drivers

This section outlines SP AusNet's major achievements in the current regulatory control period, and highlights key drivers that will be encountered during the 2014-17 regulatory control period.

2.8.1 Major Achievements

2.8.1.1 Safety

SP AusNet developed its first comprehensive electricity transmission Electricity Safety Management Scheme (ESMS) in the current regulatory period and this was accepted by Energy Safe Victoria on 29 March 2011. The ESMS identifies the safety hazards associated with the electricity transmission network and the processes, systems, strategies, plans and projects by which these hazards will be managed. This ESMS is a key consideration in SP AusNet's expenditure plans for the 2014-17 regulatory control period.

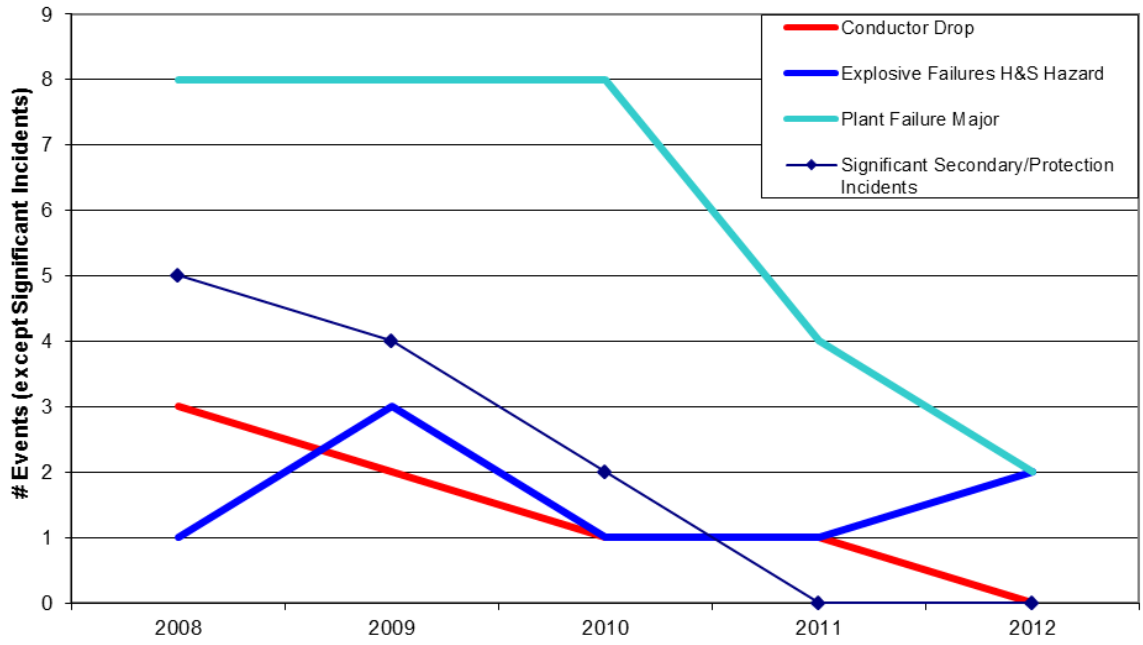
Consistent with the requirements of the Victorian Occupational Health and Safety Act (2004), SP AusNet's safety strategy 'missionZero' emphasises workplace safety, and is underpinned by

the philosophy that the company and its employees will not compromise on safety or tolerate unsafe acts and behaviours. Since its launch in April 2011 missionZero has driven significant improvements in company-wide safety performance, including a reduction in the Recordable Injury Frequency Rate (RIFR) by 35%.

2.8.1.2 Network Reliability

The number of adverse transmission system incidents has shown a steady downward trend in the current regulatory control period. In particular, the number of conductor drops and transformer failures has significantly reduced. This has contributed to enhanced reliability and safety of the network. Figure 2.13 shows the frequency of transmission incidents since 2008.

Figure 2.11: Transmission System Incidents



Source: SP AusNet

Related to this, SP AusNet's performance under the AER's STPIS has been strong, particularly under the transmission circuit availability and the loss of supply event frequency parameters. Chapter 3 outlines SP AusNet's performance over the current regulatory control period.

2.8.1.3 Delivered Key Projects

In the current period, SP AusNet has successfully delivered some significant capital works programs, including:

- Completed the regional terminal station replacement program.
- Completed a number of major transformer replacement projects, including at Ringwood, Keilor, Geelong and Brooklyn Terminal Stations.
- Replaced the 500kV Heywood-APD line and undertook a line insulator and fittings replacement program.
- Undertook significant safety and compliance capital works, including replacing bulk circuit breakers which pose oil leakage risk and installing tower fall arrests.

Further details of significant capital works programs are provided in Chapter 3.

2.8.1.4 PAS 55 Certification

In 2008 SP AusNet was the first TNSP in Australia to become accredited to British Standards Institution's Publically Available Specification 55 1:2008 (PAS 55). PAS 55 is the internationally recognised standard for the optimised management of physical infrastructure assets to achieve a desired and sustainable outcome. It is applied where physical assets are a critical factor in achieving business objectives and effective service delivery, and permits organisations to assess their asset management systems in a similar manner to other management systems, such as ISO 9000 and ISO 14001. PAS 55 implements a risk management focussed approach to asset management.

Accreditation demonstrates robust and transparent asset management policies, processes, procedures, practices and a sustainable performance framework. Accreditation is an indicator that SP AusNet remains an effective, efficient and competent asset manager able to demonstrate an industry leading approach to asset management.

2.8.2 Key Drivers for the Forthcoming Period

2.8.2.1 Minimising the Impact of Electricity Transmission Costs To Users

SP AusNet recognises the widespread concern over electricity prices in the current operating environment.

The impact of electricity prices on consumers (both small and industrial) highlights the importance of balancing cost and reliability issues in providing transmission services. The major means by which this is addressed in SP AusNet's Revenue Proposal is through the use of rigorous economic evaluations to identify the most economically efficient options for network investment. This cost benefit analysis includes an assessment of the supply risk which is informed by the most recent AEMO demand forecasts which reflect falling demand.

2.8.2.2 Addressing Local Community Expectations

SP AusNet recognises that understanding, and to the extent appropriate, meeting, local community requirements, is crucial to ensure the successful delivery of a rebuild project in a densely populated location.

SP AusNet conducted extensive consultation with the local community around Richmond Terminal station through newsletters, feedback forms, a phone hotline and face-to-face discussions with residents through door-knocking. The consultation aided understanding of local issues and values including:

- the value of parks in the area to locals for socialising, sport, leisure, exercise (including personal training clinics) and the amenity benefits of public 'green' space;
- the pressures on local traffic and car parking, which is exacerbated by non-locals who use the local roads and car parks;
- the value placed on screening and landscaping around the terminal station and a preference for the terminal station to be better integrated with the adjacent parkland areas;
- concerns over change of use of the site;
- traffic and noise disruptions during construction;
- health and Electric and Magnetic Fields (EMFs) associated with the terminal station; and
- the importance of providing a safe environment for Richmond Primary School.

The above community concerns regarding safety, visual amenity, road congestion and noise pollution have informed decisions made in relation to the project design and execution of the

Richmond Terminal Station rebuild. Residents had the opportunity to view and provide comments on the proposed solution design during the planning permit process.

In designing and delivering this project, SP AusNet has sought to select means of addressing community concerns and priorities whilst minimising the overall cost of the project.

Similarly, SP AusNet will assess the West Melbourne Terminal Station site and its surrounds in terms of noise levels, ecology, traffic, the local economy and other matters such as Vic Roads and state government plans for the area. This process will identify the potential impacts of the proposed project and inform the design of a suitable development.

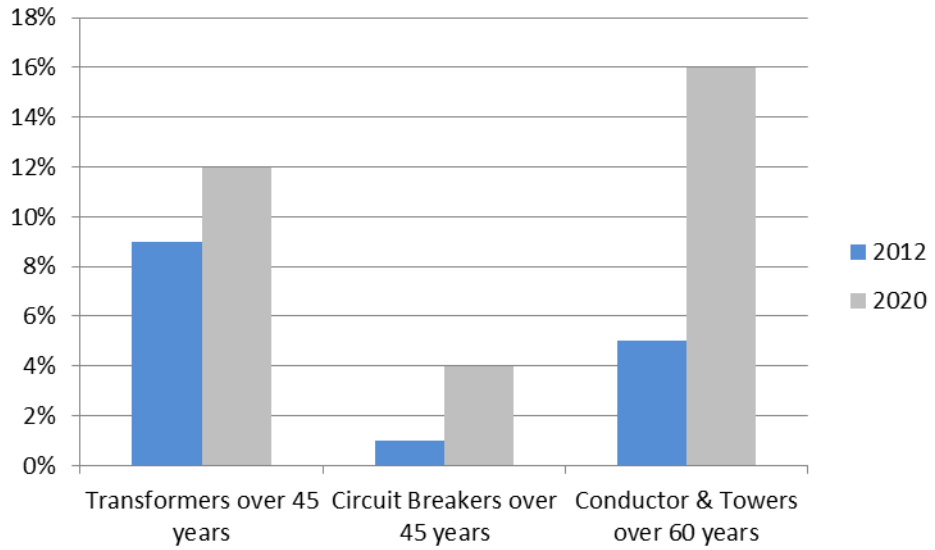
2.8.2.3 Assets Nearing the End of their Useful Lives

Compared to other TNSPs in the NEM, SP AusNet's assets are relatively old.

The impacts of age are compounded by the physical environment in which assets are located. SP AusNet's network covers alpine regions, rural areas, forested areas and coastal areas that are exposed to high winds and salt deposition. The condition of assets located in such locations can deteriorate at a faster rate than otherwise, particularly towers and conductors. Therefore these environmental characteristics affect both network performance and efficient expenditure.

The average asset ages of key plant will remain relatively stable across the next period. However the proportion of very old assets will increase as shown in the figure below.

Figure 2.12: Proportions of Very Old Assets



2.8.2.4 CBD Rebuilds

The planned Richmond and West Melbourne terminal station rebuilds are large scale projects which comprise over a third of the capital expenditure forecast for the 2014-17 regulatory control period. Due to the inner city location of these terminal stations, the planning and delivery is particularly complex. Both projects involve difficult rebuilding work at confined inner city sites where security of supply is critical at all times.

2.9 Organisational Arrangements

Section 4.3.24 of the AER's Submission Guidelines requires TNSPs to provide information on related party arrangement where the costs of those arrangements are attributed to, or allocated between, categories of transmission services provided by the TNSP. This section summarises SP AusNet's related party arrangements, to the extent that these are relevant in the context of the

transmission services provided by SP AusNet in the forthcoming regulatory control period. Further detail on related party arrangements is provided in *Appendix 2B – Related Party Arrangements*.

SP AusNet is a member of the SP AusNet Stapled Group, which is listed on the Australian and Singapore Stock Exchanges as a stapled security. The SP AusNet Stapled Group comprises three principal corporate entities, namely SP Australia Networks (Distribution) Ltd and subsidiaries, SP Australia Networks (Transmission) Ltd and subsidiaries and SP Australia Networks (Finance) Trust. The group's majority shareholder is Singapore Power International Pty Ltd.

The principal activities of the SP AusNet Stapled Group are conducted through the following operating group companies:

- SPI Electricity Pty Ltd (holder of a Victorian electricity distribution licence);
- SPI Networks (Gas) Pty Ltd (holder of a Victorian gas distribution licence); and
- SPI PowerNet Pty Ltd (holder of a Victorian electricity transmission licence).

2.9.1 Related Party Contracts

SP AusNet has arrangements or contracts for the direct or indirect provision of services with three related parties, namely:

- SPI Management Services Pty Ltd – provides management and strategic services to SP AusNet.
- Enterprise Business Services (Australia) Pty Ltd – provides Information Technology services to SP AusNet.
- SPI (Australia) Assets Pty Ltd – provides capital works services to SP AusNet.

SP AusNet's regulatory accounts reflect only the costs related to the provision of services to the transmission business and not the price of the contracts themselves.[6]

Outsourcing agreements between related parties achieve the same financial and qualitative benefits as between independent third parties, including economies of scale, strategic flexibility and an increased ability to hedge risk. Related party agreements however, achieve even greater benefits in comparison to relationships with unrelated third parties due to:

- lower transaction costs;
- fewer barriers to accessing proprietary information or resources;
- fewer integration issues between systems and structures;
- shared goals across parties; and
- lower counterparty risk.

Full details about SP AusNet's related party arrangements and transactions are provided in *Related Party Arrangements (*Appendix 2B).

2.9.2 Allocation of Costs between Networks

The regulatory accounts relating to the electricity transmission business include only the share of SP AusNet's total costs that relate to the transmission business. Where possible the allocation is made on a direct causal basis. Shared labour costs are not directly attributable to the transmission network are allocated based on the results of quarterly surveys of individual staff

[6] This reference to SP AusNet's regulatory accounts relates specifically to the SPI PowerNet's regulatory accounts.

members and cost centre managers. Significant non-labour expenses (e.g. insurance premiums) are allocated based on appropriate causal drivers, such as asset values or inventory transactions. This approach is reflected in the expenditure forecasts contained in this Revenue Proposal.

For example, key operating costs are allocated as follows:

- Labour costs – are either directly attributed to asset related work types and activities via the asset management system and labour timesheets, or allocated (for corporate services) on the basis of an activity based costing approach;
- Invoiced contract and services costs – are directly attributed to asset related work types and activities via the accounts payable system, or allocated on an activity based costing approach, referencing the causal drivers of the cost;
- Directly costed items – are attributed on a systems basis (direct coding) due to the consistent nature of the cost, e.g. property taxes, licensing fees, network charges; and
- Management charges (including regulatory and legal services) provided by SPI Management Services (SPIMS) – are allocated to each SP AusNet business via an activity based costing approach, and in turn to business segments, activities and services on the basis of direct expenditure.

More details are provided in SP AusNet's *Cost Allocation Methodology* (CAM) (Appendix 2C).

2.9.3 Allocation of Costs between Regulated and Unregulated

The regulatory accounts relating to the electricity transmission business only include regulated costs. All unregulated costs are allocated to unregulated activities at the time of deriving the regulatory accounts for the electricity transmission businesses. This approach is reflected in the expenditure forecasts contained in this Revenue Proposal.

More details are provided in SP AusNet's CAM (Appendix 2C).

3 Historic cost and service performance (2008 – 14)

3.1 Summary

This chapter sets out SP AusNet's actual and expected capital and operating expenditure performance for the current regulatory control period (1 April 2008 – 31 March 2014). The information provided is based upon audited regulatory accounts for 2008/09 – 2011/12 and forecasts for 2012/13 – 2013/14. The chapter explains the reasons for the difference between the regulatory allowance and SP AusNet's actual expenditure, and also explains why SP AusNet regards its actual expenditure as efficient and prudent.

This chapter also summarises SP AusNet's service performance in relation to the AER's service target performance incentive scheme (STPIS), including performance under the market impact parameter.

The chapter is structured as follows:

- Section 3.2 sets out the Rules and compliance obligations that relate to expenditure in the current period;
- Section 3.3 discusses SP AusNet's recent capex performance;
- Section 3.4 discusses SP AusNet's recent opex performance;
- Section 3.5 sets out SP AusNet's service performance against the AER's service standards scheme (STPIS); and
- Section 3.6 sets out results of an international operating expenditure cost benchmarking exercise.

3.2 Rules requirements

NER 6A.6.6(e)(5) and 6A.6.7(e)(5) require the AER to have regard to the actual and expected capital and operating expenditure of the TNSP during any preceding regulatory control periods in assessing forecast expenditure.

NER S6A.1.1(6) and (7) require the TNSP to provide an annual summary of capital and operating expenditure for the current regulatory control period categorised in the same way as for the forecast expenditure. This requirement is also reflected in section 4.3.3(a)(6) of the AER's Electricity Transmission Submission Guidelines.

Section 4.3.3(a)(7) of the AER's Submission Guidelines requires an explanation of any significant variations in the forecast capital expenditure from historical expenditure.

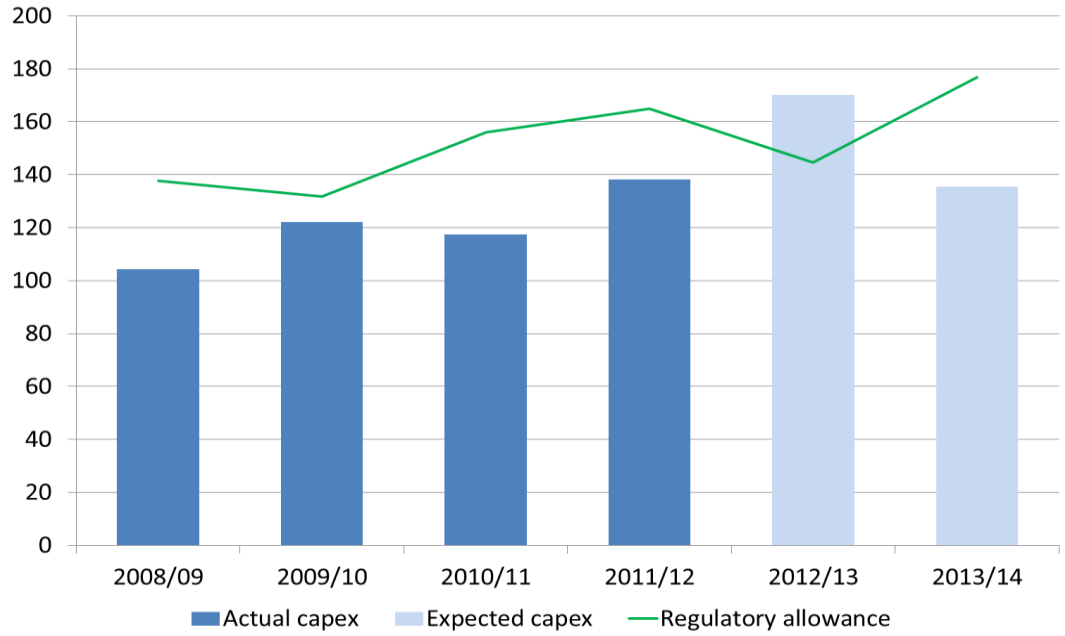
The expenditures reported below are based upon the regulatory financial statements submitted to the AER on an annual basis for SP AusNet's transmission network business (owned and operated by SPI PowerNet). As part of this annual reporting process, SP AusNet's regulatory accounts and cost reporting have been subject to audit assurance which includes checks that all capital expenditure has been properly allocated to prescribed services. This ensures that only appropriately allocated expenditure is rolled into the RAB.

3.3 Capital expenditure

3.3.1 Overall capex

Overall capex in the current period is expected to total $789 million (real 2013-14). This is 13% below the capex provided by the 2008 Revenue Determination.[7] The figure below illustrates SP AusNet's actual and expected capex against the regulatory allowance.

Figure 3.1: 2008-14 actual and expected capex ($m, real 2013-14)



Note – as incurred.

The table below details the annual and total variance between out-turn capex and the regulatory allowance, in accordance with the requirements of NER S6A.1.1(6) and section 4.3.3(a)(6) of the Submission Guidelines.

Table 3.1: 2008-14 actual/ expected capex ($m, real 2013-14)

	2008-09 (Actual)	2009-10 (Actual)	2010-11 (Actual)	2011-12 (Actual)	2012-13 (Budget)	2013-14 (Budget)	Total
Regulatory allowance	137.3	131.5	155.6	164.4	144.2	176.2	909.1
Actual / estimated capex	104.9	121.9	117.9	138.7	169.9	135.5	788.7
Variation	-32.5	-9.6	-37.7	-25.6	25.7	-40.8	-120.5
Variation (%)	-23.7%	-7.3%	-24.2%	-15.6%	17.8%	-23.1%	-13.3%

Note – as incurred. Numbers may not add up due to rounding.

[7] It is noted that in 2007-08, the final year of the previous regulatory period, SP AusNet overspent the approved capex incorporated into the AER's closing asset base by $32.3 million (real 2013-14). If this expenditure is taken into account in the analysis, SP AusNet's overall underspend against regulatory allowance for the current period is 9.7%.

Key aspects of SP AusNet's capital program which account for the majority of the expected capex performance in the current regulatory control period are:

- Completion of the Richmond Terminal Station rebuild has been deferred into the forthcoming regulatory control period,;
- SP AusNet has staged components of major stations projects such as Brooklyn and Ringwood Terminal Station redevelopments; and
- The re-prioritisation of the Hazelwood Power Station redevelopment and staging of project components.

SP AusNet has implemented a number of measures to strengthen project management and governance, and to ensure the timely and cost-effective completion of capital projects. An explanation of SP AusNet's capex delivery and governance improvements is provided in SP AusNet's *Deliverability Strategy* at Appendix 3A. These initiatives, which reflect the company's culture of continuous improvement and its focus on contributing to the achievement of the NEO, have contributed to the capex savings.

However a number of unexpected capital requirements and upward cost pressures have partially offset the capex performance for this period including:

- unplanned conductor replacement on the 500kV Heywood – APD line (at a cost of $45 million);
- unexpected transformer failures at Thomastown and Morwell Terminal Stations which required urgent replacement;
- greater than expected insulator replacement costs due to increased use of elevated work platforms and greater live line work; and
- higher than forecast IT infrastructure services replacement costs associated with enterprise asset integration systems, server replacements, data centre renewal and storage upgrades.

Actual and estimated capex by driver category is shown in the table below.

Table 3.2: 2008-14 actual/ expected capex by category ($m, real 2013-14)

	2008-09 (Actual)	2009-10 (Actual)	2010-11 (Actual)	2011-12 (Actual)	2012-13 (Budget)	2013-14 (Budget)	Total
Major Station Replacement	46.2	47.6	47.9	58.8	69.8	81.7	352.1
Asset Replacement	26.3	40.9	35.1	34.9	52.8	28.4	218.4
Safety and Compliance	16.5	20.2	16.8	30.9	23.5	3.0	110.9
Other	1.9	2.9	2.2	1.1	2.6	1.4	12.0
Non-system	14.0	10.1	15.9	13.0	21.1	21.0	95.2
Total	**104.9**	**121.9**	**117.9**	**138.7**	**169.9**	**135.5**	**788.7**

Note –as incurred.

The above categories align with those used to present SP AusNet's capex forecasts for the forthcoming period.

Outcomes in relation to the each category of capex are detailed below.

3.3.2 Station rebuilds

Capex for major station rebuilds constitutes roughly 45% of SP AusNet's capex in the current period. The majority of major stations projects address risks arising from switchyard assets and transformer banks.

The focus of the major stations capital works moved from regional to metropolitan locations in this period. The forecast projects for the forthcoming period will maintain this pattern, with most work focussed on the inner Melbourne stations at Richmond and West Melbourne.

By the end of the current regulatory control period SP AusNet will have successfully completed nearly all of the major stations projects forecast at the last revenue determination. The table below shows the expected status of major stations projects at the end of the period.

Table 3.3: Terminal Station Redevelopment Program 2008-14

Terminal Station	22kV	66kV	220kV	500kV	Transformers	Status at end of current period
Brooklyn (BLTS)	S	S	Y		Y	Stage 1 Complete
Glenrowan (GNTS)		P	P		Y	Underway
Geelong (GTS)		Y	Y		Y	Complete
Hazelwood (HWTS)				Y		Complete
Hazelwood Power Station (HWPS)			S			Stage1 Complete
Keilor (KTS)		Y	Y	Y	Y	Complete
Richmond (RTS)		Y	Y		Y	Underway
Ringwood (RWTS)	Y	S	S		S	Stage1 Complete
Rowville (ROTS)			Y			Complete
Thomastown (TTS)		Y	Y		Y	Complete
West Melbourne (WMTS)	Y	Y	Y		Y	Underway

Key: Y=Yes, P= Partially, some works remain, S=Staged.

The above table notes that the 22kV and 66kV bay replacements at Brooklyn Terminal Station have been staged. This was the result of gaining better information on the condition of these assets at the detailed design stage which led to certain components of these rebuilds being efficiently deferred to the next stage of works at the station. Some of the 22 and 66 kV works have been completed as part of Stage 1 and the remainder will be completed at Stage 2.

The rebuild of Glenrowan Terminal Station commenced in 2012-13 and will be completed in July 2015. While the B3 transformer will be commissioned by the end of the current regulatory period, additional time required for detailed design and construction have contributed an extra year to the project timeframes.

The planned refurbishment works at Hazelwood Power Station have been staged due to the uncertainty around the future of the power station. In the current period Stage 1 of this project was completed, including the replacement of the G1 and G2 switch bays and 220kV circuit breakers which were assessed as the minimum necessary to maintain an acceptable level of safety risk. Stage 2, which will replace a further 5 circuit breakers and their associated isolators and earth switches, is included in the forecast capex for the next period.

The redevelopment of Richmond Terminal Station is now underway and due to project redesign and scheduling changes, is expected to be complete in 2018. More detailed discussion of RTS is provided at section 4.6.1 below.

The rebuild of West Melbourne Terminal has reached design and procurement stage and is scheduled for completion in November 2017.

Following detailed project design, the redevelopment of Ringwood Terminal Station has been staged. Stage 1, which replaces the 220/22 kV transformers, all of the 22kV, and some 66kV and 220kV switching, will be complete by end of the current regulatory period. Further works to replace 220kV circuit breakers are underway and will be complete in 2014/15. A project to replace the B4 220/66kV transformer and the remaining circuit breakers is included in the forecast capex for the next regulatory period.

Unexpected transformer failures occurred at Thomastown and Morwell Terminal Stations, and these urgent works were also completed in the period. In addition, a transformer replacement was completed at Keilor Terminal Station, following an analysis of the asset's condition and associated level of risk.

In all cases, the replacement and refurbishment works were undertaken after careful analysis and consideration of the conflicting objectives of achieving safe, secure, reliable and quality electricity supply, against delivering long term benefits to customers in an economically efficient manner. The projects were undertaken when this analysis demonstrated that the works were necessary.

3.3.3 Asset replacements

SP AusNet has undertaken a number of asset replacement programs over the current regulatory control period including:

- Transformers replacements (not associated with station rebuilds) including replacing the B2 transformer and repairing the failed B1 transformer at Thomastown Terminal Station; purchasing spares used to replace the Thomastown B2 transformer, and the 230kV 165MVA transformer which failed at Morwell Terminal Station; replacing 220/66kV (B1 and B2) transformers and repairing the 500/220/22kV transformer at Keilor Terminal Station;
- Replacing around 16 km of the 500kV Heywood – Portland line;
- Over 90 individual secondary and protection projects were completed, including:
    - batteries replaced at terminal stations and communications sites;

- protection at Heywood Terminal Station (HYTS) and the Alcoa Portland smelter (APD) to meet new Code requirements and align with generator protection installed at Mortlake as well as replacing 500kV protection at Moorabool and Sydenham Terminal Stations (MLTS and SYTS);
- replacing ageing relays at Dederang, Wodonga and South Morang, and replacing the control system at HYTS due to unacceptable performance;
- upgrading the obsolete dynamic monitoring system in conjunction with AEMO; and
- replacing remote terminal units (RTUs).

- Investment in digital communications, including completing a $22 million project during 2008/09 – 2011/12 installing 400 kilometres of optic fibre ground wire (OPGW) along the Moorabool-Heywood-Portland 500kv line and Moorabool-Terang 220kv line. Radio links from Portland to Terang were also installed.

3.3.4 Safety and compliance

SP AusNet has carried out extensive safety and compliance related capital works over the current regulatory control period, including:

- Replacing 350 post-type instrument transformers, which posed a risk of failing and exploding;
- Replacing around 180 bulk oil circuit breakers (CBs), which posed oil leakage risk and risk to staff to working in confined spaces;
- Replacing over 20% of the existing fleet of insulators and fittings, which posed safety risks from potentially breaking and falling over road crossings;
- Installing tower fall arrests and improved tower climbing at 40% of SP AusNet's tower structures. This safety program rolls out a cable based system across the entire transmission network and will continue into the forthcoming period;
- Around $9 million on oil containment to comply with Environment Protection Authority (EPA) requirements; and
- Improving and addressing security levels at stations and sites, largely through fencing, access infrastructure and security cameras. The fencing program has replaced fencing at 22 stations at a cost of $9 million.

In addition to these works, rebuilds at major stations include expenditure which is not reported separately but is partially driven by safety and compliance, such as asbestos removal and site refurbishment.

3.3.5 IT and non-system

SP AusNet expects to have invested $71 million in IT capex over the current regulatory control period, completing projects in:

- accessibility and mobility automation;
- asset management and network management automation;
- corporate services automation;
- reporting and interrogation; and
- IT infrastructure services.

SP AusNet is expecting its total IT capex this period to exceed the regulatory allowance by approximately 35%. This performance primarily reflects unanticipated increased costs of IT

infrastructure, which is the single largest category of IT capex. Over the six year current period, SP AusNet will have invested over $30 million of investments in IT infrastructure such as server replacements, data centre renewal, enterprise asset integration (EAI) and storage upgrades. Further detail on historic performance related to IT capex can be found at *IT Transmission Regulatory Control Period Performance* which is provided as a supporting document to this Revenue Proposal.

The "non-system – general" category of expenditure covers vehicles, property and tools and equipment. Examples of non-system – general capex which SP AusNet has invested in over the period include:

- a power transformer high voltage field test system;
- developing a Station Design Manual;
- purchasing test equipment for testing and commissioning; and
- fleet vehicles.

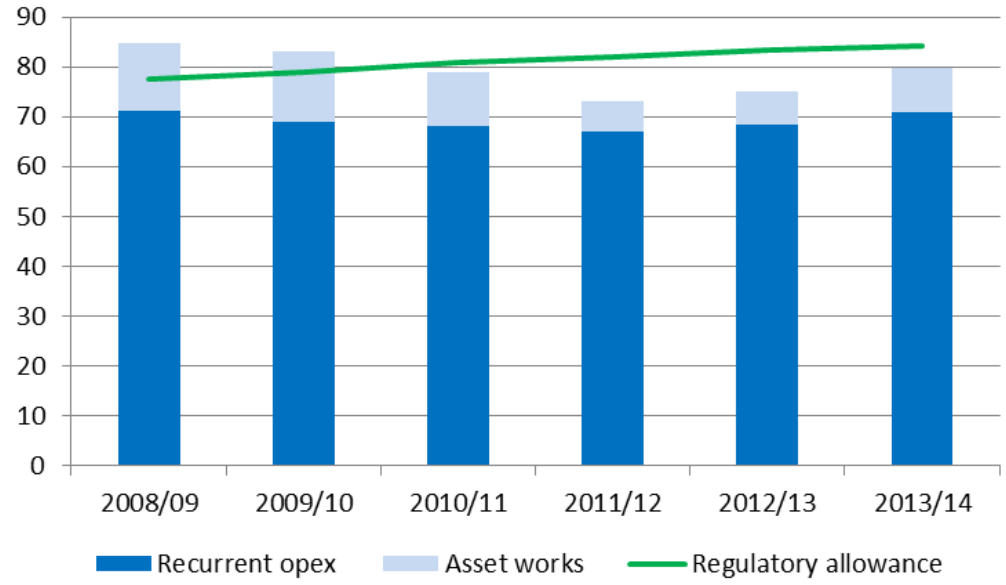
3.4 Operating expenditure

SP AusNet categorises its operating expenditure (opex) as controllable costs and all other costs (for convenience, referred to as non-controllable). This categorisation is explained further in the opex forecasting methodology set out in section 5.3.1. SP AusNet's current period performance in relation to opex is outlined below consistent with these categorisations.

3.4.1 Controllable opex

SP AusNet's total controllable opex is expected to average $79.2 million (real) over the current regulatory control period based on actual expenditure for 2008/09 – 2011/12 and expected expenditure for the remaining two years of the period. The expected total spend is $15.7 million or 3.2% below regulatory allowance.

Figure 3.2: Total controllable opex 2008-14 ($m, real 2013-14)



Note – Total controllable opex figures exclude self-insurance.

Annual controllable opex and variance against the regulatory allowance is shown in the table below.

Table 3.4: 2008-14 actual/ expected controllable opex ($m, real 2013-14)

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	Total
Regulatory allowance*	77.6	78.9	81.0	81.9	83.4	84.5	487.3
Actual / forecast opex	84.8	82.1	77.5	72.2	75.2	79.8	471.6
Variation	7.2	3.3	-3.5	-9.7	-8.3	-4.7	-15.7
Variation (%)	9.2%	4.1%	-4.3%	-11.8%	-9.9%	-5.5%	-3.2%

Note – Total controllable opex figures exclude self-insurance.

Over the current period, recurrent operating costs have exceeded the regulatory allowance for that particular category of cost. However, this increase has been more than offset by lower than forecast expenditure in relation to asset works. Annual actual controllable operating costs are shown in the table below by category.

Table 3.5: 2008-14 actual/ expected controllable opex by category ($m, real 2013-14)

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	Total
Direct Maintenance	27.0	27.7	25.6	25.4	25.6	27.1	158.4
Maintenance Support	7.1	9.0	5.8	5.1	5.1	5.2	37.3
System Operation	3.3	4.0	5.2	5.7	5.8	6.1	29.9
Health & Safety	0.8	0.8	1.0	0.7	0.7	0.7	4.7
Taxes / Leases	3.8	5.6	5.1	5.4	5.4	5.4	30.7
Insurance	2.8	2.9	3.2	4.0	4.6	5.2	22.8
Asset works	12.4	12.4	7.8	4.2	5.8	7.8	50.3
Asset works support	1.1	0.9	1.5	1.0	1.1	1.1	6.8
Finance	3.5	4.0	3.1	3.6	3.6	3.7	21.4
HR	1.0	1.3	1.6	0.5	0.5	0.5	5.4
IT	2.2	6.3	7.2	6.4	6.4	6.4	34.7
Other	7.6	5.1	5.5	4.1	4.2	4.2	30.6
Management Fee	12.2	2.2	5.0	6.3	6.4	6.5	38.6
Total Controllable	**84.8**	**82.1**	**77.5**	**72.2**	**75.2**	**79.8**	**471.6**

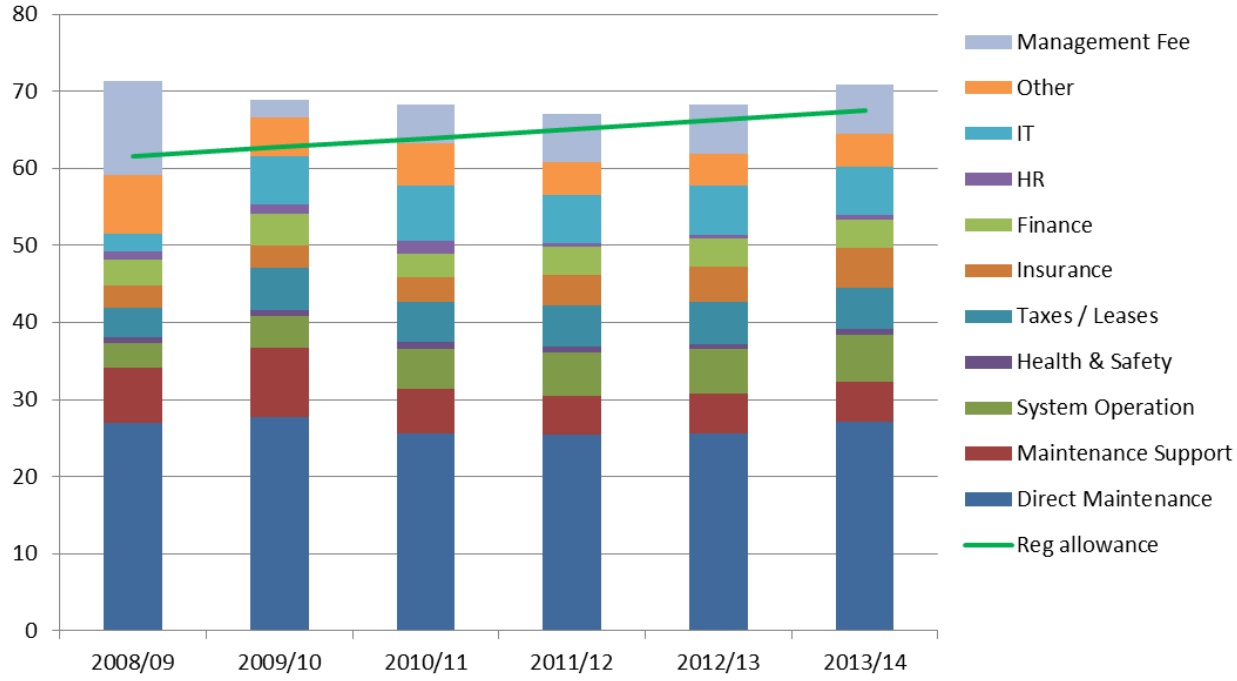
Note – Excludes self-insurance, easement land tax, debt and equity raising costs and incentive scheme payments.

The above categories of operating costs correspond to those used to forecast opex requirements for the forthcoming regulatory control period, consistent with the requirements of 4.3.4(a)(7) of the Submission Guidelines.

3.4.2 Recurrent controllable opex

As already noted, while total controllable opex has been lower than the regulatory allowance in this period, the recurrent expenditure component has been consistently above the regulatory allowance (7% higher on average) for that category of cost. The chart below shows total recurrent expenditure in individual opex categories against the total regulatory allowance.

Figure 3.3: 2008-14 actual/ expected recurrent opex ($m, real 2013-14)



The overspend against regulatory allowance in these categories is due to:

- Underestimated cost impacts of the ageing asset base which has necessitated increased condition monitoring and direct maintenance costs;
- Higher insurance premiums considered to be prudent and efficient and commensurate with the risks faced by SP AusNet's transmission business;
- New administrative functions introduced in response to non-network innovations, regulatory reporting and STPIS requirements which have increased system operations costs; and
- Increasing the frequency of tower inspections in 2012 to address the Bushfire Taskforce's recommendations.

As already noted, the higher than expected recurrent opex has been more than offset by lower non-recurrent opex. Non-recurrent opex is discussed below.

3.4.3 Non-recurrent opex (asset works)

SP AusNet is expected to spend $57 million (real) on non-recurrent opex projects (asset works) over the current regulatory control period. This expenditure delivers:

- Refurbishments of SF_6 circuit breakers and GIS equipment.

- Oil treatment to replace or reclaim aged or contaminated oil in transformers and major oil leak repairs, including at Richmond and Keilor Terminal Stations and Morwell Power Station.
- Various facilities maintenance works, including rust treatment and general maintenance and repairs.
- Comprehensive major failure investigations and condition monitoring to improve the reliability of various assets including transformers, switchgear and conductors.
- Undertook tower ground level corrosion works, including structural reinforcements and applying protective coatings.
- Repaired power cable joints on the Brunswick to Richmond line.

The forecast total asset works expenditure is 43% under the regulatory allowance over the current regulatory control period. The expenditure reflects realised cost efficiencies in project delivery and changing priorities due to unexpected capital works needs which emerged during the period. Specific reasons for lower than forecast expenditure include:

- Optimisation of works across the capital portfolio meant that a number of asset works projects were delivered through capital projects. For example, switchyard resurfacing and asbestos removal were carried out as part of major station rebuilds, rather than as stand-alone asset works projects.
- The presence of asbestos on corrosion protection system of 66kV towers which slowed the progress of the ground level tower corrosion protection program.
- Cost savings through delivering projects in-house, rather than using contractors.
- Changed priorities as the condition of assets was determined not to be as poor as originally thought when the work program was proposed. This forecasting inaccuracy has been reflected in the forecasting of asset works for the forthcoming regulatory control period, and the forecast asset works program is aligned with actual expenditure in the 2008-14 period (see section 5.8).

It is noted that some asset works expenditure categories exceeded the regulatory allowance, including facilities maintenance and condition monitoring. However, in overall terms the total opex in relation to asset works was substantially lower than the regulatory allowance.

3.4.4 Other (non-controllable) opex

Any costs that are not part of controllable opex are categorised as other, or “non-controllable,” opex. The table below shows actual annual non-controllable opex costs for the current regulatory control period.

Table 3.6: 2008-14 actual/ expected non-controllable opex ($m, real 2013-14)

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	Total
Self-insurance	2.5	2.5	2.5	2.5	2.5	2.5	**14.8**
Debt and equity raising costs	-	-	-	-	-	-	**-**
AIS rebates	2.0	1.9	2.8	2.3	3.3	3.3	**15.6**
Inventory adjustment	-0.3	1.9	-1.6	-0.3	0.0	0.0	**-0.2**
EBSS payments	-	-	-	-	-	-	**-**
Easement tax	89.8	103.0	100.9	104.7	101.5	103.4	**603.3**
Total	**93.9**	**109.3**	**104.6**	**109.1**	**107.3**	**109.3**	**633.5**

Notes –

(1) No Efficiency Benefit Sharing Scheme (EBSS) payments were recovered in this period as the scheme did not apply in the previous period.

(2) Debt and equity raising costs are not reportable.

SP AusNet's non-controllable opex is expected to average $105.6 million (real 2013-14) over the current regulatory control period. This expenditure is comprised of the following:

- Self-insurance – opex for self-insurance is held as provisions to enable SP AusNet to bear the specified self-insurable risks in the 2008 Revenue Determination, rather than expenditure undertaken. Therefore this is equal to the regulatory allowance set to compensate for bearing these risks. Where a claim against self-insurance has been made, this is recorded in the regulatory accounts as a provision for self-insurance costs.
- Debt and equity raising costs – debt and equity raising costs are not reported as part of the regulatory accounts. These costs are incurred at a group level, and cannot meaningfully be allocated between networks.
- AIS rebates – this includes monthly rebates paid to AEMO under the Availability Incentive Scheme (see Section 2.5.1.2). Average annual expenditure has been 22% less than the regulatory allowance provided for the rebates. This difference represents the incentive provided to SP AusNet to improve and maintain network reliability under this scheme. However, since 2012/13, expenditure is expected to be in line with the allowed revenue of $3.3 million per year ($2013-14 real). This is partly due to the strong financial incentives provided by the market impact measure of the AER's STPIS, resulting in a deterioration of SP AusNet's performance against the AIS (see section 6.5).
- Inventory adjustment – this represents the opex costs associated with inventory which was reclassified as opex in the 2008 Revenue Determination[8].
- Efficiency Benefit Sharing Scheme (EBSS) payments – the EBSS applied for the first time during the current regulatory control period, and any payments under the scheme will not be received until the next regulatory control period. Therefore there are no EBSS payments in this current period.

[8] AER, Final Decision, SP AusNet Transmission Determination, 2008-09 to 2013-14, January 2008.

- Easement land tax – the Victorian Government easement land tax has applied since 2004, and is a levy recovered by the Victorian Government through transmission charges. Expenditure under this category is determined directly by the Victorian Government. Any positive or negative variation between the actual tax paid and the forecast approved by the AER is recovered via the pass-through mechanism outlined in NER 6A.7.3.

3.5 Service Performance

SP AusNet has been subject to an outage management incentive scheme since 1994 (an early version of AEMO's AIS), and, in 2003, became the first TNSP to be subject to the AER's Service Target Performance Incentive Scheme (STPIS). The company has responded well to these schemes through improving outage management and planning, minimising disruption and risk to customers.

3.5.1 STPIS

The AER's STPIS provides strong incentives for TNSPs to improve network reliability. In the current period, the following parameters and sub-parameters have applied to SP AusNet:

- Transmission Circuit Availability parameter:
    - Total circuit availability
    - Peak critical circuit availability
    - Peak non-critical circuit availability
    - Intermediate critical circuit availability
    - Intermediate non-critical circuit availability
- Loss of Supply Event Frequency parameter:
    - Number of events greater than 0.05 system minutes per annum
    - Number of events greater than 0.30 system minutes per annum
- Average Outage Duration parameter:
    - Average outage duration – lines
    - Average outage duration – transformers
- Market Impact Component (since 1 August 2011).

The Market Impact Component was introduced in the March 2008 version of the STPIS. The AER approved SP AusNet's request for early application of this parameter commencing 1 August 2011.

The table below shows SP AusNet's performance against each of these parameters. This is discussed in a higher level of detail below.

Table 3.7: Current Period STPIS Performance (Service Component)

Parameter	Target	2008	2009	2010	2011	2012	Weight (% MAR)
Total circuit availability (%)	**98.73**	99.12	99.02	99.15	99.11	99.25	0.20
Peak critical circuit availability (%)	**99.39**	99.80	99.85	99.67	99.80	99.79	0.20
Peak non-critical circuit availability (%)	**99.40**	99.93	99.94	99.81	99.88	99.91	0.05
Intermediate critical circuit availability (%)	**98.67**	99.42	99.06	99.82	99.29	99.67	0.25
Intermediate non critical circuit availability	**98.73**	99.53	98.97	99.01	99.09	98.91	0.25
Number of events greater than 0.05 system minutes per annum	**6**	1	6	1	0	2	0.125
Number of events greater than 0.30 system minutes per annum	**1**	1	2	0	0	1	0.125
Average outage duration – lines (mins)	**382**	226	177	319	129	207	0.125
Average outage duration – transformers (mins)	**412**	263	395	818	1048	147	0.125

Note – 2008 data is from April to December only. 2012 performance data will be audited by the AER by March 2013.

SP AusNet has generally performed strongly against STPIS parameters in the current regulatory control period. The majority of network outages are required due to maintenance and capital expenditure projects. SP AusNet plans to ensure that planned outages do not impact customers.

The frequency of unplanned outages is affected by the condition of network assets. SP AusNet's asset replacement program is strongly determined by asset condition, and the implications of a potential failure (see Section 2.6.4). Consequently the asset replacement program reduces the risk that an unplanned outage will occur, particularly an unplanned outage that could result in a loss of supply event.

SP AusNet's performance against each STPIS parameter is discussed below.

3.5.1.1 Transmission Circuit Availability Parameter

SP AusNet's performance compared with target performance for each of the five transmission circuit availability sub-parameters is shown in Figures 3.4 to 3.8. These show that SP AusNet has exhibited strong performance, significantly outperforming the targets for all years in the current period.

This strong performance is due to a combination of factors including outage planning to avoid peak periods. Where possible, practices such as live line work have also been implemented to allow maintenance and capital works projects to be carried out without taking assets out of service.

In the performance shown below, data for 2008 only covers the period from April to December, as the current regulatory control period began on 1 April 2008.

Figure 3.4: Total Circuit Availability (%)

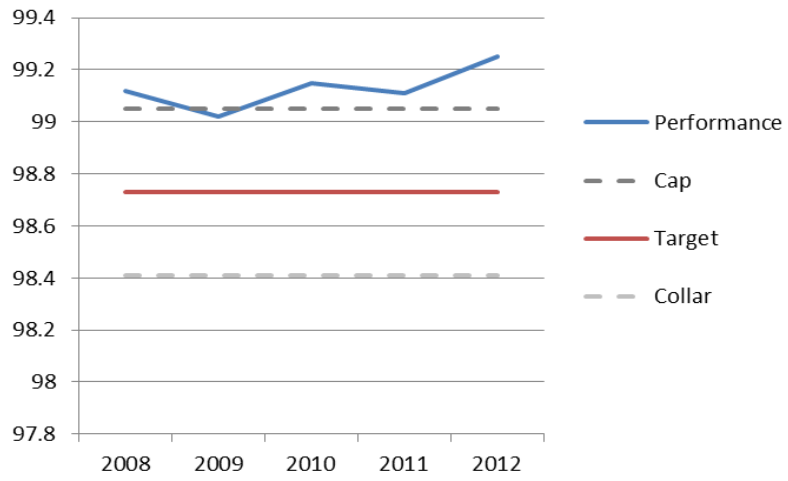


Figure 3.5: Peak Critical Circuit Availability (%)

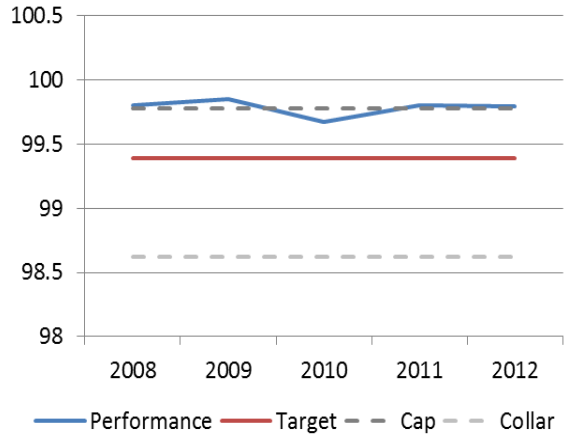


Figure 3.6: Peak Non-Critical Circuit Availability (%)

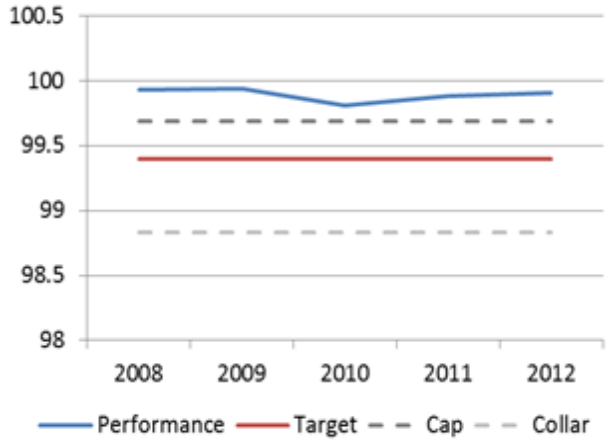


Figure 3.7: Intermediate Critical Circuit Availability (%)

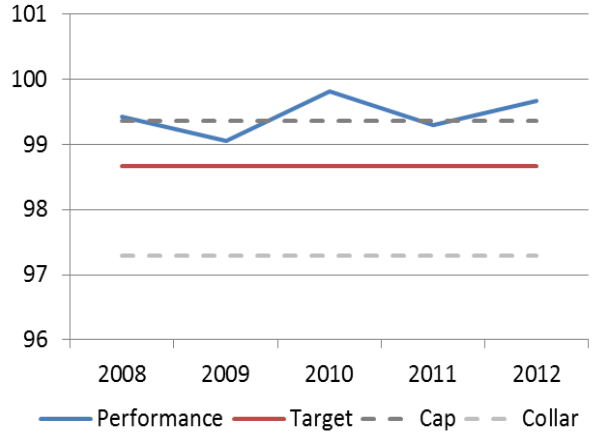
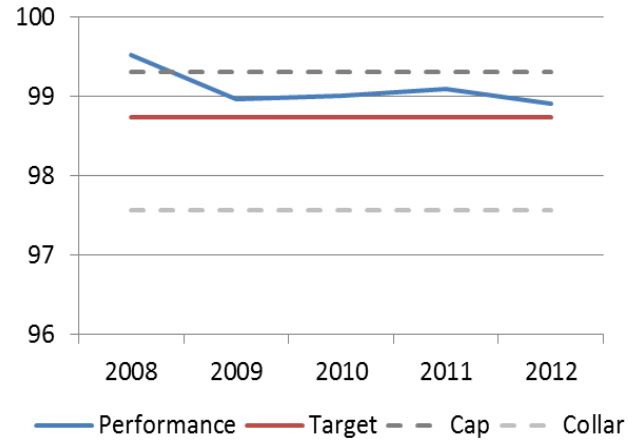


Figure 3.8: Intermediate Non-Critical Circuit Availability (%)



The transmission circuit availability parameter has been replaced with the Average Circuit Outage Rate parameter for the forthcoming period. This is timely as further improvement against the Transmission Circuit Availability parameter would be difficult to achieve as SP AusNet considers that it is currently operating at the performance frontier for this parameter.

3.5.1.2 Loss of Supply Event Frequency Parameter

This parameter measures the frequency of loss of supply events exceeding thresholds of 0.30 and 0.05 system minutes. Loss of supply events are caused by unplanned outages and only a handful of events are likely to occur each year. Therefore performance against this parameter has the potential to be relatively volatile.

In the current regulatory control period performance against this parameter has been extremely strong. However, in 2009 a number of low probability events resulted in SP AusNet incurring a small penalty under this parameter. These events were driven by a range of causes, not just the high temperatures experienced during this year. For this reason, performance in 2009 cannot be considered to be an outlier. This is relevant when calculating performance targets for the 2014-17regulatory control period (see Chapter 6).

Despite this, in 2008, 2010 and 2011 a maximum of a single event was recorded under this parameter. This is due to the effective implementation of protection schemes, and field practices including ensuring assets undergo vigorous testing before they are placed in service. This helps avoid unforeseen outages that may result in loss of supply.

Figure 3.9: Loss of Supply Event Frequency (>0.05 system minutes)

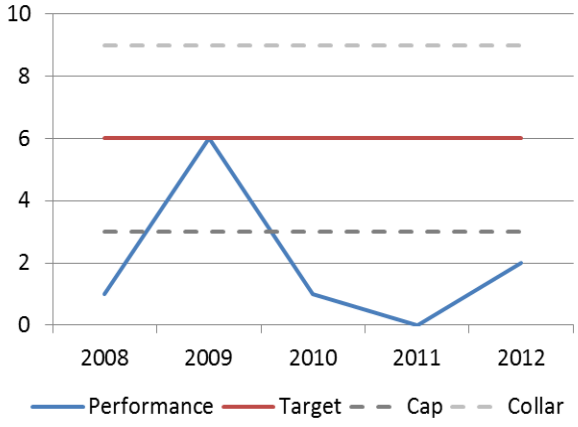
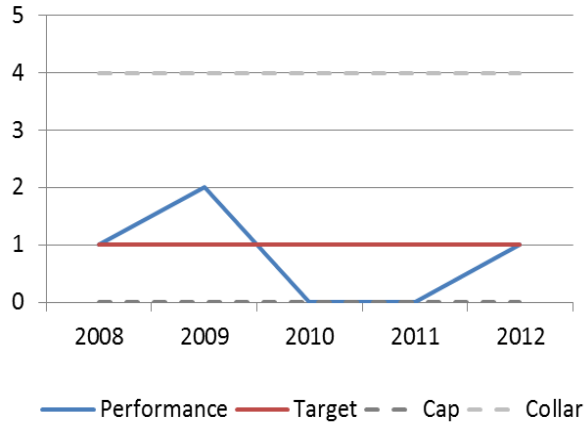


Figure 3.10: Loss of Supply Event Frequency (>0.30 system minutes)



The loss of supply event frequency parameter will continue to apply to SP AusNet during the forthcoming period. However, further performance improvements will be unlikely, particularly given the forecast increase in the volume of capital works to be undertaken during the period. This should be reflected when setting targets, caps and collars for this parameter (see Chapter 6).

3.5.1.3 Average Outage Duration parameter

The average outage duration parameter measures SP AusNet's ability to restore service following an unplanned outage in a timely manner. Performance against this parameter can be severely affected by a small number of particularly long outages, for example outages on assets such as transformers which can take several weeks to restore.

SP AusNet's performance against the lines component of this parameter has been consistently below the target throughout the period and has exhibited a downward trend over the period.

Performance against the transformer component has trended up over the period. This has been due to a couple of low probability transformer failures in 2010 and 2011, including one at Keilor Terminal Station.

Performance against this parameter is shown in Figures 3.11 and 3.12.

Figure 3.11: Average Outage Duration – Lines (minutes)

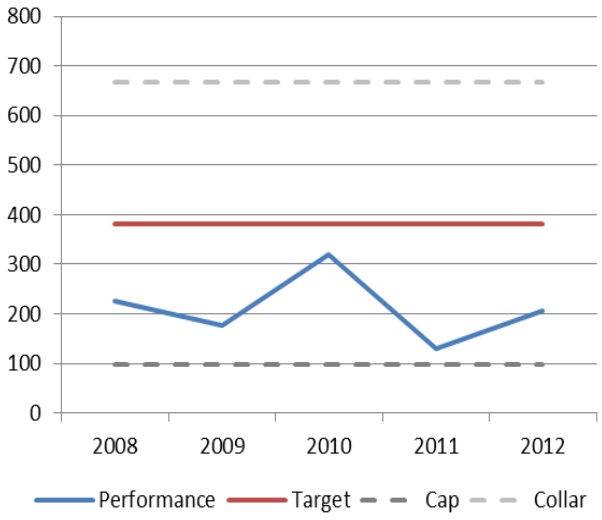
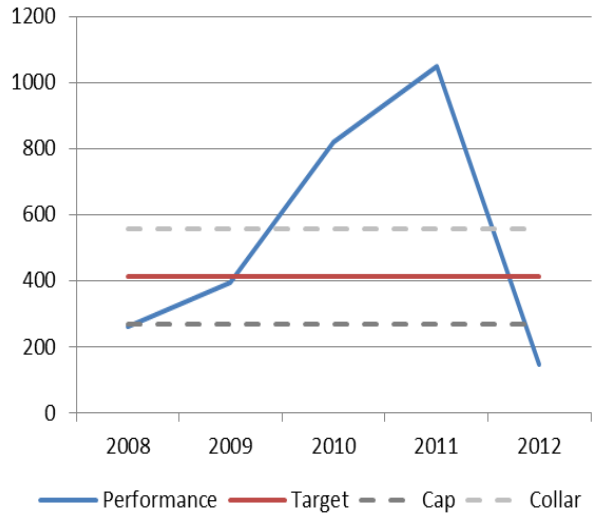


Figure 3.12: Average Outage Duration – Transformers (minutes

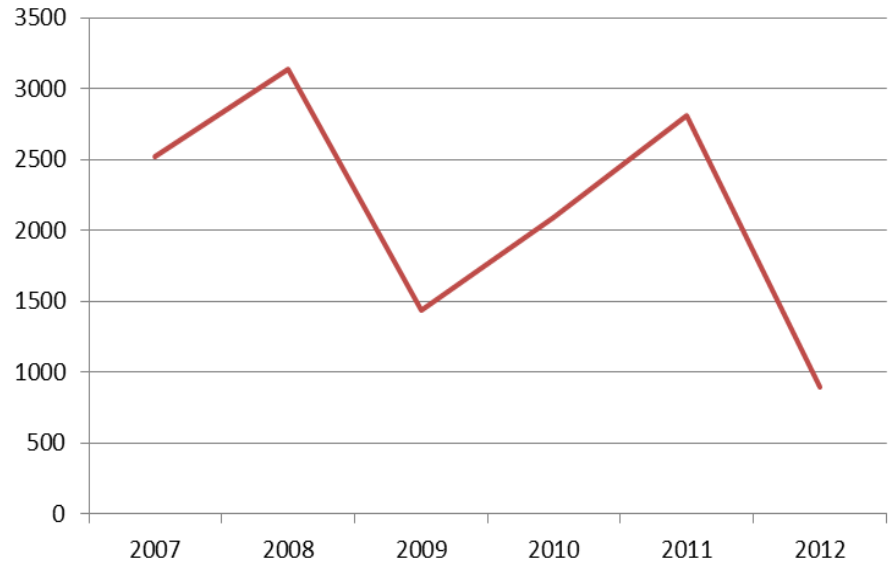


3.5.2 Market Impact Component

In March 2011 SP AusNet requested early application of the Market Impact Component (MIC). The request was accepted by the AER, and SP AusNet began participating under the MIC from 1st August 2011, but only commenced an active response to the parameter in January 2012.

Figure 3.13 shows annual performance data for years 2006 to 2012.

Figure 3.13: Market Impact Component – Number of Constrained Dispatch Intervals with a Marginal Value greater than $10/MWh



The market impact of outages taken by SP AusNet has fallen since 2006. While annual performance is highly dependent on maintenance and capital works activities undertaken, enhanced outage planning activities have contributed to a reduction of the market impact of these activities.

Enhanced outage planning practices involve identifying periods where network outages are likely to have a significant impact on the market, and scheduling outages to avoid these times where possible. Real time market monitoring allows scheduled works to be cancelled at short notice where they are likely to have a high market impact.

SP AusNet has actively responded to the MIC since January 2012. The application of the MIC in the 2014-17regulatory control period will encourage improvements in terms of the market impact of outages, although this may be offset to some extent by the forecast increase in capital works programs. In addition, recent generator connections into congested areas of the network have had a significant impact on the balance of incentives faced across SP AusNet's network. These new network conditions present additional challenges when planning outages to minimise the market impact, while continuing to deliver long term efficiencies and benefits for customers.

3.5.3 Availability Incentive Scheme

During the current period SP AusNet has continued to participate in AEMO's Availability Incentive Scheme (AIS). SP AusNet receives revenue through its revenue determinations to fund its participation in the AIS. The scheme operates through SP AusNet paying AEMO a rebate each month which is based on prescribed outages that have occurred.

The total rebate amount is calculated using specified hourly outage rates assigned to each asset. These hourly rates differ for specified peak, intermediate and off-peak periods, and is calculated based on the cost of an outage to network users in the event of a second contingency event occurring. The rebate reflects the potential impact faced by network users whenever SP AusNet removes a network element from service, and accounts for the following potential impacts:

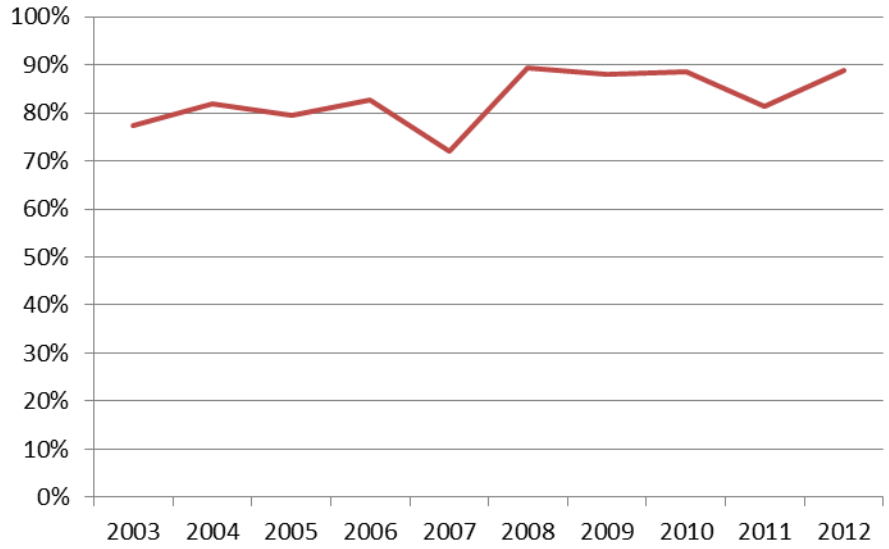
- Loss of load to customers (costed at the value of loss of load); and
- Loss of generator access to market (costed at marginal cost of generator rescheduling).

As the incentives provided by the AIS duplicate those provided by the three Service Component parameters of the STPIS, AIS performance has been strong.

Figure 3.14 shows the percentage of outage hours taken during off-peak periods. This has gradually increased since 2003, reflecting the incentives provided by the AIS to schedule outages during off-peak periods rather than peak or intermediate periods. In the current regulatory control period performance has been relatively constant. However, this indicator alone does not determine the total rebate paid, as demonstrated in section 3.4.4, which reports the current period's total annual rebates which have increased since 2012-13.

The application of the MIC since August 2011 has introduced strong financial incentives that, in some cases, conflict with those provided by the AIS. The MIC incentivises TNSPs to take outages when there is limited network congestion, while the AIS incentivises SP AusNet to take outages at specified times deemed 'off peak' based on Victorian consumption patterns. However, the time periods during which there is most likely to be network congestion do not align with the time periods classed as 'peak' in the AIS. This is likely to limit further performance improvements under the AIS in the forthcoming regulatory control period.

Figure 3.14: Percentage of Outage Hours Taken During Off-Peak Periods 2003-12



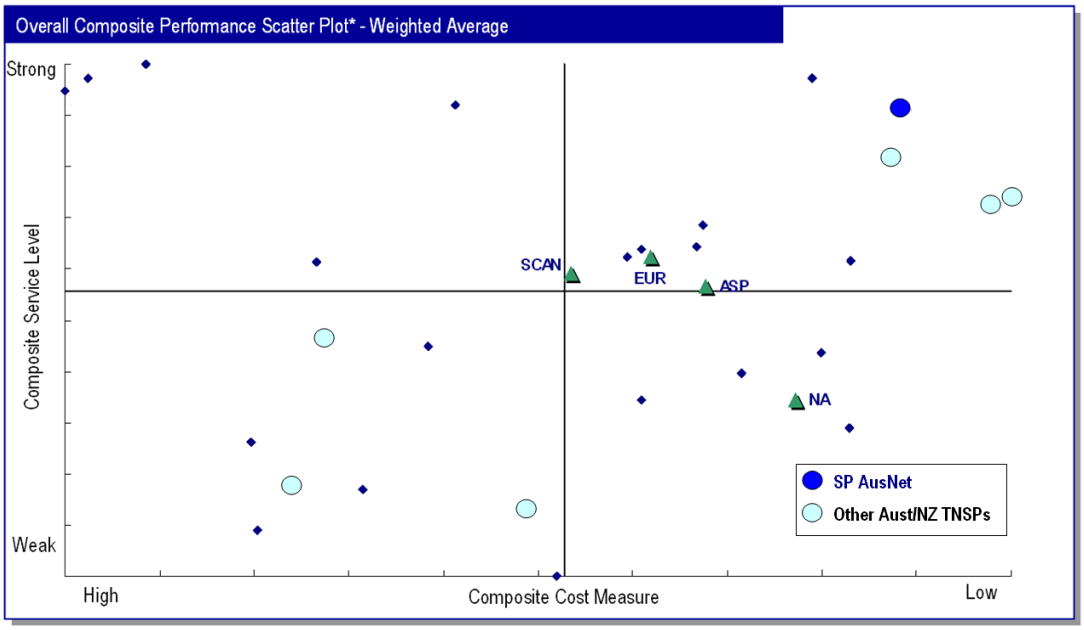
Source: SP AusNet. Note that outage hours exempt under the AIS have not been removed from performance data.

3.6 Benchmarking

3.6.1 Operating Expenditure Cost Benchmarks

The most recently available International Transmission Operations and Maintenance Study (ITOMS) Report from 2009 shows that SP AusNet ranks highly (in the top right quadrant) in overall benchmarked average performance in terms of transmission network service level and equivalent operating costs (a favourable ranking compared to of other Australian and New Zealand transmission companies and the average performance in Europe and North America). This is illustrated in the figure below.

Figure 3.15: Overall Composite Performance Benchmark – 2009



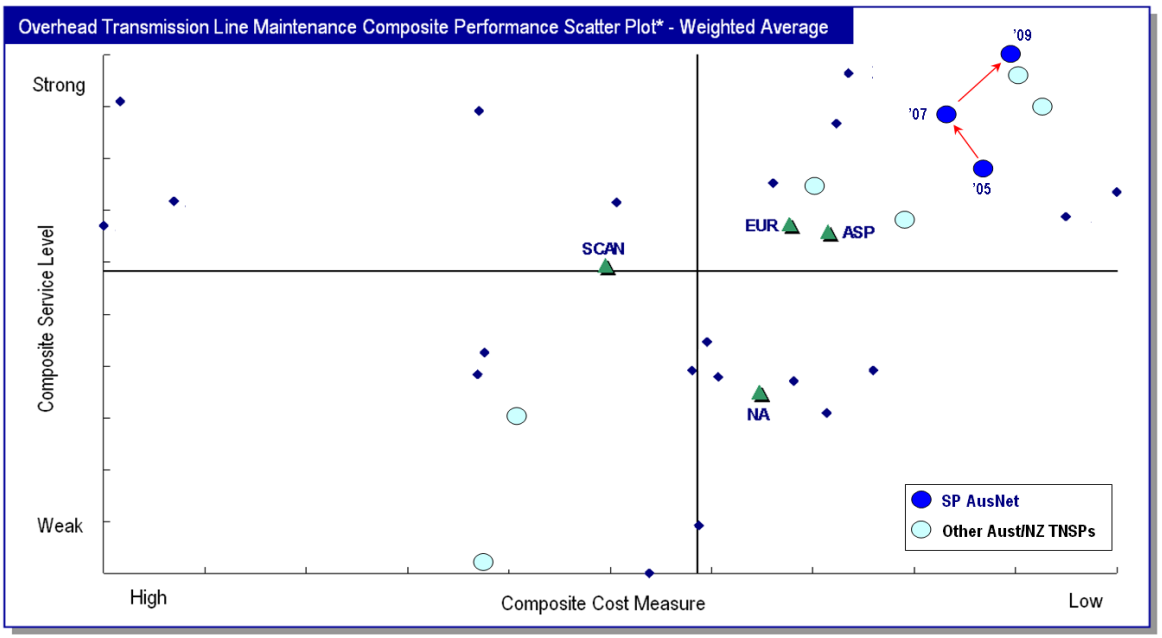
Source: International Transmission Operations and Maintenance Study, 2009.

The 2009 ITOMS results also show that SP AusNet has improved its benchmarked performance for transmission lines maintenance since 2005 and is now recognised as a top performer among all benchmarked transmission companies in the following categories:

- Patrol and inspect – over 200kV; and
- Line maintenance – over 200kV.

SP AusNet's benchmarked performance for transmission lines maintenance is depicted in the figure below.

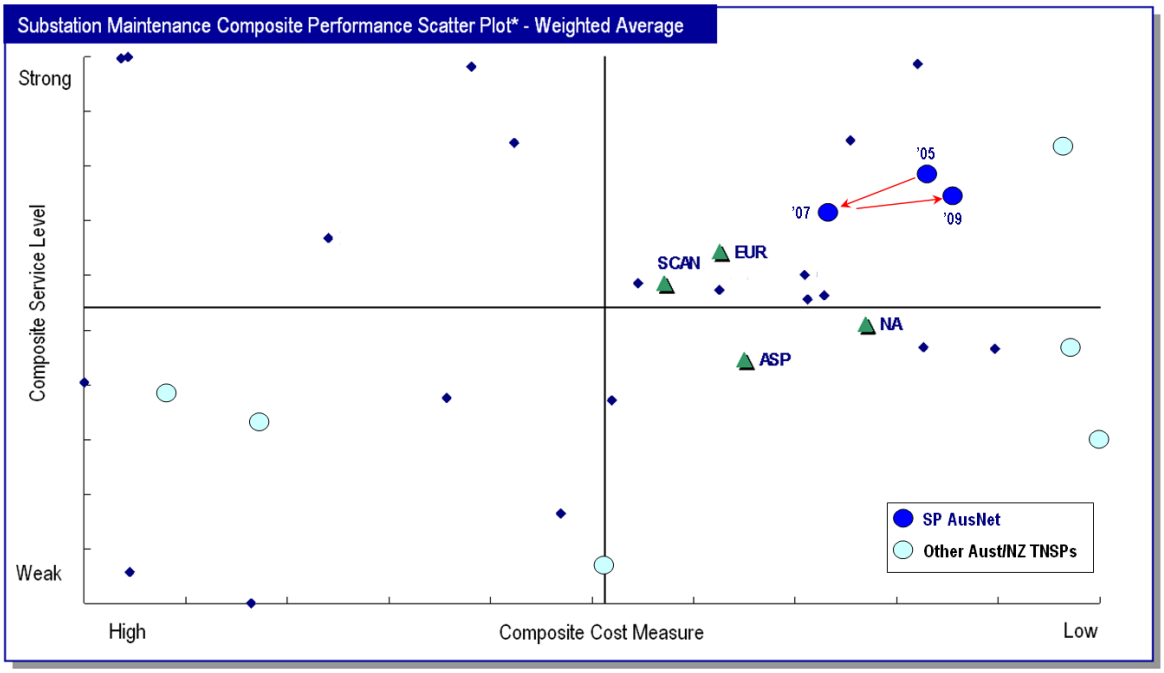
Figure 3.16: Overhead Transmission Line Maintenance Performance Benchmark – 2009



Source: International Transmission Operations and Maintenance Study, 2009.

The 2009 ITOMS results show that SP AusNet has improved its benchmarked performance for substations maintenance since 2007 and is a sound performer among benchmarked transmission companies in the categories of power transformers (60 to 99kV) and auxiliary equipment. SP AusNet's benchmarked performance for substations maintenance is shown in the figure below.

Figure 3.17: Substations Maintenance Performance Benchmark – 2009



Source: International Transmission Operations and Maintenance Study, 2009.

The benchmarking evidence, together with the analysis of the company's performance against the regulatory allowances and service targets, show that SP AusNet's expenditure and service performance is relatively efficient. This provides important background information in assessing SP AusNet's revenue cap proposal. In particular, SP AusNet is commencing the forthcoming regulatory control period in circumstances where its costs and service performance compare well against its peers.

4 `Capital Expenditure Forecast

4.1 Introduction and overview

4.1.1 Introduction

This chapter sets out SP AusNet's capital expenditure (capex) forecasts required to facilitate the on-going provision of prescribed transmission services for the forthcoming regulatory control period.

SP AusNet recognises the importance of providing value for money to its customers and end users, particularly in light of current concerns regarding the impact of electricity price increases on the cost of living. In preparing its capex forecast, SP AusNet has therefore sought to identify an overall program of capital work that will maintain the quality, reliability and security of supply of prescribed network services[9] at an efficient level of long-run cost to customers. This approach reflects both the NEO and the capital expenditure objectives and criteria in the NER.

The capex forecast presented in this chapter is a product of SP AusNet's sound and prudent asset management practice, which delivers an optimal balance between quality, safety, reliability and security of electricity supply with price and efficient investment for the long term interests of consumers. Rigorous asset replacement planning – based on economic evaluation – is used to ensure the efficient timing of network investment. SP AusNet's prudent investment decision-making practices are supported by a robust project governance framework which incorporates continuous improvement to ensure projects are delivered at lowest efficient cost. SP AusNet analysis indicates that if any component of its proposed capex forecast were not implemented, there would be a real risk that the performance of Victoria's main transmission network would undermine the achievement of the NEO. This is explained in more detail in SP AusNet's *Asset Management Strategy 10-01* (Appendix 2A) and the *Capital Expenditure Overview* (Appendix 4A).

The forecast capex program is expected to result in the efficient management of risk resulting from asset failure. Risks such as supply outage and injury have been assessed for each major asset based on the probability of asset failure. Across SP AusNet's entire asset base, the sum of these risks reduces marginally over the forecast period. This reduction is principally driven by the planned replacement of transformers at Richmond and West Melbourne Terminal Stations and the replacement of other high-risk assets, such as oil-filled circuit breakers. The reduction in risk is, however, offset in part by an increase in the risk related to transmission lines due to ageing and deteriorating condition.

SP AusNet's capex forecast only relates to the replacement of shared transmission network assets and transmission connection assets, and excludes any expenditure to augment (expand capacity) of the transmission system. As explained in chapter 2 of this Revenue Proposal, AEMO is responsible for planning the augmentation of the shared transmission network, and the five DBs have responsibility for planning the augmentation of transmission connections to their distribution networks. In planning network replacements, SP AusNet has consulted with AEMO and the DBs in relation to future network and transmission connection augmentations, in order to ensure that asset replacement and capacity augmentation works are optimised, and all opportunities for cost synergies are identified.

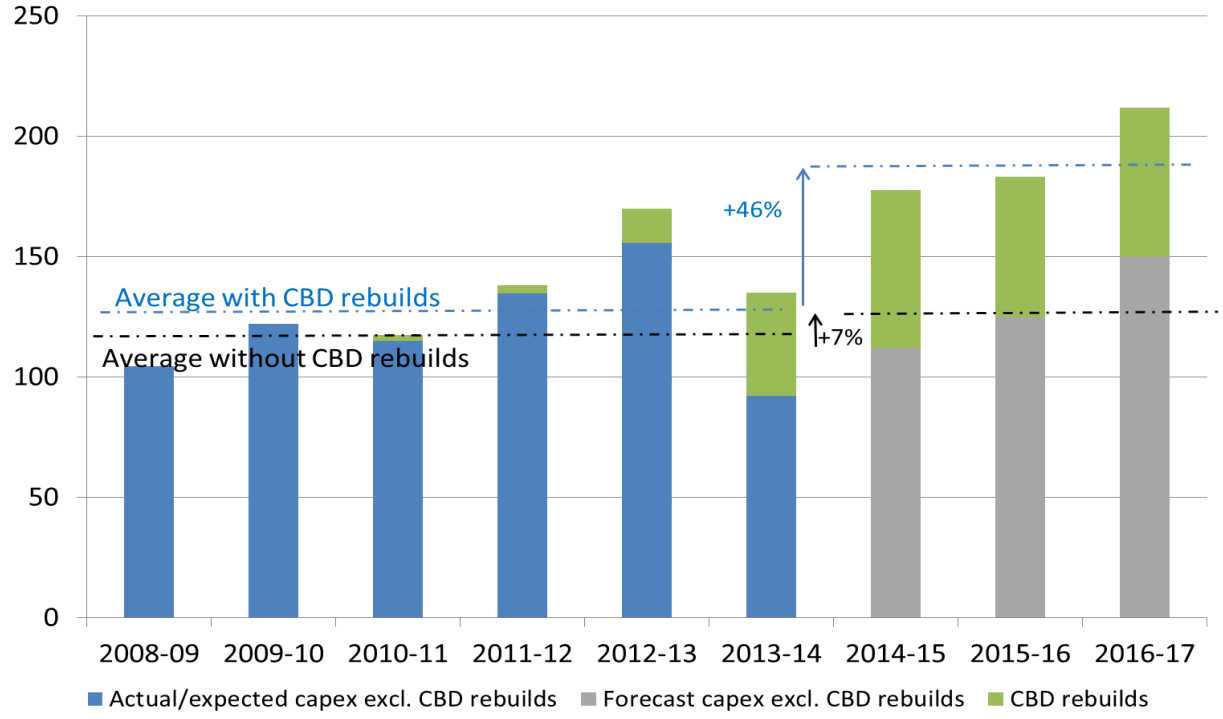
9 As required by NER 6A6.7(a)(3).

4.1.2 Capex forecast overview

SP AusNet is forecasting total capex requirements of $575 million (real 2013-14) in the forthcoming regulatory control period.[10] [11] This short regulatory control period is dominated by two major terminal station rebuilds, the redevelopments of the Richmond and West Melbourne Terminal Stations (the CBD rebuild projects). The remainder of the capex program for the forthcoming regulatory control period represents a 7% increase in average annual capital expenditure levels compared to the current regulatory control period (excluding the CBD Rebuilds from historic expenditure).

The annual capex requirements for both the current and forthcoming regulatory control periods are illustrated in the figure below. That data, and the explanatory information that follows are provided in accordance with NER S6A.1.1(7) and section 4.3.3(a)(7) of the Submission Guidelines.

Figure 4.1: Actual/ expected and forecast capex ($m, real 2013-14)



Note –capex as incurred.

Figure 4.1 shows that when the cost of the CBD rebuild projects is excluded from the forecast and historic capex, the remaining total capex forecast represents a 7% average increase from historical levels (in real terms).

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[10] As required by section 4.3.3(c), SP AusNet confirms that its forecasts of capex and opex are consistent with its capitalisation policy, which has not changed in the current regulatory control period.

[11] It is noted that the AER's 2008 Revenue Determination for SP AusNet did not identify any contingent projects for the current regulatory period. Therefore, in accordance with section 4.3.3(b) of the Submission Guidelines, SP AusNet confirms that the capital expenditure forecasts presented in this revenue proposal do not include any unspent capital expenditure for a contingent project. SP AusNet also confirms that the capital expenditure forecasts do not include any amounts relating the contingent projects described in section 4.6.9 of this revenue proposal.

However when the CBD Rebuilds are included in the analysis the average annual capex requirement for the forthcoming regulatory control period represents a 46% increase in real terms from current levels.

The magnitude of the step increase in capital expenditure reflects the highly lumpy nature of long-lived transmission investment and is driven by the CBD rebuild projects. Together, these two projects are expected to cost $186 million over the forthcoming regulatory control period, which is 32% of the total capital expenditure forecast for the period. Both of these projects involve difficult and complex rebuilding work at confined inner city sites where supply must be fully maintained at all times throughout the work. In addition, the CBD rebuild projects will not involve like-for-like asset replacement, as the existing switchgear at both stations is being converted from air-insulated to more expensive gas-insulated switchgear (GIS) equipment. The adoption of GIS is necessary due to the space restrictions at the terminal stations and the project designs allow for future capacity expansion to meet future demand. The GIS design also accords with local community expectations.

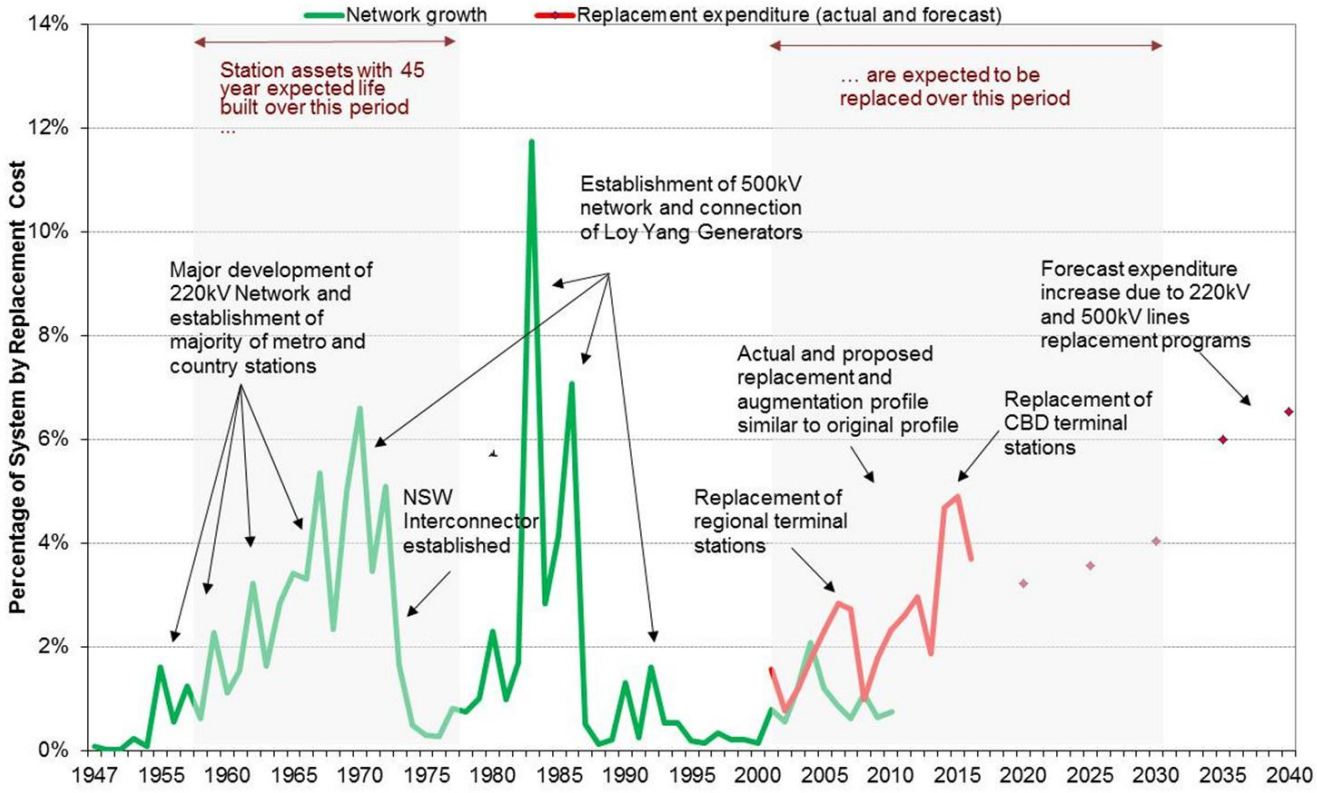
Other factors causing modest upward pressure on capex requirements are:

- an increase in the volume of assets in poor condition (consistent with the age profile of SP AusNet's asset stock) which gives rise to an increase in asset replacement expenditure requirements;
- continued investment in transformer replacements over the next regulatory control period, to address the poor condition of a number of transformers which have suffered accelerated deterioration following extended periods of high loading; and
- independent expert forecasts of real cost increases in labour, materials and equipment.

SP AusNet's forecast capital expenditure for the forthcoming regulatory control period builds on the capex program which was delivered successfully during the current regulatory control period. The capex forecast is also consistent with the company's previous Revenue Proposals[12] which foreshadowed the need for increasing levels of asset replacement over the next few decades, reflecting the historical development of Victoria's transmission system. The figure below shows the forecast capex in the context of the historic development of the Victorian transmission network, and the long-term outlook for asset replacement expenditure requirements.

[12] See SP AusNet's Electricity Transmission Revenue Proposal for 2008/09 - 2013/14, section 5.5.1 pp 60-61.

Figure 4.2: Historic Development of the Victorian Transmission Network



Source: SP AusNet

The figure shows that in the longer term, and against a backdrop of an ageing asset base, it is expected that SP AusNet will continue to require increasing levels of replacement expenditure as assets reach their end of useful life over the next few decades. Longer term forecast expenditures reflect requirements associated with replacement of major stations and lines, consistent with the overall transmission system life cycle.

However, SP AusNet expects that future replacement expenditure will not perfectly mirror the original investment profile, in terms of timing and cost. This is because effective asset management enables SP AusNet to identify opportunities to efficiently defer the replacement of some assets, maximising the service life of assets and thus minimising long-run costs to customers. Further, future costs are expected to differ from those incurred historically because there have been significant changes in technology, community expectations, safety obligations, design standards and regulatory requirements, such that like-for-like replacement is not appropriate.

SP AusNet considers that the information presented in the Revenue Proposal and its accompanying appendices and other supporting documents demonstrates that the company's capex for the forthcoming regulatory control period reasonably reflects:

- the efficient costs of achieving the capital expenditure objectives set out in NER 6A.7(a);
- the costs that a prudent operator in SP AusNet's circumstances would require to achieve the capital expenditure objectives set out in NER 6A.6.7(a); and
- a realistic expectation of the cost inputs required to achieve the capital expenditure objectives set out in NER 6A.7(a).

SP AusNet also considers that the capital expenditure forecasts comply with the other requirements of the NER and are consistent with the NEO to promote efficient investment in electricity services for the long term interests of consumers taking into account the price, quality, safety, reliability and security of supply of electricity and the reliability, safety and security of the national electricity system.

Accordingly, pursuant to the provisions set out in NER 6A.6.7(c), the capex forecasts should be accepted by the AER.

A more detailed overview of the capital expenditure forecast is provided in Appendix 4A.

The remainder of this chapter is structured as follows:

- Section 4.2 sets out the Rules and compliance obligations that the capex forecast must satisfy;
- Section 4.3 describes SP AusNet's forecasting methodology;
- Section 4.4 sets out the assumptions that underpin the forecasts;
- Section 4.5 sets out SP AusNet's capex forecast;
- Sections 4.6 to 4.9 inclusive provide further details of the main components of SP AusNet's capex forecasts, and the key drivers underpinning these. SP AusNet's contingent projects forecast for significant but uncertain capex are also set out in section 4.6;
- Section 4.10 describes the expected benefits of the forecast programs to customers; and
- Section 4.11 describes SP AusNet's plans to deliver the forecast capex, and the efficiencies expected from SP AusNet continuous improvement initiatives.

4.2 Rules and compliance requirements

4.2.1 Rules requirements

In accordance with NER 6A.6.7 SP AusNet's Revenue Proposal must contain a capital expenditure forecast which is required to achieve each of the following capital expenditure objectives (capex objectives):

- meet the expected demand for prescribed transmission services over the period;
- comply with all applicable regulatory obligations or requirements associated with the provision of prescribed transmission services;
- maintain the quality, reliability and security of supply of prescribed transmission services; and
- maintain the reliability, safety and security of the transmission system through the supply of prescribed transmission services.

In addition, the forecast of required capital expenditure must:

- comply with the requirements of the AER's Submission Guidelines;
- be properly allocated to prescribed transmission services in accordance with SP AusNet's Cost Allocation Methodology; and
- include both the annual and total forecast capital expenditure for the relevant regulatory control period.

The AER must accept the forecast of capital expenditure if it is satisfied that the total of the forecast capital expenditure for the regulatory control period reasonably reflects the following capital expenditure criteria (capex criteria):

- the efficient costs of achieving the capital expenditure objectives;
- the costs that a prudent operator in the circumstances of the relevant TNSP would require to achieve the capital expenditure objectives; and
- a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.

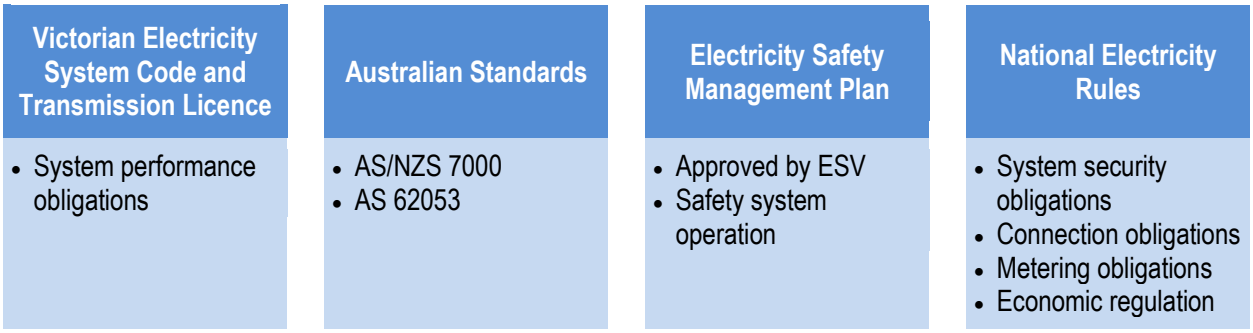
Minimum information requirements outlined in NER S6A.1.1 also specify that the forecast must reflect an appropriate categorisation of the capital expenditure forecast, include the methodology used for developing the forecast, and explain key input variables and assumptions that underlie the forecast. A certification by the Directors of SP AusNet attesting to the reasonableness of the key assumptions must accompany this Revenue Proposal.

4.2.2 Compliance with Laws, Codes and Standards

SP AusNet is required to comply with its Transmission Licence conditions and national and state electricity industry legislation, rules, standards and regulations. A number of these requirements result in various significant secondary system capex requirements for SP AusNet. These include the requirements defined in Schedule S5 of the NER, along with and operational requirements set by AEMO in relation to system protection, communication and metering as well as the specific performance obligations regarding the provision of services to AEMO that are specified in the network arrangements for Victoria.

The key compliance drivers are outlined in the figure below.

Figure 4.3: Applicable compliance instruments



SP AusNet is also required to comply with health and safety, environmental and security obligations which impact on the design and operation of the network. These obligations and the related internal standards cover matters such as:

- safe access for work on towers;
- management of fire hazards;
- changes to the Occupational Health and Safety Act 2004 requiring additional reviews of safety issues at the design stage of a project and additional liability (and therefore cost) for designers;
- management of various pollutants and environmental effects (oil discharge, noise and greenhouse gas emissions); and
- physical security.

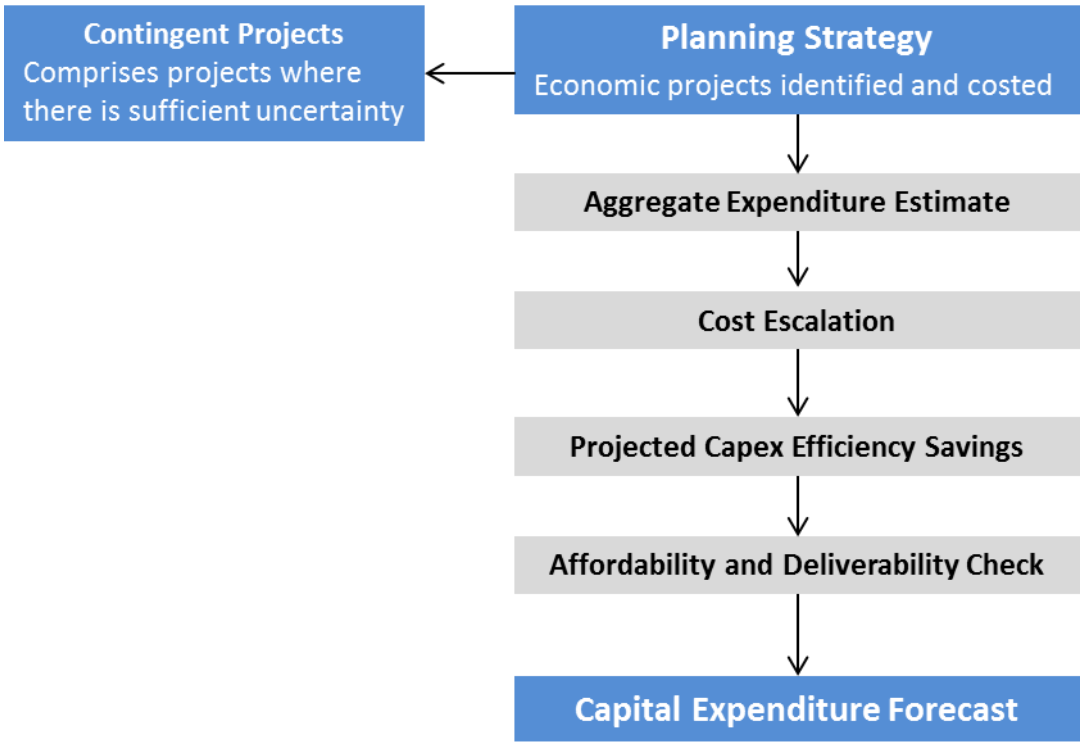
These obligations have a substantial bearing on the level of forecast capital expenditure that will be incurred by SP AusNet in the provision of prescribed transmission services over the forthcoming regulatory control period. Pursuant to NER 6A.6.7(2), SP AusNet's capital expenditure forecast includes the forecast costs of complying with all applicable regulatory obligations or requirements associated with the provision of prescribed transmission services.

4.3 Forecasting Methodology

In accordance with NER Schedule 6A.1.1 and section 4.3.3(a)(2) of the Submission Guidelines, this section describes the methodology used by SP AusNet in developing the capex forecast, and sets out the key assumptions that underlie that forecast. The capex forecasts presented in this chapter reflect, and are consistent with the implementation and efficient execution of this methodology and SP AusNet's AMS.

SP AusNet's overall capex forecasting approach is based on a bottom-up build of individual project costs summated to form an initial total forecast. Cost escalation or de-escalation is then applied across the entire suite of forecast projects (according to their labour and material cost profiles) to account for expected changes in input costs. Finally, the expected savings from continuous capital project management and governance (capex efficiency) is applied across the entire program of works to provide the final forecast. The overall forecasting methodology is illustrated in the figure below.

Figure 4.4: Capex forecasting methodology



The major stages of the bottom-up build are outlined in further detail below.

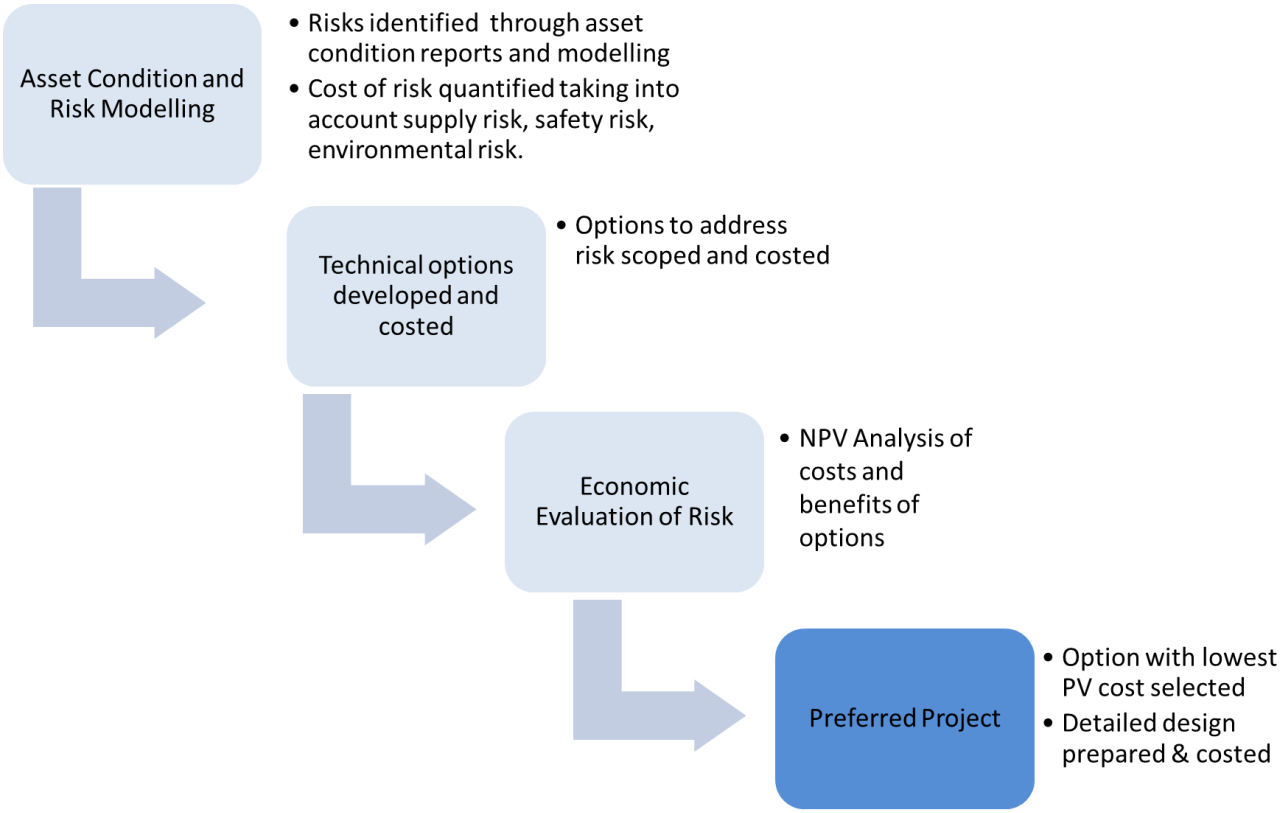
4.3.1 Determining the bottom up forecast from economic evaluations

Individual projects and replacement programs are assessed using economic evaluations. The expected total cost of asset failures is evaluated (where expected cost is a function of

consequence and probability) and the costs and benefits of alternative feasible options which address the risk of asset failure are evaluated. The objective is to identify the feasible option that has the lowest expected present value (PV) cost.

The process is outlined in Figure 4.5 and discussed in more detail below.

Figure 4.5: Project selection method



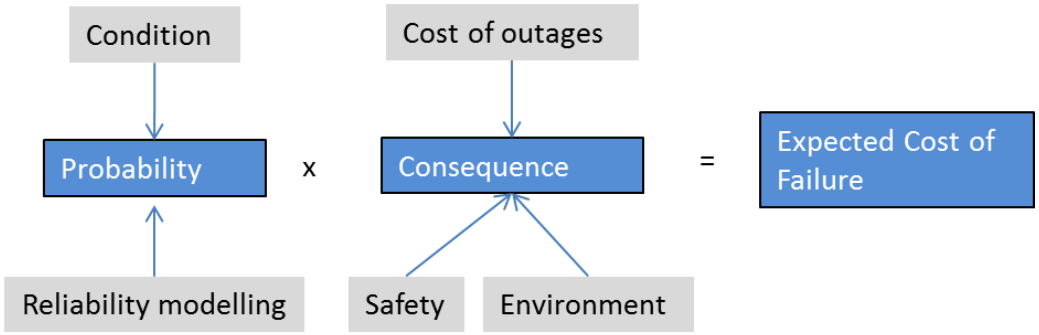
Candidates for asset replacement are first identified through asset class based modelling that identifies the assets in each class that present the highest risk based on asset condition and consequences of failure. Assets identified through this process are then subject to an economic evaluation where the consequences of asset failure are estimated taking into account:

- The cost of outages to energy consumers: Load at risk (that is, load that would not be supplied in the event of asset failure) is evaluated using AEMO's forecasts of demand at terminal station level. The load at risk is valued using the latest value of customer reliability (VCR) published by AEMO for transmission planning purposes;
- The direct cost of outages in terms of potential collateral damage risk for plant that could fail explosively;
- Safety risk as a result of an explosive failure; and
- Environmental risk associated with asset failure.

The details of how each of these inputs are valued are provided in greater detail in the inputs discussion at section 4.4 below.

The resulting estimates of the consequence and probability of failure are multiplied to determine the expected cost of the failure. This evaluation is illustrated in the figure below.

Figure 4.6: Economic evaluation method



Different technically credible and feasible options to address the risk are identified and scoped. There is also analysis undertaken across projects to identify the potential efficiencies to be achieved through the coordination of the scope and timing of different projects. For example, some minor replacement work may be included in a major replacement project to attain synergies in project design, project management and project establishment costs. This reduces the cost of minor replacement work and ensures that new assets are configured to function reliably with other assets, as an integrated system. The shared network augmentation needs of AEMO and the connection asset augmentation needs of the distribution businesses over the planning period are taken into account in the scoping and scheduling of all asset replacement work.

Initial project cost estimates are then provided. Following this, a Net Present Value (NPV) study is undertaken to analyse the costs and benefits of each option, with the aim of identifying the most economic option (the preferred option). The economic timing of the selected option is established by comparing the annualised total cost of the selected option with the annual incremental benefits (that is, reduced risk or avoided cost of failure) it is expected to deliver. Under this evaluation approach, the economic timing is identified as the point in time at which the annual incremental benefits just exceed the annualised cost.

Once the preferred option has been economically selected a detailed project scope and detailed project cost can be estimated. SP AusNet does this using a detailed technical scope of works (refined from the preferred option) and current unit costs for installing assets. This resulting cost estimate is the most likely cost of the project and assumes the scope of work will not change during the detailed design and construction phases. The estimate does not capture likely changes in unit costs but does account for the expected cost of various project contingencies (estimated using Monte Carlo analysis).

Sensitivity studies around the discount rate, asset failure rate and demand scenarios are conducted to test the robustness of the economic evaluation. The forecasts from different demand scenarios for Victoria are used in the sensitivity analysis to test the robustness of project economic evaluations. This is a crucial step in ensuring replacement investment is economic under a range of reasonable scenarios[13].

SP AusNet also explores the potential for efficiencies to be derived by staging the timing of large complex projects. Under this approach, SP AusNet identifies the highest asset failure

[13] SP AusNet's use of demand forecasts in asset replacement planning is explained in section 4.4.1 below.

risks so that these can be addressed in a timely fashion, while lower-risk project components may be deferred.

Overall, SP AusNet's approach is consistent with that documented in the Victorian distributors' annual Transmission Connection Planning Report and in the Distribution Annual Planning Reports published by distributors each year[14]. It is also consistent with the principles underpinning the regulatory investment test for transmission (RIT-T).

4.4 Assumptions and Inputs

The key assumptions and inputs underpinning SP AusNet's capex forecast are outlined below.

4.4.1 Demand Forecasts

Demand forecasts are used in sensitivity analysis to test the robustness of project economic evaluations. SP AusNet has relied upon AEMO's *Victorian Terminal Station Demand Forecasts*.[15] This is provided in Appendix 4B of this Revenue Proposal. According to these forecasts, overall 2012-13 Victorian peak demand is expected to be 9,690 MW, with growth averaging 1.6% per year. SP AusNet has used forecasts provided at the terminal station level for asset replacement planning purposes. Specifically, SP AusNet uses the terminal station demand forecasts to assess load at risk under transformer outage conditions, and that assessment forms part of SP AusNet's economic evaluation of asset replacement decisions.

4.4.2 Supply risk

SP AusNet has relied upon AEMO's Value of Customer Reliability (VCR) as weighted by the DBs based on the load composition for each individual terminal station. The average VCR across Victoria is $61,830/MWh.[16]

4.4.3 Safety risk

In estimating the consequence of asset failure for economic evaluation purposes, SP AusNet calculated the safety risk using the value of lost life of $20 million.

This estimate has been calculated by SP AusNet based on a methodology established in several government studies including by the UK's Health and Safety Executive and the New Zealand Government. The methodology estimates direct safety benefits and escalates this by a disproportionality factor of three to form an appropriate "cost of preventing a fatality" (CPF). This figure is used in SP AusNet's cost-benefit studies to establish the scope and timing of remedial projects.

This approach is consistent with section 119 of the Victorian Electricity Safety Act 1998 which states that responsible Electricity Safety Scheme operators have a duty to:

> *"..manage the carrying out of electrical work by or for the scheme operator to minimise as far as practicable—*
>
> *(a) the hazards and risks to safety of any person arising from electricity; and*
>
> *(b) the hazards and risks to property arising from electricity"*

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14 AEMO, 2012 Victorian Annual Planning Report, Electricity and Gas Transmission Network Planning for Victoria, 2012 and SP AusNet , Distribution System Planning Report 2013-17, 2012.

15 AEMO, Victorian Terminal Station Demand Forecasts for 2012-13 to 2022-23, October 2012.

16 See the 2012 Victorian Electricity Distributors' Transmission Connection Planning Report at: http://www.sp-ausnet.com.au

Under the Act, practicable is defined as:

> *".. practicable having regard to—*
>
> *(a) the severity of the hazard or risk in question; and*
>
> *(b) the state of knowledge about the hazard or risk and any ways of removing or mitigating the hazard or risk; and*
>
> *(c) the availability and suitability of ways to remove or mitigate the hazard or risk; and*
>
> *(d) the cost of removing or mitigating the hazard or risk."*

As the operator of the Electricity Safety Management Scheme (ESMS) for transmission accepted by the ESV, SP AusNet applies the above interpretation of safety.

4.4.4 Condition reports

Asset condition is measured with reference to an asset health index, on a scale of 1 to 5. The 1 to 5 range of the index is consistent across all asset types and relates to the expected amount of remaining asset life. The table below provides a simple explanation of the range of asset health assessments.

Table 4.1: Asset health reporting

Health Index	1	2	3	4	5
Description	As new	Signs of wear	Starting to deteriorate	Deteriorating	Advanced deterioration

Different techniques are used to measure the health of different types of assets. The table below provides an overview of the condition assessment methods used for major asset types.

Table 4.2: Condition assessment methods

Asset type	Condition assessment methods
Transformers	Offline electrical testing Dissolved Gas Analysis SF_6 analysis
Power Cables	Visual inspection of cable joints for signs of corrosion
Insulators	Visual inspection for degradation
Circuit Breakers	Gas and oil sampling Offline electrical testing SF_6 analysis
Switchgear	Visual inspection for corrosion Thermal imaging
Conductors	Visual inspection for corrosion

4.4.5 Failure risk ratings

Asset failure risk information flows from SP AusNet's Reliability Centred Maintenance (RCM) asset management techniques which centre on asset condition (rather than age) to guide optimal replacement timing. This approach takes into account performance requirements and actual failure data to assign failure rates to individual network assets or classes of assets. Failure Mode Effect Criticality Analysis (FMECA) based on historical asset performance data is undertaken to determine typical root causes of functional failures, and the resulting effects these causes have on key performance measures including network safety, reliability and availability. Asset condition data collected during scheduled maintenance tasks is used to determine dynamic time-based probability of failures and the remaining service potential of the asset in that lifecycle phase.

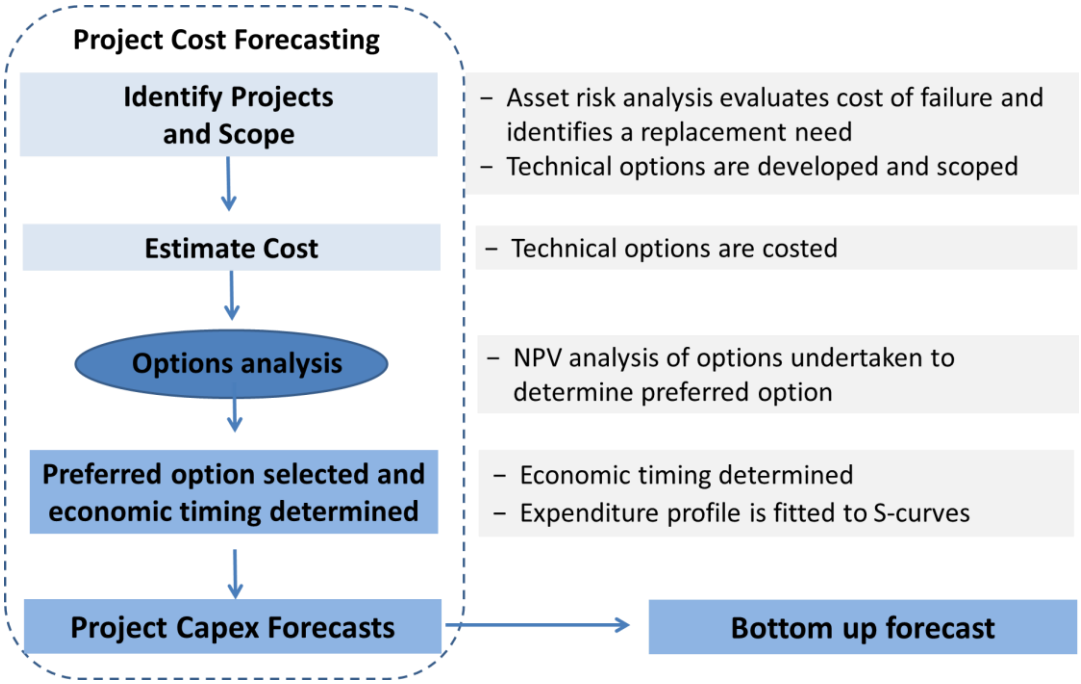
4.4.6 Project cost estimates

Project cost estimates form the basis of the bottom-up capex forecast, as the estimates for selected projects are summated to provide the total initial capex forecast.

Where investment appears necessary, the costs of technical options are estimated using SP AusNet's estimating methodology, which is outlined in SP AusNet's *Project Cost Estimating Methodology* (Appendix 4C to this Revenue Proposal). As explained in that appendix, SP AusNet uses internally-established standard costs (unit rates) and robust estimating methods. The scope and estimated cost of each capital project is specific to the project. For example, where difficult working conditions are expected, such as restricted space, or temporary works are required to maintain supply, this is reflected in the scope and cost estimate for the work.

The figure below illustrates the purpose of project estimates in the context of the overall expenditure forecasting process.

Figure 4.7: Project estimates and the bottom-up forecast



4.4.7 Unit Rates and S-curves

SP AusNet has used unit rates from internally-established standard costs to derive project estimates. Projects were estimated using 2012/13 unit rates and these have been updated to reflect the latest available where necessary. Detailed information relating to Unit Rates is outlined in *Unit Rates* (Appendix 4D to this Revenue Proposal). Forecast cost escalators are applied to project estimates.

S-curves are used to define the profile and timing of expenditure over the term of a major capital project. The S-curves applied by SP AusNet are based upon empirical cost evidence.

4.4.8 Cost escalators

Cost escalators for labour and materials are applied after initial project estimates have been determined. The escalators used in developing SP AusNet's capex forecast are set out in the table below in real terms.

Table 4.3: Escalators used in developing forecast capex (in real terms)

	2012/13	2013/14	2014/15	2015/16	2016/17
Labour					
Labour (internal)	2.0%	1.5%	2.2%	2.3%	1.6%
Labour (external)	1.3%	1.5%	2.1%	2.1%	1.8%
Materials					
Aluminium	-16.4%	6.6%	9.2%	7.9%	8.5%
Copper	-9.0%	1.8%	3.6%	2.7%	0.8%
Steel	-3.7%	6.5%	3.6%	-0.1%	2.8%
Crude Oil	0.4%	5.6%	13.7%	14.9%	7.6%
Construction costs	-0.4%	0.0%	-0.2%	0.1%	-0.0%
General labour	1.1%	1.5%	1.5%	1.1%	1.1%
Site labour	1.3%	1.5%	1.3%	1.1%	1.2%

Source: BIS Shrapnel and Sinclair Knight Mertz (SKM).

Note – Numbers rounded to one decimal place.

The proportion of SP AusNet's total capex forecast due to labour and materials escalation is approximately 5.3% ($31 million) over the forthcoming regulatory control period.

The escalators set out above are supported by independent reports from suitably qualified consultants in combination with information that specifically relates to SP AusNet (such as the sources of materials and equipment). In particular:

- BIS Shrapnel has estimated the labour escalators. The BIS Shrapnel Report (*Real Labour Cost Escalation Forecasts to 2016/17 – Australia and Victoria,* November 2012),

which is provided in Appendix 4E to this Proposal, describes its sources, data conversions and assumptions.

- Sinclair Knight Mertz's (SKM) Report (*Annual Material Cost Escalators 2014/15- 2016/17 Final Report* –November 2012) which is provided as Appendix 4F, outlines the forecast real cost increases to key materials and inputs for the transmission network. It also provides weightings given to each escalator for major equipment items, and explains how these weightings have been developed, including any assumptions.

The same labour escalators have been used in developing the opex forecast. Please refer to section 5.4 for a more detailed discussion of the labour escalators.

4.4.9 Capex efficiency

Consistent with its culture of continuous improvement, SP AusNet has implemented a number of measures to strengthen project management and governance, and to ensure the timely and cost-effective completion of capital projects.

An explanation of SP AusNet's capex delivery and governance improvements is provided in section 4.11.1 below. On the basis of its assessment of the positive impacts of these improvements, and following a portfolio-level analysis of outturn capex costs against planning estimates, SP AusNet has reflected the achieved efficiency saving of 1.44% in the capex forecasts for the forthcoming regulatory control period. This approach ensures that customers benefit from achieved efficiency savings through lower future costs, in accordance with the incentives provided by the regulatory framework.

4.4.10 Affordability and deliverability

SP AusNet tests any initial total capex forecasts against affordability considerations to derive a complete and appropriate capital expenditure proposal. Financial assurance of the forecast is conducted to ensure it can be appropriately funded not just within transmission but also in the context of all three of SP AusNet's networks.

The deliverability of a proposed program is also taken into consideration to ensure that the forecast projects and programs are reasonable and able to be delivered to schedule and cost. Further discussion of deliverability is at section 4.11 below and in the *Deliverability Strategy* at Appendix 3A.

4.5 Capital expenditure forecast

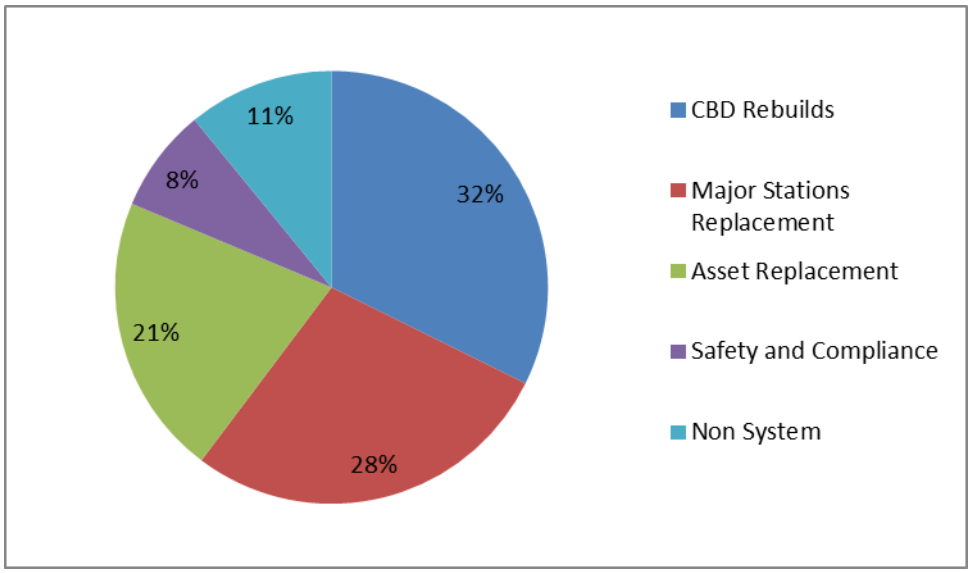
An overview of SP AusNet's forecast capex is provided in the table below. As already noted, SP AusNet's capex is forecast to increase significantly in the forthcoming regulatory control period, to enable the company to deliver its major station rebuild projects, and to address network risks in a prudent and efficient manner.

Table 4.4: Forecast Capex 2014/15 – 16/17 by category ($m, real 2013-14)

	2014-15	2015-16	2016-17	Total
CBD Rebuilds	65.7	58.3	61.9	185.8
Major Stations Replacement	32.8	52.5	75.3	160.7
Asset Replacement	38.2	38.8	44.1	121.1
Safety and Compliance	16.3	14.9	13.5	44.7
Non System	25.4	19.4	17.8	62.7
Sub Total	178.5	183.9	212.6	575.0

The composition of SP AusNet's forecast capex is shown diagrammatically in the figure below. The majority of capex (60%) is related to the substantial rebuilding and refurbishment of terminal stations (with the CBD rebuild projects accounting for 32% of the total forecast). The next largest component is stand-alone asset replacement programs addressing specific plant items or fleet problems (21%). The remainder of the expenditure relates to safety, compliance or security obligations (8%), and non-system IT and business support programs (11%).

Figure 4.8: Breakdown of capex forecast into driver categories



NER S6A.1.1(1) requires the Revenue Proposal to attribute capital expenditure in relation to material assets to particular categories of prescribed transmission services. In accordance with this requirement, the proposed capital expenditure can be attributed to prescribed transmission services as follows:

- CBD Rebuilds capital expenditure will provide prescribed exit services and prescribed TUOS services;
- Major Stations Replacement capital expenditure will provide prescribed entry services; prescribed exit services; and prescribed TUOS services;

- Asset Replacement capital expenditure will provide prescribed entry services, prescribed exit services; prescribed TUOS services; and prescribed common transmission services;
- Safety and compliance capital expenditure will provide prescribed entry services; prescribed exit services; prescribed TUOS services; and prescribed common transmission services; and
- Non system capital expenditure will provide prescribed common transmission services.

4.5.1 Drivers of capex

The projected increase in capital expenditure requirements in the forthcoming regulatory control period is consistent with the commentary contained in SP AusNet's previous two Revenue Proposals which foreshadowed increasing replacement requirements given the historic pattern of development of the Victorian transmission network and the consequential age profile of the asset base. The significant capital work planned for the forthcoming regulatory control period is driven by:

- the continued roll out of the major terminal station rebuild projects coupled with projects located in metropolitan areas which tend to involve more complex technical design and higher project cost;
- continued investment in transformer replacements to address the poor condition of a number of transformers which have suffered accelerated deterioration due to continued levels of high loading;
- an increase in the volume of other assets in a condition which reflects the age profile of SP AusNet's stock of assets, and which gives rise to a corresponding increase in asset replacement requirements; and
- external cost pressures in labour, materials and equipment which are beyond SP AusNet's control.

Each of these drivers is discussed below.

4.5.2 Continued roll out of major station projects

As foreshadowed in its previous Revenue Proposal, SP AusNet will continue to make considerable investments in the 2014 to 2017 period to replace assets at, and to rebuild terminal stations as, they reach end of useful life.

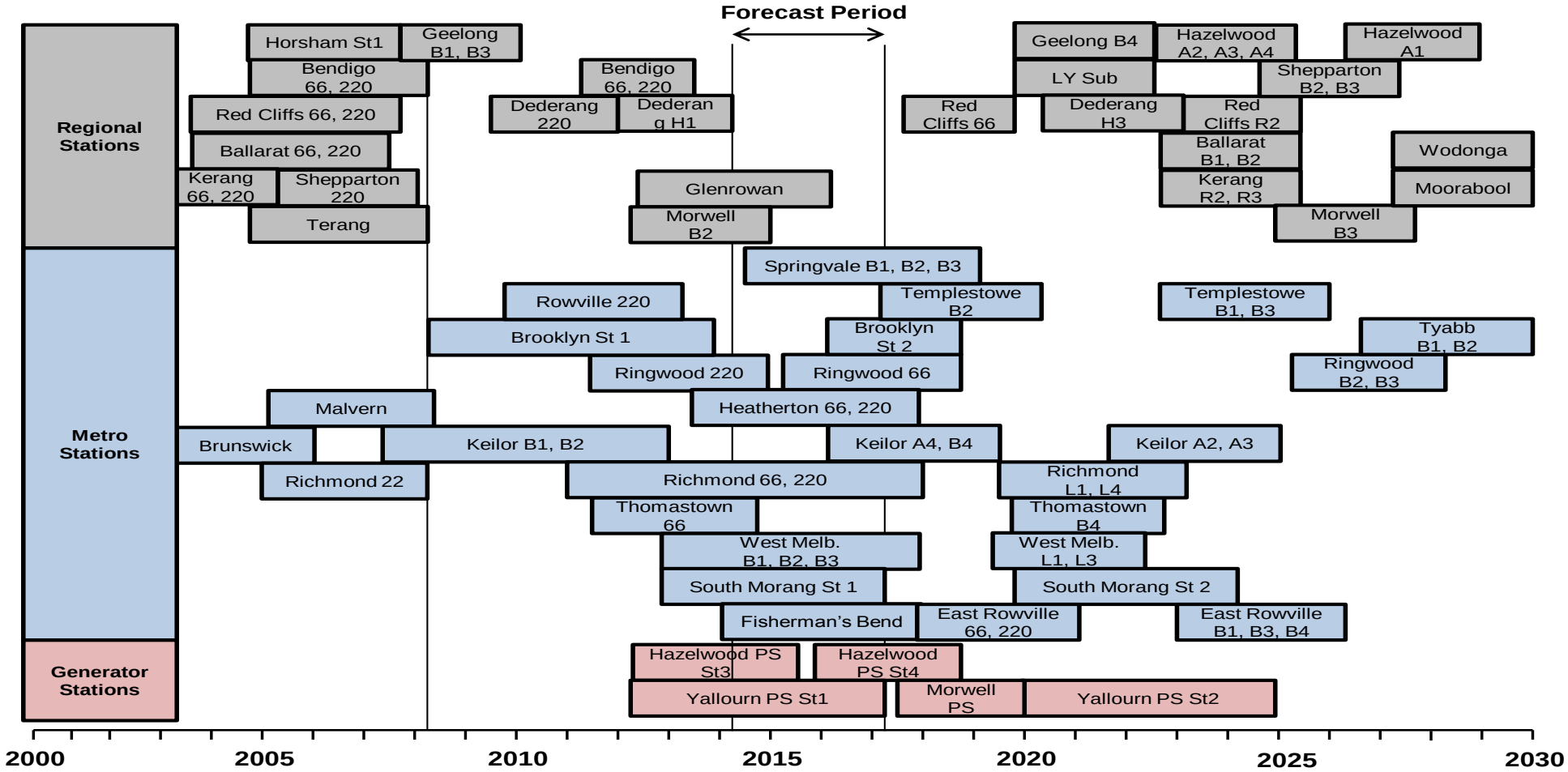
The costs of undertaking major replacement and refurbishment of terminal stations have changed significantly since the existing assets were installed. There have been significant changes in safety obligations, community expectations and environmental requirements, all of which lead to upward pressure on replacement costs. In some cases, like-for-like asset replacement is not possible, due to community and council planning concerns and environmental standards. For instance, in some cases (such as the CBD rebuild projects) more expensive GIS designs have to be employed to replace existing air insulated designs.

The number of transformer replacements will continue to form a major component of station rebuilds in the forthcoming regulatory control period, driven by asset condition and supply risks. The station rebuilds at Brooklyn, Glenrowan, Geelong, Richmond, Ringwood and Thomastown all involve replacement of one or more transformers at the site.

Substantial upgrading and replacement of secondary and communication systems is also included in these station rebuilds to ensure that the overall reliability of each station is maintained. Enhanced system capability of modern systems also allows more efficient utilisation of the higher-cost primary system assets.

The figure below provides a summary of the historic and forecast long-term station rebuilding and refurbishment program. It is largely consistent with information submitted by SP AusNet in previous Revenue Proposals and it illustrates clearly the long-term nature of transmission asset replacement planning. Major station replacements will continue to be required at current levels through the following two regulatory control periods, and are expected to taper after 2030 (in terms of volume).

Figure 4.9: Historic and forecast station program, 2000/01 to 2029/30



Source: SP AusNet

Note – Only major rebuilding projects shown; timing is indicative only. Numbers e.g. 22, 66 refer to equipment k., A, B, L or R followed by a number refer to transformers.

Figure 4.9 above shows the completed and forecast stations rebuild program. It shows that the need for rebuilding and refurbishing has now shifted from regional to metropolitan stations. Metropolitan work often involves additional project complexity and costs because metropolitan stations generally supply much higher loads in comparison to regional stations, and they involve undertaking work in confined brown-field sites while maintaining supply. There are also significant council planning permit requirements associated with rebuilding a terminal station in densely populated areas.

The CBD rebuild projects provide good examples of SP AusNet's recent experience in undertaking major station projects in metropolitan brown-field sites. When Richmond and West Melbourne Terminal Stations were originally built in the 1960s, their immediate surroundings were largely industrial. However, these are now inner-city residential locations, which are likely to become increasingly built-up. Consequently, the sprawling outdoor switchyards which characterised these sites no longer accord with community and Council expectations, especially with regard to visual amenity and provide no room for future expansion. In these settings, communities and councils now have high expectations as to how terminal stations should be built. SP AusNet has responded by actively engaging with communities and looking for designs that balance community needs with cost within the requirements of the local planning schemes.

SP AusNet will, where efficient, seek to defer less critical components of rebuild projects through staging and spreading projects over time to minimise long-run costs to customers.

4.5.3 Condition-based asset replacement

SP AusNet applies a condition and risk based asset replacement approach, which has been found, after rigorous testing and analysis, to avoid asset failure in an efficient manner.

Weighted Average Remaining Life (WARL) provides a good network-wide indication of remaining life. The current WARL estimate for SP AusNet is 50%, meaning that on average, network assets are half way through their service life. Average asset ages for major asset categories are set out in the table below.

Table 4.5: Network Age

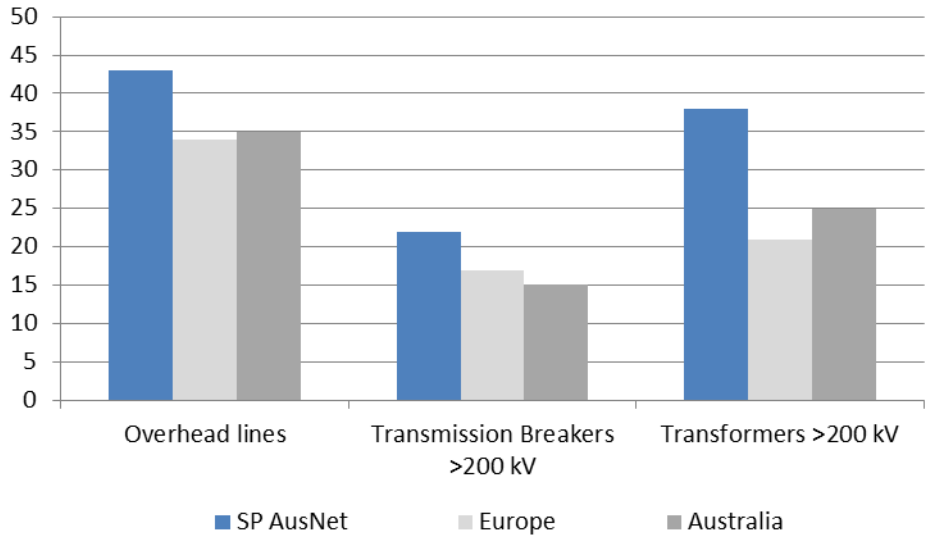
Asset Type	Average Age (years)		Remaining Life (years)		Average Expected Life (years)*	% Remaining Life	
	2012	2017	2012	2017		2012	2017
Transformers	33.6	29.0	11.4	16.0	45.0	25%	36%
Circuit Breakers	21.6	18.6	36.5	39.3	57.9	63%	68%
Structures	42.2	47.9	48.9	43.2	91.1	54%	47%
Conductors	39.4	44.7	30.8	25.5	70.2	44%	36%

* Each asset type contains several groups of assets which each have a distinct expected life. The average expected life is the weighted average of the expected lives of all the groups of assets that make up the asset type.

Even with the considerable investment forecast for the replacement of transformers and circuit breakers over the forthcoming regulatory control period, SP AusNet's WARL for its assets is expected to only decrease to 46%. The magnitude of the decrease reflects the increasing ages of transmission line conductor and structures, which make up more than half of the total network asset replacement value.

Compared to other TNSPs in the NEM, SP AusNet's assets have lower remaining asset lives. The figure below shows the average ages of SP AusNet's major asset groups compared with the average ages of the same assets across European and Australian TNSPs, surveyed by the most recently available ITOMS Survey (2009). In the three asset classes SP AusNet's assets are older than the benchmarks, and in particular transformers are much older.

Figure 4.10: Average age (in years) of major network assets compared to other TNSPs



Source: ITOMS 2009 Survey, SP AusNet

4.5.4 Transformer life

In Victoria AEMO is responsible for planning the augmentation of the shared transmission network and the five Distribution Businesses are responsible for planning and directing augmentation of the facilities that connect their distribution networks to the shared transmission network.

AEMO and the Victorian Distribution Businesses, including SP AusNet, use a probabilistic planning approach to optimise capital efficiency, rather than a deterministic (N-1) planning approach. Probabilistic planning can result in power transformers being subjected to high levels of utilisation for long periods. These higher loading levels accelerate the deterioration of power transformers, especially when combined with high ambient temperatures and the associated heavy air conditioning loads.

A prime example of this excessive loading occurred in the summer of 2008-09 where peak demand in Victoria reached 10,603 MW. It appears that peak demand growth has since moderated due to a combination of mild weather, lower economic activity, better building energy efficiency, and higher energy prices. However, this historic period of high demand has had a lasting impact on both the reliability and the condition of SP AusNet's power transformers.

Since 2004, major power transformers have failed at Keilor, Morwell, Mount Beauty and Thomastown terminal stations. This has driven the Victorian failure rate above the CIGRE Australia average of 0.4% per annum. Additionally, unusually high levels of deterioration have been detected in the cores and coils of 14% of SP AusNet's power transformer fleet. Poor core and coil condition of power transformers presents clear evidence of increasing probability of failure.

The transformers at West Melbourne and Fisherman's Bend Terminal Stations have furthermore been loaded to higher levels compared to other terminal stations due to the practice to operate these two terminal stations with one transformer on "hot-standby" to manage high fault levels.[17]

Given the above, continuing investment in urgent power transformer refurbishment and replacement is therefore necessary over the next decade to manage failure risks efficiently. SP AusNet's transformer replacement expenditure is driven by the value of unserved energy and measurable deterioration due to high utilisation.

4.5.5 External cost pressures

SP AusNet has applied cost escalators to its capex forecast to reflect expert advice it has received in relation to the expected real cost increases in labour, materials and equipment.

BIS Shrapnel projects a modest real cost increase averaging 1.9% per annum in the utilities sector and 1.8% per annum in the construction sector in Victoria over 2014/15-16/17. This reflects the faster real wages growth expected in the electricity, gas and water sector, in line with historical movements in the Labour Price Index (LPI) over the past six years.

SKM has forecast modest real cost increases in input costs for transmission materials and equipment over 2014/15-16/17, taking into account the introduction of the carbon price.

Further details in relation to these cost escalators can be found in Appendices 4E and 4F to this Revenue Proposal.

4.6 Major projects: Station Rebuilding and Refurbishment Program

SP AusNet has forecast total capital expenditure of $347 million on major station projects in the forthcoming regulatory control period. The station rebuilding and refurbishment program (incorporating the CBD rebuild projects) constitutes 60% of the total capex forecast for the forthcoming period.

The Major Projects (Station Rebuilding and Refurbishment) capital program will replace selected high-risk assets in terminal stations where economic assessments have found the projects maximise net benefits. SP AusNet plans major work to replace assets and to rebuild the Richmond, West Melbourne, Keilor, Brooklyn, Heatherton and South Morang terminal stations in the forthcoming regulatory control period. These replacement projects are focussed on strengthening the resilience and reliability of the transmission system by stabilising circuit breaker and transformer failure risks within sustainable ranges. The forecast works also include re-configuration to ensure that future needs (as defined by AEMO and the Distribution Businesses) can be met.

SP AusNet's largest major stations projects (with costs over $10 million) in the 2014-17 regulatory control period are summarised in the table below.

[17] This approach has been adopted by the responsible planners to avoid significant cost to manage fault levels by uprating switchgear and networks downstream of West Melbourne and Fisherman's Bend Terminal Stations or implementing alternative fault level management options.

Table 4.6: Key Major Stations Projects ($m, real 2013-14)

Project	Description	Overall Project Timing	Expenditure over 2014-17 period
Committed (underway)			
Richmond Terminal Station (RTS) Rebuild	Rebuild 22 kV, 66 kV and 220 kV switchyards using indoor GIS technology. Replace four 150 MVA 220/66 kV transformers with three 225 MVA transformers. Includes architecturally treated buildings, buffer zones around the site and landscaping.	2012-2017	81
West Melbourne Terminal Station (WMTS) Rebuild	Replace 22 kV, 66 kV and 220kV switchyard with four buildings and indoor GIS switchgear. Replace B1, B2 and B4 transformers. Establish new control room in the existing control building. Establish new AC and DC supplies and install a new oil separation and treatment facility.	2013-2017	108
Planned			
Yallourn Power Station (YPS)	Replace 220kV CBs and all 220 kV oil CTs.	2014-16	23
South Morang TS (SMTS) Transformer Replacement	Install a new 700 MVA 330/220 kV transformer bank of three single phase units. Install new 330 kV switch bay for the new transformer.	2014-16	31
Heatherton Terminal Station (HTS) Rebuild	Replace B1, B2 and B3 Transformers with 150MVA 220/66kV Transformers, 2 x 220kV Minimum Oil CBs and 14 x 66kV Bulk oil CBs. Also replace protection and control.	2014-17	39
Brooklyn Terminal Station (BLTS) CB Replacements	Replace 4 x 220kV Minimum Oil CBs, 66kV and 22kV CBs.	2016-18	11
Fisherman's Bend Terminal Station (FBTS)	Replace B1 transformer, and rebuild 220kV and 66kV switchyard.	2015-17	20
Springvale Terminal Station (SVTS) Redevelopment	Replace B1, B2 and B3 220/66kV Transformers, 4 x 220kV minimum oil CBs and 18 bulk oil and minimum oil 66kV CBs as well as protection and control.	2015-19	12

Note – these project costs exclude the 1.44% capex efficiency.

These major projects are discussed in further detail below.

4.6.1 Richmond Terminal Station

Richmond Terminal Station (RTS) provides supply to the Eastern Central Business District and inner suburban areas in the inner east and south-east of metropolitan Melbourne. Three of the four existing transformers have been identified as having some of the highest risk of failure of any transformers in the SP AusNet network. The 220 kV switchyard is situated in a very compact site which makes replacement work difficult and increases the outages required for the work.

The terminal station's present 220 kV switching arrangement presents a supply risk as it is possible to lose two lines and 3 transformers from a single circuit breaker failure. In addition, there is no space to increase the station capacity or to improve the switching configuration with the existing arrangement.

Development of a greenfield site was considered as an alternative option for the redevelopment however, it was found not possible. Investigation and analysis showed it would be prohibitively costly, complex and require impractically long lead times because:

- no suitable vacant land was readily available in the immediate area of the existing station. The vacant parkland adjacent to RTS sits on reclaimed quarry land and is subject to similar subsidence issues as at RTS. The development on this site would not be economically viable due to the extensive piling and civil works that would be required;
- the physical relocation of the incoming 220kV lines and cable and the outgoing 66kV and 22kV supplies and their cut in to the existing street circuits would present security of supply risk issues;
- obtaining new 220kV transmission line easements in the heavily built up area with high property values would be prohibitively expensive. Therefore 220kV underground cables would be required to relocate to a new site and would result in very high costs;
- large scale design and construction works to establish the site and essential infrastructure (civil and electrical) would involve significantly more cost; and
- obtaining the necessary council and landholder agreements to proceed with the development would be complex and time-consuming.

It is therefore necessary for RTS to be rebuilt at the existing site to secure supply to the CBD and inner Melbourne.

The existing 220 kV switchyard will be replaced with indoor GIS equipment that provides independent switching for all lines and transformers. Replacement of ageing 150 MVA 220 / 66 kV transformers with larger 225 MVA units is also required to create more space to facilitate the refurbishment and provide for further capacity expansion. This will maintain total N-1 capacity at current levels. Significant replacement of protection, control, metering and communications equipment is also required.

The redevelopment of RTS was included in the capex forecast approved by the AER in its 2008 Revenue Determination for SP AusNet, and the project was expected to be underway by the end of the regulatory control period. The AER accepted the need for this project and included $96 million (real 2007/08) in its capex allowance for the project in the current regulatory control period.

The project received approval from SP AusNet's Board in 2010.

Following Board approval, further planning and initial design was undertaken leading to a revision to the project scope in 2012. The decision was made to:

- Redevelop the entire 66 kV switchyard with indoor GIS rather than a combination of AIS and GIS. This followed studies that revealed the existing pile foundations for the site

may not be able to support the weight of AIS switchgear over their expected life and that the cost, safety risks and supply risks of 66 kV AIS replacements might be higher than what has been assumed in the original project plan[18]. The expected benefits of the use of GIS technology include:

- avoiding the need to reinforce some or all of the existing pile structures for the 66 kV switchyard, which may have been required for redevelopment with AIS
- enabling a 'greenfield' approach to be adopted for switchgear replacements. The GIS equipment can be assembled and pre-commissioned in a new building without impact on existing infrastructure.
- minimising the risk of transmission network outages during construction phases.
- reducing the safety risk associated with implementation as the majority of works will be effectively isolated to the new GIS building, largely eliminating the risks associated with working in close proximity to energised equipment.
- meeting the future plans for RTS.
- minimising the need for SP AusNet to rely on the existing resource pool to complete the work because the installation of GIS equipment will use specialised resources provided by the equipment manufacturer. This reduces potential project delays.

- Improve the site's visual amenity consistent with the expectations of the local community and Council. Following SP AusNet's experiences with the Brunswick Terminal Station (BTS) augmentation project, it was important to address the planning approval requirements of the local Council and endeavour to meet the needs of the local community to ensure smooth delivery of this project.

The revised project was approved by SP AusNet's Board in May 2012. The project cost approved was higher than the original forecast from 2010 due to the changed project scope.

As committed expenditure, work on the RTS rebuild project commenced in 2011/12 with expected completion is due in 2017/18.

Since May 2012, SP AusNet has developed more accurate cost forecasts as the project has progressed. As the detailed design for RTS was completed, it became clear that the technical requirements of the project were less demanding than initially estimated. Also, tendering for some of the works has been undertaken and the cost of plant and equipment such as transformers and switchgear has been lower than expected. As such, the current forecasts for RTS are lower than the internally approved estimate from May 2012. These reduced forecasts are reflected in SP AusNet's capex forecast for the next regulatory control period.

Given this, there is a higher level of cost certainty around the $81 million of capex required for RTS in the forecast period compared to the previous 2007 Revenue Proposal.

More information in relation to RTS is provided in the Capital Expenditure Overview 2014/15 – 16/17 at Appendix 4A.

4.6.2 West Melbourne

The West Melbourne Terminal Station (WMTS) is one of the three terminal stations in Melbourne supplying the CBD plus the surrounding residential, commercial and industrial western area. It sits on a relatively small site. Expansion at the site is limited by space.

Much of the existing equipment was installed in 1964 and is now at risk of failure. The redevelopment of WMTS is driven by reliability considerations, load criticality and asset

[18] An AIS replacement will require work to be undertaken in a live switchyard with consequent safety and supply risks. The piles for the 66 kV switchyard would have to be reinforced for an AIS 66 kV redevelopment, which would be more complex and expensive.

performance, particularly as several faults have already been experienced and the manufacturer has withdrawn further support for many of the circuit breakers. In May 2012 the SP AusNet Board approved the rebuild of WMTS to secure supply to the CBD and inner Melbourne.

The planned rebuild will replace end-of-life assets with modern, safe and more compact equivalents. The station will also be re-designed to accommodate capacity expansion at WMTS to meet future demand. The project will include:

- replacement and conversion of the 220 kV switchyard to indoor GIS;
- replacement of the 66 kV switchyard;
- replacement of the 22 kV switch room; and
- replacement of the 220 / 66 kV and 220 / 22 kV transformers.

Protection and control systems for the 220 kV switchyard will also be replaced and fire systems and auxiliary supplies will be upgraded.

As a committed project, design and procurement work has commenced on the WMTS rebuild with completion due in November 2017.

4.6.3 Yallourn Power Station

Yallourn Power Station (YPS) is located in the La Trobe Valley approximately 126 km south-east from Melbourne's CBD. It connects the Yallourn West Power Station to the transmission network and the 220kV switching station also connects Hazelwood Power Station and Rowville Terminal Station.

Most of the 220 kV switchgear and infrastructure at YPS has deteriorated and economic studies support their replacement in the forthcoming regulatory control period taking into account the probability of failure and cost of failure risk. This project addresses supply risk by refurbishing YPS, including replacing seven 220 kV circuit breakers and all 220 kV oil current transformers.

While uncertainty may exist over the future of the generators at YPS, the 220 kV switchyard will continue to be an important node in the transmission network as it connects Rowville and Hazelwood. AEMO does not plan for a reduced need for the assets at YPS and wants to retain the existing switching flexibility. As such, SP AusNet must continue to plan appropriate replacement at this site.

4.6.4 South Morang

South Morang Terminal Station (SMTS) supplies loads to northern Melbourne.

Six 330/220 kV single-phase H transformers at the station were installed at the station in the 1960s. These transformers are in poor condition and carry a rising probability of failure. The potential for a major failure of one of these transformers is a significant supply risk, with an expected annual risk cost rising from $2 million to $26 million over the period from 2014 to 2020. This project will replace the three 330/220 kV single-phase H transformers with a new 700 MVA 330/220 kV transformer bank of three single phase units and install a new 330 kV switch bay for the new transformer. Replacement of the second 330/220 kV transformer has been deferred to the following regulatory control period in light of current demand projections.

4.6.5 Heatherton

Heatherton Terminal Station (HTS) is the main source of supply for much of bayside Melbourne, from Brighton in the north to Edithvale in the south.

HTS was commissioned in 1964, and the primary and secondary assets at the station have deteriorated. This is leading to high and increasing risks of failure, and inefficient operation

and maintenance. Further, the security of supply risks presented by a failure of the 220/66 kV transformer, 220 kV circuit breaker or 66 kV circuit breaker are high. Economic studies support their replacement in the forthcoming regulatory control period taking into account the probability of failure and cost of failure risk. This project will:

- replace the three 150 MVA 220/66 kV transformers;
- replace the 220 kV switchgear and reconfigure the transformer and line connections;
- upgrade the 66 kV and 220 kV busbars;
- replace the 66 kV switchgear; and
- replace secondary systems.

4.6.6 Brooklyn

Brooklyn Terminal Station (BLTS) supplies the inner western residential area of Melbourne and various large commercial entities in the West of the metropolitan area. It is supplied from Keilor Terminal Station (KTS) and is connected in the western metropolitan 220 kV ring.

BLTS commenced operation as a 220/66/22 kV transformation station in 1963 and is currently being redeveloped to replace the 220/66 kV and 220/22 kV transformers, which present a high risk of failure. The staging of works at BLTS means that the next stage of works will involve replacing 220 kV circuit breakers connecting the four 220 kV transmission lines to BLTS, SPI PowerNet's old 22 kV circuit breakers and the old 66 kV circuit breakers.

4.6.7 Fisherman's Bend

Fisherman's Bend Terminal Station (FBTS) is located approximately 3 km south-west of Melbourne's CBD and is the main source of supply for Docklands and Southbank, Port Melbourne, Fisherman's Bend, Albert Park, Middle Park and St Kilda West.

Established in late 1960s, the primary and secondary assets at FBTS have deteriorated and are leading to increasing risks of failure, and inefficient operation and maintenance costs. Economic studies support their replacement in the forthcoming period taking into account the probability of failure and cost of failure risk. This project will replace 66 kV circuit breakers and the B1 transformer with a 150 MVA 220/66 kV transformer.

4.6.8 Springvale

Springvale Terminal Station (SVTS) is located in south-east Melbourne. It supplies the eastern Melbourne zone substations of Clarinda, East Burwood, Glen Waverley, Notting Hill, Noble Park, Oakleigh East, Riversdale, and three Springvale stations via 66 kV feeders.

As many of the primary and secondary assets at SVTS have deteriorated, the risks associated with plant failure are increasing and assets are becoming more difficult and expensive to maintain. This is, in part, because the manufacturer no longer supports these assets and spare parts are generally unavailable.

Economic studies support their replacement in the forthcoming period taking into account the probability of failure and cost of failure risk. The staged redevelopment with 220 kV and 66 kV AIS and 150 MVA transformers will be undertaken to address asset condition and configuration risks at SVTS. This project will:

- replace three of the four 150 MVA 220/66 kV transformers;
- replace 220 kV switchgear and reconfigure the transformer and line connections;
- upgrade 66 kV and 220 kV busbars;
- replace 66 kV switchgear; and
- replace secondary systems.

4.6.9 Contingent projects

Under NER 6A.8 SP AusNet may propose capex projects that are contingent on an identified trigger event occurring in the regulatory control period.

Pursuant to NER 6A.8.1(b), each forecast contingent project must satisfy the following criteria:

- It must be reasonably required to be undertaken in order to achieve any of the capital expenditure objectives specified in NER 6A.6.7(a);
- It must not otherwise be provided for (either in part or in whole) in the total of the forecast capital expenditure;
- It must reasonably reflect the capital expenditure criteria specified in NER 6A.6.7(c), representing efficient costs of a prudent operator; and
- It must exceed either $10 million or 5% of the value of the maximum allowed revenue (MAR) for the first year of the regulatory control period (whichever is the larger amount). SP AusNet's MAR for the first year of the regulatory control period is $500 million (see Table 12.7). Five per cent of that amount is $25 million, which makes this amount the threshold for contingent projects for the purpose of this Revenue Proposal.

The contingent project and the forecast expenditure must also comply with the requirements of the AER's submission guidelines in that the forecast trigger event must:

- be reasonably specific and capable of objective verification;
- make the contingent project reasonably necessary to achieve any of the capital expenditure objectives if it occurs;
- generate increased costs related to a specific location rather than the network as a whole; and
- have a reasonable chance of occurring in the forthcoming regulatory control period, but its occurrence is not sufficiently certain that the project should be included in the total capital expenditure forecast.

SP AusNet proposes three contingent projects that meet these criteria. The projects are described in the table below, along with their estimated additional capex requirements.

Table 4.7: Forecast Contingent Projects ($m, real 2013-14)

Contingent Project	Trigger	Cost Estimate
South Morang Transformer Replacement – Stage 2	Failure of the H1 transformer at South Morang Terminal Station resulting in the spare transformer being operationalized.	29
C-I-C	C-I-C	C-I-C
C-I-C	C-I-C.	C-I-C

Note – these estimates are direct costs only and exclude overheads and escalation.

[C-I-C]

More detailed descriptions of the forecast contingent projects and explanations of how they meet the requirements of the NER are provided in *Proposed Contingent* Projects (Appendix 4G).

4.7 Asset Replacement Programs

SP AusNet is proposing to undertake $121 million of expenditure on asset replacement programs over the forthcoming regulatory control period. This expenditure is necessary to maintain the resilience and reliability of the network and address operational or asset failure risk. A number of protection, control and communication renewal projects can be categorised as modernising the network to meet operating standards. The major categories of expenditure are as follows.

Table 4.8: Asset replacement programs ($m, real 2013-14)

	2008-14 Average	2014-15	2015-16	2016-17	Total
Lines	9.9	12.5	14.0	15.0	41.5
Stations	7.8	6.0	4.3	3.9	14.2
Secondary and protection	11.7	8.0	9.2	11.6	28.8
Communications	7.1	11.7	11.3	13.6	36.6
Total	**36.5**	**38.2**	**38.8**	**44.1**	**121.1**

These programs are discussed in further detail below.

4.7.1 Lines

Approximately $42 million is forecast for replacement of tower structures, conductors, insulators and fittings.

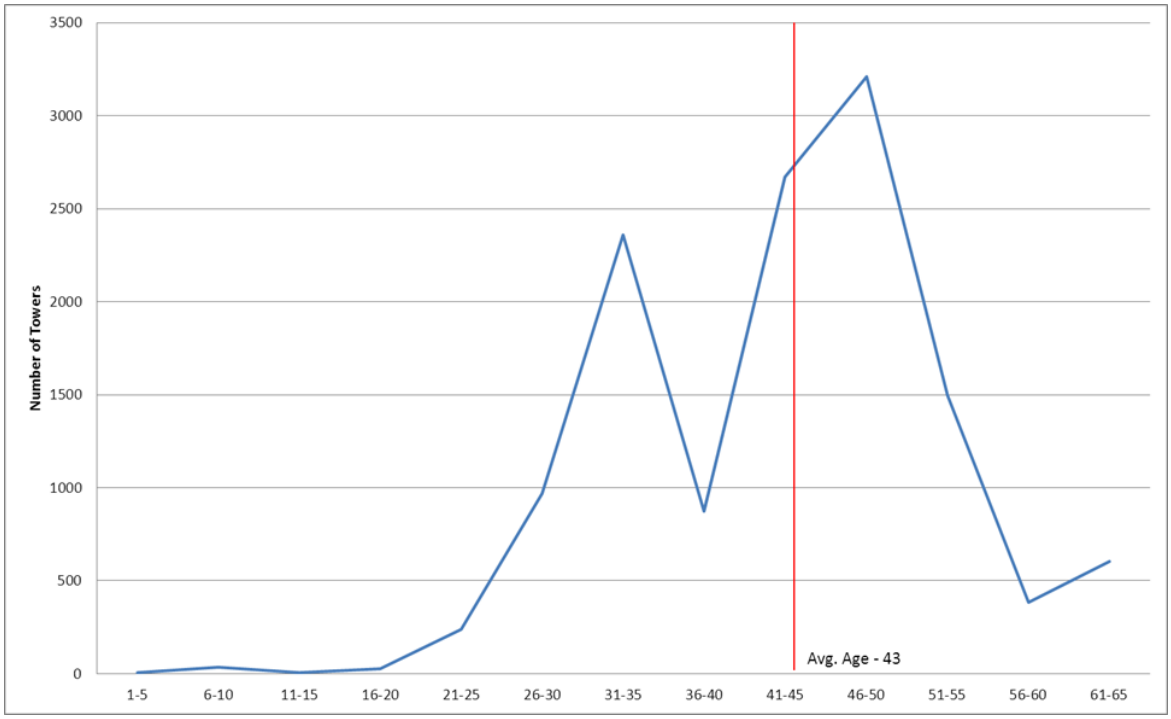
Key programs include:

- A limited program of conductor and ground wire replacements is forecast to target a number of poor condition conductor spans. Visual inspection of these conductors has found that they are corroded, especially where older conductors are located near the ocean and exposed to salt. Individual conductor spans have been selected for replacement based on thorough risk analysis which considers the probability and consequence of failure. SP AusNet's program prioritises conductor spans that pose a risk to public safety or which are essential for the reliable supply of sensitive loads, such as the Portland Alcoa Aluminium Smelter.
- A tower replacement program is forecast to undertake complete tower replacements where it is not economically efficient to carry out life extension corrosion mitigation activities, or to strengthen towers in key locations. Similar to conductor replacement, risk analysis has identified a number of transmission towers for replacement. Unlike most

asset replacements, the primary issue here is one of public safety. A small group of towers, built in the 1960s, feature design that is inappropriate for their environment. These towers can and have collapsed in high winds. This program targets high risk towers in locations where a falling tower presents a public safety risk.

As explained above, the forecast lines program is driven by asset condition, however condition and age are heavily linked. The figure below shows the age profile of SP AusNet's lines structures (which also acts as a good proxy for conductor age).

Figure 4.11: Line structures age profile



The chart above shows the concentration of approximately 2,700 assets in the 46-50 year age mark, with approximately 1,500 towers in the 51-55 years old category. There is therefore an increasing group of assets which require condition monitoring and, where it is warranted, targeted replacement. Significant conductor replacement is anticipated from 2025 but this timing will depend on condition monitoring results and forensic examination of replaced conductor.

4.7.2 Stations

Approximately $14 million is forecast for stations and plant outside of the major stations projects forecast. This includes expenditure in relation to:

- reactive plant: Refurbishment of synchronous condensers and replacement of their associated auxiliary systems is being planned to meet AEMO's specification for dynamic reactive support of the shared transmission network;
- transformers: Power Transformer component replacements are aimed to strengthen the resilience and reliability of our existing network and improve safe working access. It is envisaged that there will be minimal transformer replacement outside of the major station developments, which, as already noted include significant expenditure on transformers.

4.7.3 Secondary and Protection

Over the forthcoming regulatory control period, approximately $29 million is forecast for expenditure on secondary and protection replacements outside of major stations projects. This expenditure has three key drivers:

- Modernisation – Replacement of relays as a progression to a modern standardised design for station equipment using integrated functions in an intelligent device and serial communication;
- Compliance with the NER and AEMO Protection & Control Requirements (PCRs); and
- Obsolence – Replacement of relays that are inadequate, obsolete, failing, aged and unsupported.

Protection system replacements will address reliability risks associated with slow or incorrect operation and deterioration of out-dated electro-mechanical and first generation electronic relays which do not meet current power system security requirements.

The remaining works will replace failing, non-compliant, unsupported or end of life secondary and protection assets.

4.7.4 Communications

Approximately $37 million is forecast for expenditure on communications replacements over the forthcoming regulatory control period. Investments in communications systems are driven by:

- Modernisation – Replacement of communications equipment that no longer delivers acceptable performance based on existing and/or new requirements.
- Obsolence – Replacement of communications equipment that is inadequate, obsolete, failing, aged and or unsupported.

Key projects in the communications program include the following:

- Replacements – Batteries, generators, new radio and PLC systems and telephone networks which have reached the end of their operating life will be replaced.
- Upgrades – Operations and management systems used to monitor and diagnose the communications systems will be upgraded, as will multiplexers (which gather the streams of data that are required to be transported over communications paths such as fibre or radio) that are no longer supported or have insufficient capacity to meet current data volume requirements. Monitoring systems to ensure relevant data on the status of communications systems will also be purchased.

4.8 Safety, security and compliance capex

SP AusNet is proposing approximately $45 million in capex for safety, security and compliance. The table below provides a summary of the forecast expenditure in this category of capex.

Table 4.9: Safety, security and compliance capex ($m, real 2013-14)

	2008/09-13/14 average	2014-15	2015-16	2016-17	Total
Tower fall arrests	4.0	4.1	4.1	4.2	12.4
Safe maintenance access	0.1	0.9	1.0	1.0	2.9
Instrument transformer replacement	2.5	1.2	1.7	2.0	4.9
Bulk oil CB replacement	1.4	2.8	1.1	1.1	5.0
Insulator replacement	5.1	1.4	1.4	1.5	4.3
Fire protection and infrastructure	0.7	2.1	2.1	2.1	6.2
Infrastructure Security Systems	1.8	2.3	2.3	0.9	5.5
Communications safety and security	NA	1.6	1.2	0.8	3.5
Total	**15.6**	**16.4**	**14.9**	**13.5**	**44.8**

The programs included in this category are outlined below.

4.8.1 Tower structures and station racks fall arrest installation

The tower structures and stations racks fall arrest program is a safety initiative which is required to comply with OHS (Prevention of Falls) Regulations 2003. The regulations set a standard for preventing falls from SP AusNet's fleet of towers and station rack structures. SP AusNet has implemented the roll out of a cable system to meet the requirements at a cost of $15.9 million (nominal) over 2008/19 -2011/12, and expects to have spent $24.0 million by the end of the period.

The $12.4 million forecast for the next period will allow SP AusNet to complete the installation of cable fall arrest systems across its towers.

4.8.2 Instrument Transformer Replacements

In the previous regulatory control period SP AusNet initiated a project to replace high-risk instrument transformers which posed a safety and reliability risk. Instrument transformers include Current Transformers (CTs), Voltage Transformers (VTs) and CVTs (capacitive voltage transformers). Oil filled porcelain-clad HV instrument transformers deteriorate over time and, beyond a manageable level, deterioration can lead to a catastrophic failure. The consequences of such a failure can result in injury to field staff working nearby, damage to nearby equipment and unplanned network outages.

SP AusNet assesses the condition of CTs and VTs using dissolved gas analysis (DGA). This analysis, combined with known asset faults and degradation patterns, has been used to identify transformers in poor condition which require replacement.

SP AusNet has spent $13.6 million (nominal) in the past four years undertaking this program, and is forecasting a further $4.9 million in the next period to complete it.

4.8.3 Improved safe maintenance access

On-going periodic transformer maintenance requires staff to access the top of transformer and gas relays. This generally involves working at height and presents a fall risk. Current safety arrangements are considered insufficient, as ladder placement and suitable tie-off points are not defined. This project will retrofit handrails and ladder access points to a number of transmission transformers across Victoria.

4.8.4 Insulator replacements

The replacement of deteriorating cap and pin insulators which isolate conductor from tower structures will be continued on from the current period to address risk of insulators located over road crossings breaking and falling.

4.8.5 Oil CB Replacement Program

SP AusNet will continue a replacement program for selected replacement of critical 66 kV bulk oil units due to safety, reliability and environmental risks.

The fleet of Email 345GC Circuit Breakers (CBs) have an average service life of 47 years and are the last examples of bulk oil breaking technology, in Victoria's 22 kV networks. Similarly, the fleet of AEI LG4C CBs have an average service life of 46 years and are the last examples of bulk oil breaking technology, in Victoria's 66 kV networks. These ageing assets are maintenance-intensive, in poor condition, have fault level limitations and do not have bunding that is sufficient to meet EPA requirements. Additionally, the manufacturer no longer supplies spares or product support for these assets. This program will replace four 22 kV Email 345GC Bulk Oil Circuit Breakers with SF_6 Circuit Breakers and 12 66 kV GECAEI LG4C Bulk Oil Circuit Breakers with GIS Circuit Breakers.

4.8.6 Fire protection and infrastructure repairs

This program involves the upgrade of fire protection systems to comply with modern standards and restoration of building and general infrastructure.

Fire protection systems (detection and suppression) protect SP AusNet's assets from fire, improve system security and reliability. A fire in a terminal station's control building or in a relay building could result in a major and long-lasting loss of supply. Similarly, the loss of a major system transformer due to fire could constrain the system for an extended period. An uncontrolled fire poses a risk to health and safety both for company employees and contractors. A terminal station fire also poses a bushfire risk and therefore a risk to the public.

Existing fire protection systems are deemed inadequate for a variety of reasons including, age related deterioration, corrosion and obsolete systems that no longer meet the appropriate Australian Standards. This program will replace a variety of assets that are in poor condition. The program will facilitate SP AusNet's compliance with Australian Standards.

4.8.7 Infrastructure Security Systems Upgrade

The Infrastructure Security Systems Upgrade will increase security at sensitive transmission sites. The threat of terrorism led the Commonwealth and State governments to impose legal responsibility on the owners and operators of critical infrastructure, such as electricity transmission installations, to take all necessary preventative security measures to ensure the continuity of supply.

These requirements are codified in the Terrorism Community Protection Act (2003), to which SP AusNet has developed a long term plan to become compliant with. Part of this plan involves the proposed project to upgrade the existing security arrangements at key sites and ensure compliance with legislation. The project includes expenditure to.

- install CCTV surveillance cameras;
- upgrade security fencing;
- upgrade access controlled vehicle gates;
- replace old security fencing;
- install remotely operated lights;
- install electronic alarm systems; and
- upgrade Access Control.

4.8.8 Communications safety and security

This program involves buying tools to improve both physical and cyber security along with the installation of safety systems to prevent falls from communications towers.

SP AusNet must manage increasing risk and potential vulnerabilities associated with physical and cyber security of critical national infrastructure. The communications networks are critical to the safe and reliable operation of the transmission network. Security takes the form of electronic security and physical security with many communications sites located in remote locations (such as mountain tops).

4.9 Non-system Capital Expenditure

Forecast non-network capex across buildings and property, vehicles, other and IT totals $63 million over the next regulatory control period.

Table 4.10: Non-network capital expenditure 2014 – 16 ($m, real 2013-14)

	2008/09-13/14 average	2014-15	2015-16	2016-17	Total
Buildings and property	0.2	0.2	0.2	0.2	0.7
IT	11.5	20.3	14.3	13.2	47.9
Vehicles	0.8	1.9	1.9	1.3	5.2
Other	2.3	2.9	3.0	3.1	9.0
Total	**14.7**	**25.4**	**19.4**	**17.8**	**62.7**

An overview of the expenditure forecast in each of these categories is provided below.

4.9.1 Buildings and Property

SP AusNet owns a number of buildings and properties which are used in the provision of prescribed transmission services and the company is responsible for the management and maintenance of these assets. Forecast expenditure in this area covers expenses such as office modifications including installing portable offices and rearrangements and purchasing office equipment such as desks and chairs. This expenditure will continue at historic levels.

4.9.2 Support the Business – vehicles and other

SP AusNet maintains a fleet of vehicles, both owned and leased. These vehicles are used to carry out routine work on the network, to respond to network events, to travel between work sites and to travel to meet stakeholders.

Over the forthcoming regulatory control period, existing vehicle capability will be maintained at its current level, costing an estimated $5.2 million.

The non-network category of 'other' captures miscellaneous non-network expenditure. Historically, expenditure in this category has been to procure tools and measurement equipment. Over the forthcoming regulatory control period this expenditure is forecast to continue at historic levels.

4.9.3 Business Information Technology

The forecast $48 million of IT capital expenditure builds on those programs completed in the current period. The forecast IT capex is necessary to maintain IT infrastructure and systems to enable SP AusNet to continue to deliver reliable prescribed transmission services.

The IT forecast has been developed following a rigorous analysis of the costs and benefits of each program, including the following key steps to determine an efficient IT capital expenditure forecast:

- Assess the current performance of IT systems and infrastructure to inform to what extent our existing IT systems and infrastructure can be utilised to support the Asset Management Strategy;
- Engage business units to understand the AMS and jointly assess requirements of IT to support deliverability of these strategies;
- Consider alternate options where they are clearly identifiable;
- Consider emerging technologies and trends that can be applied, where it is effective and efficient to do so;
- Engage experienced independent sources to provide research and/or cost estimates; and
- Assess the risk of preferred options, identifying appropriate mitigation strategies and the resulting residual risk.

The table below sets out the forecast capex in each category.

Table 4.11: Forecast IT capex by category ($m, real 2012-13)

	2014-15	2015-16	2016-17	Total
Asset & Works Management	4.1	0.1	0.3	4.5
Back Office Management	4.6	0.0	0.0	4.6
Workforce Collaboration	0.7	3.9	2.0	6.6
Analytics & Reporting	0.6	0.7	0.2	1.5
Network Management (SCADA)	3.2	3.8	1.4	8.4
IT Infrastructure & Operations	5.0	4.0	7.5	16.5
Totals	**18.3**	**12.5**	**11.3**	**42.1**

Note – These figures are direct costs and exclude corporate overheads and escalations, consistent with the forecasts set out in the *ICT Strategy FY2014/15-16/17 Electricity Transmission Network*

The programs of work align with SP AusNet's corporate Information and Communication Technology (ICT) strategy principles of reducing complexity, using best fit solutions and capturing data efficiently.

The largest component (around 40%) of the IT capex forecast is to invest in IT infrastructure and operations, consistent with the actual expenditure in the current period. It is comprised of around 25 separate projects to replace end of life assets or upgrade assets due to obsolence. This includes, amongst other things, data centre facilities, desk-top refresh, Wintel and Unix server refreshes, and communication and hardware refreshes. This capex is for necessary replacements given the life-cycle of IT assets.

The next largest component is the Network Management (SCADA) capex program which is aimed at upgrading and enhancing SP AusNet's SCADA Energy Management System (EMS) Master Station and Historical Information Systems (Pi). The program also seeks to improve Transmission Outage Reporting systems to provide enhanced integrity and management of data for use in Outage Management and Planning.

A significant project within the Asset and Works Management and Back Office Management program areas which commenced in the current period and will be completed in the forecast period is the EAM/ERP project. This project will deliver a new consolidated and integrated enterprise asset and works management platform (EAM), as well as implement an integrated enterprise resource planning platform (ERP) which ensures back office systems meet and can competently service an increased volume of business transactions. The project is expected to drive efficiencies across asset and works management processes and back office functions and is forecast to deliver $850,000 of operating efficiencies in the forecast regulatory period. These savings have been factored into the opex forecast presented in Chapter 5.

SP AusNet considers the proposed IT capex reasonably reflects the costs a prudent operator in its circumstances would require to meet the capex objectives in the next regulatory control period. The majority of the forecast projects have been previously approved by the AER in the 2011 Electricity Distribution Price Review (EDPR) and the 2012 (Gas Access Arrangement Review) GAAR regulatory determinations, on the basis of costs being shared by SP AusNet's three different network businesses.

SP AusNet's *ICT Strategy FY2014/15-16/17 Electricity Transmission Network* (Appendix 4H of this Revenue Proposal) provides further detail on the drivers and content of forecast IT programs for the forthcoming regulatory control period.

4.10 Expected Benefits of Capital Program

This section provides an overview of the key benefits of SP AusNet's forecast capital investment over the regulatory control period. The aggregate outcomes of the capital program are consistent with those identified in the detailed underlying project justifications. The key outcomes are outlined below.

4.10.1 Network risk and reliability

SP AusNet expects that the forecast asset replacement capex will progressively improve total asset failure risk by 5% in the period to 2020. This will support SP AusNet's ability to maintain the quality, reliability and security of supply of prescribed transmission services, and to maintain the reliability, safety and security of the transmission system through the supply of prescribed transmission services, in accordance with NER 6A.6.7(a)(3) and (4). Expected reductions in the risk of asset failure also result in a reduced risk of adverse environmental impacts, third party property damage, injury or death that may arise from asset failure.

4.10.2 Safety and safety compliance

As discussed in Chapter 2, SP AusNet must meet legislated safety requirements. Therefore, safety is the focus of ongoing investment by the company in equipment, training and awareness. SP AusNet expects that the forecast safety capex over the forthcoming regulatory control period will make the Victorian Transmission Network safer both for the public and employees. Many of the safety improvements delivered by the capex program will arise incidentally as a result of replacing old equipment with new, safer equipment and through the application of modern, safer station design standards. Other improvements will result directly from projects aimed at improving safety (or safety compliance). A high level summary of the safety outcomes provided by SP AusNet's forecast capital works program is shown in the table below.

Table 4.12: Safety outcomes of capital program

Project or Type of Project	Outcome
Tower replacement	Substantially reduced risk of public injury or death from a tower collapse.
Cable fall arrests systems	Reduced risk of death or injury to an employee from falling.
Old transformer replacement	Reduced risk of death or injury from a transformer explosion.
Indoor switchgear	Reduced risk of electrocution.
Conductor replacement	Reduced risk of conductor drop causing injury or death.
Site security	Improved site security reduces the risk of injury resulting from unauthorised entry to stations.
Insulator replacement	Reduced risk of death or injury from an explosive insulator failure.
Circuit breaker replacement at Ringwood Terminal Station	Reduced risk of death or injury from an explosive failure of circuit breaker bushings.

A critical safety risk that will be reduced in the forthcoming period will through a program to eliminate all asbestos at its properties. If left unaddressed, asbestos can be very harmful to health.

As part of SP AusNet's commitment to making its workplaces safe for all staff and the public, the company has initiated a comprehensive asbestos removal program. As part of this program, SP AusNet has performed asbestos audits at all of its terminal stations and nine sites which have been identified for asbestos removal. Asbestos will be safely removed from these sites over the forthcoming regulatory control period as part of this forecast capital work program.

In forecasting it capex requirements, SP AusNet has developed a program which also facilitates SP AusNet's compliance with its ESV-approved Electricity Safety Management Scheme (ESMS).

4.10.3 Environment

Modern transmission equipment poses some environmental risks. Typically, these risks arise from SF_6 gas leakage, oil leaking from transformers or pollution caused by a fire. In both cases, the risk of these outcomes increases as assets degrade and is accompanied by an increase in the probability of an asset failure. As part of its replacement programs, SP AusNet will be replacing assets which pose a risk to the environment such as replacing oil CTs and CBs which will reduce the risk of oil spillage, leaks, PCB contamination and fires. Installation of new CBs will also lead to a reduction in SF_6 gas leakages.

4.10.4 Enabling future development

In Victoria, AEMO is responsible for shared network planning and augmentation, while the Distributors are responsible for planning and augmenting their connections to the transmission network. SP AusNet is responsible for maintaining and managing the assets that comprise the transmission system. The two activities of augmentation planning and asset management need to be carefully coordinated to ensure the capital programs of AEMO, SP AusNet and the Distributors are aligned and where possible synergies derived. SP AusNet will continue to work closely with AEMO and the Distributors to ensure that all capital works programs are coordinated, scheduled and delivered as efficiently as possible.

4.11 Program Deliverability

SP AusNet has implemented a number of measures during the current regulatory control period to improve program delivery capability, to ensure the forecast program can be delivered. These are outlined in detail in the Deliverability Strategy (Appendix 3A). Some key deliverability issues are highlighted below.

4.11.1 Program Management and Governance

SP AusNet has implemented a number of program management improvement initiatives in the current regulatory control period. One of the key improvements has been the development of a consolidated 5-year works program for SP AusNet's electricity distribution and electricity transmission networks. The works program provides business-wide visibility of capital and operational expenditure programs and is a central source of information for decision-makers, resource planners and delivery teams. The works program provides a targeted analysis of categories of portfolio expenditure, which enables balancing of portfolio expenditure with the resource capacity and availability. In addition, the works program provides details at a regional expenditure level which further enhances resource planning and portfolio optimisation.

SP AusNet established the Program Management Office (PMO) in 2010 which has introduced a number of key process improvements which have enhanced the organisational focus on project delivery. In particular, the review and implementation of the project lifecycle (and associated governance and compliance framework) has improved the effectiveness and consistency of project governance and reporting.

SP AusNet has implemented system improvements through Enterprise Project Management (EPM) for capital works program management. This has enabled SP AusNet to improve the management of the transmission portfolio of projects by providing centralised reporting and performance monitoring functionality.

4.11.2 SP AusNet experience in delivering a significant amount of capex

The forecast capex program represents a 46% increase in expenditure compared to actual expenditure in the current period (using annual averages). However, this increase is less significant when viewed in the context of the totality of the capex invested in SP AusNet's network businesses. For instance, in 2012/13 SP AusNet will have undertaken a total of $1.1 billion (nominal) of capital works across its three Victorian gas and electricity networks and the Advanced Metering Infrastructure (AMI) Program. In this context, the increase in transmission capex represents around a 5% increase in the company's total planned capex.

Further, SP AusNet has also demonstrated that it can deliver substantial step-ups in capex, having gone from an annual average of $100 million in the previous period to $131 million in the current period.

To ensure that it has the capability to deliver these planned capital works, SP AusNet will continue to optimise projects by taking advantage of opportunities to bundle projects across programs where it is efficient to do so.

4.11.3 Dedicated delivery team for CBD rebuild projects

Given the critical nature and magnitude of the CBD rebuild projects, in 2011 SP AusNet formed a dedicated project team (Project Edison) to deliver the CBD rebuild projects. The establishment of a dedicated team has enabled clearer focus and accountabilities within the business.

Project Edison is a program of projects, which aims to provide safe, secure, reliable and cost effective power supply to the Melbourne CBD and its surrounding inner suburbs. The three major projects that make up Project Edison include the Rebuild of Richmond Terminal Station, Upgrade of Brunswick Terminal Station (a network augmentation project which falls outside the scope of the revenue cap which is the subject of this Proposal) and the Rebuild of West Melbourne Terminal Station.

Project Edison has adopted a number of significant measures to ensure the delivery of these projects. These are outlined in the Deliverability Strategy (Appendix 3A).

5 Operating Expenditure Forecast

5.1 Introduction and overview

5.1.1 Introduction

This chapter sets out SP AusNet's operating and maintenance expenditure (opex) forecasts for prescribed transmission services for the forthcoming regulatory control period.

The efficient operation and maintenance of the transmission network is critical to minimising the whole-of-life cost of the network and the costs faced by customers. SP AusNet has responded positively to the efficiency incentives in the regulatory framework and achieved cost savings (relative to the regulatory allowance) in the current regulatory control period, primarily by achieving efficiency gains in asset works and internal corporate costs. While costs are generally stable, there has been ongoing deterioration in the condition of some assets (reflecting SP AusNet's ageing asset base), which has led to increases in routine maintenance costs. Insurance costs have also increased. SP AusNet's operating expenditure performance in the current regulatory control period is discussed in Chapter 3 of this Revenue Proposal.

SP AusNet has identified a number of factors that will impact on controllable operating expenditure requirements in the 2014-17 period including:

- asset failure risks – and the consequential increase in maintenance activity – associated with the ageing asset base;
- increased resource requirements associated with compliance with legislation, rules and regulations;
- the increase in prescribed service opex in the forthcoming regulatory control period associated with the rolling-in of currently excluded (Group 3) prescribed service assets constructed in the current regulatory control period. This does not result in an increase in overall network costs borne by customers; and
- real cost increases in labour, materials and equipment.

Together, these cost drivers will increase SP AusNet's operating expenditure requirements in the forthcoming regulatory control period.

SP AusNet recognises the importance of providing long term benefits to its customers and end users, particularly in light of current concerns regarding the impact of increasing electricity costs on the cost of living. SP AusNet has, therefore, made every effort to minimise its opex forecast without compromising safety or network reliability.

The opex forecasts are consistent with SP AusNet's approved cost allocation methodology and only reflect the opex requirements for the provision of a level of prescribed services at the commencement of the period. Therefore, the opex forecasts do not include the costs associated with augmentations of the shared network or transmission connection facilities over the period[19], nor do they include the costs associated with provision of negotiated or unregulated services.

[19] As explained in chapter 2, these augmentations are undertaken at the direction of AEMO or the Victorian Distribution Businesses.

5.1.2 Overview

SP AusNet is forecasting total opex requirements of $658 million over the next regulatory control period.[20] This is comprised of $281 million of controllable costs and $377 million of non-controllable costs. The total annual opex forecast is outlined below.

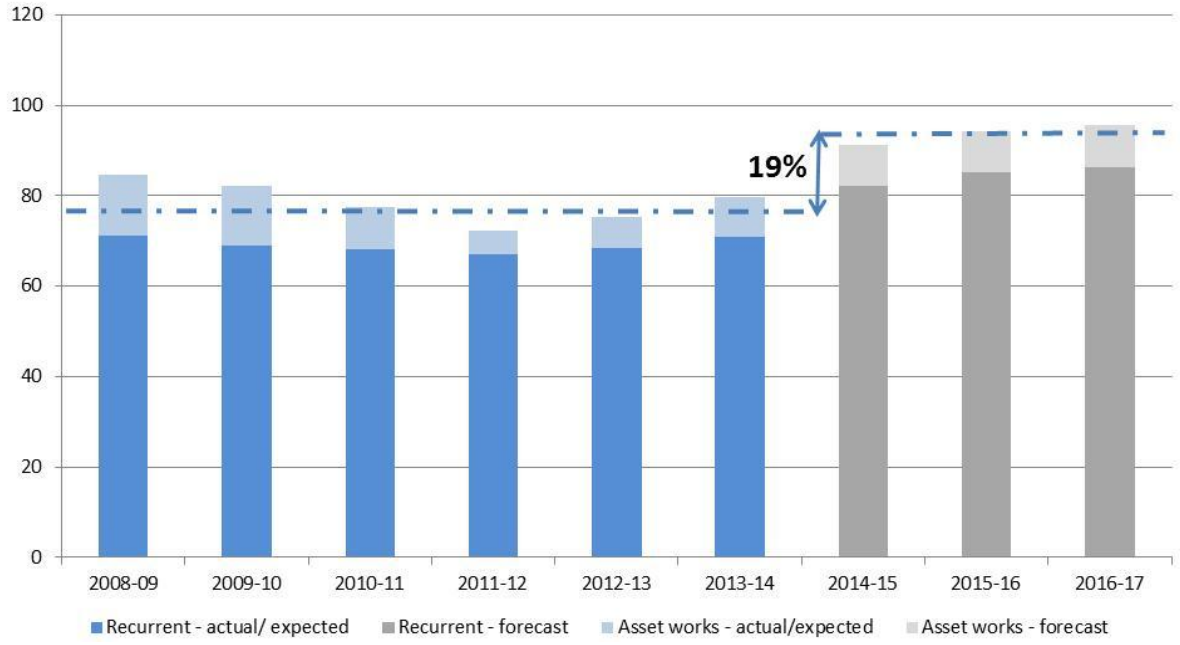
Table 5.1: Total Forecast Opex ($m, real 2013-14)

	2014-15	2015-16	2016-17	Total
Total opex	**209.3**	**222.6**	**225.7**	**657.6**

Of the total forecast opex, $305.3 million, or 46%, is easement land tax. Easement land tax is a levy applied by the Victorian Government which is passed through in regulated revenues, but does not represent the underlying costs of running the company.

SP AusNet has forecast $281 million of controllable opex, which comprises recurrent operating costs (excluding self-insurance, debt and equity raising costs, easement land tax and incentive scheme payments) and non-recurrent costs for asset works. An overview of SP AusNet's historic and forecast controllable opex expenditure is provided in the figure below.

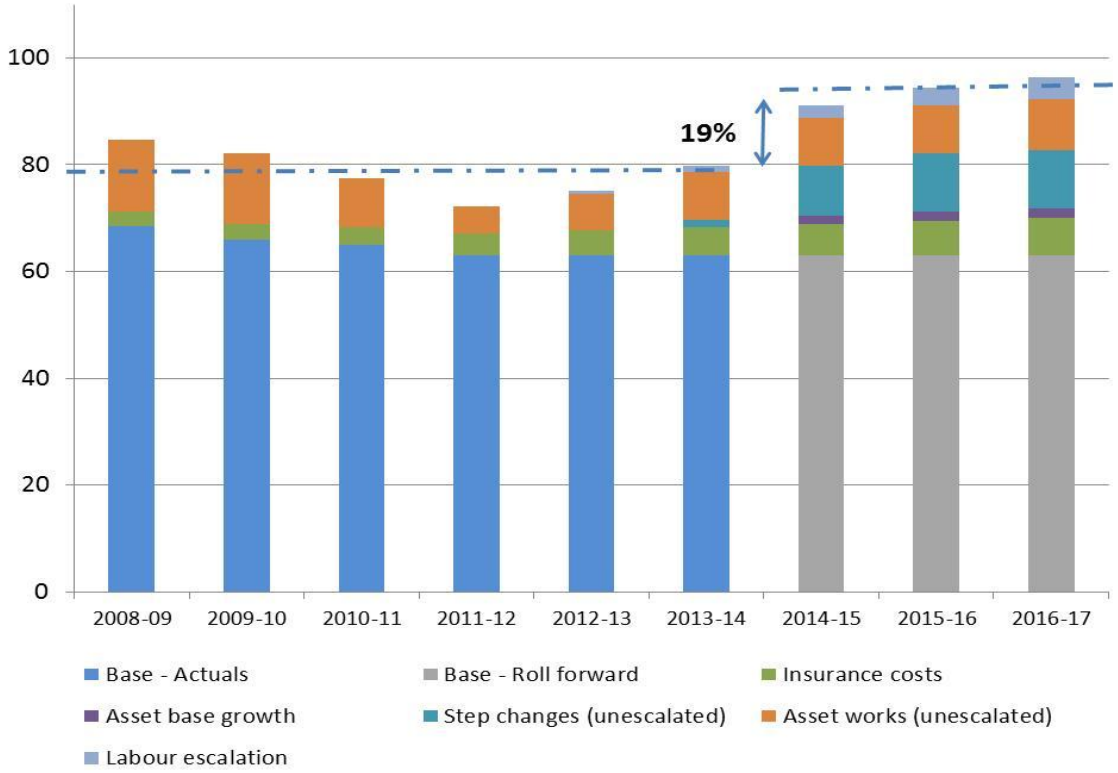
Figure 5.1: Controllable Opex (2008-09 to 2016-17) ($m, real 2013-14)



The above figure shows SP AusNet's average annual controllable opex for prescribed services in the forthcoming regulatory control period will be approximately 19% higher than the current period. This 19% increase from current period average is driven by step changes (13%), real labour escalation (4%), an increase in forecast insurance costs (3%) and growth in opex demands to service a larger asset base following the rolling-in of Group 3 assets (2%). These components, in terms of historic and forecast opex, are shown in the figure below.

[20] In accordance with section 4.3.4(c)(2) of the Submission Guidelines, SP AusNet confirms that its forecasts of capex and opex are consistent with its capitalisation policy, which has not changed in the current regulatory control period.

Figure 5.2: Components of Controllable Opex Increase ($m, real 2013-14)



Note – excludes self-insurance, debt and equity raising costs, easement land tax and AIS rebates.

The above cost drivers are reflected in SP AusNet's average annual controllable opex forecast which is summarised in the table below.

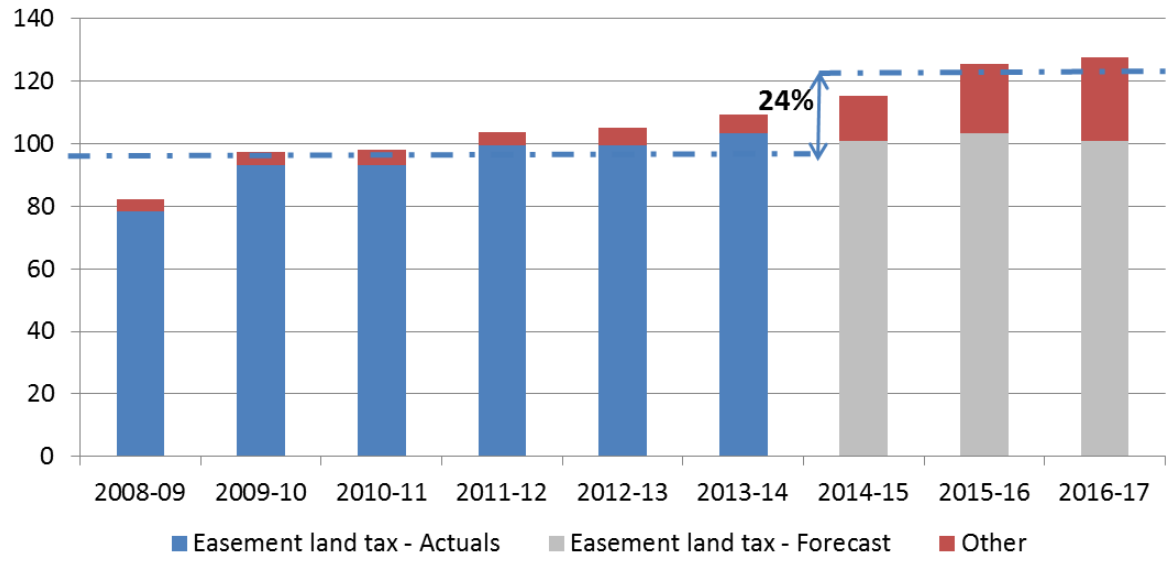
Table 5.2: Annual Average Forecast Controllable Opex ($m, real 2013-14)

Opex Component	Opex Cost
Base year opex	63.1
Plus	
Insurance costs	6.4
Asset base growth (due to Group 3 roll-ins)	1.7
Labour escalation	3.3
IT efficiency savings	-0.3
Step changes	10.4
Asset works (including management support)	9.1
Total	**93.7**

Note – may not add due to rounding.

SP AusNet has forecast $377 million of non-controllable opex, which comprises self-insurance, debt and equity raising costs, easement land tax and incentive scheme payments. An overview of SP AusNet's historic and forecast non-controllable opex expenditure is provided in the figure below. Debt and equity raising costs are not included in the analysis as these actuals are not reportable.

Figure 5.3: Actual/expected and Forecast Non-controllable Opex ($m, real 2013-14)



Note – 'Other' includes self-insurance and incentive scheme rebates.

The above figure illustrates that the majority of non-controllable opex is due to easement land tax.

In accordance with NER 6A.6.6(c), SP AusNet considers that the information presented in this chapter (and its accompanying appendices and other supporting documents) demonstrates that the company's opex forecast for the forthcoming regulatory control period reasonably reflects:

- the efficient costs of achieving the operating expenditure objectives;
- the costs that a prudent operator in SP AusNet's circumstances would require to achieve the operating expenditure objectives set out in NER 6A.6.6(a); and
- a realistic expectation of the cost inputs required to achieve the operating expenditure objectives.

As such, the opex forecasts presented in this Chapter should be accepted by the AER.

NER S6.A.1.2(1) requires a Revenue Proposal to identify the categories of transmission service that will be provided by each category of operating expenditure. In practice, each category of operating expenditure contributes to the provision of each category of prescribed transmission service. It is therefore not feasible to attribute the categories of operating expenditure to particular categories of transmission service.

The remainder of this chapter is structured as follows:

- Section 5.2 sets out the Rules and compliance obligations that the opex forecast must satisfy;
- Section 5.3 describes the forecasting methodology used to derive the opex forecast;
- Section 5.4 sets out the key assumptions and inputs that underpin the forecasts;
- Section 5.5 sets out SP AusNet's base year opex;
- Section 5.6 describes variations between historic and forecast opex;

- Section 5.7 sets out the insurance premium forecast;
- Section 5.8 describes the roll-in of Group 3 prescribed assets into the RAB;
- Section 5.9 sets out the capex-opex trade-offs considered;
- Section 5.10 sets out opex step changes for the forthcoming period;
- Section 5.11 describes the asset works forecast;
- Section 5.12 summarises the total controllable opex forecast;
- Section 5.13 presents SP AusNet's non-controllable opex forecast; and
- Section 5.14 summarises the total opex forecast and provides concluding comments.

5.2 Rules and compliance requirements

5.2.1 Rules requirements

NER 6A.6.6 requires SP AusNet's Revenue Proposal to contain an opex forecast which achieves each of the following operating expenditure objectives (opex objectives):

- meet the expected demand for prescribed transmission services over the period;
- comply with all applicable regulatory obligations or requirements associated with the provision of prescribed transmission services;
- maintain the quality, reliability and security of supply of prescribed transmission services; and
- maintain the reliability, safety and security of the transmission system through the supply of prescribed transmission services.

In addition, the opex forecast must:

- comply with the requirements of the AER's Submission Guidelines;
- be properly allocated to prescribed transmission services in accordance with SP AusNet's Cost Allocation Methodology; and
- include both annual and total forecast operating expenditure for the relevant regulatory control period.

The AER must accept the opex forecast if it is satisfied that the total forecast opex for the regulatory control period reasonably reflects the following opex criteria:

- the efficient costs of achieving the opex objectives;
- the costs that a prudent operator in the circumstances of the relevant TNSP would require to achieve the opex objectives; and
- a realistic expectation of the demand forecast and cost inputs required to achieve the opex objectives.

NER S6A.1.2 requires that a Revenue Proposal must contain at least the following information and matters relating to opex:

- a forecast of the required opex that complies with the requirements of NER 6A.6.6 and identifies the forecast operating expenditure by reference to well accepted categories;
- the methodology used for developing the opex forecast;
- the forecasts of key variables relied upon to derive the opex forecast and the methodology used for developing those forecasts of key variables;

- the methodology used for determining the cost associated with planned maintenance programs designed to improve the performance of the relevant transmission system for the purposes of any service target performance incentive scheme that is to apply to the Transmission Network Service Provider in respect of the relevant regulatory control period;
- the key assumptions that underlie the opex forecast;
- a certification of the reasonableness of the key assumptions by the directors of the Transmission Network Service Provider;
- opex for each of the first three regulatory years of the current regulatory control period, and the expected opex for each of the last two regulatory years of that regulatory control period, categorised in the same way as for the operating expenditure forecast;
- an explanation of any significant variations in the forecast opex from historic opex; and
- any non-network alternatives considered by the Transmission Network Service Provider.

5.2.2 Compliance with legislation, safety, operating and reporting requirements

SP AusNet's opex requirements are affected by its compliance obligations, as described in Section 4.2. The following obligations will have a significant impact on SP AusNet's opex requirements in the forthcoming regulatory control period:

- Safety obligations related to the Electricity Safety Management Scheme (ESMS) approved by Energy Safe Victoria (ESV). The ESMS requires SP AusNet to implement ESV's policy decisions relating to conductor clearances with risk based safety assessments;
- AER reporting requirements for network performance; and
- Changes in network outage planning requirements set down by AEMO.

These obligations are reflected in the forecast opex step changes outlined in section 5.10 of this chapter.

SP AusNet must also continue to comply with existing legislation and regulations. These include:

- Regulations under the *Occupational Health and Safety Act 2004*, which drive asset works projects to undertake non-routine maintenance of facilities at Terminal Stations, including asbestos removal, building repairs, switchyard surface repairs and fire protection and security system works.
- The *Environmental Protection Act 1970*, which promotes sound environmental practices and procedures to ensure ecologically sustainable development. Requirements under this Act drive asset works projects including condition assessments to identify oil and gas leaks.
- Part 6 of the *Terrorism (Community Protection) Act 2003*, which requires owners of declared essential services to take appropriate steps to secure their assets against foreseeable risks.

These obligations are reflected in the forecast of recurrent opex and asset works expenditure outlined in this chapter.

5.3 Operating Expenditure Forecasting Methodology

5.3.1 Forecasting methodology

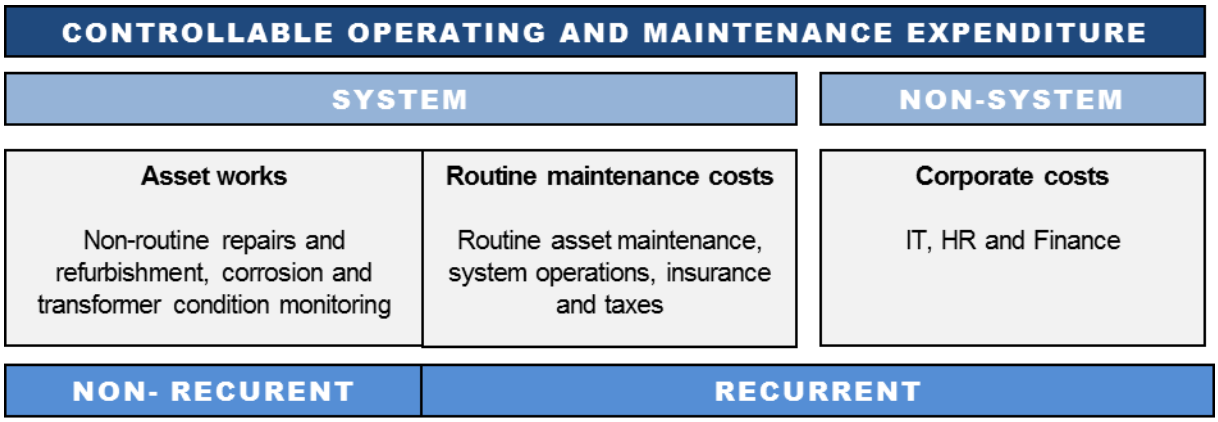
For the purposes of forecasting opex, SP AusNet's costs are categorised as either controllable or non-controllable.

There are three main categories of controllable opex for SP AusNet's regulatory reporting purposes:

- Routine maintenance and operations – system recurrent costs directly attributable to maintaining and operating the transmission network including maintenance and other costs such as insurance and taxes;
- Corporate Support – non-system recurrent costs that encompass activities and services which are not directly related to maintaining or operating the network including finance, Information Technology (IT) and Human Resources (HR); and
- Asset works – system non-recurrent costs that are directed at addressing specific problems on the transmission system.

The figure below provides a framework for categorising controllable operating expenditure between system and non-system costs, and recurrent and non-recurrent costs.

Figure 5.4: SP AusNet's Opex Framework



Source: SP AusNet

In forecasting opex, recurrent expenditure (such as routine maintenance, operations and corporate costs) is treated differently to non-recurrent expenditure.

Recurrent expenditure is forecast by applying labour and material cost escalators to a base year. The base year must be appropriately adjusted for the costs of one-off events in that year and scoped so that new functions or increased activities (perhaps to meet future compliance obligations) are taken into consideration. While these 'step changes' are generally recurrent in nature, the opex forecast for the forthcoming regulatory control period includes a step change for the transitional arrangements for the new Chapter 6A of the NER which only applies to two years of the period.

Analysis of capex-opex trade-offs is undertaken to ascertain whether any adjustments to the recurrent opex forecast need to be made in light of forecast capex.

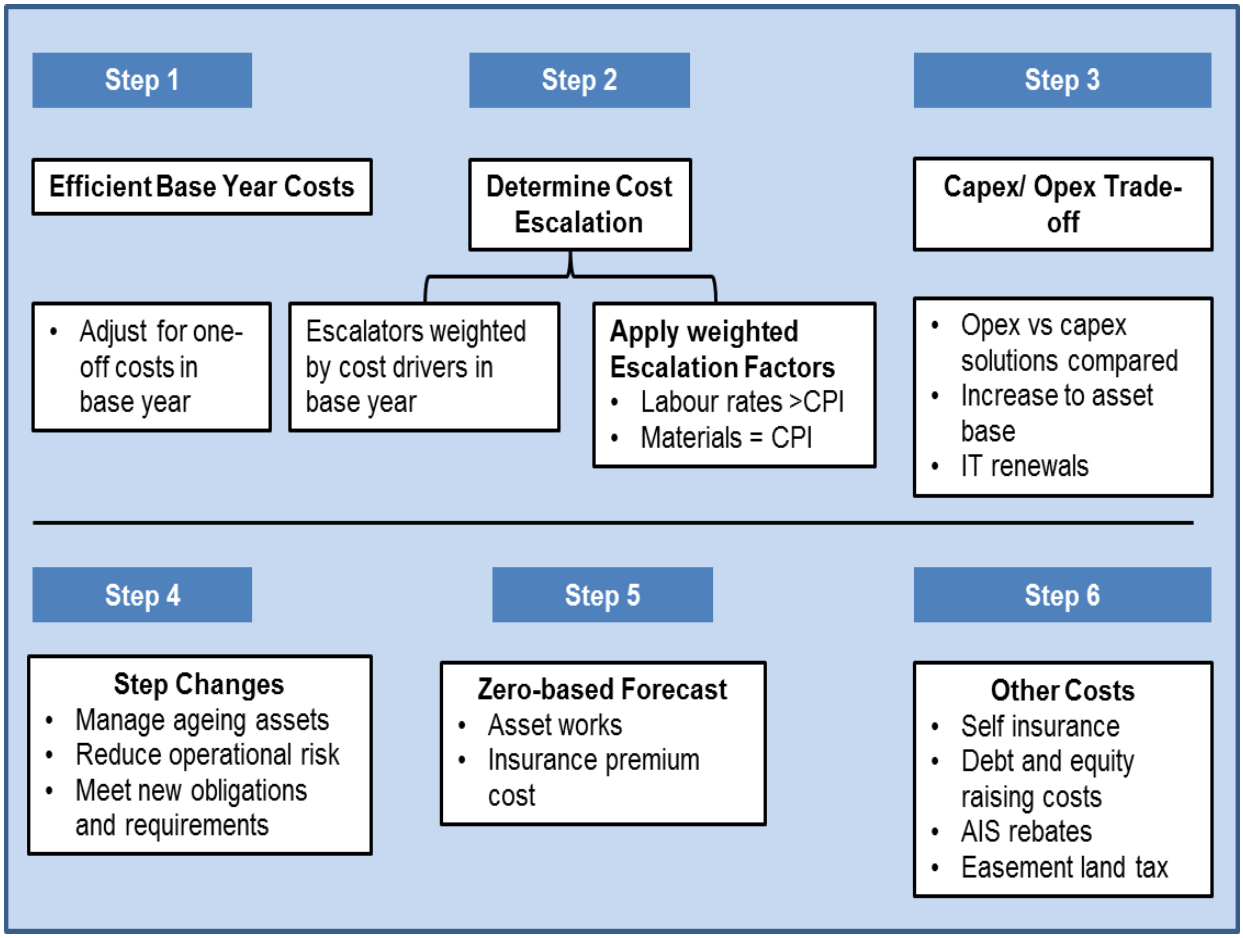
This 'base year' forecasting approach has been applied to each component of recurrent opex with the exception of insurance costs, which are subject to a zero-based (bottom up) forecasting approach. This approach recognises that future insurance costs depend on the specific conditions in that market which prevail in the forecast period.

The forecast of non-recurrent expenditure, which comprises asset works to undertake non-routine repairs and refurbishments on the network, uses a zero-based approach. Asset works programs address specific drivers such as asset failure risk, ad-hoc work required to ensure compliance with legislation, rules and regulations, or particular challenges or network issues that must be addressed in the forthcoming regulatory control period.

Finally, all other costs, referred to as non-controllable costs, such as self-insurance, debt and equity raising costs, incentive scheme payments and easement land tax are then included to provide the total opex forecast.[21]

SP AusNet's forecasting methodology is illustrated in the figure below.

Figure 5.5: Opex forecasting methodology



Each of these aspects of the opex forecasts are discussed in further detail in the following sections of this chapter.

5.4 Assumptions and Inputs

Schedule S6A.1.2(3) requires a Revenue Proposal to provide information on the forecasts of key variables relied upon to derive the operating expenditure forecast and the methodology used for developing those forecasts of key variables. Schedule S6A.1.2(5) requires a Revenue Proposal to include key assumptions which underlie the opex forecasts. This information is set out below. A certification of the reasonableness of the key assumptions by the directors is included as part of the directors' responsibility statement required under sections 4.3.2 and 4.3.4(a)(6) of the Submission Guidelines.

[21] Section 4.3.4(a)(1)(C) of the Submission Guidelines requires that the business indicate to what extent forecast expenditure relates to fixed or variable costs. The method by which SP AusNet's operating costs are recorded and forecasted does not present this information. SP AusNet notes that its forecasts are consistent with the categories of cost recorded in the annual Regulatory Accounts which the AER has each year approved.

5.4.1 Base year opex

SP AusNet's base year opex is the company's audited actual recurrent opex for the year ending March 2012. The efficiency of 2011/12 as a base year is addressed in more detail in section 5.5.1 below.

5.4.2 Labour Cost Escalators

SP AusNet has applied labour cost escalators in its opex forecast based on estimates provided by BIS Shrapnel (see *Real Labour Cost Escalation Forecast to 2017 – Australia and Victoria (November 2012)* at Appendix 4E).

Given the discontinuation of a number of data series used for Average Weekly Ordinary Time Earnings (AWOTE) and the volatility in the index, SP AusNet has based its labour escalations on the Labour Price Index (LPI).

For labour cost escalation SP AusNet has differentiated between external and internal resources as SP AusNet's operating costs include both internal labour costs and external (contractor) costs. Internal and external labour rates reflect different labour market segments and, therefore, require different forecasts of cost increases. A brief explanation of each of these escalators is provided below.

Internal labour

In forecasting internal labour costs, SP AusNet has relied upon BIS Shrapnel's forecast growth for the electricity, gas and water (EGW) industry using the LPI unadjusted for productivity.

SP AusNet has relied upon the electricity, gas and water (EGW) sector which includes a range of skilled labour involved in construction, maintenance, design and operation of electricity assets. SP AusNet considers that the EGW sector, rather than the Electricity, Gas, Water and Waste Services (EGWWS) sector better reflects the likely labour cost increases SP AusNet will face in the future. Importantly, SP AusNet's labour requirements differ from those of the Waste Services (WS) sector, and therefore, the inclusion of this sector will distort the index. In fact, the inclusion of the WS data introduces a systematic downward bias in the forecasts of real labour costs that SP AusNet would be likely to face.

This view is supported by compelling evidence of lower wage growth in the WS sector set out in the BIS Shrapnel Report which shows that:

> *"Using a comparison of the historical wages and employment data of EGW versus EGW and Waste Services at the national (Australian) level, annual growth in the combined EGWWS sector is 0.1 per cent less on average than the EGW sector over the period from 1998/99 to 2008/09, and 0.6 per cent less on average over the same period for AWOTE — both of which are significant and can make a material difference to an enterprise's overall labour costs, see table 4.3."*[22]

SP AusNet notes that BIS Shrapnel's approach to deriving the EGW series was rejected by the AER in its recent Draft Decision for ElectraNet's 2013-17 Revenue Determination:

> *"The AER does not consider that BIS Shrapnel's reasons for excluding the waste service component (that it would result in a lower wage growth) are sufficient to adjust the EGWWS data. Removing the waste services component from the data introduces a potential source of forecasting error since it is necessary to estimate the waste services component. Further, there is likely to be forecasting errors in applying the discontinued EGW industry data series which concluded in June 2009 when the ABS moved to the ANZSIC 2006*

[22] BIS Shrapnel, Real Labour Forecasts to 2016/17 – Australia and Victoria, November 2012, p. 23.

> *classification. This forecasting error will be magnified over time as the period between the last available EGW data (2009) and the forecast period increases."*[23]

SP AusNet notes that the AER's alternative forecasting method presented in its Draft Decision for ElectraNet relied on a series of adjustments using AWOTE data. However, the AER's consultant also explained that the AWOTE data series is particularly volatile, and this volatility limits its usefulness in forecasting.[24] The consultant's qualification regarding the AWOTE data casts doubt on the veracity of the resulting forecasts.

SP AusNet also noted that ElectraNet's revised proposal has provided additional expert evidence by KPMG to support the removal of the WS data from the EGWWS index, noting that the influence of that sector is significant and the adjustment can be achieved without introducing errors.

In SP AusNet's view, the AER's current position gives insufficient weight to the revenue and pricing principles at section 7A(2) of the National Electricity Law which require that a regulated network service provider should be provided with a reasonable opportunity to recover at least the efficient costs the operator incurs in providing network services. SP AusNet does not accept that a forecasting error would result from making an adjustment to determine the EGW sector forecast because:

- BIS Shrapnel has presented sound historical data to support the different growth outcomes between EGW and WS; and
- The AER has not presented any evidence to support an assumption that the gap between EGW and WS will narrow in the future.

SP AusNet's view that the AER's approach would result in underestimating likely internal labour costs is shared by BIS Shrapnel who have noted:

> *"The problem for SP AusNet and indeed all the electricity and gas utilities dealing with the AER, is that the inclusion of waste services understates the growth in 'true' labour costs, both historically and going forward. Under the Rules, the AER is required to deliver a ruling on labour and other cost escalators pertinent to the electricity and gas utilities, hence should use the wages escalator for EGW services rather than the labour costs growth for the EGWWS industry."*[25]

SP AusNet, therefore, considers that the advice provided by BIS Shrapnel, applied in the context of the revenue and pricing principles, provides a sound basis for the adoption of the EGW data for the purpose of forecasting real internal labour costs.

External labour

For external (contractor) labour, SP AusNet has relied upon forecast growth for the construction industry as most contractor labour is assumed to undertake construction or maintenance related projects and are more suitably classified to the construction sector. BIS Shrapnel's forecasts of construction activity by state (which includes residential and non-residential building, plus engineering construction) were used to derive the wages forecasts, using the LPI unadjusted for productivity.

Escalators used

The raw escalators applied to roll forward all base opex costs are set out in the table below.

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23 AER, Draft Revenue Determination for ElectraNet 2013-17, November 2012, p. 59.

24 Deloitte Access Economics, Forecast growth in labour costs: Victoria and South Australia, 15 October 2012, p. 53.

25 BIS Shrapnel, Real Labour Forecasts to 2016/17 – Australia and Victoria, November 2012, p. 23.

Table 5.3: Escalators used in developing forecast opex

Escalator (in real terms)	2012/13	2013/14	2014/15	2015/16	2016/17
Labour					
Labour (internal)	2.0%	1.5%	2.2%	2.3%	1.6%
Labour (external)	1.3%	1.5%	2.1%	2.1%	1.8%

Source: BIS Shrapnel, Real Labour Forecasts to 2016/17 – Australia and Victoria.

The forecast labour escalators provided by BIS Shrapnel are weighted within each opex category (routine maintenance, system operations, finance, etc) consistent with the composition of actual costs in the 2011-12 base year. (These actual costs are categorised into a range of general cost categories (including labour, external labour, maintenance, administration, materials, etc)).

These average weighted escalators for labour are applied to the relevant categories of base opex to roll forward base year costs. Using an average weighted escalator for labour ensures that the escalation applied to each opex category more accurately reflects the likely impact that labour cost increases will have on each opex line.

The application of labour escalation to the opex forecast results in an additional $3.3 million per annum on average over the forthcoming regulatory control period.

Non labour costs

The non-labour component of SP AusNet's operating expenditure includes a wide range of costs and materials ranging from field costs (protective clothing, minor tools, fuel and oil, fees and tolls, etc) to back-office costs (postage, freight and transport, cleaning, office supplies, etc). Given the general nature of these costs, SP AusNet considers it is appropriate to assume that these costs will increase at the same rate as CPI and has not applied a real escalator to non-labour components in forecasting opex.

5.4.3 Capex opex trade offs

SP AusNet's forecast opex reflects the optimal level of expenditure (that is, the level required to minimise total capital and operating costs over the asset life cycle), and it reflects the impact on the company's operating and maintenance requirements that flow from the capital expenditure program proposed for the forthcoming regulatory control period. The objective of minimising asset life cycle costs is embodied in SP AusNet's *Asset Management Strategy AMS 10-01* (Appendix 2A).

Further information on SP AusNet's analysis of capex-opex trade-offs is set out in section 5.9 below.

5.4.4 Cost Allocation Methodology (CAM)

The base year costs, along with all other cost data used as inputs to the opex forecast, have been allocated in accordance with SP AusNet's Transmission and Electricity Distribution Cost Allocation Methodology (CAM). SP AusNet's application of the CAM is audited annually during the regulatory accounts approval process. More details are provided in Appendix 2C – Cost Allocation Methodology.

5.4.5 Loss events

Insuring against loss is a necessary cost for every business. SP AusNet conducts a careful assessment of the risks faced by its transmission business and, with the assistance of experienced brokers and analysts, seeks the most cost effective range of cover available in the market and balances this with other mechanisms for insuring against loss. As a consequence of

this process, SP AusNet proposes to adopt a combination of insurance policies, self-insurance and (where possible) cost pass-through arrangements.

This process has been conducted so as to achieve an optimal balance of risk management and cost, with the ultimate objective of minimising the overall cost to customers.

For some risks that are assessed to be extremely unlikely, this may involve bearing the risk and, in the unlikely event that the risk eventuates, seeking to pass through any costs associated with the risk to customers. For other risks, the ultimate costs to customers can be better contained by acquiring insurance cover at market rates that are assessed to be commercially reasonable and commensurate with the size and risk profile of SP AusNet's transmission business.

Insurance policies and self-insurance are addressed in this chapter, while cost-pass through arrangements are addressed in Chapter 11.

SP AusNet has forecast insurance premium costs on a bottom-up basis, in order to reflect the best available information. These forecasts are detailed in section 5.7 below.

Forecast self-insurance costs are derived from AON's analysis and estimate of SP AusNet's uninsured risk as detailed in its report *Self Insurance Risk Quantification (February 2013)* (Appendix 5A). Further information in relation to this area of expenditure is provided in section 5.12.1 below.

5.4.6 Group 3 prescribed assets

At the commencement of the forthcoming regulatory control period, the opex associated with network and connection augmentation works will be included in the base costs, in accordance with SP AusNet's CAM. Pursuant to NER 11.6.21(c), the relevant assets will also be rolled into SP AusNet's Regulated Asset Base (RAB). Information on these assets is derived from SP AusNet's fixed asset register and relevant connection agreements.

A full list of projects to be rolled into the RAB is provided in Appendix 5C.

5.4.7 Asset works and step changes

In developing step changes and asset works forecasts, SP AusNet has applied unit costs from internally established standard costs to derive cost estimates. These have been based on actual costs incurred for similar projects or activities.

5.4.8 Carbon price

For the estimation of step changes related to SF_6 top-ups, the carbon price scenario adopted for forecasting is based on current policy settings (medium scenario of $23/tonne from July 2012, and $29/tonne in 2015) with no price floor.

5.4.9 Opex associated with the service target performance incentive scheme

SP AusNet's opex forecast will only enable SP AusNet to maintain current levels of service performance. The opex forecast does not, therefore, include the costs of activities that are specifically designed to improve the performance of the transmission system for the purpose of the Service Target Performance Incentive Scheme that will apply in the forthcoming regulatory control period.

5.5 Base year opex

The operating expenditure objectives set out in NER 6A.6.6(a) require SP AusNet's opex forecast to reflect the level of expenditure required to maintain the existing level of service to customers.

As already noted, SP AusNet employs a base year forecasting methodology for controllable opex (except for insurance costs and non-recurrent asset works programs). Under this approach, SP AusNet uses its latest audited year of actual opex data (adjusted for non-recurrent costs) as a

base from which future recurrent opex is projected. The reasonableness of this forecasting methodology depends on the base year opex being efficient; appropriate adjustments being made to address non-recurrent costs; and the appropriate recognition of future cost increases as a result of compliance obligations; labour cost escalation; and network growth.

5.5.1 Efficient base year

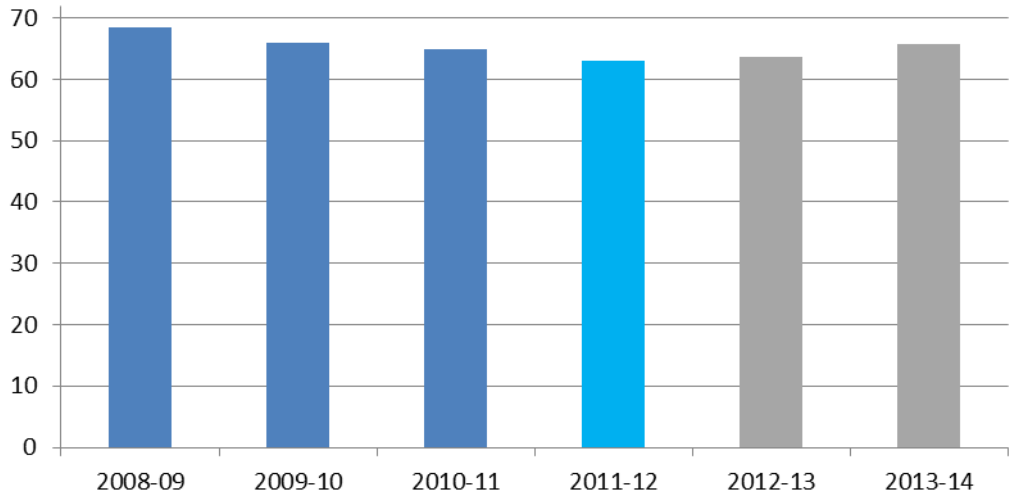
For the purposes of this opex proposal, 2011/12 has been used as the base year. SP AusNet considers 2011/12 is an efficient base year because:

- at the time of submission, 2011/12 is the most recent full year of available operational costs, and contains data that has been independently verified and audited;
- 2011/12 opex reflects the circumstances that could reasonably be assumed to occur over the forthcoming regulatory control period, with respect to recurrent operating expenditure; and
- benchmarking results confirm that SP AusNet's 2011/12 opex is efficient. This is discussed in further detail in section 5.5.3 below.

For these reasons, SP AusNet considers 2011/12 opex to form a suitable base upon which to roll forward recurrent costs for forecasting purposes.

The chart below shows that the chosen base year is consistent with the recent opex and is lower than opex in the previous two years. It also shows that SP AusNet is expecting base opex to increase very slightly in the last two years of the period.

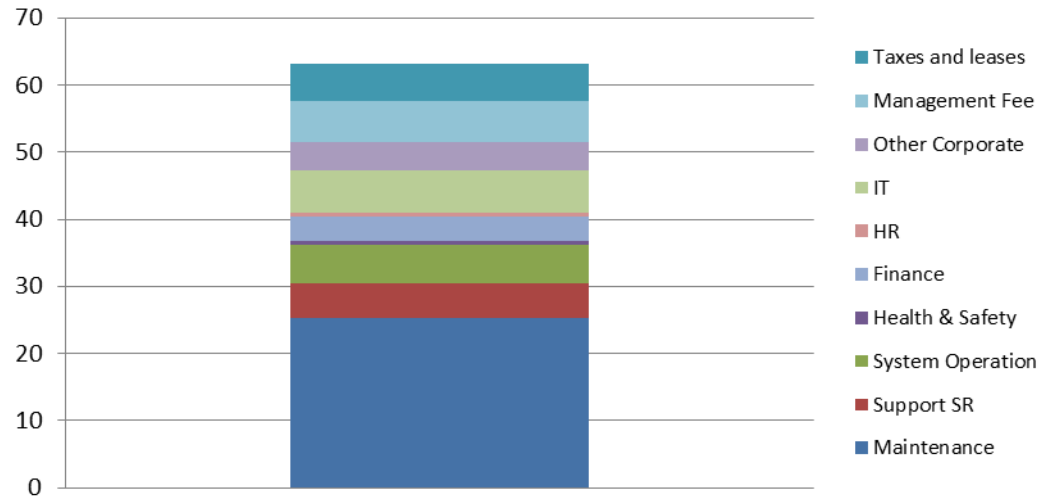
Figure 5.5: Actual and expected base opex ($m, real 2013-14)



Note – non-recurrent costs (asset works) and insurance costs are not included in base opex for the purposes of forecasting.

Base opex for 2011/12 was $63.1 million (real). The figure below shows the components of 2011/12 base year opex.

Figure 5.6: Break down of base year recurrent opex ($m, real)



Note – non-recurrent costs (asset works) and insurance costs are not included in base opex.

As explained in further detail below, a number of cost items will be forecast using a 'zero-based' budgeting approach. With the exception of these items, SP AusNet has not identified any other non-recurrent costs that should be removed from the base year.

5.5.2 Base year opex forecast relative to 2012/13 year

The penultimate year of the regulatory control period is normally used as the base year for forecasting opex for the next regulatory control period. This is because the efficiency incentives provided by the regulatory framework encourage businesses to make continuous opex savings such that the most recent year of expenditure (after adjustment for one-off expenditure items) is usually taken to represent the most efficient level of expenditure.

At the time of preparing this Revenue Proposal, SP AusNet's forecast of 2012/13 opex is very similar to that incurred in 2011/12. This Revenue Proposal is submitted to the AER prior to the end of the 2012/13 year, and so audited operating expenditure data for that year will not be available. For simplicity, SP AusNet considers that it is appropriate to use 2011/12 as a base year for the purposes of this Revenue Proposal. SP AusNet notes that the AER has previously accepted proposals to use the third regulatory year as its base year.

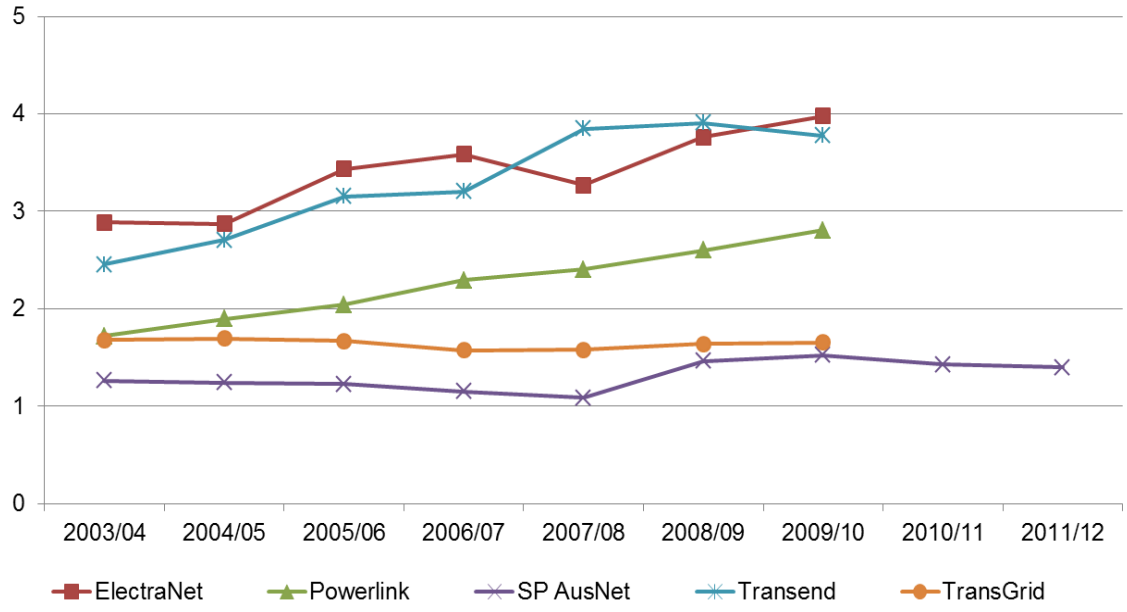
SP AusNet is open to reviewing its base year following the completion of the 2012/13 year in April 2013 if opex in that year proves to be materially different to 2011/12 opex, or if the AER finds 2011/12 to be an unacceptable base year.

5.5.3 Opex benchmarking

As explained in Section 3.6, SP AusNet's opex performance in relation to the transmission services it provides compares relatively well against other results in the NEM. For example, the figure below shows that SP AusNet's opex costs, on a per unit of energy transmitted basis, compares favourably against that of other TNSPs.[26]

[26] AER, TNSP Electricity Performance Report for 2009-10, January 2012.

Figure 5.7: Opex / energy transmitted ($000's/GWh)



Source: AER Regulatory Report 2009-10 and SP AusNet.

Note – It should be noted that the above reflects only one measure of opex benchmarking analysis, and does not necessarily indicate a firm's operating efficiency. The nature of the Victorian transmission network as an established and meshed network also lends itself to higher operating efficiency compared to jurisdictions that have networks which are still developing and cover a larger geographical area.

5.6 Variations between forecast opex from historic opex

NER S6A.1.2 requires that a Revenue Proposal must contain an explanation of any significant variations in the forecast opex from historic opex.

A review of SP AusNet's historic opex is provided in Chapter 3.

The identified areas where there is significant variation from historic opex are:

- labour cost increases (5.4.2);
- insurance premium costs (5.7.1);
- the roll in of Group 3 assets (5.4.6); and
- step changes (5.10).

The reasons for the variations are explained in the respective sections of this chapter which explain these forecast costs, as provided above.

5.7 Insurance premium forecast

5.7.1 Insurance premium forecast

SP AusNet's insurance costs are forecast to increase over the forthcoming regulatory control period, reflecting the higher premiums charged to utilities since 2009. The forecast is based on actual 2012/13 premiums rolled forward with:

- 10% per annum increases to property insurance;
- 15% per annum increases to liability insurance; and
- 5% per annum increases to all remaining categories.

These forecast increases are based on observed trends in insurance costs over the current period, and they reflect a rigorous process of assessing available insurance cover for SP AusNet with the assistance of experienced analysts and brokers in Australia and internationally. It is noted that the market has experienced an upward trend in premiums across most business sectors in Australia and internationally, due to a large number of significant natural disasters that have occurred in recent years. These events have reshaped current experience of risk levels, many of which are relevant to network businesses, generally. In addition to this, the significant current and forecast capex program is further driving property insurance cost increases as the transmission networks is going through a major replacement phase, which is expected to continue into the next couple of decades.

The forecast, totalling $19 million, reflects current allocations of insurance costs between SP AusNet's distribution and transmission networks. A model showing the allocation of 2012/13 insurance costs is provided as commercially confidential supporting information to this Proposal. The forecast insurance costs are set out below.

Table 5.4: Forecast insurance costs ($m, real 2013-14)

	2014/15	2015/16	2016/17	Total
Forecast	5.7	6.3	7.0	19.0

SP AusNet engaged Aon Risk Services to conduct and independent expert review of this forecast and its assumptions for reasonableness. Aon concluded that:

> *"From Aon's perspective, as the leading global provider of risk management services, insurance and reinsurance broking services, the forecast would not be considered unreasonable, given the general state of the insurance market, the specific circumstances surrounding the Power / Utilities industry and SP AusNet's own circumstances."*[27]

Aon's report, *Review of Insurance Premium Forecast – SP AusNet (Transmission)*, provided as Appendix 5D of this Proposal, provides further analysis of SP AusNet's insurance forecast and insights into how it is aligned with the current insurance market and the business's operating circumstances. Aon considers that the forecast is reasonable given the drivers behind liability and property insurance which are the main components of the insurance forecast.

Therefore, SP AusNet considers the proposed insurance of $19 million reasonably reflects the costs a prudent operator in its circumstances would require to meet the opex objectives in the next regulatory control period.

5.7.2 Applying a zero-based approach to insurance premium costs

SP AusNet's insurance costs are forecast separately from base opex and use 2012/13 actual insurance premiums as a starting point, with expected annual increases applied.

Excluding insurance costs from base year opex costs is consistent with the approach applied by Powerlink and approved by the AER in its Revenue Determination for Powerlink's 2012-17 regulatory control period. In that decision the AER concluded:

[27] Appendix 5D, AON, Review of Insurance Premium Forecast – SP AusNet (Transmission), p. 1.

> *"The AER considers Powerlink is a price taker in a global insurance market. Using independent actuarial advice to develop insurance cost forecasts will take into account the most up to date information which impacts insurance premiums. The AER has previously accepted insurance cost forecasts on the basis of actuarial advice prepared for TNSPs, rather than extrapolating base year data"*[28]

However, the AER has more recently rejected the use of the above approach in its Draft Determination for ElectraNet's 2013-18 regulatory control period:

> *"The AER does not find that the variability of insurance market premiums sufficient reason to exclude insurance from the base year extrapolated approach. In general, a TNSP, for any one year, is likely to have some insurance premiums costs that are higher than the base year extrapolated amount (business as usual) and some insurance premium costs that are lower. While ElectraNet's actual insurance premium payable in any one insurance category might have been lower in the base year, other insurance premium types were possibly higher. Many factors influence actual insurance market premiums in any one year in both directions (and in aggregate), so the AER considers a forecast of total opex is more likely to include estimation errors if it does not reflect of all opex incurred in a financial year."*[29]

SP AusNet considers the AER's reasoning in the ElectraNet Draft Decision is flawed as insurance costs are driven by their own unique market which does not reflect the broader basket of costs in base opex. This view is confirmed by Aon Risk Services, who note that:

> *"It is important to recognise that insurance premiums are subject to external factors that SP AusNet's other operating costs are not. Whilst insurance premiums largely reflect the risk that is being insured, other factors such as recent claims activity, global natural catastrophes, insurer competition, market capacity (amount of available insurer capital) and capital requirements have considerable bearing on insurance pricing, particularly for low frequency, high severity risks."*[30]

As such, SP AusNet considers it is reasonable to forecast insurance costs separately to base opex and, as already noted, the proposed insurance estimate of $19 million reasonably reflects costs which a prudent operator in its circumstances would require to meet the opex objectives in the next regulatory control period.

5.8 Roll in of Group 3 prescribed assets

As already explained in Chapter 2, NER 11.6.21(c) provides for the RAB to be increased by the value of constructed assets during the previous regulatory control period used to provide prescribed transmission services, adjusted for outturn inflation and depreciation. The newly constructed assets are network augmentations and connection works undertaken at the direction of AEMO or the distribution businesses (DBs) which provided prescribed transmission services but are currently excluded from SP AusNet's revenue cap because the planning and forecasting of them is the responsibility of other parties.

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28 AER, Draft Decision, Powerlink, Transmission Determination, 2012-13 to 2016-17, November 2011, p. 196.

29 AER, Draft Decision, ElectraNet, Transmission Determination, 2013-14 to 2017-18, November 2012, p. 223.

30 AON, Review of Insurance Premium Forecast – SP AusNet (Transmission), February 2013, p. 1. Available at Appendix 5D.

A full list of projects to be included in the RAB for this determination is provided in Appendix 5C. The value of the assets being rolled into the RAB on 1 April 2014 in accordance with NER 11.6.21(c) is $144 million (real)[31].

The periodic inclusion of additional assets in the RAB requires that an appropriate opex allowance must be provided in the building block calculation.

In forecasting the opex related to the RAB growth as a result of the Group 3 roll in, SP AusNet has adopted the approach determined by the AER in its 2008 Final Decision for SP AusNet[32]. In accordance with the AER's approach, SP AusNet has increased the opex on a pro rata basis consistent with the net change in ratio between the regulated and unregulated asset bases between 1 April 2009 and 1 April 2014, but reduced by a factor of 30% in routine maintenance cost categories to account for expected economies of scale. SP AusNet has, therefore, calculated an additional opex allowance for the newly constructed assets of $5.2 million in total over the period. This adjustment does not result in an increase in overall network costs borne by customers.

5.9 Capex-opex trade off

SP AusNet seeks to optimise the balance between operating and capital expenditure with the aim of minimising the total costs to customers, expressed in net present value terms. This section focuses on the substitution possibilities between capital and operating expenditure to the extent that it affects SP AusNet's opex for the forthcoming regulatory control period.

It is also noted that NER 6A.6.6(e)(7) requires the AER to consider the substitution possibilities between capital and operating expenditure in its assessment of SP AusNet's opex forecasts. The information presented in this section is therefore intended to assist the AER in this task.

The objective of minimising total capital and operating costs over the asset life cycle is embodied in SP AusNet's AMS. The substitution possibilities between capital and operating expenditure are considered as part of the project selection process. In particular, adjustments may be made to the opex forecast to reflect efficiencies flowing from the capital expenditure program. Conversely, opex may reduce the need for additional capital expenditure through maintaining asset condition.

Examples of where the substitution possibilities between capital and operating expenditure have been taken into account in SP AusNet's forecast include:

- A targeted asset works program to improve asset condition and defer asset replacement. This includes repairs, replacements and refurbishments of assets including transformers, switchgear, circuit breakers and reactive plant.
- A new ongoing corrosion risk management program which targets towers located in areas of high corrosion. Proactively painting towers to extend their lives can substantially defer the need to undertake tower replacement, thereby opex in the current period is substituting more significant capital expenditure in future periods.
- A proposed technology innovation program to develop technologies with the potential to achieve future capital expenditure efficiencies through increasing asset capacity and reducing the risk of failure.
- Expected operating efficiencies from investing in better back office IT systems.

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31 Includes projects completed and in service by 1 June 2012. SP AusNet may update the project list for more recent projects in a supplementary submission at the time of the Draft Decision.

32 AER, Final Decision, SP AusNet transmission determination, 2008-09 to 2013-14, January 2008.

As a result of the above SP AusNet has included expected opex savings from the delivery of an IT capex project which replaces and upgrades enterprise asset management and enterprise resource planning (EAM/ERP) systems. This project is forecast to provide total opex savings of $848,000 over the next regulatory control period.

5.10 Step Changes

5.10.1 Step Change definition

Section 4.3.4(c)(3) of the AER's Submission Guidelines requires that:

> *'the operating expenditure forecast must include any necessary adjustments for changes in responsibilities that result from compliance with a new or amended law or licence, or other statutory or regulatory requirement, including a requirement that can be demonstrated to arise directly from a recognised policy, practice or policy generally applicable to similar firms participating in the National Electricity Market'*[33].

In addition to changes in the external obligations that must be met, SP AusNet considers that an ageing asset profile and the prudent and efficient exploration of enhanced technologies will require an increase in opex in order to meet the NER operating expenditure objectives and the NEO over the forthcoming period. This is consistent with the AER's Submission Guidelines, which require that the opex forecast must include necessary adjustments to meet requirements arising from policies or practices applicable to similar firms in the NEM.

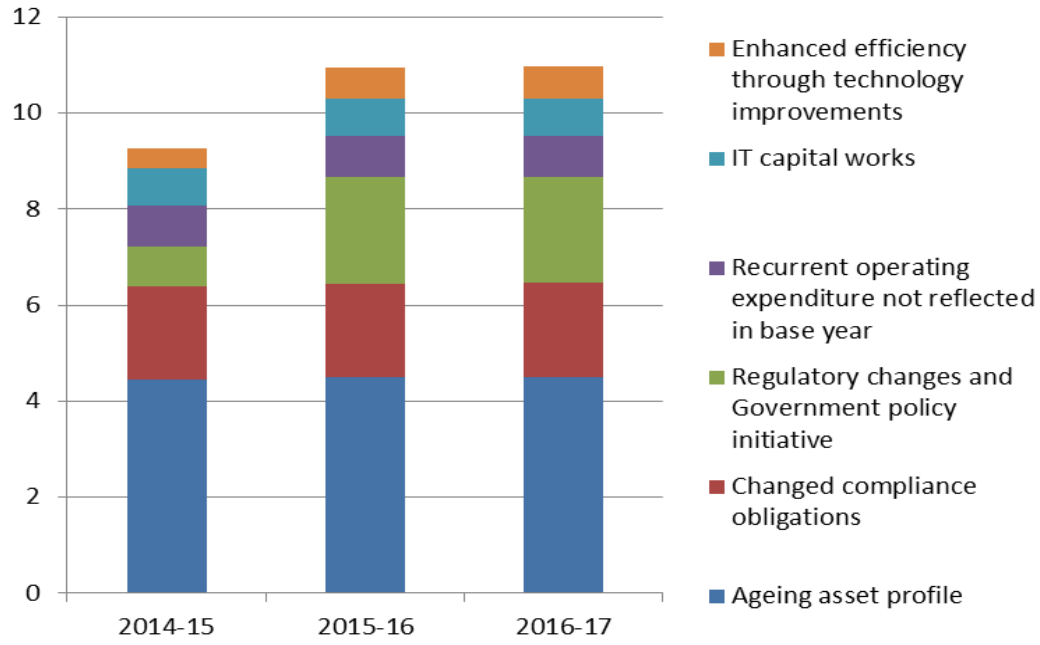
SP AusNet has identified the following drivers that require 'step changes' in SP AusNet's future opex requirements:

- Ageing asset profile;
- Changed compliance obligations;
- Regulatory changes and Government policy initiatives;
- Recurrent operating expenditure not reflected in base year;
- IT capital works; and
- Enhanced efficiency through technology improvements.

The figure below shows forecast opex in each category. The total increase in opex over the forthcoming period due to step changes (including escalators) is $32.53m ($2013-14). This represents an additional 14% of average controllable opex in the current period. The step change costs presented below are direct costs to which labour escalators have not been applied.

[33] AER, Electricity transmission network service providers – Submission guidelines, September 2007, p.14

Figure 5.8: Step Changes by Category ($m, real 2013-14)



The drivers and descriptions of each step change are outlined briefly below. Additional information and analysis on the proposed step changes, including a description of how they comply with the operating expenditure criteria specified in the NER is contained in Appendix 5E – Proposed Operating Expenditure Step Changes 2014-17.

5.10.2 Ageing Asset Profile

The average age of SP AusNet's assets will increase over the forthcoming regulatory control period, and the number of older assets (>60 years), particularly towers, will grow. These assets are approaching the ends of their technical lives. Changes in operational practices have been required to address the ageing asset profile, in order to maintain the reliability, safety and security of the transmission system, as required by the opex objectives. Changed practices include enhanced condition assessment and a step change in corrosion risk management practices. These practices are recognised as good industry practice.

In addition, the Electricity Safety Management Scheme (ESMS) endorsed by Energy Safe Victoria (ESV) in 2010 for SP AusNet's transmission network includes SP AusNet's safety strategies which, in turn, encompass the work described below. To deliver the endorsed ESMS, SP AusNet must therefore carry out these works.

Table 5.5: Ageing Assets Profile Step Changes ($m, real 2013 – 14)

Step Change	Driver and Description	Total Cost over the Period
Overhead Lines Condition Assessment Program	**Driver** SP AusNet manages an ageing transmission network. The older assets (>60 years) have an increasing probability of failure due to deteriorating condition. Some existing condition monitoring techniques, which rely on the judgements of asset inspectors, cannot identify hidden defects. Enhanced condition assessments of transmission lines would support the ESMS but is not currently included in base year costs. **Description** SP AusNet has successfully trialled new condition monitoring technologies over the last few years. These include Smart Aerial Image Processing (SAIP) and Line Detector Corrosion Equipment (CORMON) technologies to assess the condition of transmission line conductors. A wider program of asset inspection using these technologies needs to be rolled out to improve the accuracy of condition assessments of overhead lines.	**3.9**
Corrosion Risk Mitigation	**Driver** Towers and rack structures in coastal areas, or near industrial pollution, experience rust of above ground steel members. Protective coatings applied to steel members during manufacture break down after long periods of exposure to corrosive environments. Painting towers at the optimal time provides a protective layer which guards steel members against harmful corrosion and defers the need for widespread replacement. Corrosion risk mitigation works are part of the ESMS. Proposed asset works to manage tower corrosion risk include corrosion repairs to ground level steel and tower steelwork replacement. Tower replacements also form part of forecast capital expenditure. Collectively, these projects will reduce the corrosion risk across SP AusNet's tower fleet. **Description** This approach is recognised as good practice and has been adopted by other network service providers in the NEM (e.g. Powerlink). The requirement to paint a similar number of towers will continue in subsequent regulatory control periods as SP AusNet's tower structures continue to suffer deterioration and therefore a permanent increase in opex is required.	**9.5**
	Total	**13.5**

5.10.3 Changes in Compliance Obligations

SP AusNet will be required to meet several changes in compliance requirements and obligations over the forthcoming regulatory control period. The additional opex required to comply with these obligations is outlined below.

Table 5.6: Changed Compliance Obligations Step Changes ($m, real 2013 – 14)

Step Change	Driver and Description	Total Cost over the Period
AEMO Outage Planning Requirements	**Driver** AEMO will require TNSPs to provide a monthly list of network outages planned for the subsequent thirteen months that are likely to materially affect transfer capabilities. Currently, the outage and work plan does not optimise further than six months ahead. **Description** An additional outage planner is required to undertake long-term outage planning.	**0.6**
Security of Critical Infrastructure (Terminal Stations)	**Driver** SP AusNet must comply with Part 6 of the Terrorism Community Protection Act (2003) which requires owners of essential services to take appropriate steps to secure their assets against foreseeable risks. In addition, recent internal assessment shows existing security measures for critical infrastructure should be improved to meet industry standards. **Description** The following new actions are required in addition to those already undertaken by SP AusNet in accordance with its responsibilities: - Security patrols of terminal stations and high-priority communications sites. - Weekly perimeter inspections of all terminal stations to ensure fences have not been breached. - Monitoring of security systems by an external security monitoring company (security is currently monitored by the Customer and Energy Operations Team). - Annual security assessments at every transmission site, biannual assessments of communications sites. - Internal responsibility to be taken for annual statutory counter terrorism exercise.	**4.8**
	Total	**5.4**

5.10.4 Regulatory changes and Government policy initiatives

SP AusNet's opex is affected by changes in the regulatory framework or Government policy initiatives. In relation to the forthcoming regulatory control period, the primary changes are:

- The introduction of the carbon price under the Australian Government's Clean Energy Future Plan, which will directly increase SP AusNet's opex in relation to purchases of SF_6, a greenhouse gas.

- The AEMC's transitional provisions for the Economic Regulation of NSPs Rule Change require SP AusNet to submit its next transmission revenue review proposal in October 2015. This timeframe directly coincides with the submission of the EDPR and will require an augmentation of already scarce regulatory and engineering resources to enable the regulatory requirements to be met.
- Potential changes in transmission planning responsibilities in Victoria, as recommended in the AEMC's Transmission Frameworks Review Draft Report. The AEMC's final report is timetabled for March 2013, and its final recommendations will be considered by the Standing Council on Energy and Resources (SCER). At this stage, an opex amount will only be proposed if responsibility for network planning is likely to be transferred to the company. SP AusNet may be aware of any proposed changes before submission of its Revised Proposal.

The additional opex associated with changes to the regulatory framework and Government policy initiatives is outlined below.

Table 5.7: Regulatory Changes and Government Policy Initiatives Step Changes ($m, real 2013 – 14)

Step Change	Driver and Description	Total Cost over the period
Impact of the 'Clean Energy Future' Plan on SF_6 Top Ups	**Driver** A levy on SF_6 imports was imposed from 1st July 2012 under the Australian Government's 'Clean Energy Future' Plan. This will increase the price of SF_6 which SP AusNet must purchase to replace leakages. **Description** For SP AusNet's transmission business, there are two main sources of SF_6 cost: 1. replacing leakages of SF_6 from the existing network (opex); and 2. replacing or upgrading equipment or plant containing SF_6 (capex). This opex step change covers the increased cost of replacing SF_6 leakages from the existing network. GIS and circuit breaker refurbishments in the asset works program aim to mitigate increased SF_6 leakages due to ageing assets. However, any net reduction in SF_6 leakages achieved by these programs is likely to be offset by GIS installations which will be undertaken. Therefore network-wide SF_6 leakages are expected to remain relatively flat throughout the period.	**2.5**

Step Change	Driver and Description	Total Cost over the period
Transitional Arrangements for the Economic Regulation of NSPs Rule Change	**Driver** SP AusNet has realised efficiencies through staggering the timelines of price reviews across each of its three networks. Under the transitional arrangements associated with the Economic Regulation of Network Service Providers Rule Change, SP AusNet is required to submit the next pricing proposals for electricity distribution in April 2015, and for transmission in October 2015. The preparation and regulatory review periods for SP AusNet's transmission and distribution will substantially overlap. This will require an augmentation of regulatory and engineering resources as currently SP AusNet's resources only support these resets when they are staggered in time. **Description** Two additional regulatory staff and five additional planning engineers will be required temporarily to work on the next transmission regulatory reset, with the Revenue Proposal due in October 2015. This step change is non-recurrent as SP AusNet intends to adopt a longer transmission regulatory control period in the 2015 revenue reset which would remove the overlapping of regulatory processes.	**2.8**
Potential Transfer of Planning Responsibilities	**Driver** The AEMC is reviewing the arrangements for the provision and utilisation of electricity transmission services in the NEM. The AEMC published its second interim report on 15 August 2012 which recommended significant changes to the planning arrangements in Victoria, whereby the investment decision making functions would move from AEMO to SP AusNet, creating a consistent approach across the NEM. A Final Report is due in March 2013. Further, the Productivity Commission's Review of Electricity Network Regulation has made different recommendations in relation to transmission planning its Draft Report published on 18 October 2013. Its Final Report is due in April 2013. The Standing Council on Energy and Resources will make a decision on future transmission planning arrangements following the receipt of these Final Reports. **Description** Transferring responsibility for transmission planning to SP AusNet would require funding for a team of planners, as well as funding for any augmentation capex projects that may be required to meet increased customer demand. Overall, there should be no net cost impact to the market as there will be a corresponding reduction in AEMO's operating expenditure.	**To be estimated if the event occurs**
	Total	**5.2**

5.10.5 Operating Expenditure to Support ICT Capital Works

Forecast capital expenditure on ICT systems during the forthcoming regulatory control period will have a consequential effect on ICT opex. Additional opex is required to provide on-going application support and to administer and licence new ICT systems.

Table 5.7 shows the additional opex that will be incurred due to the following ICT capex programs:

- SCADA Enhancements – Controller Simulator Training
- SCADA Security – Software QA/QC Environment
- ICT Network Security
- Service Standard Reporting Tools – Enable Market Reporting

Other IT projects will require on-going opex in addition to that listed above. However, these opex requirements will be funded by efficiency improvements resulting from the implementation of previous ICT programs.

A full discussion of the ICT capital expenditure program is contained in Appendix 4H – ICT Strategy FY2014/15-16/17 Electricity Transmission Network.

Table 5.8: IT Capital Works Step Changes ($m, real 2013-14)

Step Change	Driver and Description	Total Cost over the Period
SCADA Enhancements – Controller Simulator Training	**Driver** This expenditure is a direct result of the ICT capital project 'SCADA Enhancements – Controller Training Simulator'. This project deploys a controller training simulator to train new network controllers in line with industry standards (and other TNSPs). This will improve the quality and effectiveness of training as different scenarios can be developed, tested and operated in a controlled training environment. Currently network controllers are trained using the live network under supervised controls, which presents risks. **Description** An additional 1.5 Full-Time Equivalent (FTE) is required for the following functions: • 0.5 FTE to provide Information Technology Infrastructure Library (ITIL) compliant application support; and • 1 FTE to develop, build and test scenarios and train staff in processes and procedures to deliver effective training programs.	**0.9**

Step Change	Driver and Description	Total Cost over the Period
SCADA Security – Software QA/QC Environment	**Driver** This expenditure is a direct result of the ICT capital project 'SCADA Security – Software QA/QC Environment'. This project introduces a Software QA/QC testing environment as a component of the SCADA Security programme. This will reduce the security threat associated with the SCADA EMS system. Security reviews in 2009 and 2011 identified that this system is vulnerable to external attack due to insufficient software patching. **Description** An additional 1 FTE is required to support the SCADA EMS systems. The tasks that will be undertaken by this resource include: • Reviewing security patches based on Microsoft and SCADA Vendor advice • Creating patch bundles • Deploying and test patches in the test environments • Deploying and test patches to pre-production environments • Managing the deployment of patches to production machines • Regularly review firewall rules • Regularly review logs	**0.6**
IT Network Security	**Driver** This expenditure is a direct result of the ICT capital project 'IT Infrastructure and Operations – ICT Network Security'. This program implements identity access management, governance, risk and compliance (GRC) tools to ensure security of the IT network. This is critical to maintaining the integrity of the transmission network, ensuring data security and preventing confidentiality breaches. **Description** An additional four FTE are required to support the security systems on a 24x7 roster. The roles will include but are not limited to: • Security policy and procedure development and application • Risk management programs • Oversight of the security systems • Incident and Violation Reporting • Security Auditing	**0.8**

Step Change	Driver and Description	Total Cost over the Period
	• Contingency Planning and Documentation As this project benefits all three of SP AusNet's networks, 30% of the increased operating expenditure costs have been allocated to the SP AusNet transmission network.	
Service Standard Reporting Tools – Enable Market Reporting	**Driver** This step change represents ICT support for the direct interface with AEMO's Electricity Wholesale Market Management System (MMS) and the proposed new business to business (B2B) link between SP AusNet's systems and AEMO's Network Outage Schedule (NOS) system. The interface with MMS will provide accurate data on the market impact of outages which is required for effective participation in the Market Impact Component. All other TNSPs currently have an interface with MMS as part of their planning roles. The B2B link with NOS is required as AEMO requires TNSPs to use NOS as the primary form of providing outage information, which will require SP AusNet to optimise planned outages 13 months in advance. **Description** An additional 0.75 FTE is required to manage the implemented solution incorporating the MMS and NOS solutions. This person will be used to augment outage management planning and optimise reconciliation of all relevant data to ensure compliance to nominated schemes. While software licence costs are currently incurred through the consultancy fees, and are therefore captured in base year operating expenditure.	**0.5**
	Total	**2.8**

5.10.6 Enhanced Efficiency through Technology Improvements

SP AusNet considers that longer term efficiency gains, in the long term interests of customers, can be achieved through innovation, such as advanced condition monitoring and inspection techniques. With longer term efficiency objectives in mind, SP AusNet is establishing an innovation program to focus on:

- developing solutions to the most urgent and significant network problems; and
- trialling existing leading edge technologies or conducting research and development where there is no existing solution.

While the EBSS provides incentives to invest in programs with efficiency benefits, the EBSS only provides truncated returns on this investment. Therefore, the incentive to invest in initiatives with a longer-term repayment profile, such as the innovation program proposed here, is insufficient unless this can be funded through regulated revenue.

Any efficiency gains realised from the research and development will be passed back to customers through lower future operating or capital expenditure requirements.

Details of the proposed step change in innovation expenditure are set out below.

Table 5.9: Enhanced Efficiency through Technological Improvements Step Change ($m, real 2013-14)

Step Change	Driver and Description	Total Cost over the Period
Technology Innovation	**Driver** New technologies with the potential to improve transmission service delivery are available. Undertaking research to trial the application of these technologies to SP AusNet's network could lead to significant opex and capex reductions in future regulatory control periods, increasing the efficiency of the transmission business. A step change in innovation expenditure is necessary to capture the potential benefits of research. **Description** Technologies proposed for further exploration include: - **Wireless Sensor Network (WSN) system for substations** – reduce the risk of explosive failure. - **Line Fault Detection System** – increase the efficiency of line inspections. - **Polymer Insular Diagnostics** – enable efficient management of aging insulators. - **Nano Technology Development** – potential to increase the capacity of transformers.	**1.7**
	Total	**1.7**

5.10.7 Recurrent Opex not reflected in Base Year

The following communications operating expenditure is currently included as asset works in the regulatory accounts, which is non-recurrent expenditure. However, given the recurrent nature of this expenditure, SP AusNet considers that it would be more appropriately classified as part of the base operating expenditure. For the sake of simplicity, the expenditure is treated as a 'step change' although it is actually a reclassification of expenditure from 'asset works'. Relevant details are set out below.

Table 5.10: Recurrent Opex not reflected in Base Year Step Change ($m, real 2013-14)

Step Change	Driver and Description	Total Cost over the Period
Communications Infrastructure	**Driver** Operating expenditure on communications asset replacement programs are currently classified as asset works. This should be treated as base opex as it is recurrent in nature. **Description** This expenditure covers communications asset replacement programs including the periodic testing of fibre and reducing the risk to the public of radio frequency exposure. This expenditure includes: - Radiation hazard assessment and documentation - Digital communications support contracts - Maintenance on optic cables - Operational telephony maintenance and support	**2.6**
	Total	**2.6**

5.11 Asset Works

5.11.1 Asset Works Definition and Overview

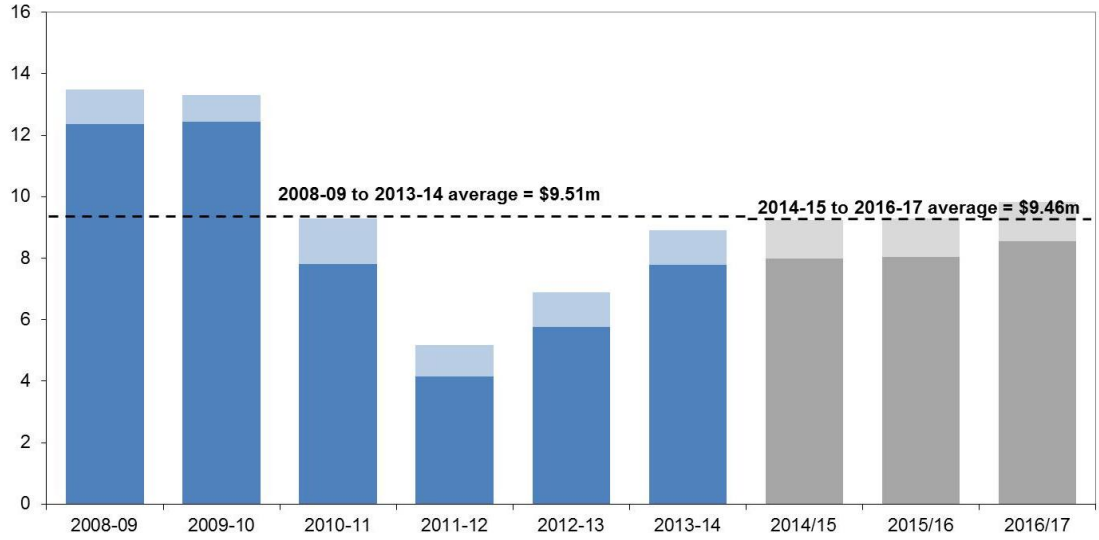
The asset works program is comprised of system non-recurrent expenditure that is required to manage operational risk within an acceptable band. The program includes non-routine repairs and refurbishment, corrosion and transformer condition monitoring.

Over the 2014-17regulatory control period actual asset works expenditure is forecast to total $28.39 million including management support costs, an annual average of $9.46 million. This represents a 0.5% reduction in current period expenditure which has averaged $9.51 million per year.

5.11.2 Historic and Forecast Asset Works Expenditure

An overview of SP AusNet's historic and forecast asset works expenditure is provided in Figure 5.9.

Figure 5.9: Actual/ expected and Forecast Asset Works ($m, real 2013-14)



Source: SP AusNet

Notes: - Light shaded areas are asset works management support costs.
- Actual expenditure includes communications spend that has been historically classified as asset works (see section 5.10.7).

Actual and forecast asset works expenditure over the current regulatory control period is 43% below the regulatory allowance for the period. The reasons for the underspend are specific to individual asset works programs, but generally reflect realised cost efficiencies in project delivery and changing priorities due to unexpected capital works needs which emerged during the period. This is discussed further in Section 3.4.3.

The proposed asset works program is driven by emerging priorities and challenges, and reflects one-off projects that are required to address a specific network or asset requirement. The program focuses on the following areas:

- Major asset repairs and refurbishments – stations and lines;
- Reduction in health and safety and environmental risk through enhancing line ground clearance assessments;
- Facilities maintenance; and
- Miscellaneous works.

Asset works projects under each of these areas are described below. Note that cost estimates presented below direct costs to which labour and materials escalators have not been applied. Management support costs are excluded.

5.11.3 Major Asset Repair or Refurbishment

5.11.3.1Stations

Major asset repair or refurbishment constitutes the bulk of the proposed asset works program. These projects are necessary to ensure that assets continue to perform reliably until the end of their technical lives.

These projects entail the following activities:

- condition assessments;
- repairs;
- refurbishments; and
- replacements.

The program is expected to have significant benefits, including reducing greenhouse gas (SF6) emissions, reducing the risk of asset failures and extending the lives of certain assets. Further details are provided below.

Table 5.11: Asset Works – Stations ($m, real 2013-14)

Asset Works	Description	Estimated Cost over the Period
Gas Insulated Switchgear (GIS) Refurbishment	The following projects aim to reduce SF6 leakages and improve reliability. **Newport Power Station (NPSD)** • This project is to undertake refurbishment works to overhaul some of the GIS equipment and to seal the leaks to ensure reliable life of the equipment for another 20 years. • Includes works to address moisture levels, SF6 gas leaks, mechanical operation and gas compressors. • The issues are not of the type that can be addressed by increasing routine maintenance, but require dedicated, major work programs. **Sydenham Terminal Station (SYTS)** • This project covers the possibility that the current refurbishment program is not able to be completed in the current reset period. **South Morang Terminal Station (SMTS)** • Refurbish the 500 kV CB Accumulators.	**0.8**
Transformers	This covers the following projects: • EHV Bushings Minor Workshop Repairs • Online tap changer repairs • On-Line Gas & Moisture Analyser Replacement • Repair / Replacement of weather seals for Phase Isolated Buses • Transformer tank preservation repair / replacement • Refurbishment of L Series Transformers	**5.2**
Switchgear	This includes refurbishments and upgrades to disconnectors and earth switches.	**0.6**

Asset Works	Description	Estimated Cost over the Period
SF6 Circuit Breakers	This covers the following projects: • 220 kV SF_6 CB refurbishment programs • 500 kV SF_6 CB refurbishment programs • High operating circuit breakers refurbishment program • Circuit breakers SF_6 leaks repair program	**2.1**
Oil Circuit Breakers	This covers the following projects: • Minimum Oil CB Refurbishment Program • 66 kV Bulk Oil Circuit Breakers Assessments	**1.6**
Reactive Plant	This project involves synchronous conductor rotor inspections and overhauls.	**1.5**
	Total	**11.8**

5.11.3.2 Lines

The increasing age profile of lines requires a specific program of corrosion risk condition assessments and replacements. This program will reduce operational risk associated with these assets, and allow the deferral of expensive asset replacement by extending the lives of existing assets by up to 20 years. Further details of the proposed work are provided below.

Table 5.12: Asset Works Lines ($m, real 2013-14)

Asset Works	Description	Estimated Cost over the Period
Tower Corrosion – Ground Level	Investigations have revealed the need for ongoing corrosion repairs to ground level steel on an approximate average of 340 transmission line towers per year. Detailed assessments of ground level steel are required on a further 700 towers per year approximately. About 30% of SP AusNet's towers have some direct buried steel. A high proportion of fully concreted foundations are also exposed to soil at surface level. Soil build-up or moisture ingress leads to corrosion and metal loss in ground-line steelwork. Treatment often involves structural reinforcement and the application of protective coatings.	**5.0**
Replacement of Transmission Line Hardware	This includes replacement of conductor spacers, conductor dampers and other line hardware items which have become damaged or corroded. The dampers and spacers for conductors and ground-wires, and suspension and termination assemblies, comprise a variety of forged and cast components in galvanised steel, cast iron and aluminium alloys. These items wear and corrode at connection points and can fatigue due to cyclic loading. Deterioration can sometimes be related to age or type, but is often site-specific because of loading or wind conditions. Spacers and dampers, designed to protect conductors and ground-	**0.4**

Asset Works	Description	Estimated Cost over the Period
	wire, can damage them if attachment clamps become loose. Failure of transmission line hardware can result in dropped conductors.	
Replacement of Tower Steelwork	This work is for the replacement of members damaged due to corrosion or impact by vehicles or farm machinery. Steel members on towers can corrode at different rates depending on the thickness and quality of protective coatings applied during manufacture. Some towers contain small numbers of steel members which require replacement. The main drivers for replacement vary between unacceptable levels of corrosion and damage due to impact by vehicles or farming machinery.	**1.4**
	Total	**6.8**

5.11.4 OHS and Environmental Compliance

SP AusNet must comply with a range of regulatory and statutory obligations related to both health and safety and environmental management. Enhanced line clearance management is required to be undertaken to enable SP AusNet to comply with ESMS commitments endorsed by ESV. Further details are provided below.

Table 5.13: Asset Works – Compliance ($m, real 2013 – 14)

Asset Works	Description	Estimated Cost over the period
Line Clearance Management	In the past, SP AusNet's transmission lines have been subject to Energy Safe Victoria (ESV) statutory clearance requirements. These regulations were withdrawn in December 2009 and SP AusNet lodged an Electrical Safety Management Scheme (ESMS) with the ESV in 2010. The ESMS requires SP AusNet to support ESV's policy decisions relating to conductor clearances with risk based safety assessments. As part of this requirement, SP AusNet has undertaken a program to assess line ground clearances using Light Detection and Ranging (LIDAR) technology. The completed LIDAR program targeted the oldest transmission lines and has provided line ground clearance values for all lines assessed. During the forthcoming regulatory control period, LIDAR must be expanded to all other transmission lines. Risk assessments must be performed and risk management plans developed for each non-compliant span identified as part of the completed and proposed LIDAR assessments. Risk management actions may include tower rectification works, access restriction measures, communications with landowners and installation of warning signage.	**0.9**
	Total	**0.9**

5.11.5 Facilities Maintenance

This program involves restoring and maintaining existing facilities. Activities undertaken in this program cover both the restoration of heritage buildings (which also addresses health and safety risks) and non-routine maintenance activities at terminal stations. Further details are provided below.

Table 5.14: Asset Works – Facilities ($m, real 2013-14)

Asset Works	Description	Estimated Cost over the period
Facilities Maintenance in Yarraville	The Yarraville Machine Hall high voltage testing site requires restoration works including evaluation and removal of lead paint, repairing cracks and removing organic growth from walls. This one-off maintenance project will prevent further deterioration of this heritage building and address identified safety risks. This is necessary to meet building maintenance requirements set out under the Building Code of Australia.	**1.8**
Civil Infrastructure and Station Facilities Asset Works Program	This activity involves non-routine maintenance of facilities at terminal stations. This will include activities such as: • Asbestos removal • Building repairs • Switchyard surface repairs • Fire protection and security system repairs SP AusNet's policy for asbestos removal involves removal of the material when other work is being undertaken at a site. For example, if a building contained asbestos material in the flooring and routine maintenance was planned for the flooring (such as sanding and resealing worn areas) then the asbestos material would be removed prior to the routine maintenance activity. Other non-routine maintenance activities follow from the identification of defects through routine or incidental inspection. The type of defects that would be incorporated in asset works are defects that are not minor repairs and include projects such as replacement of building roofs, resealing surfaces in stations, and replacement of fire protection and security components that are no longer effective.	**1.7**
	Total	**3.5**

5.11.6 Miscellaneous

The activities identified below address specific requirements and will have long-lasting benefits to enable SP AusNet to address the maintenance needs of an aging asset base more efficiently.

Table 5.15: Asset Works – Miscellaneous ($m, real 2013-14)

Asset Works	Description	Estimated Cost over the period
Maintenance Support	This covers the following projects: • Refurbishment of Maintenance Support Facilities This involves conducting a condition assessment of SF_6 gas carts, oil carts and circuit breaker timing equipment and doing necessary remedial works and refurbishments to maintain the equipment in serviceable condition. It includes the provision of necessary training for this equipment. The condition assessment will identify issues such as SF_6 gas and oil leaks, condition, technology, etc. and the actions that need to be taken to resolve these issues. • Maintenance Training and SMI There are more than 60 different types of Circuit Breaker on the networks and other equipment. This ongoing program aims to improve knowledge capture in maintenance instructions and the level of knowledge of field staff. This involves incorporating original manufacturer and engineering input into the review of existing practices and upgrading to modern standards of working. The program also identifies safety issues in maintenance activities that need to be addressed. This ensures safer, more efficient and better maintenance and therefore improved network reliability, and improved incident response. • Critical Spares Availability This program aims to ensure there are sufficient strategic spares of transformer bushings, instrument transformers and bulk oil CB bushings to facilitate a rapid changeover in the event of a fault. This program is a continuation of existing spares testing projects and will include the project salvaging, transport logistics, electrical testing and storage at all voltages.	**0.9**
	Total	**0.9**

5.12 Total Controllable Opex

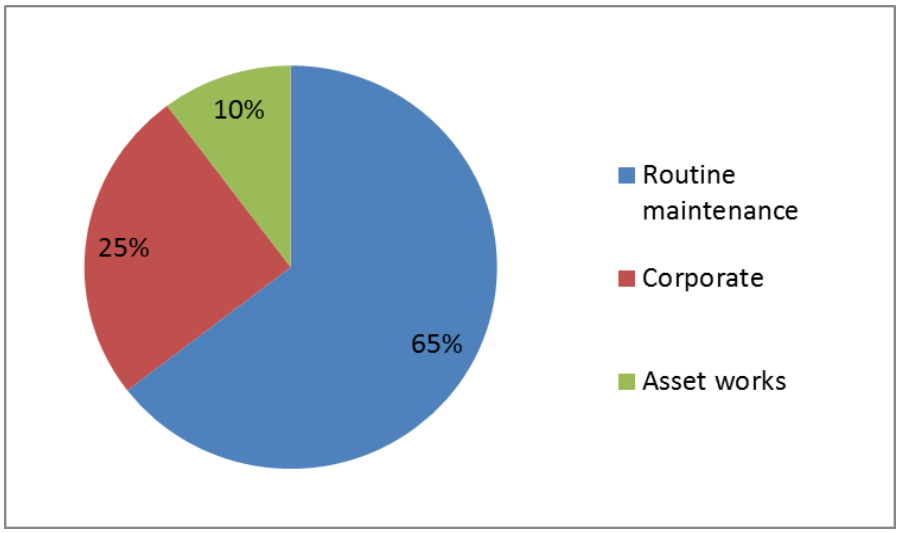
Taking into account the forecast opex outlined above, the total controllable opex forecast is $281 million over the next regulatory control period. The annual forecast is set out below.

Table 5.16: Total Controllable Opex ($m, real 2013–14)

	2014-15	2015-16	2016-17	Total
Controllable Opex	91.1	94.3	95.6	**281.0**

The different components of forecast controllable opex are shown in the figure below.

Figure 5.10: Components of controllable opex proposal



5.13 Other (Non-controllable) Costs

In addition to the operating expenditure items described above, SP AusNet's opex forecast for the forthcoming regulatory control period includes self-insurance costs, easement tax, debt and equity raising costs and rebates which do not fall into the controllable opex category. All of these costs are excluded from base year costs. These forecast costs form part of the total operating expenditure that SP AusNet expects to incur in order to efficiently meet the operating expenditure objectives set out in NER 6A.6.6.

These are addressed in detail below.

5.13.1 Self-insured Risks

Consistent with the requirements of Section 4.3.21 of the Submission Guidelines, this section presents details of SP AusNet's proposed self-insurance premiums for the 2014-17regulatory control period.

SP AusNet bears and manages a number of risks related to the conduct of its regulated business which cannot be insured efficiently (that is, cost effectively in light of the nature of the risk and its likelihood and consequences), and which are either not covered by, or fall under the cost threshold for, a cost pass-through event.

As noted above, not all insurance cover is efficient. SP AusNet conducts a careful assessment of the risks faced by its business and, with the assistance of experienced brokers and analysts, seeks the most cost effective range of cover available in the market and balances this with other

mechanisms for insuring against loss. As a consequence of this process, SP AusNet proposes to adopt a combination of insurance policies, self-insurance and (where possible) cost pass-through arrangements.

This process has been conducted so as to achieve an optimal balance of risk management and cost, with the ultimate objective of minimising the overall cost to customers.

For some risks that are assessed to be extremely unlikely, this may involve bearing the risk and, in the unlikely event that the risk eventuates, seeking to pass through any costs associated with the risk to customers. Bearing and managing these risks internally is consistent with minimising total costs to customers and is consistent with the behaviour of an efficient and prudent network service provider.

SP AusNet engaged Aon Risk Solutions to estimate the external equivalent insurance premium in relation to self-insured risks for the forthcoming regulatory control period. This analysis covers the following risks that SP AusNet has resolved to self-insure (either fully or partially):

Risks that are otherwise uninsured:

- Tower failures;
- Key person; and
- Insurer default.

Risks where a portion will be self-insured (within deductible losses):

- Machinery breakdown;
- Property damage (insured assets and maintenance costs);
- Bushfire liability; and
- Other insured risks.

The proposed self-insurance premium is $6.4 million. This is AON's estimated theoretical insurance premium for the period, less the 10% profit margin and the 10% expense margin[34] assumed by Aon. The proposed self-insurance premium is comprised of an average self-insured cost and a risk margin for volatility. These elements must be incurred to bear and manage self-insured risk, and therefore, the proposed premium is an efficient and prudent estimate of the self-insurance costs SP AusNet will incur. The table below sets out the forecast of self-insurance costs.

Table 5.16: Forecast Self-Insurance Premium ($m, real 2013–14)

	2014-15	2015-16	2016-17	Total
Self-Insurance Forecast	2.1	2.3	2.2	**6.4**

Full details on the data and methodology used to calculate the proposed self-insurance premium are outlined in Aon's report *Self Insurance Risk Quantification – SP AusNet Transmission* (Appendix 5A).

SP AusNet's *Board Resolution to Self-insure* is provided at Appendix 5B.

[34] The expense margin and profit margin would accrue to commercial insurance entities, and as such are not applicable to SP AusNet.

5.13.2 Debt and Equity Raising Costs

5.13.2.1Debt raising costs

Transactions costs incurred raising debt to fund the provision of regulated electricity transmission services are a necessary and legitimate expense for which the transmission business should be compensated. These costs are incurred on an ongoing basis as the business continually rolls over its stock of debt. Provision of an allowance for these expenses in the cost of debt is firmly established in regulatory decision-making.

Debt raising costs are not expensed through the Profit and Loss Statement[35], so these costs are not present in SP AusNet's base year reported opex. Therefore, a separate benchmark debt raising cost allowance needs to be included in the opex forecast for the forthcoming regulatory control period.

The AER has established a methodology to calculate benchmark debt raising costs in previous regulatory decisions. This methodology is based on a 2004 Report from the Allen Consulting Group (ACG)[36] which recommends an allowance of 0.08% be used for debt raising costs – excluding an allowance for the dealer swap margin of 5 basis points.

SP AusNet's transmission business has an opening capital base of $2,866 million (nominal). On the basis of the assumed benchmark gearing ratio of 60:40, the notional debt component of the opening capital base is approximately $1,719 million (nominal). Based on the ACG method (adjusted for SP AusNet's proposed WACC), SP AusNet will require 7 bond issues over the forthcoming regulatory control period to adequately fund transmission capex in the forthcoming regulatory control period. Therefore, the appropriate benchmark for SP AusNet's direct debt raising costs is 9.2 basis points per year.

SP AusNet has calculated its proposed debt raising costs using this methodology. The debt raising costs are shown in the table below.

Table 5.17: Debt Raising Costs ($m, real 2013 – 14)

	2014-15	2015-16	2016-17	Total
Debt Raising Costs	1.5	1.6	1.6	**4.7**

5.13.2.2Equity raising costs

SP AusNet has performed an analysis of its ability to finance its proposed capex program from retained earnings (using benchmark financing assumptions). Based on the results of this analysis, SP AusNet has concluded that the company can fund its proposed capex over the forthcoming period without requiring further equity finance.

Therefore SP AusNet has calculated the equity raising costs only on the assets comprising the 2003 initial asset base (excluding the rolled in assets and work in progress) as per the 2002 and 2008 Revenue Determinations. This means the allowance declines over time as that initial asset base depreciates. The equity raising costs are shown in the table below. This calculation uses the methodology applied by the AER to determine SP AusNet's equity raising cost allowance in its current (2008) Revenue Determination.

35 They are reported in financing charges in SP AusNet's Regulatory Accounts.

36 ACG, *Debt and equity raising transaction costs, Report to the ACCC*, December 2004.

Table 5.18: Equity Raising Costs ($m, real 2013 – 14)

	2014-15	2015-16	2016-17	Total
Equity Raising Costs	1.2	1.1	1.1	**3.4**

5.13.3 Easement Land Tax

In 2004, the Victorian Government extended land tax to electricity transmission easements owned by electricity transmission companies in Victoria. The new tax arrangement was designed to counter a shortfall in Government revenue as a result of the Government's abolition of the Smelter Reduction Amount levy.

This very significant impost was not provided for in regulated revenues and since its introduction, SP AusNet applies annually for a pass-through of the financial effect associated with this new tax in accordance with NER 11.6.21.

This tax, therefore, needs to be included in the opex forecasts used in the calculation of the revenue cap for the forthcoming regulatory control period. The forecast assumes that the tax increases at the same rate as CPI.

Over the period, any positive or negative variation between the actual tax paid and the forecast approved by the AER will be recovered/reimbursed via the pass-through mechanism outlined in NER 6A.7.3. Therefore, SP AusNet will only recover the actual tax paid over the period.

Table 5.21: Easement Land Tax ($m, real 2013-14)

	2014-15	2015-16	2016-17	Total
Easement Land Tax	100.9	103.4	100.9	305.3

5.13.4 Incentive Scheme Payments

Incentive scheme payments are included in non-controllable opex as although there is a controllable element to the magnitude of these payments, these will be fixed for the forthcoming regulatory period. The two incentive schemes that impact on opex are:

- The Availability Incentive Scheme (AIS); and
- The Efficiency Benefit Sharing Scheme (EBSS).

These are discussed below.

5.13.4.1AIS Rebates

As outlined in section 3.5.3, SP AusNet is subject to a jurisdictional performance incentive scheme, the Availability Incentive Scheme (AIS) administered by AEMO. This is funded through regulated revenue, and SP AusNet pays monthly rebates to AEMO depending on the level of service delivered.

At this time, it is unclear whether the AIS will apply during the 2014-17regulatory control period. SP AusNet has formally requested the scheme's closure from 1 April 2014, and is awaiting a response from AEMO (see section 6.3 for further details). This is expected to be resolved before SP AusNet submits the Revised Proposal, which will contain an expenditure forecast based on the agreed form of the scheme in the forthcoming regulatory control period. If AEMO accepts SP AusNet's request that the AIS will not apply in the forthcoming period, no operating expenditure will be requested here.

As mentioned in Chapter 2, the current AIS is heavily asymmetric. If the AIS continues to apply in the forthcoming period, the high level of downside risk should be reflected in the operating expenditure provision.

The expenditure forecast in Table 5.19 is equal to the revenue received during the current period to fund the scheme, and is a placeholder pending resolution of the operation of the AIS in the forthcoming period.

Table 5.19: Availability Incentive Scheme ($m, real 2013-14)

	2014-15	2015-16	2016-17	Total
Availability Incentive Scheme	3.3	3.3	3.3	**9.9**

Source: SP AusNet

5.13.4.2Efficiency Benefit Sharing Scheme Payments

SP AusNet is subject to the AER's Efficiency Benefit Sharing Scheme (EBSS) which provides for the sharing of operating expenditure efficiency gains and losses between the network business and customers. This requires EBSS payments, in the form of carry over amounts, to be estimated for the forthcoming regulatory period and factored into forecast revenues as an opex line item. SP AusNet's forecast EBSS payments are set out in the table below.

Table 5.20: EBBS Payments ($m, real 2013-14)

	2014-15	2015-16	2016-17	Total
Efficiency Benefit Sharing Scheme	9.1	16.8	21.2	**47.1**

A full explanation of how the scheme operates and how these payments were calculated is provided in Chapter 10.

5.13.1 Total Non-Controllable Opex

Taking into account the forecast non-controllable costs outlined above, the total non-controllable opex forecast is $376.6 million. The annual non-controllable opex forecast is set out in the table below.

Table 5.21: Total Non-Controllable Opex ($m, real 2013-14)

	2014-15	2015-16	2016-17	Total
Non Controllable Opex	118.2	128.3	130.2	376.6

5.14 Total Opex Forecast

SP AusNet forecasts a total opex requirement of $657.6 million in the 2014-17 regulatory control period. This forecast represents the necessary operating costs for the efficient operation and maintenance of SP AusNet's transmission network.

The forecast represents a 19% real increase in average annual controllable operating expenditure in the 2014-17 regulatory control period. This increase is driven by:

- an ageing asset base – requiring an increase in condition monitoring, risk management and maintenance activities to stabilise asset failure risk and defer asset replacement;

- increased resource requirements associated with compliance legislation, rules, regulations and government policy initiatives;
- an increase in insurance costs reflecting forecast market availability;
- the increase in prescribed service opex in the forthcoming regulatory control period associated with the rolling-in of Group 3 prescribed service assets constructed in the current regulatory control period; and
- real cost increases in labour, materials and equipment.

A summary of the individual categories of expenditure which comprise total forecast opex are shown in the table below.

Table 5.22: Total Opex Forecast ($m, real 2013-14)

Year ending 31 March	2014-15	2015-16	2016-17	Total
Direct Maintenance	32.5	32.9	33.2	**98.6**
Maintenance Support	5.7	6.0	6.1	**17.8**
System Operation	6.5	6.6	6.7	**19.8**
Health & Safety	2.4	2.5	2.5	**7.4**
Taxes / Leases	5.4	5.4	5.4	**16.2**
Insurance	5.7	6.3	7.0	**19.1**
Asset works	8.0	8.0	8.5	**24.6**
Asset works support	1.3	1.3	1.3	**3.8**
Finance	3.7	3.7	3.8	**11.2**
HR	0.5	0.5	0.5	**1.5**
IT	7.0	7.0	7.0	**20.9**
Other	4.2	5.6	5.6	**15.4**
Management Fee	6.7	6.8	6.9	**20.3**
Asset base growth (Group 3)	1.7	1.7	1.8	**5.2**
IT efficiency savings	0.0	-0.1	-0.8	**-0.8**
Self-insurance	2.1	2.1	2.2	**6.4**
Debt raising costs	1.5	1.6	1.6	**4.7**
Equity raising costs	1.2	1.1	1.1	**3.4**
AIS rebates	3.3	3.3	3.3	**9.9**
EBSS payments	9.1	16.8	21.2	**47.1**
Total opex (excluding easement land tax)	**108.4**	**119.1**	**124.8**	**352.3**
Easement land tax	100.9	103.4	100.9	305.3
Total opex	**209.3**	**222.6**	**225.7**	**657.6**

6 Service Performance Incentive Schemes

6.1 Introduction and Overview

This chapter sets out the values to be attributed to the Service Target Performance Incentive Scheme (STPIS) that will apply to SP AusNet in the forthcoming regulatory control period. As required under NER S6A.1.3(2), it includes SP AusNet's proposed targets, caps and collars under the STPIS parameters in accordance with NER 6A.4.2(a)(5) and the STPIS of December 2012 (referred to as the 'STPIS Guidelines').

SP AusNet is the first TNSP to be subject to this version of the STPIS, following the AER's recent review of the scheme.

SP AusNet is also currently subject to the jurisdictional Availability Incentive Scheme (AIS), which is administered by AEMO. SP AusNet has requested that the AIS does not operate in the forthcoming regulatory control period, and is currently awaiting a response from AEMO.

A description of the STPIS and AIS is provided in Chapter 2 and SP AusNet's recent service performance under these schemes is provided in Chapter 3.

SP AusNet is strongly committed to achieving high operational performance at all times, including when implementing capital works and undertaking maintenance programs.

Key features of SP AusNet's incentive scheme proposal are:

- Service Component parameter targets are set equal to average historic performance, except for the Loss of Supply Event Frequency sub-parameters, which are adjusted for the volume of planned capital works.
- Service Component caps and collars are calculated using standard deviations of 2008-12 performance data and the statistical distributions that best fit this performance data.
- Market Impact Component (MIC) performance data for 2011 and 2012 is included to enable calculation of the target for 2014.
- The Network Capability Incentive Parameter Action Plan (NCIPAP) proposes a range of priority projects to improve network capability.

The remainder of this chapter is structured as follows:

- Section 6.2 sets out SP AusNet's proposed targets, caps and collars for the Service Component of the STPIS to apply during the 2014-17 regulatory control period;
- Section 6.3 provides required performance data for the Market Impact Component of the STPIS for the forthcoming regulatory control period;
- Section 6.4 outlines SP AusNet's proposed NCIPAP, prepared jointly with AEMO; and
- Section 6.5 describes the status of AEMO's AIS.

6.2 Service Target Performance Incentive Scheme – Service Component

The Service Component of the STPIS consists of four parameters which measure different aspects of service performance. These parameters measure network reliability by focusing on unplanned outages (the ability to minimise the number of events and to quickly rectify them when they occur) and by providing an incentive for TNSPs to improve their performance. The parameters are:

- Average Circuit Outage Rate – measures the frequency of unplanned (forced and fault) outages on lines, transformers and reactive plant.

- Loss Of Supply Event Frequency – measures the frequency of outages which cause a loss of supply to customers.
- Average Outage Duration – measures the duration of unplanned outages with a loss of supply.
- Proper Operation Of Equipment – requires TNSPs to report on 'near miss' events such as failures of protection systems, material failure of the Supervisory Control and Data Acquisition (SCADA) system and incorrect operational isolation of primary and secondary equipment. No financial incentive is associated with this parameter.

The weightings applied to each parameter and sub-parameter of the Service Component are specified in Table 1 of the STPIS Guidelines.

6.2.1 Methodology for Setting Targets

Clause 3.2(g) of the STPIS Guidelines specifies that, subject to some exceptions, proposed performance targets must be equal to the TNSP's average performance history over the most recent five years. To meet this requirement, SP AusNet proposes to use performance data for the years 2008-12; the most recent five years for which performance data is available.

The data used to calculate the performance target must be consistently recorded based on the parameter definitions that apply to the TNSP under the scheme. As the Average Circuit Outage Rate parameter is new and the definition of the Average Outage Duration parameter has changed, SP AusNet has undertaken an exercise to determine SP AusNet's historic performance in accordance with the amended definitions (including the specified exclusions).

The resulting performance data is considered to be robust as:

- The data has been verified at the aggregate level as part of the AER's annual service standards review[37].
- The definition for forced and fault outages in the STPIS is consistent with the definition used by SP AusNet to record outages. All other definitions used to categorise the data are either straightforward (e.g. 'reactive plant') or are consistent with the previous STPIS.
- Historic outages have been recorded with sufficient detail to determine whether inclusions and exclusions specified as part of the new STPIS apply.

If available, historic performance data for each sub-parameter is provided in Table 6.1.

[37] 2012 performance data will be audited by March 2013.

Table 6.1: Performance Data 2008-12 and Proposed Target 2014-17

Parameter	Sub-parameters	2008	2009	2010	2011	2012	2008-12 Average	Proposed Target	Weight
Average Circuit Outage Rate	Line outage – fault	20.0%	35.8%	16.8%	24.4%	32.5%	25.9%	**25.9%**	0.20
	Transformer outage – fault	13.2%	27.6%	7.7%	12.6%	19.3%	16.1%	**16.1%**	0.20
	Reactive plant – fault	28.6%	35.1%	24.7%	32.5%	41.6%	32.5%	**32.5%**	0.10
	Line outage – forced	16.7%	12.5%	14.3%	16.8%	14.2%	14.9%	**14.9%**	0.00
	Transformer outage – forced	10.5%	15.5%	14.5%	5.0%	14.3%	12.0%	**12.0%**	0.00
	Reactive plant – forced	6.5%	9.1%	13.0%	24.7%	20.8%	14.8%	**14.8%**	0.00
Loss of Supply Event Frequency	No. events > 0.05 system minutes	1	6	1	0	2	2.0*	**3**	0.15
	No. events > 0.30 system minutes	1	2	0	0	1	0.8*	**1**	0.15
Average Outage Duration (mins)	Average outage duration	71.5	91.8	92.5	4.0	230.0	98.0	**98.0**	0.20
Proper Operation Of Equipment (no. of events)	Failure of protection system	n/a	n/a	n/a	n/a	n/a	n/a	**n/a**	0.00
	Material failure of SCADA	0	1	2	0	0	1	**1**	0.00
	Incorrect operational isolation of primary or secondary equipment	n/a	n/a	n/a	n/a	n/a	n/a	**n/a**	0.00

*Note that these averages are non-adjusted (see section 6.2.1.2.1 for details of the adjustment applied).

The proposed targets have been calculated as discussed below. The targets, caps and collars are then summarised in section 6.2.3.

6.2.1.1 Average Circuit Outage Rate

The proposed target is equal to average annual performance for the years 2008 to 2012.

Only the three fault outage sub-parameters for lines, transformers and reactive plant have a positive weighting for the forthcoming period. The forced outage sub-parameters will operate as reporting only sub-parameters.

SP AusNet notes that the Average Circuit Outage Rate parameter is not, and should not be interpreted as, a traditional 'Outage Rate' measure. This is because the numerator and the denominator of the definition are expressed in different units.

6.2.1.2 Loss Of Supply Event Frequency

Current period performance under the Loss Of Supply Event Frequency parameter is discussed in Section 3.5.1. Proposed targets for each sub-parameter in the forthcoming regulatory control period have been calculated using the following methodology:

- Calculate an average annual performance for the years 2008 to 2012;
- Apply an adjustment for the increased volume of capital works; and
- Round the adjusted average performance data upwards.

The latter two steps are outlined below.

6.2.1.2.1 Adjustment for increased volume of capital works

To calculate the targets, an adjustment has been applied to the historic average to account for the substantial increase in the volume of forecast capital works planned during the 2014-17regulatory control period. Adjusting on this basis is provided for under section 3.2(k)(2) of the STPIS Guidelines.

The increased volume of capital works correspondingly increases the risk of a loss of supply event occurring, due to the increased frequency of single contingency network configurations. Single contingency network configurations result where redundancy is removed from part of the network, due to, for example, planned outages, such that a further outage will result in a loss of supply. The forecast increase in volume of the capital works program means that maintaining performance under the loss of supply events parameter in the forthcoming regulatory control period will be far more difficult than during the current regulatory control period.

Parsons Brinkerhoff previously recommended adjusting targets for the loss of supply event frequency parameter on this basis:

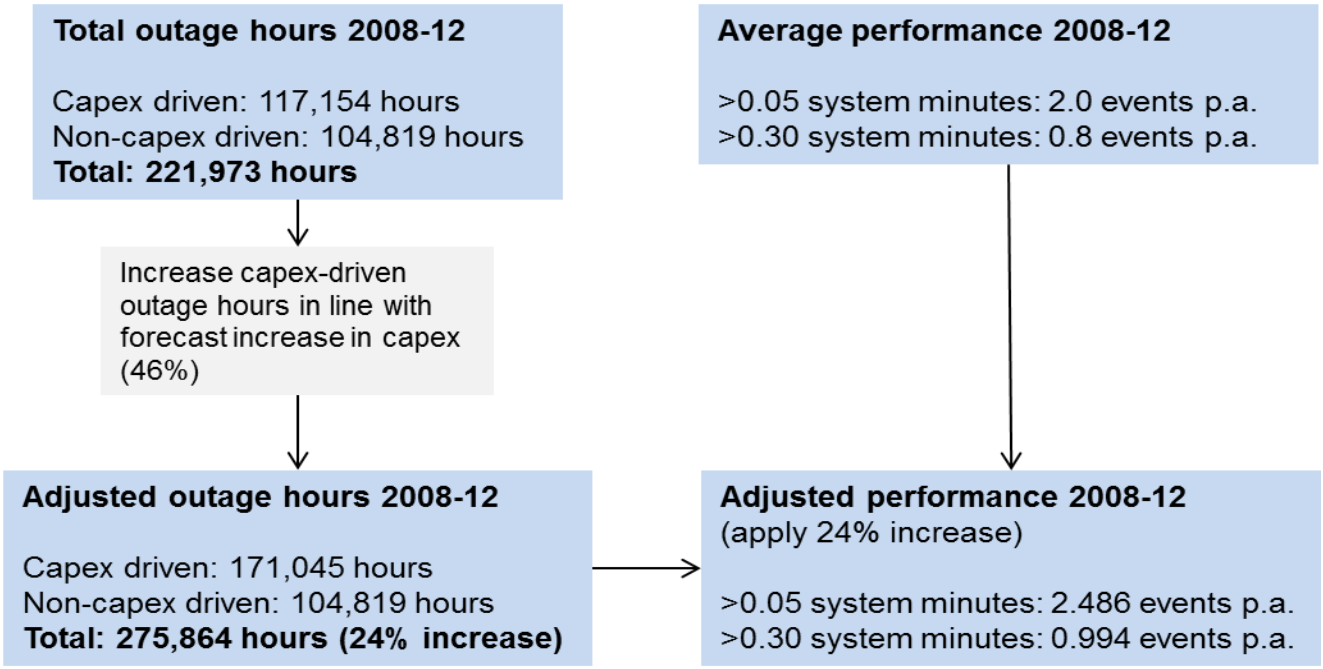
> *'The adjustment assumes that there is a direct relationship between outage hours and the loss of supply events. PB considers that this assumption is reasonable. Typically on SPA's network, two network elements must incur outages simultaneously for a loss of supply to occur. If the risk of a second network outage remains the same (there is no evidence to suggest that it will vary) then doubling the duration of the outage of a network element will, on average, result in twice the number of loss of supply events exceeding the thresholds.'*[38]

This approach was accepted by the AER.

The methodology applied to adjust the loss of supply event parameter target in line with the increase in forecast capital expenditure is outlined in Figure 6.1 below.

[38] Parsons Brinkerhoff, SP AusNet Revenue Reset – An independent review prepared for the AER, 16 August 2007, p. 261.

Figure 6.1: Adjustment Methodology



In the AER's recent draft decision on ElectraNet's STPIS proposal the AER did not accept an adjustment based on a change in the volume of capital expenditure on the basis that this approach is unlikely to result in an accurate figure. Instead, the AER considered that an adjustment should be based on a bottom up estimate of the effect of capital works on reliability[39].

However, in SP AusNet's case a bottom-up build of outage requirements will yield the following results:

- Excluding the CBD rebuilds, the nature and expenditure of the forecast capital works program is similar to the current period's capital works program, and therefore a similar number of outage hours will be required.
- The CBD rebuilds will result in a step increase in outage requirements in the forthcoming regulatory control period. The increase in capex is considered to be the best available proxy for the increase in outage requirements.

As such, the total number of planned outage hours required for the capital works program in the forthcoming period will be greater than the planned outage hours required in the current period. It is reasonable to assume that the adjustment detailed in figure 6.1 based on forecast capex will yield a similar result as adjusting the historic average based on a bottom-up build of outage hours both sub-parameters.

As both adjustment approaches are expected to yield very similar adjustments to 2008-12 performance, the proposed rounding approach outlined below will yield targets of three and one events per year for the sub-parameters, whichever adjustment methodology is applied. As identical outcomes will result, adjusting the targets based on the volume of capex is considered to be appropriate and efficient.

6.2.1.2.2 Rounding applied

Clause 3.2(l) of the STPIS Guidelines states that *'…performance targets, caps and collars for loss of supply event frequency parameters must be rounded to the nearest integer number'.* Given performance under this parameter is approaching the performance frontier, SP AusNet proposes

[39] AER, Draft decision – ElectraNet Transmission determination 2013-14 to 2017-18, November 2012, p. 48.

that performance targets for the loss of supply event parameters should be rounded upwards. As the targets are very low, rounding can make a substantial difference to a TNSP's performance against this parameter and therefore the mathematically derived premise that the target should be rounded to the nearest integer is inappropriate in this instance.

Rounding upwards results in the following targets:

- Number of events > 0.30 system minutes – one event per year. This is consistent with the result if rounding to the nearest integer were applied.
- Number of events > 0.05 system minutes – three events per year. If the adjusted target was rounded to the nearest integer, the target would be set at two events per year.

The discussion below draws on the rounding applied to the adjusted target of 2.49 for the number of events > 0.05 system minutes sub-parameter.

Clause 3.2(j) of the STPIS Guidelines allows the AER to approve a performance target based on an alternative methodology where it is satisfied that:

- The methodology is reasonable.
- The TNSPs performance as measured by the relevant parameter has been consistently very high over at least every calendar year of the previous five years.
- It is unlikely that the TNSP will be able to improve its performance during the forthcoming regulatory control period (or any potential improvement would be marginal), or any further improvements are likely to compromise the TNSP's other regulatory obligations.
- Where applicable, the TNSP's proposed performance targets (calculated using the proposed methodology) are not a lower threshold than the performance targets that applied to an identical parameter in the previous regulatory control period (regardless of whether those performance targets were calculated under the old service standards guidelines or under this scheme).
- The proposed methodology is consistent with the objectives in clause 1.4 of the scheme.

Rounding the adjusted targets upwards is an alternative methodology for calculating the target. This is justified as the specified conditions above are satisfied by this proposal. The alternative methodology is considered to be more consistent with both the NEO and the principles outlined in NER 6A.7.4 (b) than the standard methodology.

NER 6A.7.4 (b) states that the STPIS should:

> *'Provide incentives for each Transmission Network Service Provider to:*
>
> *… (ii) improve and maintain the reliability of those elements of the transmission system that are most important to determining spot prices'.*

Rounding the adjusted target to three events per year means that SP AusNet will only receive an incentive payment when performance exceeds the adjusted target of 2.49 events; that is when two or fewer events occur. Given that performance is near the frontier, the incentive should always reward small improvements. If performance were maintained at the adjusted target of 2.49, over time a small bonus could be expected to be received. This is consistent with NER 6A.7.4(b), which states that incentives should be provided for both improving and maintaining reliability.

However, if the adjusted target was rounded to two events per year, small improvements below 2.49 events would not be rewarded. Indeed, over time maintained, or small improvements in, performance would yield a net penalty. This conflicts with NER 6A.7.4 as there would be no incentive to 'maintain', but only to (substantially) 'improve' performance. This also conflicts with the NEO as investment in improving reliability when performance is approaching the performance frontier is not necessarily efficient, particularly as improvements are very difficult to make when a TNSP is performing at this level.

Table 6.2 demonstrates that robust targets are maintained using this methodology. The proposed target of three events per year is much closer to the performance frontier than the current period's target of six events and will be challenging to achieve. This is especially true when compared with existing targets for other TNSPs for this parameter, which are generally much higher than those SP AusNet is currently subject to.

Table 6.2: Loss of Supply Event Frequency sub-parameter – target, cap and collar

Loss of Supply Event Frequency Parameter	Cap		Target		Collar	
	Current	*Proposed*	*Current*	*Proposed*	*Current*	*Proposed*
> 0.05 system minutes	3	1	6	3	9	7
> 0.30 system minutes	0	0	1	1	4	3

6.2.1.3 Average Outage Duration

The proposed target is equal to average annual performance for the years 2008 to 2012.

6.2.1.4 Proper Operation of Equipment

The Proper Operation of Protection and Control Equipment parameter requires TNSPs to report on 'near miss' incidents that have the potential to impact on the market or to cause an interruption to customer supply. This parameter is comprised of the following sub-parameters:

1. Failure Of Protection System – measured by the number of protection system failure events per annum.
2. Material Failure Of The SCADA System – measured by the number of SCADA failures per annum.
3. Incorrect Operational Isolation Of Primary And Secondary Equipment – measured by the number of incorrect operational isolation events per annum.

A zero weighting is assigned to this parameter, meaning that no financial penalty or incentive will be received by the TNSP.

The following points explain the extent to which historic performance data is available for these sub-parameters:

1. Failure Of Protection System – internal data is captured for SP AusNet's transmission and distribution networks, but is not reported separately for each network. Therefore it has not been possible to provide historic data for the transmission network.
2. Material Failure Of The SCADA System – performance data since 2003 is available.
3. Incorrect Operational Isolation Of Primary And Secondary Equipment – internal data is captured for all transmission system incidents, but these have not been classified using the definition for this new STPIS sub-parameter. Therefore it has not been possible to provide historic data for the transmission network.

Due to the absence of reliable historic performance data for both the Failure Of Protection System and Incorrect Operational Isolation Of Primary And Secondary Equipment sub-parameters, SP AusNet does not propose a target to apply to these sub-parameters in the forthcoming regulatory control period.

In the forthcoming regulatory control period SP AusNet will work with the AER to ensure that performance reporting under these sub-parameters is consistent with the definitions in the STPIS.

6.2.2 Methodology for Setting Caps and Collars

Clause 3.2(e) of the STPIS specifies that the proposed caps and collars must be calculated by reference to the proposed performance targets and using a sound methodology. These may result in symmetric or asymmetric incentives for the TNSP.

This proposal adopts caps and collars that are two standard deviations below and above the historical average respectively. However, where this methodology results in the proposed cap being an impossible outcome (for example, the number of events is less than zero), an amount equal to one standard deviation from the target is substituted. This approach is consistent with that taken by the AER for determining the current period's incentive scheme.

The standard deviations are calculated using the distribution which best fits the 2008-12 performance data, as determined by statistical analysis undertaken by Parsons Brinkerhoff (see *Fitting Probability Distributions For SP AusNet Reliability Data* -Appendix 6A). The exception is the 'Material failure of SCADA' sub-parameter, for which caps and collars have been set assuming a normal distribution.

The methodology used for setting caps and collars for each sub-parameter is described in Table 6.3.

Table 6.3: Methodology for Setting Caps and Collars

Parameter	Sub-parameter	Distribution	Methodology for setting Caps and Collars
Average Circuit Outage Rate	Line outage – fault	Log-logistic	**Caps** – set two standard deviations below the target (except Reactive Plant – Forced and Transformer Outage – Fault which have caps set one standard deviation below the target). **Collars** – set two standard deviations above the target.
	Transformer outage – fault	Pearson5	
	Reactive plant – fault	Log-logistic	
	Line outage – forced	Pearson5	
	Transformer outage – forced	Weibull	
	Reactive plant – forced	Rayleigh	
Loss of Supply Event Frequency	No. events > 0.05 system minutes	Negative binomial	**Caps** – set one standard deviation below the target. **Collars** – set two standard deviations above the target.
	No. events > 0.30 system minutes	Integer uniform	
Average Outage Duration	Average outage duration	Exponential	**Cap** – set at one standard deviation below the target. **Collar** – set at two standard deviations above the target.
Proper Operation of Equipment	Failure of protection system	n/a	No cap or collar proposed.
	Material failure of SCADA	Normal	**Cap** – set at one standard deviation below the target. **Collar** – set at two standard deviations above the target.

Parameter	Sub-parameter	Distribution	Methodology for setting Caps and Collars
	Incorrect operational isolation of primary or secondary equipment	n/a	No cap or collar proposed.

6.2.3 Summary of Service Component Parameters

The table below summarises the targets, caps and collars proposed under the Service Component of the STPIS. For the sub-parameters with a positive weighting, these are also presented in Figures 6.2 to 6.7.

Table 6.4: Summary of Service Component Values

Parameter	Sub-parameters	Cap	Target	Collar
Average Circuit Outage Rate	Line outage – fault	7.9%	25.9%	43.9%
	Transformer outage – fault	7.6%	16.1%	33.1%
	Reactive plant – fault	19.7%	32.5%	45.3%
	Line outage – forced	11.5%	14.9%	18.3%
	Transformer outage – forced	5.2%	12.0%	18.8%
	Reactive plant – forced	7.2%	14.8%	30.0%
Loss of Supply Event Frequency	No. events > 0.05 system minutes	1	3	7
	No. events > 0.30 system minutes	0	1	3
Average Outage Duration	Average outage duration	0.0	98.0	293.9
Proper Operation of Equipment	Failure of protection system	n/a	n/a	n/a
	Material failure of SCADA	0	1	3
	Incorrect operational isolation of primary or secondary equipment	n/a	n/a	n/a

Figure 6.2: Average Circuit Outage Rate – Line outage (fault) – target, cap and collar

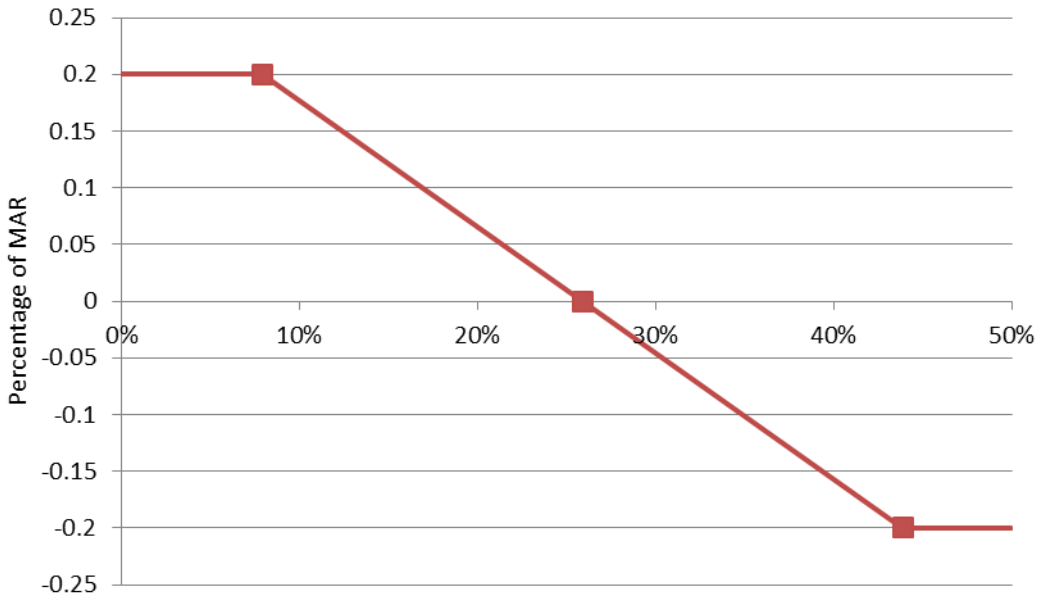


Figure 6.3: Average Circuit Outage Rate – Transformer outage (fault) – target, cap and collar

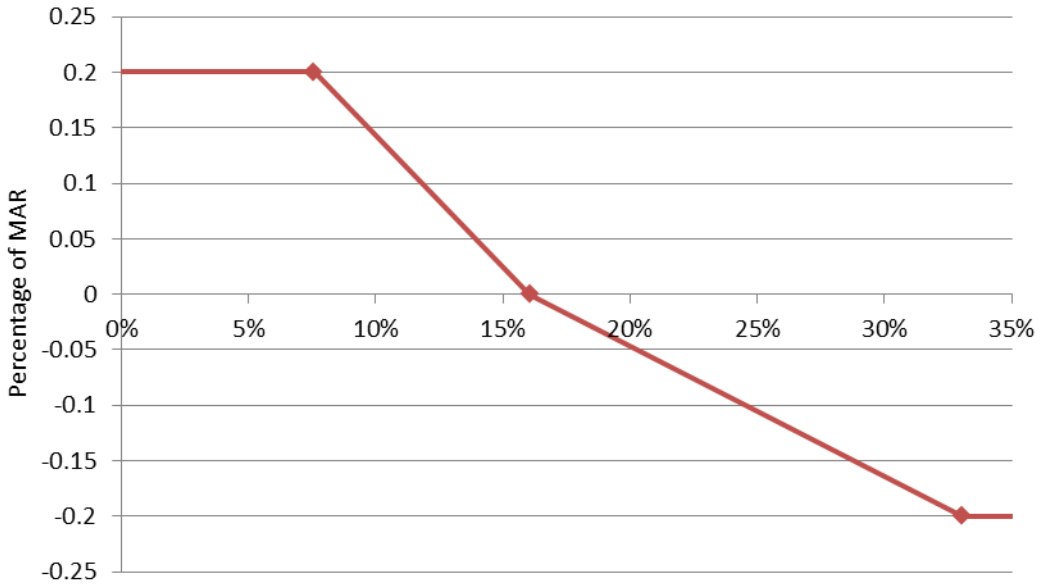


Figure 6.4: Average Circuit Outage Rate – Reactive plant (fault) – target, cap and collar

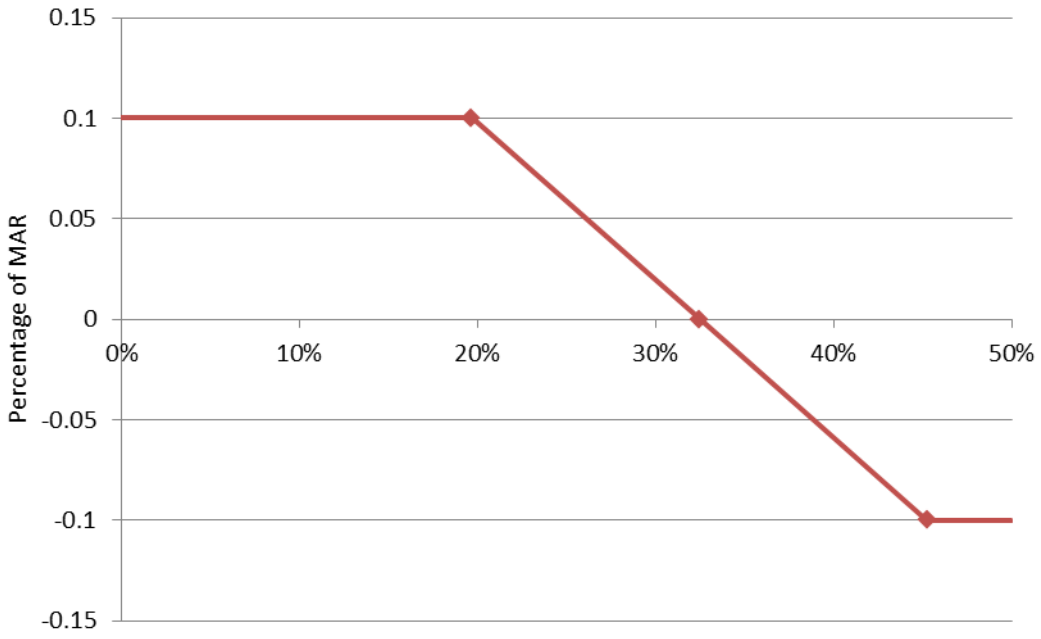


Figure 6.5: Loss of Supply Event Frequency (>0.05 system minutes) – target, cap and collar

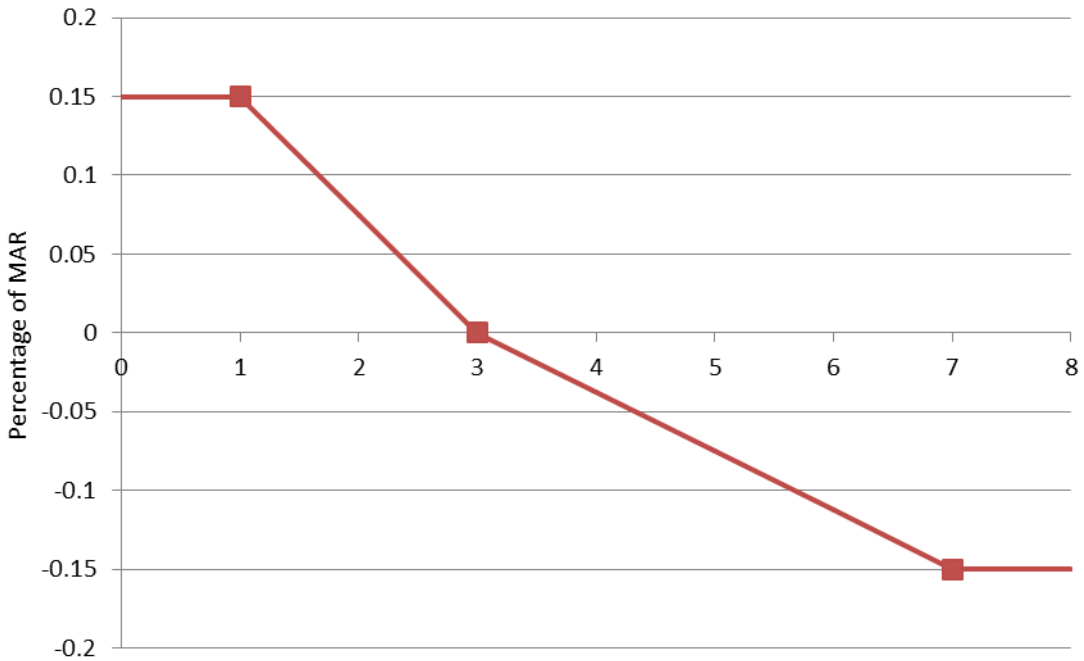


Figure 6.6: Loss of Supply Event Frequency (>0.30 system minutes) – target, cap and collar

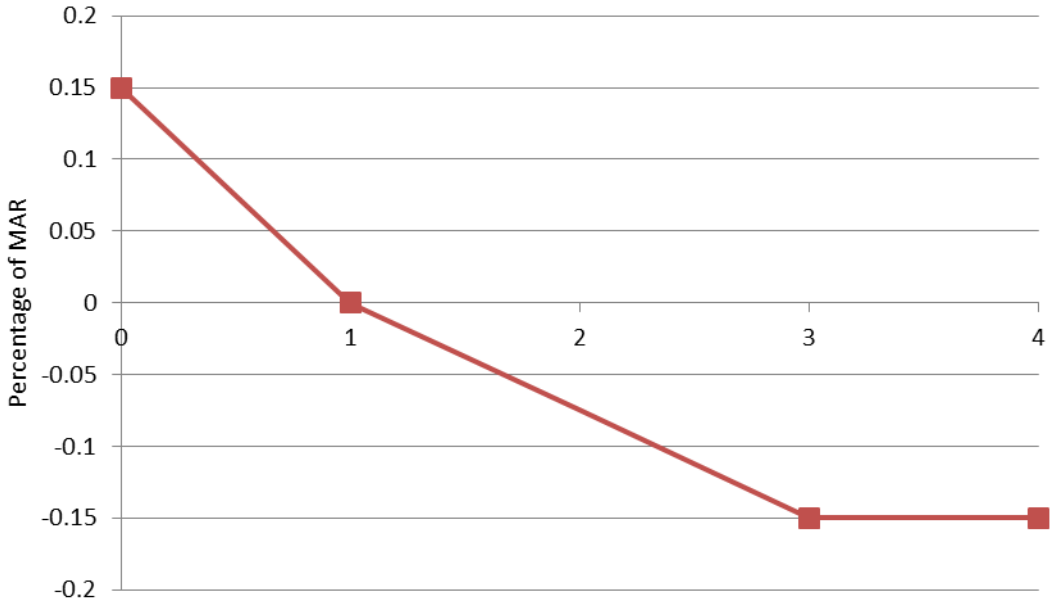
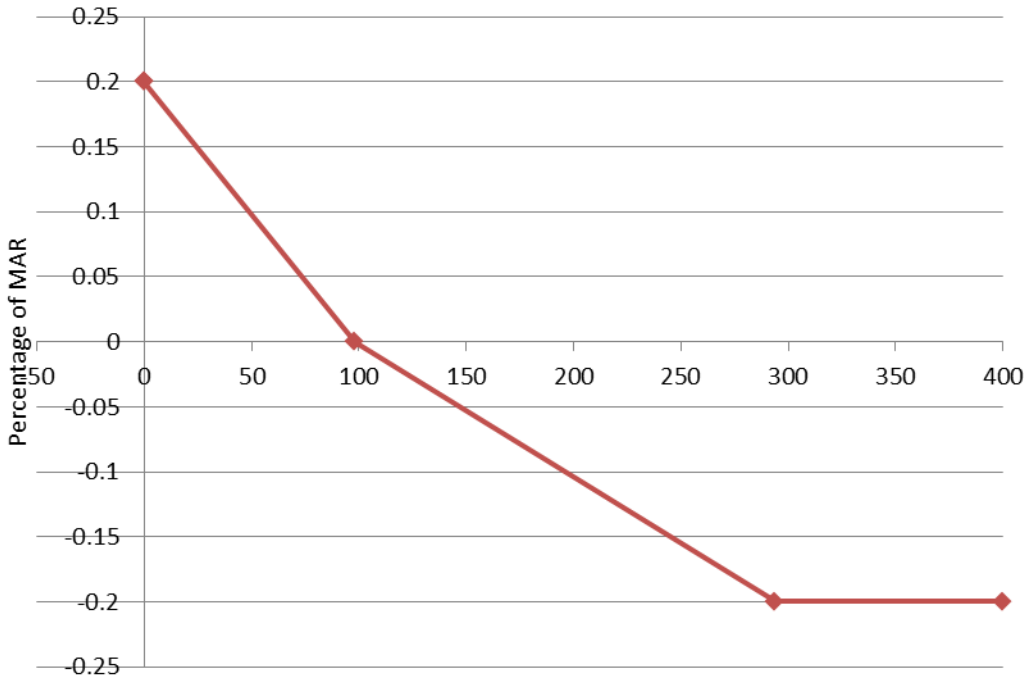


Figure 6.7: Average Outage Duration – target, cap and collar



6.3 Service Target Performance Incentive Scheme – Market Impact Component

The Market Impact Component of the STPIS incentivises TNSPs to minimise transmission outages that can affect the dispatch of generation in the NEM. This is measured by the number of five minute Dispatch Intervals (DIs) where an outage on the transmission network results in a network outage constraint with a marginal value greater than $10/MWh.

Clause 4.2(a) of the current STPIS requires TNSPs to submit MIC performance data in accordance with Appendix C of the STPIS Guidelines for the preceding two calendar years. This is provided in Table 6.5 below. The target for the forthcoming regulatory control period will be determined by a rolling average of the previous three years performance. Therefore from April 2014, the target will be an average of performance in 2011, 2012 and 2013. Performance will be measured as a two year rolling average which in 2014 will be 2013 and 2014.

Table 6.5: Performance for 2011 and 2012

MIC Performance	2011	2012
Performance (Dispatch Intervals)	2,806	896*

Note – 2012 performance data will be reviewed by the AER in March 2013.

6.4 Service Target Performance Incentive Scheme – Network Capability Component

The Network Capability Component was introduced in the December 2012 version of the STPIS, and, as such, SP AusNet is the first TNSP to participate in this parameter.

The Network Capability Component has been introduced to encourage improvements in the capability of transmission assets, particularly those that are most important to determining spot prices and at times when network users place greatest value on the reliability of the transmission system.

Participation in this component requires TNSPs to submit a Network Capability Incentive Parameter Action Plan (NCIPAP) which contains:

- A list of every transmission circuit and injection point on the network, and the reason for the limit for each.
- A list of priority projects to be undertaken during the forthcoming regulatory control period to improve the limit of the transmission circuits and injection points listed above.

AEMO plans the transmission network in Victoria. Therefore the NCIPAP has been prepared jointly with AEMO. Clauses 5.4(e) and (g) of the STPIS require the TNSP to consult with AEMO about the NCIPAP proposal, and to record any disagreements in the proposal. There were no such disagreements during the development of the NCIPAP.

The full *NCIPAP* is attached (Appendix 6B). A complete list of projects identified and total expenditure is provided in Table 6.6.

As agreed by the AER, due to the limited time available to SP AusNet and AEMO to prepare the NCIPAP, the benefits analysis of the proposed priority projects will be provided by AEMO in the form of a public submission to this Revenue Proposal in May 2013. This analysis will inform the ranking of the proposed projects.

Table 6.6: Proposed NCIPAP Projects ($'000s, real 2013-14)

Project Number	Proposed Project Circuit / Injection Point	Description	Total Cost
1	East Rowville-Cranbourne 220kV circuits	Replace protection relays.	1,033
2	Rowville – East Rowville 220kV circuits and Rowville – Springvale 220kV circuit	Isolator replacements and protection setting changes.	999
3	Geelong – Moorabool 220kV circuits	Isolator replacements	871
4	Wodonga Terminal Station (WOTS)	Cable connections replacement	778
5	Dederang circuits	Interplant connections replacement and protection setting change.	486
6	Templestowe Terminal Station (TSTS)	Interplant connections replacement and review and uprate equipment ratings.	377
7	Thomastown Terminal Station (TTS)	Interplant connections replacement and review and uprate equipment ratings.	177
8	South Morang – Dederang 330kV circuits	Develop the system overload control scheme layout to display combined line and series capacitor bank ratings.	72
9	Horsham Terminal Station (HOTS)	Protection setting change	14
10	Altona Terminal Station (ATS)	Protection setting change	14
11	Hazelwood – Loy Yang 500kV circuits	Dynamic line model development and implementation.	2
12	Geelong Terminal Station (GTS)	Review and uprate equipment ratings	0
13	Ringwood Terminal Station (RWTS)	Review and uprate equipment ratings	0
14	Moorabool – Mortlake 500kV circuit and Moorabool – Terang 500kV circuit	Review and uprate protection settings	0
15	Keilor – Sydenham 500kV circuit & Keilor – South Morang 500kV circuit	Protection setting change	0
		Total Expenditure	**4,823**

SP AusNet routinely verifies the validity of equipment and protection ratings, and, where appropriate, revises these. Due to the 'business as usual' nature of these revisions, SP AusNet does not propose that expenditure related to paper uprates is included as part of the NCIPAP incentive, although those that have been identified during the process will be addressed in the forthcoming regulatory control period.

As previously raised with the AER[40], SP AusNet's transmission licence specifies that SP AusNet must not augment the transmission system except:

- In accordance with ESC guidelines; or
- Pursuant to a network agreement with AEMO, or a connection agreement with a distributor, generator or customer.

Therefore, full approval of the NCIPAP requires approval from AEMO for SP AusNet to undertake the projects. Preferably AEMO would approve all NCIPAP projects to proceed alongside the AER's draft decision and/or final decision. This will enable SP AusNet to focus on project delivery during the three year regulatory period. It also eliminates the risk that AEMO will not approve NCIPAP projects which have been endorsed by the AER.

6.5 AEMO's Availability Incentive Scheme

As outlined in Chapter 2, SP AusNet participates in the jurisdictional Availability Incentive Scheme (AIS) administered by AEMO. In December 2012, SP AusNet formally requested agreement from AEMO to cease the operation of the AIS from 1 April 2014. This is because the AER's STPIS is a comprehensive incentive scheme which provides strong incentives to secure both Victorian and NEM-wide load, and to minimise the market impact of outages. The continued simultaneous application of the AIS will not be in the public interest.

Since the application of the AER's STPIS, the incentives provided by the AIS are not necessary. In addition, in some instances they conflict with the incentives provided by the STPIS. However, SP AusNet continues to face the costs of participating in the AIS, such as the administrative burden and operational confusion created by two overlapping incentive schemes.

SP AusNet ceasing its participation in the AIS from the start of the forthcoming regulatory control period (1 April 2014) will have the following consequences:

- SP AusNet will not forecast operating expenditure for AIS participation as part of its Revised Proposal, reducing required revenue and hence customer prices.
- The administrative burden of participating in the AIS is removed, which could constitute an opex saving that would be included in SP AusNet's Revised Proposal.

In addition, there will be no adverse impact on reliability, as the STPIS provides strong and comprehensive incentives to improve performance.

SP AusNet is currently awaiting a response from AEMO on the request to cease the operation of the AIS. SP AusNet understands that AEMO has initiated a process to determine their response to our request.

Chapter 5 – Operating Expenditure contains an operating expenditure allowance for the AIS equal to that received in the current period. This totals $3.3m per annum ($2013-14). AEMO's response will inform the revenue forecast that will be submitted as part of the Revised Proposal.

[40] SP AusNet, Submission – Draft Service Target Performance Incentive Scheme, 16 October 2012.

7 Regulatory Asset Base

7.1 Introduction

This chapter presents SP AusNet's regulatory asset base (RAB) for the forthcoming regulatory control period. The RAB has been calculated in accordance with NER S6A.1.3(5) and Schedule 6A.2, and sections 4.3.9(a) to (c) of the AER's Submission Guidelines.

In its Final Decision for SP AusNet's transmission determination for 2008-09 to 2013-14, the AER used its roll forward model (RFM) to determine SP AusNet's RAB to be $2,191.2 million (nominal) as at 1 April 2008. For revenue setting purposes, the AER must estimate an opening RAB as at 1 April 2014 and the forecast RAB over the remaining years of the forthcoming regulatory control period.

In light of these requirements, this chapter is structured as follows:

- Section 7.2 sets out SP AusNet's estimate of the opening RAB at the start of the forthcoming regulatory control period, 1 April 2014.
- Section 7.3 estimates the RAB value for each year of the forthcoming regulatory control period, which reflects SP AusNet's forecast capital expenditure and depreciation.

7.2 Roll Forward of 2008 Regulatory Asset Base to 1 April 2014

To establish the opening RAB as at 1 April 2014, it is necessary to roll forward the AER's RAB value as at 1 April 2008 for capital additions, disposals, revaluations and deductions of actual depreciation. The arrangements for rolling forward the RAB value are set out in NER S6A.2.1(f)(3). In effect, the roll forward of the RAB value from 1 April 2008 to 1 April 2014 is undertaken through the following steps:

- Commence with the nominal RAB value determined by AER as at 1 April 2008; add
- An indexation adjustment to convert the nominal RAB value to December 2013 prices; add
- Actual and estimated capital expenditure for each year of the current regulatory control period, 1 April 2008 to 31 March 2014; deduct
- Actual and estimated actual depreciation during the current regulatory control period; add
- Group 3 assets which were completed during the current regulatory control period up to 30 June 2012; deduct
- Any difference between the AER's forecast capital expenditure and depreciation in establishing the RAB as at 1 April 2008 and the actual amounts, in accordance with NER S6A.2.1(c)(2); add
- The value of work in progress.

It is worth noting the following points in relation to the steps described above:

- There is no need to revisit the AER's opening RAB as at 1 April 2008, apart from making an adjustment to address any forecasting errors in relation to 2007-08.
- The deduction of actual depreciation from the RAB provides a stronger incentive on SP AusNet to minimise capital expenditure, compared to an approach that deducts the AER's forecast depreciation. To the extent that this incentive has delivered lower capital expenditure, customers will benefit through lower capital-related costs in the forthcoming and subsequent regulatory control periods.

- The inclusion of Group 3 prescribed assets is the process by which certain network augmentations undertaken during the current regulatory control period are rolled into the RAB. The network augmentations were either instigated by AEMO in its role as planner of the shared transmission network in Victoria, or by DNSPs in their role as planners of the transmission connection assets that interface with their distribution networks. The inclusion of these assets into SP AusNet's RAB is in accordance with the provisions set out in NER 11.6.21(c). The list of assets and their values is provided at Appendix 5C.
- The adjustment for differences between forecast and actual capital expenditure in the 2007-08 regulatory year recognises that the AER adopted an 'as commissioned' approach to capital expenditure at that time. From 1 April 2008, SP AusNet's capital expenditure is recognised on an 'as incurred' basis. For this reason, it is necessary to include a value for work in progress in the opening RAB.

The below shows the calculation of SP AusNet's opening RAB value as at 1 April 2014.

Table 7.1: Estimation of opening RAB value as at 1 April 2014 ($m, nominal)

Year ending 31 March	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Opening RAB	**2,191.2**	**2,260.7**	**2,310.8**	**2,366.9**	**2,454.0**	**2,552.4**
Capital expenditure	95.7	115.3	113.5	137.3	173.8	141.5
CPI indexation on opening RAB	80.8	47.7	61.3	73.5	54.1	63.8
Straight-line depreciation	-107.0	-112.8	-118.8	-123.7	-129.5	-129.2
Closing RAB	**2,260.7**	**2,310.8**	**2,366.9**	**2,454.0**	**2,552.4**	**2,628.5**
Difference between forecast and actual capex (1 July 2006 to 30 June 2007)						29.8
Return on difference for 2006-07 capex						22.7
Difference between forecast and actual assets under construction (2006-2007)						22.2
Return on difference (assets under construction)						16.9
Difference between forecast and actual Group 3 assets						0.7
Return on difference (Group 3 assets)						0.5
Opening RAB						**2,721.3**

As shown in Table 7.1, the RAB value as at 1 July 2014 (in nominal dollars) is $2,721.3 million. It is noted that capital expenditure for 2012/13 and 2013/14 are forecast and therefore the opening RAB as at 1 July 2014 may be subject to change during the AER's review process as new information on SP AusNet's actual capital expenditure becomes available. In addition, an adjustment will be made at the next revenue reset for any differences between forecast capital expenditure and depreciation and the outturn amounts, similar to the adjustment described earlier in relation to the 2008-09 financial year.

The calculations set out above are consistent with the AER's published roll forward model. SP AusNet has completed this model and includes it as part of this Revenue Proposal.

7.3 Forecast of regulatory asset base over the forthcoming regulatory control period

The closing RAB of the previous period becomes the opening RAB for the forthcoming period. This then needs to be adjusted to include the depreciated value of Group 3 assets completed as at 30 June 2012. The roll-in of group 3 assets is explained in section 2.2.2 of this proposal.

The table below presents a summary of the amounts, values and inputs used by SP AusNet to derive its forecast RAB value for each year of the forthcoming regulatory control period. In accordance with NER S6A.2.1(f)(4), only actual and estimated capital expenditure properly allocated to the provision of prescribed transmission services in accordance with SP AusNet's Cost Allocation Methodology has been included in the RAB.

Table 7.2: Regulatory asset base roll forward 2014-17 ($m nominal)

	2014-15	2015-16	2016-17
Opening RAB	**2,721.3**		
Group 3 Assets	**144.4**		
Adjusted Opening RAB	**2,865.7**	**2,978.5**	**3,096.4**
Capital expenditure	**186.6**	**197.1**	**233.8**
CPI indexation on opening RAB	**71.6**	**74.5**	**77.4**
Straight-line depreciation	**-145.5**	**-153.8**	**-163.3**
Closing RAB as at 31 March 2017	**2,978.5**	**3,096.4**	**3,244.2**

Source: SP AusNet PTRM.

8 Depreciation

8.1 Introduction

This chapter sets out SP AusNet's proposed depreciation allowance for the forthcoming regulatory control period. The depreciation allowance relates to assets that are included in the RAB, as discussed in the previous chapter. The chapter is structured as follows:

- Section 8.2 describes SP AusNet's depreciation methodology and standard asset lives.
- Section 8.3 presents SP AusNet's depreciation forecast for the forthcoming regulatory control period.

8.2 Depreciation Methodology and standard asset lives

NER 6A.6.3 sets out the regulatory requirements for calculating depreciation. In particular, NER 6A.6.3(b)(1) requires the depreciation schedule to reflect the nature of the asset or category of assets over the economic life of that asset or category of assets.

For statutory accounting purposes, depreciation must conform to Accounting Standard AASB 116 (property, plant and equipment).

In the 2008-9 to 2013-14 determination, the AER accepted SP AusNet's proposed depreciation schedule with two exceptions[41]:

- In relation to proposed economic life of vehicles, the AER concluded that seven years (as opposed to three years) better reflects the expected economic life of these types of assets and adjusted SP AusNet's depreciation schedules accordingly.
- The AER also required revisions to the remaining economic and tax lives of non-contestable assets that SP AusNet proposed to roll into its RAB, in light of advice from Nuttall Consulting.

SP AusNet's proposed standard asset lives for the forthcoming regulatory control period are unchanged from the current period, and are presented in the table below.

[41] These matters were raised by the AER in its Draft Decision, dated 31 August 2007, p. 220 and were later accepted by SP AusNet as noted in the AER's Final Decision, dated January 2008, p. 188.

Table 8.1: Standard asset lives

Asset class	Standard life
System assets	
Secondary	15 years
Switch gear	45 years
Transformers	45 years
Reactive plant	40 years
Lines	60 years
Establishment	45 years
Communications equipment	15 years
Business support	
Buildings	45 years
Vehicles	7 years
Other business support	10 years
IT	5 years
Land	Not depreciated
Easements	Not depreciated

Source: SP AusNet

SP AusNet uses economic depreciation, based on straight-line depreciation and standard asset lives, for each regulatory asset class. Straight-line depreciation is a well-established method used to reflect the decline in the service potential of an asset over its economic life.

To determine the annual depreciation charge for the forthcoming regulatory control period, SP AusNet applied the post-tax revenue model (PTRM) using:

- the estimated asset base value as at 1 April 2014 derived from the roll forward model and set out in section 7.2 above;
- the remaining lives of assets in existence as at 31 March 2014 derived from the roll forward model;
- the capital expenditure forecasts set out in chapter 5; and
- the standard asset lives set out above.

The PTRM completed by SP AusNet and provided with this revenue proposal sets out the values, inputs and calculations used to calculate depreciation.

8.3 Depreciation Forecast

Based on the depreciation methodology and asset lives described above, SP AusNet's forecast depreciation allowance for the forthcoming regulatory control period is presented in the table below.

Table 8.2: 2014-17 forecast depreciation ($million, nominal)

	2014-15	2015-16	2016-17	Total
Straight-line depreciation	145.5	153.8	163.3	462.6
Less: indexation on opening RAB	71.6	74.5	77.4	223.5
Regulatory depreciation	**73.9**	**79.3**	**85.9**	**239.1**

Source: SP AusNet, AER PTRM.

9 Cost of Capital and Taxation

9.1 Introduction

This chapter sets out SP AusNet's proposed return on capital (weighted average cost of capital, or WACC) for the purpose of this Revenue Proposal. SP AusNet's proposal satisfies the NER and the *Statement of the Revised WACC Parameters – Transmission* ("WACC Statement"), published by the AER on 1 May 2009. The remainder of this chapter is structured as follows:

- Section 9.2 sets out the regulatory requirements that govern the estimation of SP AusNet's WACC and the determination of its allowance for the cost of corporate tax for the forthcoming regulatory control period.
- Sections 9.3 to 9.9 set out parameter values and methodologies that SP AusNet has adopted in the calculation of its WACC for the forthcoming regulatory control period.
- Section 9.10 sets out information relating to the estimated cost of corporate tax.
- Section 9.11 concludes the chapter by providing a summary of the proposed WACC parameter values.

9.2 Rules and Statement of Revised WACC parameters requirements

NER 6A.6.2 contains provisions governing the determination of SP AusNet's WACC for the purposes of the current review. Specifically, NER 6A.6.2 defines:

- the formula for determining the WACC (in NER 6A.6.2(b));
- the meaning of the nominal risk free rate (in NER 6A.6.2(c) and (d)); and
- the meaning of the debt risk premium (in NER 6A.6.2(e)).

NER 6A.6.2(f) provides for certain matters relating to the WACC to be reviewed periodically by the AER. Following such a review, the AER must issue a statement setting out the values, methods and credit rating levels to be applied in the determination of a WACC for Transmission Network Service Providers. In accordance with these requirements, the AER issued a WACC Statement on 1 May 2009, which applies to the current review. The various matters set out in the WACC Statement and in NER 6A.6.2 are summarised in the below.

Table 9.1: WACC Parameters set out in the WACC Statement and NER 6A.6.2

Parameter	Value / Methodology	Where specified
Gearing	60% debt to total assets	WACC Statement clause 2.6
Beta	0.8	WACC Statement clause 2.4
Market Risk Premium	6.5%	WACC Statement clause 2.5
Measurement period for the nominal risk free rate and Debt Risk Premium	Either: (i) a period ('the agreed period'), being one which is as close as practically possible to the commencement of the regulatory control period, proposed by the relevant TNSP, and agreed by the AER (such agreement is not to be unreasonably withheld), or (ii) a period specified by the AER, and notified to the provider within a reasonable time prior to the commencement of that period, if the period proposed by the provider is not agreed by the AER under paragraph (i), and is also to be calculated in accordance with NER 6A.6.2(c)(1), 6A.6.2(c)(2)(iii) and 6A.6.2(c)(2)(iv).	WACC Statement clause 2.2
Nominal Risk Free Rate	The annualised yield on Commonwealth Government bonds (CGS) maturing in 10 years from the measurement period (see above) using indicative mid rates published by the RBA. If necessary, the 10 year yield is to be determined by linear interpolation of the yields on the two CGS closest to the 10 year term and which straddle the 10 year expiry date.	NER 6A.6.2(c) and (d); WACC Statement clauses 2.2(a) and 2.3
Debt Risk Premium	The margin between the annualised nominal risk free rate and the observed annualised Australian benchmark corporate bond rate for corporate bonds which have a BBB+ credit rating from Standard & Poors and a maturity equal to that used to derive the nominal risk free rate.	NER 6A.6.2(e)
Credit Rating for the purpose of determining the Debt Risk Premium	BBB+	NER 6A.6.2(e) and WACC Statement clause 2.7
Gamma	0.65	WACC Statement clause 2.8

Pursuant to NER 6A.6.2(h) and 6A.6.4(f), the AER must use the WACC parameter and gamma values set out in the WACC statement for SP AusNet's forthcoming transmission determination.

NER 6A.6.4 prescribes the approach to be taken in estimating the allowance for the cost of corporate income tax. In effect, the clause requires an annual benchmark allowance to be provided based on the taxable income for that year, the statutory tax rate and the assumed value of gamma.

9.3 Gearing level

In accordance with clause 2.6 of the WACC Statement, SP AusNet proposes to adopt a gearing level (that is, the value of debt as a proportion of the total value of equity plus debt) of 0.6.

9.4 Equity beta

In accordance with clause 2.4 of the WACC Statement, SP AusNet proposes to adopt an equity beta of 0.8.

9.5 Market Risk Premium

In accordance with clause 2.5 of the WACC Statement, SP AusNet proposes to adopt a market risk premium of 6.5%.

9.6 Measurement Period for Nominal Risk Free Rate and Debt Risk Premium

In accordance with the provisions set out in NER 6A.6.2(c)(2)(i) and S6A.1.3(6), SP AusNet has nominated the future period over which the risk free rate and the Debt Risk Premium (DRP) should be measured for the purpose of determining the WACC in the AER's Final Decision (see confidential Appendix 9A).

SP AusNet has requested that the start date and the end date of the period be kept confidential until after the expiration of the period, in accordance with the provisions set out in NER 6A.6.2(c)(2)(iii).

As the proposed averaging period is in the future, for the purpose of this Revenue Proposal, a 20 business day measurement period commencing on 12 November 2012 and ending on 7 December 2012 has been adopted to enable the calculation of the WACC at the time of lodging this proposal.

9.7 Nominal risk free rate

Adopting the measurement period specified above, and applying the relevant regulatory provisions[42], SP AusNet has determined that the nominal risk free rate for the purpose of this Revenue Proposal is 3.14%.

As noted above, for the purpose of the AER's final decision, the nominal risk free rate will be re-calculated over the measurement period proposed by SP AusNet.

9.8 Inflation forecast and Real Risk Free Rate

NER 6A.6.2(a) and (b) require a nominal WACC to be applied to the RAB to determine the return on capital. The post tax revenue model (PTRM) provides the relevant revenue building blocks in

[42] NER 6A.6.2(c) and (d); WACC Statement clauses 2.2(a) and 2.3.

nominal terms, and then calculates the corresponding revenue requirements for each year of the regulatory control period in nominal terms[43], and in real terms[44] by adjusting for forecast inflation.

NER 6A.5 specifies the contents of the PTRM. In regard to inflation, NER 6A.5.3(b)(1) requires the adoption of a method that the AER determines is likely to result in the best estimates of expected inflation.

In its recent determinations, the AER has adopted a 10-year forecast of inflation based on an average of the RBA's short–term inflation forecasts (which usually cover no more than a 2 year horizon) and the mid-point of the RBA's target inflation band (for the remaining years in the 10-year forecast period).

Applying this methodology, and adopting a forecast period that matches the maturity of the 10 year bond used to establish the risk free rate, SP AusNet has determined that the expected inflation rate for the purpose of this Revenue Proposal is 2.5%. The data used to calculate this forecast is set out in Table 9.2 below.

For the purpose of the AER's final decision, the forecast inflation rate will be re-calculated using the most current RBA forecast.

Table 9.2: Forecast inflation

Year ending	Dec 2012	Dec 2013	Dec 2014	Dec 2015	Dec 2016	Dec 2017	Dec 2018	Dec 2019	Dec 2020	Dec 2021	10 year geometric mean
Forecast inflation	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%

Source: RBA Statement on Monetary Policy, 8 November 2012, p. 67.

9.9 Debt risk premium

Under the Rules applying to this determination, standard regulatory practice is to estimate the cost of debt by summing the risk free rate (being the yield on 10 year Government bonds) and a forward looking DRP.

In relation to the measurement period to be adopted for the purpose of determining the cost of debt risk free rate and the DRP, SP AusNet has adopted a 20 business day averaging period commencing on 12 November 2012 and ending on 7 December 2012.

SP AusNet has obtained independent expert opinion from PriceWaterhouseCoopers (PwC) in relation to the cost of debt, *Debt Risk Premium for the 2013 Victorian TRR* (Appendix 9B). PwC notes that the Australian Competition Tribunal has continued to endorse the extrapolated Bloomberg fair value curve as an appropriate method for estimating the DRP. PwC also commented that the Bloomberg fair value curve is the most comprehensive published embodiment of market opinion about the DRP.

Based on a benchmark BBB+, 10 year Australian corporate bond, PwC concludes that a DRP of 3.28% should be adopted for the measurement period from 12 November to 7 December 2012. Combined with the risk free rate of 3.14% over the same measurement period, the cost of debt is estimated to be 6.42%.

[43] Nominal terms means on the dollar amount in a particular year without any adjustment for the effects of inflation.

[44] Real terms means the dollar amount in a particular year adjusted for the effects of inflation, recognising that inflation diminishes the purchasing power of the dollar over time.

SP AusNet has lodged a separate and confidential request with the AER to agree, prior to the final decision, the averaging period for setting the cost of debt allowance for the purpose of the final decision (see Appendix 9A *Letter on WACC Averaging Period*). SP AusNet has requested that the agreed averaging period remains confidential until the AER delivers its final decision).

9.10 Estimated Cost of Corporate Tax

NER 6A.6.4 provides that the estimated cost of corporate income tax (ETC_t) for each regulatory year (t) must be calculated in accordance with the following formula:

$$ETC_t = (ETI_t \times r_t)\ (1 - \gamma)$$

where:

- ETI_t *is an estimate of the taxable income for that regulatory year that would be earned by a benchmark efficient entity as a result of the provision of prescribed transmission services if such an entity, rather than the Transmission Network Service Provider, operated the business of the Transmission Network Service Provider, such estimate being determined in accordance with the post-tax revenue model;*
- r_t *is the expected statutory income tax rate for that regulatory year as determined by the AER; and*
- γ *is the assumed utilisation of imputation credits.*

In accordance with the provisions set out in NER 6A.6.4, and adopting a value for gamma of 0.65 (in accordance with clause 2.8 of the WACC Statement) and a value for r_t of 30% (being the corporate tax rate) SP AusNet's taxation allowance is shown in Table 9.3 below.

Table 9.3: Allowance for the Estimated Cost of Corporate Tax, 2014 to 2017($ million, nominal)

	2014-15	2015-16	2016-17	Total
Tax payable	23.2	22.6	24.5	70.2
Less value of imputation credits	15.1	14.7	15.9	45.6
Net corporate income tax allowance	**8.1**	**7.9**	**8.6**	**24.6**

9.11 Summary of proposed WACC parameter values

Based on the parameters set out above, SP AusNet proposes a nominal vanilla WACC of 7.19% for the purpose of this Revenue Proposal. In accordance with the arrangements noted in section 9.6, the WACC calculation will be updated for the AER's Final Decision to reflect the risk free rate and DRP as measured over the measurement period proposed by SP AusNet.

The table below sets out the WACC parameters adopted by SP AusNet for the purpose of this Revenue Proposal.

Table 9.4: WACC Parameters adopted by SP AusNet

Parameter	Value / Methodology
Gearing	60% debt to total assets
Beta	0.8
Market Risk Premium	6.5%
Measurement period for the nominal risk free rate and Debt Risk Premium	The 20 business day measurement period commencing on 12 November 2012 and ending on 7 December 2012, for the purpose of this Revenue Proposal. The measurement period to be applied in the AER's Final Decision has been proposed by SP AusNet in accordance with the provisions set out in NER 6A.6.2(c)(2)(i).
Nominal Risk Free Rate	3.14%
Expected inflation	2.5%
Debt Risk Premium	3.28%
Gamma	0.65
Nominal pre–tax return on debt	6.42%
Nominal post–tax return on equity	8.34%
Nominal vanilla WACC	7.19%

10 Efficiency Benefit Sharing Scheme

10.1 Introduction

Under NER 6A.6.5, the AER has established an Efficiency Benefit Sharing Scheme (EBSS). This scheme provides for fair sharing between TNSPs and transmission network users of operating expenditure efficiency gains and losses of TNSPs over a regulatory control period. This requires EBSS payments, in the form of carry over amounts, to be estimated for the forthcoming regulatory period and factored into forecast revenues.

This Chapter outlines the proposed values under the EBSS, and an explanation of how these comply with the scheme's requirements under Section 4.3.7 of the Submission Guidelines.

10.2 Current Regulatory control period – First Proposed EBSS

During the current regulatory control period, SP AusNet has been subject to the AER's first proposed EBSS (January 2007). The AER published the final EBSS in September 2007, and this version of the scheme will apply to SP AusNet during the forthcoming regulatory control period.

10.3 Carry Over Amount

The total carry forward amount has been calculated using actual and estimates of controllable opex, which excludes the following:

- Easement land tax;
- Self-insurance;
- Rebates made under the Availability Incentive Scheme with AEMO;
- Equity and debt raising costs; and
- Efficiency or 'glide path' payments made in respect of the previous regulatory control period.

Table 10.1 outlines the opex efficiencies that have, and are expected to, be achieved during the current regulatory control period.

Table 10.1: Incremental Gain or Loss ($m, real 2013-14)

Year	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Forecast Controllable Opex[45]	76.8	78.1	80.1	81.0	82.6	83.3
Actual Controllable Opex	84.4	84.0	75.9	71.9	75.2	74.2
Within-year Saving	-7.6	-6.0	4.2	9.1	7.4	9.1
Incremental Gain / Loss	-7.6	1.7	10.1	5.0	-1.8	1.8

[45] Controllable opex excludes easement land tax, self-insurance, rebates, equity and debt raising costs and the glide path of efficiency gains from opex and capex from the previous regulatory control period.

SP AusNet has achieved significant efficiency gains over the period, realising a net saving of $22 million on benchmark operating expenditure. This saving will be passed to customers through a reduced operating expenditure requirement in the 2014-17regulatory control period.

These opex efficiencies determine the following carry forward amounts, as shown in Table 10.2. The carry forward amounts in 2016-17 have been adjusted to include the net present value of the amounts which fall outside the 2014-17regulatory control period. This adjustment is a practical solution to address the length of the forthcoming regulatory control period imposed by the transitional arrangements outlined in Section 1.2 of this proposal. This will also maintain the benefit sharing ratio of the scheme and ensure that incentives to achieve efficiency gains are not truncated.

Table 10.2 Proposed Carry Forward Amounts ($m, real 2013-14)

Year	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Carry forward amounts	9.1	16.8	15.1	5.0	0.0	1.8
NPV Adjustment			*6.1*			
Total	**9.1**	**16.8**	**21.2**			

The PTRM for the forthcoming regulatory control period has been adjusted for this amount.

Expected actual expenditure in the final year of the period (2013-14) has been estimated with regard to actual operating expenditure in 2011-12, the base year used for the operating expenditure proposal. This is approach was adopted by the AER in their recent draft decision for ElectraNet. The AER stated:

> *"The choice of base year influences the EBSS rewards and penalties adjustments to the TNSP's annual revenue requirement, but it also affects the magnitude of the opex forecast (and therefore the revenue requirement)."*[46]

Therefore, for coherency across the operating expenditure and EBSS proposals it is appropriate that the EBSS rewards and penalties are determined with regard to the base year.

In the Final EBSS in September 2007, the AER made the following observations regarding the length of the carryover period:

> *"The AER considers that the scheme will be simpler to implement and administer if the carryover period is linked to the regulatory control period. For most businesses this will mean a notional five-year period for the carryover and an effective 30:70 sharing ratio. Where a firm has proposed a longer regulatory control period, the AER will consider extending the carryover period having regard to the need for a fair sharing for efficiency gains and evidence of the relative efficiency of that firm."*[47]

It should be noted that this policy position was established prior to the AER's Final Decision for SP AusNet's 2008-14 revenue reset. It is therefore relevant to the operation of the EBSS in the current regulatory control period, even though technically the carryover calculation is subject to the First Proposed EBSS.

The AER's policy position in the Final EBSS is particularly relevant because SP AusNet's current regulatory control period is six years. Unfortunately, the First Proposed EBSS only contemplates a five year regulatory control period and therefore it lacks the flexibility of the final scheme. At the time of the AER's Final Decision in January 2008, in which a six year regulatory control period

[46] AER, Draft decision, ElectraNet Revenue Determination 2013-14 to 2017-18, November 2012, p.40

[47] AER, Electricity transmission network service providers, Efficiency benefit sharing scheme, September 2007, p. 13.

was adopted, it appears that neither the AER nor SP AusNet considered the compatibility of this decision with the First Proposed Scheme.

The AER's Final EBSS concludes that the carryover period could be extended in line with the length of the regulatory control period. The AER notes that the scheme is easier to implement and administer if the carryover period is linked to the regulatory control period. SP AusNet concurs with the AER's views, and therefore has adopted a six year carryover period for the purposes of calculating the carryover amount for the 2008-14 regulatory control period.

Notwithstanding the transitional arrangements, currently SP AusNet expects to request to revert to regulatory period length of six years commencing 1 April 2017. Therefore, adopting a six year carryover period for efficiency gains realised in both the current and forthcoming regulatory control periods will maintain a continuous incentive to achieve efficiency gains over time.

10.4 Forthcoming Regulatory control period – Final EBSS

In the forthcoming regulatory control period, SP AusNet will be subject to the AER's final EBSS (September 2007).

At this time, the following exclusions are proposed:

- Easement land tax;
- Self-insurance;
- Rebates made under the Availability Incentive Scheme;
- Equity and debt raising costs; and
- EBSS payments from the current regulatory control period.

SP AusNet notes that additional exclusion categories can be proposed in the next revenue proposal submission.

Table 10.3 presents the forecast controllable opex to be used for calculating the EBSS carryover amounts at the end of the forthcoming regulatory control period. This excludes the proposed exclusions listed above.

Table 10.3 Forecast Controllable Opex ($m, real 2013-14)

Year	2014-15	2015-16	2016-17	Total
Forecast Controllable Opex	91.1	94.3	95.6	281.0

Consistent with the AER's final EBSS, and as discussed above, any opex efficiencies realised during the forthcoming period will be carried over for the carryover period of six years consistent with the proposed length of the regulatory control period commencing 1 April 2017.

11 Cost Pass Through

11.1 Introduction

This chapter presents SP AusNet's proposed cost pass through arrangements for the forthcoming regulatory control period. In general terms, cost pass through arrangements provide for 'within period' adjustments (up or down) to the allowed regulated revenue if a non-controllable predefined event occurs that leads to a material change in the TNSP's costs.

The chapter is structured as follows:

- Section 11.2 sets out the Rules requirements in relation to cost pass through arrangements; and
- Sections 11.3 presents SP AusNet's proposed arrangements.

11.2 Rules Requirements

NER 6A.7.2 provides that network support costs should be subject to a pass through arrangement, without any materiality threshold. NER 6A.7.3 (a1) prescribes the following pass through events, each of which is subject to a materiality threshold:

(1) a regulatory change event;

(2) a service standard event;

(3) a tax change event;

(4) an insurance event; and

(5) any other event specified in a transmission determination as a pass through event for the determination.

In relation to subclause (5) above, NER 6A.6.9 provides for a TNSP to nominate pass through events, having regard to a set of considerations ("nominated pass through event considerations"), which include:

- whether the event proposed is an event covered by a category of pass through event specified in NER 6A.7.3(a1)(1) to(4);
- whether the nature or type of event can be clearly identified at the time the determination is made for the service provider;
- whether a prudent service provider could reasonably prevent an event of that nature or type from occurring or substantially mitigate the cost impact of such an event; and
- whether the relevant service provider could reasonably insure against the event.

In determining whether to accept the pass through events nominated by a TNSP in its Revenue Proposal, the AER must take into account the nominated pass through event considerations.

11.3 Proposed nominated events

Pursuant to NER 6A.6.9, SP AusNet proposes the following nominated cost pass through events:

- Natural Disaster Event;
- Terrorism Event; and
- Liability above Insurance Cap Event.

Having regard to the nominated pass through event considerations, the nominated events meet the requirements of the Rules for acceptance by the AER for the following reasons:

- The proposed events are not covered by a prescribed pass through event.
- The nature and type of the events are clearly identifiable.
- Both the occurrence of the event, and the mitigation of expenditure associated with the event are outside the control of a prudent network service provider.
- The events are not efficiently fully insurable, either through purchasing insurance or via self-insurance. (It is noted that SP AusNet proposes that where a self-insurance allowance is provided, only expenditure incurred above this allowance will be included in the pass through amount).

The sections below provide a more detailed explanation of the rationale for each of these nominated pass through events.

11.3.1 Natural Disaster Event

Event Definition

A Natural Disaster Event is:

> *"Any major fire, flood, earthquake, or other natural disaster beyond the reasonable control of SP AusNet that occurs during the 2014 to 2017 regulatory control period and materially increases the costs to SP AusNet of providing prescribed transmission services.*
>
> *For the avoidance of doubt, in assessing a natural disaster event application, the AER will have regard to:*
>
> - *the insurance premium proposal submitted by SP AusNet in its Revenue Proposal;*
> - *the forecast operating expenditure allowance approved in the AER's final decision; and*
> - *the reasons for that decision."*

Rationale

The pass through events defined in NER 6A.7.3 do not include "natural disaster event".

In its Final Decision on Victorian Electricity DNSPs for the 2011 to 2015 regulatory control period, the AER nominated "natural disaster event" as a pass through event[48]. In explaining the rationale for its decision, the AER stated:

> *"The AER's treatment of pass through events, in accordance with s. 7 of the NEL, seeks to promote the long term interests of consumers by ensuring that prices are reflective of efficient network operating costs. It also seeks to ensure that, to the extent that extra costs are passed through in the regulatory control period, those costs are beyond the control of the DNSP. The reliability and security of electricity supply on the network is also ensured by allowing costs incurred through the inclusion of the 'natural disaster event'. For example, costs associated with natural disaster events, if not passed through, could potentially*

[48] AER, Final Decision, Victorian electricity distribution network service providers: Distribution determination 2011–2015, October 2010, p. LII.

> *undermine the financial viability of the DNSP and threaten the security of supply on the network.*
>
> *The AER also considered that its approach is consistent with the RPP [revenue and pricing principles] contained in s. 7A of the NEL. In particular, ss. 7A(2)(a) and (b) of the NEL provide that DNSPs should be given a reasonable opportunity to be able to recover at least the efficient costs the operator incurs in providing direct control network services and complying with regulatory obligations or requirements. The AER notes that costs that are uncontrollable (or controllable but of a high magnitude) are only passed through where they are not recoverable elsewhere in the regulatory regime and to do otherwise would allow DNSPs to recover above the efficient costs of delivering direct control services. The AER acknowledged the need for DNSPs to recover the efficient costs associated with meeting regulatory obligations or requirements that are not recovered elsewhere. The AER considered that the appropriate mechanism for the recovery of these costs is through the pass through events contained in the NER."*[49]

SP AusNet concurs with the AER that inclusion of "natural disaster event" is consistent with the NEO and the Revenue and Pricing Principles in the NEL. SP AusNet also notes that the AER's recent Draft Decision for ElectraNet[50] has adopted the 'natural disaster event' definition as proposed by SP AusNet. Given these observations and the cost pass through event considerations in the Rules, SP AusNet's proposed "natural disaster event" should be approved by the AER.

The combination of insurance, self-insurance and pass through events means that the costs of a particular event may be managed through a range of alternative measures. Importantly, however, any pass through amount claimed in association with a 'natural disaster event' will be net of insurance and self-insurance cover. However, for those categories of events or assets that cannot be insured – such as the loss of transmission towers as a result of a natural disaster – the pass through provisions provide SP AusNet with a means of recovering efficient costs.

11.3.2 Terrorism Event

Event Definition

A terrorism event is:

> *An act (including, but not limited to, the use of force or violence or the threat of force or violence) of any person or group of persons (whether acting alone or on behalf of in connection with any organisation or government), which from its nature or context is done for, or in connection with, political, religious, ideological, ethnic or similar purposes or reasons (including the intention to influence or intimidate any government and/or put the public, or any section of the public, in fear) and which materially increases the costs to SP AusNet of providing prescribed transmission services or the costs to a Distribution Network Service Provider of providing direct control services.*

Rationale

For the purpose of this Revenue Proposal, "terrorism event" is no longer a prescribed pass through event following the Rule Change made by the AEMC in August 2012[51]. The AEMC explained the reasons for removing "terrorism event" from the prescribed pass through events as follows:

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49 Ibid, p. 746.

50 AER, Draft Decision- ElectraNet Transmission Determination 2013-14 to 2017-18, November 2012, p 382

51 AEMC, Cost Pass Through Arrangements for Network Service Providers, Rule Determination, 2 August 2012.

> *As outlined in the draft rule determination, where possible, a cost pass through event should reflect the circumstances of the NSP. The Commission was of the view that the currently prescribed terrorism event […] effectively erodes the incentives, now and in the future, on NSPs to seek alternative mechanisms to mitigate the cost impacts that may arise.*
>
> *The draft rule determination noted that the rationale behind removing the terrorism event was not to imply that these events should not be treated as a pass through event. The intention was to recognize that the cost pass through regime may not always be the most efficient mechanism to manage this risk.*
>
> *As opposed to the terrorism event, future changes are less likely to affect the incentive arrangements for the other three defined pass through events (regulatory change, service standard, or tax change events). Furthermore, the increase in administrative costs on both NSPs and the AER through removal of these events, is likely to be higher than any gain in flexibility by not prribing them in the NER. The flexibility gains in relation to these events are likely to be small because the AER and NSPs are likely to focus on making sure that the currently prescribed pass through events are included in the network determinations, as nominated pass through events.*
>
> *Notwithstanding, as with the natural disaster event, a terrorism event should only be accepted as a pass through event where the NSP has been able to satisfy the AER that all appropriate avenues for avoidance, mitigation and insurance have been effectively exhausted. For this reason, the terrorism event should also be removed from the prescribed pass through events.*
>
> *As noted above, this conclusion does not imply that these types of events should not be treated as cost pass through events, but that the decision should be made as part of the determination process, considering the circumstances of each NSP, rather than prescribed in the NER."*[52]

SP AusNet considers that including "terrorism event" (as defined above) as a nominated pass through event represents the most efficient and appropriate means of managing outcomes if such an event occurs and results in a material increase in SP AusNet's costs. Having regard to the nominated pass through event considerations, SP AusNet notes the following:

- "Terrorism event" is not defined as a pass through event in NER 6A.7.3(a), as explained in the AEMC's determination noted above.
- The nature and type of event can be clearly identified at the time that the AER makes its determination for SP AusNet, as evidenced by the proposed definition (which was previously incorporated into the Rules).
- The extent to which SP AusNet can reasonably prevent a terrorism event from occurring and/or can substantially mitigate the cost impacts of such an event is limited. That said, the company has a range of measures in place which are intended to prevent acts of terrorism, and mitigate the impacts of an event should one occur.
- The relative infrequency and potentially very high costs of terrorism events create significant practical challenges for self-insurance of such events. A pass though mechanism provides a more appropriate arrangement for managing the cost impacts in the unlikely circumstances that a terrorism event occurs and causes a material increase in SP AusNet's costs.

SP AusNet notes the AEMC's comment that the removal of the terrorism event from the list of prescribed pass through events does not imply that these types of events should not be treated

[52] Ibid, p. 24.

as pass through events, but only that the decision should be made as part of the AER's determination process, considering the circumstances of each NSP, rather than prescribed in the Rules. It is also noted that the AER accepted a nominated cost pass through terrorism event in the recent Draft Decision for ElectraNet.

Having regard to the nominated pass through event considerations defined in Chapter 10 of the NER, the AER should accept SP AusNet's proposal to include terrorism event as a nominated pass through event.

11.3.3 Liability above Insurance Cap Event

Event Definition

A liability above insurance cap event is defined as follows:

An insurance cap event means an event whereby:

1. SP AusNet makes a claim or claims and receives a payment or payments under a relevant insurance policy;
2. SP AusNet incurs costs beyond the relevant policy limit; and
3. The costs beyond the relevant policy limit materially increase the costs to SP AusNet of providing prescribed transmission services.

For the purposes of this insurance cap event:

4. The relevant policy limit is the greater of:
    i. SP AusNet's actual policy limit at the time of the event that gives rise to the claim, and
    ii. its policy limit at the time the AER made its final decision on SP AusNet's transmission determination proposal for the period 2013-18.
5. For the avoidance of doubt, in assessing an insurance cap event cost pass through application under rule 6A.7.3, the AER will have regard to:
    i. the insurance premium proposal submitted by SP AusNet in its Revenue Proposal;
    ii. the forecast operating expenditure allowance approved in the AER's final decision; and
    iii. the reasons for that decision.
6. A relevant insurance policy is an insurance policy held during the 2014-17 regulatory control period or a previous regulatory control period in which SP AusNet was regulated.

11.3.4 Rationale

This pass through event is proposed on the basis that it is not always efficient for TNSPs to fully insure against high impact, low probability events. This is because commercial insurance for these events may be unavailable, or may be available at a prohibitively high cost.

In its Final Decision on Victorian Electricity DNSPs for the 2011 to 2015 regulatory control period, the AER considered that an insured event where costs are incurred beyond the insurance cap would largely be triggered by circumstances beyond the NSP's control, could not be forecast and would likely incur costs of a high magnitude. The AER considered that a combination of self-insurance (for costs above the insurance cap but below a specified threshold) and pass throughs should compensate for such an event, and applied this event to Victorian DNSPs.

SP AusNet's proposed definition is materially consistent with the AER's recent Draft Decision for ElectraNet. The only difference is the inclusion of the plural as well as the singular with regards to claims and payments under the relevant insurance policy. This is necessary as multiple claims are possible and present a risk scenario consistent with those that pass through events seek to mitigate.

In SP AusNet's view, it satisfies the relevant provisions in the NER and would further the NEO.Maximum Allowed Revenue and Price Path.

12 Maximum Allowed Revenue and Price Path

12.1 Introduction

SP AusNet's Revenue Proposal is based on the post-tax building block approach outlined in NER 6A.5.4, and the post-tax revenue model. Information that explains and substantiates the various building block components has been set out in the preceding chapters.

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

MAR = return on capital + return of capital + Opex + Tax

= (WACC x RAB) + D + Opex + Tax

where:

MAR = Maximum allowed revenue

WACC = Post tax nominal weighted average cost of capital

RAB = Regulatory Asset Base

D = Economic depreciation (nominal depreciation – indexation of the RAB)

Opex = Operating and maintenance expenditure + revenue increments for the year arising from the operation of the efficiency benefit sharing scheme

Tax = Cost of corporate income tax of the regulated business

The annual revenue stream derived using the building block formula is then smoothed with an X factor in accordance with the requirements of NER 6A.6.8. An overview of the building blocks, the raw revenue and smoothed revenue is provided in this chapter, as follows:

- Section 12.2 provides an overview of the forecast RAB over the forthcoming regulatory control period.
- Section 12.3 provides an overview of the return on capital revenue building block.
- Section 12.4 summarises the depreciation building block.
- Section 12.5 provides a summary of the operating and maintenance expenditure building block.
- Section 12.6 provides an overview of the building block relating to the estimated cost of corporate income tax.
- Section 12.7 sets out SP AusNet's annual building block revenue requirement.
- Section 12.8 details SP AusNet's proposed maximum allowed revenue and revenue cap.
- Section 12.9 provides an overview of the average price path under the proposed revenue cap.

12.2 Projected RAB over the forthcoming period

The movements in the RAB over the forthcoming regulatory control period are set out in Table 12.1. These values incorporate the capital expenditure plan set out in Chapter 4 and the expected depreciation over the period, as described in Chapter 8.

Table 12.1: Regulatory asset base roll forward 1 April 2014 to 31 March 2017 ($m, nominal)

	2014-15	2015-16	2016-17
Opening RAB	**2,865.7**	**2,978.5**	**3,096.4**
Capital expenditure	186.6	197.1	233.8
CPI indexation on opening RAB	71.6	74.5	77.4
Straight-line depreciation	-145.5	-153.8	-163.3
Closing RAB as at 31 March 2017	**2,978.5**	**3,096.4**	**3,244.2**

Source: SP AusNet PTRM.

12.3 Return on Capital

Details of the WACC for revenue calculation purposes are set out in Chapter 9 of this proposal. The return on capital has been calculated by applying the post-tax nominal vanilla WACC to the RAB consistent with the AER's PTRM. This calculation is shown in the table below.

Table 12.2: Return on Capital from 1 April 2014 to 31 March 2017 ($m, nominal)

	2014-15	2015-16	2016-17
RAB for revenue calculation purposes	2,865.7	2,978.5	3,096.4
WACC	7.19%	7.19%	7.19%
Return on capital	**206.0**	**214.1**	**222.6**

Source: SP AusNet PTRM.

12.4 Depreciation

The calculation of depreciation is detailed in Chapter 8 of this proposal. The AER post tax revenue model calculates economic depreciation by subtracting the indexation of the opening asset base from the depreciation for each regulatory year. A summary of this calculation is shown in the table below.

Table 12.3: Depreciation from 1 April 2014 to 31 March 2017 ($m, nominal)

	2014-15	2015-16	2016-17	Total
Straight-line depreciation	145.5	153.8	163.3	462.6
Less: indexation on opening RAB	71.6	74.5	77.4	223.5
Regulatory depreciation	**73.9**	**79.3**	**85.9**	**239.1**

Source: SP AusNet PTRM.

12.5 Operating and Maintenance Expenditure and EBSS revenue increments

The derivation of SP AusNet's operating and maintenance (opex) forecasts is set out in Chapter 5 of this proposal. The total opex forecast including self-insurance, debt and equity raising costs, rebates payable under AIS, easement land tax, and EBSS revenue increments is shown in the table below.

Table 12.4: Opex forecast from 1 April 2014 to 31 March 2017 ($m, nominal)

	2014-15	2015-16	2016-17	Total
Controllable Opex	93.4	99.0	102.9	295.4
Self-insurance	2.1	2.2	2.3	6.7
Debt Raising Costs	1.6	1.6	1.7	4.9
Equity Raising Costs	1.2	1.2	1.1	3.5
AIS Rebates	3.4	3.5	3.5	10.4
EBSS Payment	9.4	17.6	22.8	49.8
Sub -total	**111.1**	**125.2**	**134.4**	**370.7**
Easement Land Tax	103.4	108.7	108.7	320.8
Total	**214.5**	**233.8**	**243.1**	**691.5**

Source: SP AusNet PTRM.

12.6 Estimated Cost of Corporate Tax

The calculation of estimated corporate income tax is detailed in Chapter 9 of this proposal. The estimated tax allowance is shown in the table below.

Table 12.5: Estimated Cost of Corporate Tax ($m, nominal)

	2014-15	2015-16	2016-17	Total
Tax payable	23.2	22.6	24.5	70.2
Less value of imputation credits	15.1	14.7	15.9	45.6
Net corporate income tax allowance	**8.1**	**7.9**	**8.6**	**24.6**

Source: SP AusNet PTRM.

12.7 Annual building block revenue requirement

The annual building block revenue requirement for each year of the period is calculated (in accordance with NER 6A.5.4) as the sum of the building blocks – namely return on capital, regulatory depreciation, forecast opex, and net tax allowance. The table below presents a summary of the building blocks and the annual building block revenue requirement.

Table 12.6: Annual building block revenue requirement from 1 April 2014 to 31 March 2017 ($m, nominal)

	2014-15	2015-16	2016-17	Total
Return on capital	206.0	214.1	222.6	642.7
Regulatory depreciation	73.9	79.3	85.9	239.1
Operating expenditure	111.1	125.2	134.4	370.7
Easement Land Tax	103.4	108.7	108.7	320.8
Net tax allowance	8.1	7.9	8.6	24.6
Annual building block revenue requirement (unsmoothed)	**502.5**	**535.1**	**560.1**	**1,597.8**

Source: SP AusNet PTRM.

12.8 Maximum allowed revenue, X factor and revenue cap

Pursuant to NER 6A.5.3(c) and 6A.6.8, the annual building block revenue requirement is converted into a maximum allowed revenue in order for the revenue cap to be implemented. The revenue cap proposed by SP AusNet is:

- for the year ending 31 March 2015, $502.49 million (nominal); and
- for the years ending 31 March 2016 and 2017, escalated according to a constant X factor of -3.31%.

The maximum allowed revenue for the year ending 31 March 2015, and the X factor chosen ensures a smooth transition (in terms of total revenue) from the current period, and accords with the requirements of the NER in that it meets the following criteria:

- the maximum allowed revenue in the last year (the year ending 31 March 2017) is within 1% per cent of the annual building block revenue requirement for that year, in accordance with NER 6A.6.8(c)(2); and
- the total building block revenue and the total maximum allowed revenue for the regulatory control period (that is, the total revenue cap) are equal in NPV terms, in accordance with NER 6A.5.3(c)(1).

The table below shows the annual building block revenue requirement, the maximum allowed revenue and the total revenue cap for the forthcoming regulatory control period.

Table 12.8: Annual building block revenue and maximum allowed revenue from 1 April 2014 to 31 March 2017 ($m, nominal)

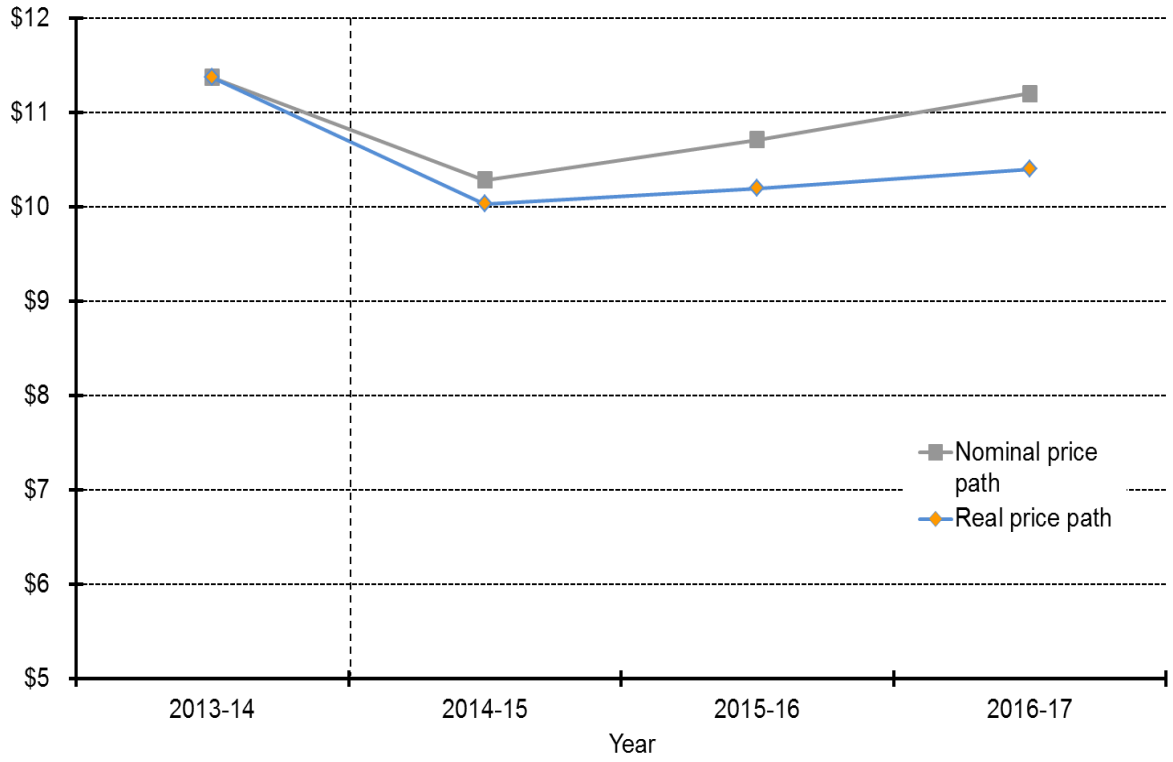
	2014-15	2015-16	2016-17	Total
Annual building block revenue requirement (unsmoothed)	**502.5**	**535.1**	**560.1**	**1,597.8**
Annual expected MAR (smoothed)	**502.5**	**532.1**	**563.4**	**1,597.9 (Total Revenue Cap)**
X factor (per cent)	**n/a**	**-3.31%**	**-3.31%**	**n/a**

Source: SP AusNet PTRM.

12.9 Average Price Path under the Proposed Revenue Cap

Prices will decrease in real terms by 11.8% in 2014/15 and increase by 1.6% and 2.0% each year after respectively. The figure below shows the forecast price path for the forthcoming regulatory control period.

Table 12.9: Future Real Price Path for SP AusNet ($/MWh)

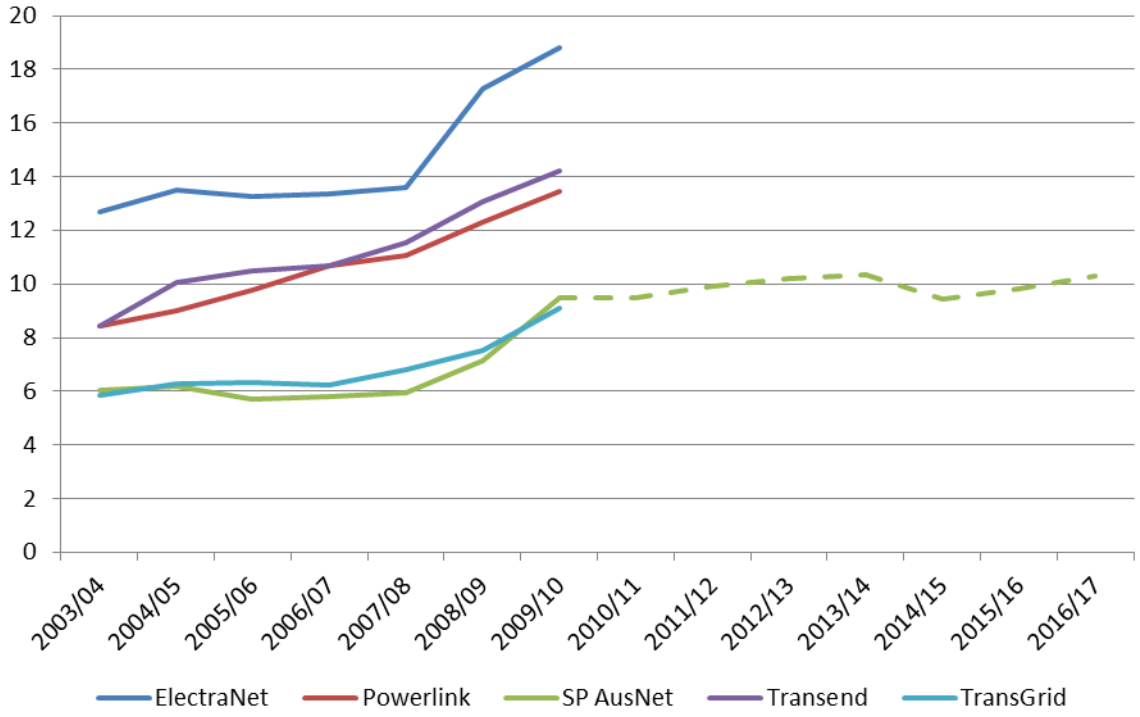


Source: SP AusNet PTRM

Note- Indicative price based on forecast revenues divided by forecast energy (delivered)

The revenue path proposed by SP AusNet will continue to deliver low average transmission charges for Victoria and ensure that those charges remain lower than most current transmission charges in the NEM, as shown in the figure below.

Table 12.10: Comparison of historic and future prices ($m/MWh)



Source: AER Regulatory Report 2009-10, SP AusNet Regulatory Accounts and PTRM, AEMO National Electricity Forecasting Report 2012, p. 8-8.
Note – Indicative prices based on revenues divided by energy (transmitted). For comparison purposes, the AER Regulatory Reports use energy transmitted, therefore the forecast prices shown in this chart do not align with the prices in figure 12.9 due to the different types of energy data used.

13 Pricing Methodology

13.1 Introduction

The NER requires a TNSP to submit a proposed pricing methodology relating to the prescribed transmission services that are provided by means of, or in connection with, a transmission system that is owned, controlled or operated by that TNSP.

The proposed pricing methodology must satisfy principles and guidelines established under the NER. Specifically, NER 6A.10.1(e) requires the proposed pricing methodology to:

(1) give effect to and be consistent with the Pricing Principles for Prescribed Transmission Services (that is to say, the principles set out in NER 6A.23); and

(2) comply with the requirements of, and contain or be accompanied by such information as is required by, the pricing methodology guidelines made for that purpose under NER 6A.25.

NER 6A.24.1(b) describes the purpose of the pricing methodology. It states that the pricing methodology is a methodology, formula, process or approach that, when applied by a TNSP:

(1) allocates the aggregate annual revenue requirement (AARR) for prescribed transmission services provided by that provider to:

(i) the categories of prescribed transmission services for that provider; and

(ii) transmission network connection points of Transmission Network Users; and

(2) determines the structure of the prices that a TNSP may charge for each of the categories of prescribed transmission services for that provider.

This chapter explains the key features of SP AusNet's proposed pricing methodology. A copy of the proposed pricing methodology is provided as Appendix 13A to this Revenue Proposal. SP AusNet is confident that the proposed pricing methodology fully complies with the NER and therefore should be approved by the AER.

The remainder of this chapter is structured as follows:

- Section 13.2 explains the relevance of the Victorian transmission arrangements to the proposed pricing methodology.
- Section 13.3 sets out the key features of SP AusNet's proposed pricing methodology.
- Section 13.4 provides concluding comments.

13.2 Pricing in the Context of the Victorian Transmission Arrangements

As explained in Chapter 2, the Victorian electricity transmission arrangements differ from that of other jurisdictions. In particular, AEMO and SP AusNet both have responsibilities in relation to the provision of prescribed transmission services in Victoria:

- AEMO provides shared transmission services. For those purposes, AEMO procures network capability and related services from SP AusNet and other TNSPs.
- SP AusNet provides and offers connection services.

In the context of the pricing methodology, the different responsibilities for providing prescribed transmission services are important. In relation to pricing matters, SP AusNet allocates its aggregate annual revenue requirement (AARR) to each of the categories of prescribed transmission services that it provides, and is also responsible for pricing connection services.

AEMO is responsible for pricing prescribed TUOS services and prescribed common transmission services. AEMO is the Co-ordinating Network Service Provider for Victoria and allocates all relevant AARR within Victoria. In light of the arrangements in Victoria, SP AusNet's proposed pricing methodology only addresses the pricing matters for which SP AusNet has responsibility.

13.3 Key features of pricing methodology

SP AusNet's proposed *Pricing Methodology* (Appendix 13A) has been prepared to satisfy the requirements of the pricing principles set out in Part J of Chapter 6A of the NER, including:

- determination of the AARR requirement for prescribed transmission services provided by SP AusNet;
- allocation of the AARR to categories of prescribed transmission services provided by SP AusNet to establish the annual service revenue requirement (ASRR) for that category of service;
- allocation of the ASRR to each transmission network connection point;
- price structure principles for the recovery of ASRR in accordance with the principles set out in the NER;
- information requirements and billing process;
- prudential requirements for prescribed transmission services;
- capital contributions or prepayments for a specific asset.

In addition, the proposed pricing methodology contains the information required by the AER's Pricing Methodology Guidelines, including a number of hypothetical worked examples to demonstrate how the pricing methodology works in practice.

In light of the respective roles of AEMO and TNSPs in Victoria in relation to prescribed transmission services, the proposed pricing methodology also includes a diagram illustrating the structure of transmission pricing under Part J of Chapter 6A of the NER and the respective responsibilities of AEMO and the TNSPs.

13.4 Concluding comments

The NER requires each TNSP to submit a proposed pricing methodology at the same time it submits its Revenue Proposal relating to its prescribed transmission services and specifies the matters that it must address. In Victoria, the transmission arrangements differ from other jurisdictions because SP AusNet and AEMO both have responsibility for providing prescribed transmission services.

The proposed pricing methodology complies fully with the NER requirements. In addition, the proposed pricing methodology provides additional information in relation to the respective roles of SP AusNet and AEMO. SP AusNet therefore considers that the proposed pricing methodology should be approved by the AER.

14 Negotiating framework

14.1 Introduction

The NER requires certain transmission services (negotiated transmission services) to be provided on terms and conditions of access that are negotiated between the TNSP and the service applicant. Each TNSP is required to prepare a negotiating framework, which sets out the procedure to be followed during negotiations.

The negotiating framework must comply with the minimum requirements specified in NER 6A.9.5(c), including matters such as:

- Negotiating in good faith.
- Provision of commercial information to facilitate effective negotiation.
- Provision of information relating to the costs of service provision.
- Timeframes for commencing, progressing and finalising negotiations.
- A process for dispute resolution.
- Cost recovery arrangements for processing applications.
- A requirement to notify and consult with any affected transmission users, and to ensure that obligations to those users continue to be met.

The NER also requires SP AusNet to conduct negotiations in accordance with the Negotiated Transmission Service Criteria, which will be specified in the AER's final determination. In turn, these criteria must give effect to and be consistent with the principles set out in NER 6A.9.1. In broad terms, these principles establish the acceptable upper and lower bounds for negotiated terms and conditions.

This chapter explains the key features of SP AusNet's proposed negotiating framework. A copy of the proposed negotiating framework is provided in Appendix 14A. SP AusNet is confident that the proposed negotiating framework fully complies with the NER and therefore should be approved by the AER.

The remainder of this chapter is structured as follows:

- Section 14.2 explains the relevance of the Victorian transmission arrangements to the proposed negotiating framework.
- Section 14.3 sets out the key features of SP AusNet's proposed negotiating framework
- Section 14.4 provides concluding comments.

14.2 Victorian transmission arrangements

As explained in Chapter 2, the Victorian electricity transmission arrangements differ from other jurisdictions. In particular, AEMO and SP AusNet both have responsibilities in relation to the provision of transmission services in Victoria:

- AEMO provides shared transmission services. For those purposes, AEMO procures network capability and related services from SP AusNet and other TNSPs.
- SP AusNet provides and offers connection services.

In the context of the negotiating framework, the different responsibilities for providing transmission services are important. A service applicant seeking a negotiated transmission service may need

to engage with either AEMO and/or SP AusNet, depending on the type of service sought. In particular:

- A service applicant must negotiate with AEMO for the provision of shared transmission services that are defined as negotiated transmission services.
- A service applicant must negotiate with SP AusNet for the provision of connection services that are defined as negotiated transmission services.

It is also important to note that:

- AEMO has primary responsibility for assessing the impact of a proposed connection on the Victorian transmission network, including its effect on other network users.
- SP AusNet or the relevant TNSP (as applicable) has primary responsibility for assessing and advising a service applicant on the connection assets at the physical interface with its transmission network (network exit services and network entry services).
- Any application to connect to the Victorian transmission network will require the service applicant to enter into agreements with both AEMO for shared transmission services and SP AusNet or the relevant TNSP (as applicable) for connection services.

SP AusNet and AEMO recognise that a service applicant seeking a negotiated transmission service may find the Victorian arrangements complex and potentially confusing. As the principal purpose of a negotiating framework is to establish procedures to facilitate effective and fair negotiation, SP AusNet and AEMO have established a joint negotiating framework to further assist service applicants. In addition to complying with the NER requirements, this joint framework explains the respective roles and responsibilities of SP AusNet and AEMO in providing negotiated transmission services.

14.3 Key features of the Negotiating Framework

The joint negotiating framework established by AEMO and SP AusNet addresses all of the matters required in the NER, including:

- Application of the negotiating framework;
- Conduct of negotiations;
- Timeframe for negotiations;
- Costs of investigation and negotiation;
- Charges for negotiated transmission services;
- Provision of information;
- Confidential information;
- Dispute resolution;
- Other network users;
- Suspension of time periods; and
- Termination of negotiations.

In relation to the provision of information to facilitate the effective negotiation, the framework requires that:

- Each Negotiating Party agrees to provide to the other Negotiating Parties all such commercial information it may reasonably require to enable that other Negotiating Party to engage in effective negotiation for the provision of the relevant negotiated transmission service.

- A Negotiating Party may give notice to another Negotiating Party requesting any additional commercial information that is reasonably required by the first Negotiating Party to enable it to engage in effective negotiations in relation to the provision of a negotiated transmission service or to clarify commercial information already provided.
- A Negotiating Party who is requested to provide information under this section must use reasonable endeavours to do so within 10 Business Days of the request or as otherwise agreed by the parties.

The negotiating framework also ensures that all service applicants are treated fairly by setting out the circumstances in which negotiation may be terminated, including where:

- AEMO or SP AusNet is of the reasonable opinion that the Service Applicant will not acquire the negotiated transmission service.
- AEMO or SP AusNet believes on reasonable grounds that the Service Applicant is not conducting the negotiations in good faith.
- The Service Applicant consistently fails to comply with the obligations in this negotiating framework.

The negotiating framework also adopts a dispute resolution process in accordance with Part K of Chapter 6A of the NER, which provides for the appointment of a commercial arbitrator. These provisions are important in allowing parties access to a timely and effective dispute resolution process should negotiations lead to dispute.

The joint negotiating framework also notes that it is intended to be capable of adoption by other declared transmission system operators in respect of the connection services they provide in Victoria, subject to AER approval.

14.4 Concluding comments

The NER requires each TNSP to establish a negotiating framework and specifies the matters that it must address. In Victoria, the transmission arrangements differ from other jurisdictions because SP AusNet and AEMO both have responsibility for providing negotiated transmission services. Given this observation, SP AusNet considers it appropriate to submit a joint negotiating framework with AEMO for the first time.

The joint negotiating framework complies fully with the NER requirements. In addition, the framework provides additional information in relation to the respective roles of SP AusNet and AEMO. SP AusNet therefore considers that the proposed negotiating framework should be approved by the AER. The proposed *Victorian Negotiating Framework* is provided at Appendix 14A.

15 Appendices

No:	Topic:
1	Appendix 1A – Compliance Checklist
2	Appendix 1B – Directors' Responsibility Statement
3	Appendix 2A – Asset Management Strategy 10-01
4	Appendix 2B – Related Party Arrangements
5	Appendix 2C – Cost Allocation Methodology
6	Appendix 3A – Deliverability Strategy
7	Appendix 4A – Capital Expenditure Overview 2014/15 – 16/17
8	Appendix 4B – AEMO Victorian Terminal Station Demand Forecasts 2012/13 – 2022/23
9	Appendix 4C –Project Cost Estimating Methodology
10	Appendix 4D – Unit Rates
11	Appendix 4E – BIS Shrapnel Real Labour Cost Escalation Forecasts to 2016/17 – Australia & Victoria
12	Appendix 4F – SKM Annual Material Cost Escalators 2014/15 to-16/17 Report
13	Appendix 4G – Proposed Contingent Projects
14	Appendix 4H – ICT Strategy FY2014/15-16/17 Electricity Transmission Network
15	Appendix 5A – Aon Report- Self-Insurance Risk Quantification SP AusNet (Transmission)
16	Appendix 5B –Board Resolution to Self-insure
17	Appendix 5C – Group 3 Assets
18	Appendix 5D – Aon Report Review of Insurance Premium Forecast – SP AusNet (Transmission)
19	Appendix 5E – Proposed Operating Expenditure Step Changes 2014-17

No:	Topic:
20	Appendix 6A – Parsons Brinkerhoff (PB) STPIS Report - Fitting Probability Distributions for SP AusNet Reliability Date
21	Appendix 6B – Network Capability Incentive Parameter Action Plan (NCIPAP)
22	Appendix 9A – Letter on WACC Averaging Period
23	Appendix 9B – PWC Report - Debt Risk Premium for the 2013 Victorian Transmission Revenue Review
24	Appendix 13A – Pricing Methodology
25	Appendix 14A – Victorian Negotiating Framework