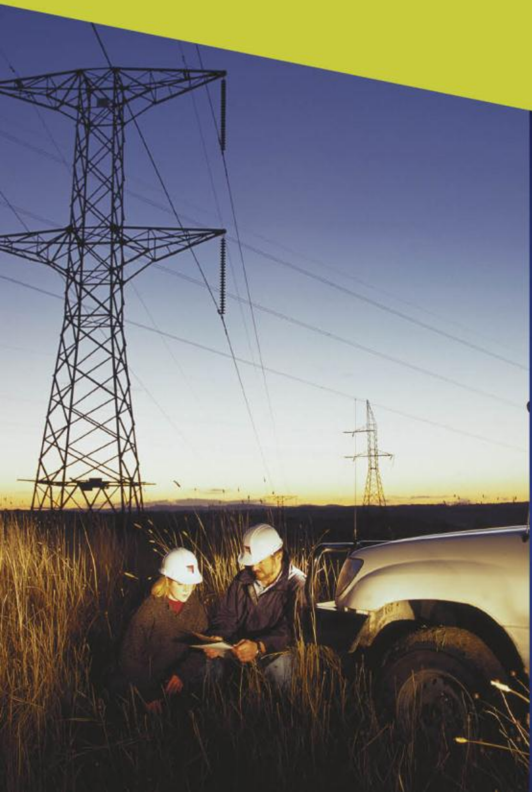
ELECTRANET TRANSMISSION NETWORK REVENUE PROPOSAL

1 JULY 2013 – 30 JUNE 2018

31 MAY 2012



ElectraNet Pty Ltd (ElectraNet) is the principal electricity transmission network service provider (TNSP) in South Australia.

For information about ElectraNet visit www.electranet.com.au.

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1. Executive Summary

ElectraNet Pty Ltd (ElectraNet) is the principal electricity transmission network service provider (TNSP) in South Australia. ElectraNet owns, operates, maintains and manages South Australia's high-voltage transmission network to enable safe and reliable transfer of electrical power from electricity generators to connection points with the distribution network and customers connected directly to the transmission network.

This Revenue Proposal to the Australian Energy Regulator (AER) is for the five-year regulatory control period from 1 July 2013 to 30 June 2018 and is submitted in accordance with the requirements of the National Electricity Rules (the Rules) and the relevant Submission Guidelines issued by the AER.

ElectraNet is confident that its Revenue Proposal fully satisfies the requirements of the Rules. Further, in recognising the increasing community concern over electricity price impacts, ElectraNet has worked hard to prepare a Revenue Proposal that delivers a customer price outcome from 2012-13 to 2017-18 in line with movements in the consumer price index (CPI).

This has been challenging in the face of increasing costs associated with delivery of efficient electricity transmission services. ElectraNet considers that this Revenue Proposal provides it with the revenue necessary to deliver transmission services to customers at the lowest long-run cost.

This Executive Summary provides an overview of ElectraNet's Revenue Proposal.

1.1 Context

South Australia's electricity transmission network is a strategic asset that underpins the State's economic and regional development and the prosperity of the South Australian community. The network comprises approximately 5,600 km of transmission lines connecting 86 high-voltage substations, and covers a service area of approximately 200,000 km^2.

ElectraNet's customers comprise the South Australian distributor ETSA Utilities, generators and directly connected loads. The transmission network is designed and operated to meet customer demand requirements and legislative reliability and quality of supply obligations.

There is increasing community and political sensitivity to rising electricity prices, driving an even stronger focus on efficient asset management and delivery of lowest long-run cost solutions. This focus requires that ElectraNet strive to extend asset lives, increase asset utilisation and maximise network performance while also seeking operational efficiencies. ElectraNet applies a risk-based approach to its decision making to achieve an efficient balance of maintaining safety, security and reliability of supply at the lowest sustainable cost.

The network is operating in an increasingly dynamic and changing environment, and faces a range of future challenges driven by economic factors, policy changes and evolving technologies. The forthcoming regulatory control period will not be 'business as usual', given the range of change drivers impacting on the future development and use of the transmission network to meet the increasing needs of the community and industry.

In that context, ElectraNet has updated, consulted on and published its long-term vision for the network to reflect this changing environment. The Network 2035 Vision sets out a future vision of safe, secure and reliable transmission services delivered to customers at lowest long-run cost in a way that supports South Australia's economic development and contributes to reducing carbon emissions. The vision sets out four key objectives to meet South Australia's needs in an increasingly dynamic and changing environment:

- **Ensure safe, secure, reliable supply** – A safe, secure and reliable network focused on resilience against natural disasters and extreme weather events that assures both community safety and secure electricity supply for South Australia.
- **Deliver transmission services at lowest long-run cost** – Continued delivery of lowest long-run cost network services by intelligent network planning and use of smart grid technology to increase network asset utilisation. ElectraNet will manage input cost pressures and work with others to seek ways to reduce the economic costs to the community of the increasing demand for peak-period capacity.
- **Support South Australia's economic development** – Economically efficient network investment that supports South Australia's development by meeting customer needs. ElectraNet will align its plans with industry needs and continue to explore opportunities for more interstate interconnection to increase price competition in the local electricity market.
- **Support development of lower emission energy sources** – A network to support the continued development of South Australia's low emission energy resources by providing the link between remote generation sources and major load centres.

1.2 ElectraNet's approach to managing the network

Consistent with stakeholder expectations, a primary objective for ElectraNet is the efficient delivery of reliable electricity transmission services to its customers. ElectraNet's approach to managing the network is, therefore, based on best practice asset management principles that seek to optimise the total life cycle costs of the transmission network.

In the pursuit of best practice and efficiency, ElectraNet has also placed a strong focus on developing improved information on asset condition to inform its decision making. This requires a longer term view and holistic approach to asset management and developing capital and operating expenditure plans.

In developing the network to meet demand and service requirements, ElectraNet follows an established planning process to develop plans and initiate projects for a safe, reliable and secure network. This involves finding lowest long-run cost solutions which deliver maximum benefit for consumers, including the efficient deferral of investments through the use of non-network solutions where technically and economically feasible.

Figure 1.1 shows a high level summary of ElectraNet's approach, which is explained in more detail in later chapters of this Revenue Proposal.

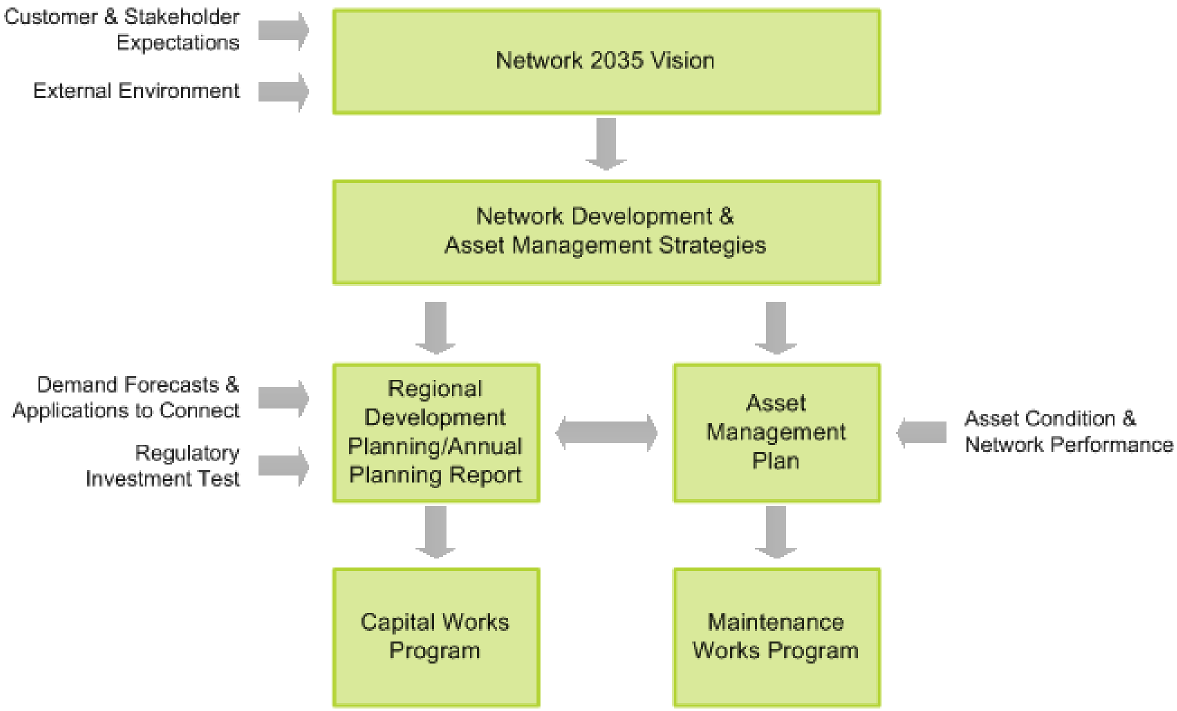

Figure 1.1: Managing South Australia's transmission network

1.3 Historic cost and service performance

ElectraNet's performance over the current period exhibits an overall level of high performance.

In the current regulatory control period, which commenced in 2008-09, ElectraNet will have invested $846m (nominal) to meet growing customer demand and maintain the reliability of the transmission network. ElectraNet has managed changing network priorities within the AER's approved capital expenditure allowance, and has made prudent investment decisions in the light of the actual circumstances that have eventuated over the course of the regulatory control period.

ElectraNet has responded positively to applicable regulatory incentives and has achieved operating expenditure cost savings (relative to the revenue cap allowance) in the early years of the regulatory period. Long-term sustainable savings, primarily in corporate costs, have been achieved through the restructuring of business operations to achieve greater efficiencies, and more immediate savings have been achieved in areas such as insurance premiums in the current environment.

However, these substantial and sustainable cost savings have been, and will continue to be, overtaken by cost increases resulting from the impacts of a number of cost drivers. In particular, initiatives aimed at improving long-run asset performance have included the introduction and implementation of an expanded maintenance regime to address fire start risk and asset condition, a more structured asset data collection and analysis system, and an extended vegetation management program to meet increased regulatory clearance requirements for transmission assets. These underlying cost drivers are explained in more detail below, and are expected to continue into the future, impacting on costs in the forecast period.

ElectraNet has been subject to service performance incentives in the current regulatory period to maintain and improve network availability and reliability and to reduce the market impact of its operations. The scheme's performance indicators include circuit availability, average outage duration, loss of supply event frequency and market impact of transmission congestion. ElectraNet's performance against these indicators is demonstrated in Table 1.1.

Table 1.1: Performance against AER service standards indicators

	2007	2008	2009	2010	2011
Availability (%)	99.37	99.27	99.94	99.64	99.59
Availability Critical Peak (%)	99.03	97.80	99.86	99.75	99.30
Availability Critical Non-Peak (%)	99.53	99.82	99.84	99.71	99.41
Average Outage Duration (Minutes)	270	199	161	127	256
No of events >0.2 System minutes	2	1	2	6	1
No of events >0.05 System minutes	7	5	4	10	7
Market Impact Parameter (Dispatch intervals)	2,427	1,834	515	1,789	1,375

ElectraNet has proposed changes to the performance incentive scheme for the forthcoming regulatory period in relation to the transmission circuit availability target to reflect the increase in complexity and volume of capital works that will require network outages in comparison with the current period.

1.4 Relative efficiency

There is increasing community and political sensitivity to rising electricity prices, engendering an ever stronger focus on efficient asset management and delivery of lowest long-run cost solutions by extending asset life, increasing asset utilisation and maximising network performance.

External factors have shaped, and will continue to shape the cost and prices of electricity transmission services in South Australia and inevitably lead to efficient transmission service costs in South Australia being higher than those in other states. These external factors – and their associated costs – reflect the unique characteristics of South Australia's electricity supply system, including the location of customer load and demand for energy at peak times.

The key characteristics driving a relatively higher level of efficient costs in South Australia for the delivery of electricity transmission services include:

- **Scale** – the overall size of the network and smaller population limit the scope for economies of scale in service delivery relative to larger networks;
- **Customer density** – South Australia has the lowest energy density in the National Electricity Market (NEM), reflecting the smaller population and large geographical size, increasing the amount of network that must be maintained to supply each customer;

- **Load factor** – South Australia has the lowest load factor in the NEM, as measured by maximum demand relative to average consumption, increasing the level of capacity to be maintained to deliver each unit of energy, pushing up unit costs; and
- **Topology** – given the spread of load, the network has a large number of substations that must be maintained for its size relative to comparable networks, and includes a range of smaller voltage assets more typically found in distribution systems (for example, long 132 kV radial lines servicing country areas) increasing the cost of transmission services.

These external factors and operating conditions result in a higher cost base for South Australia's transmission network relative to the cost base of the transmission networks in other states as illustrated below (see Figure 1.2 and Figure 1.3).

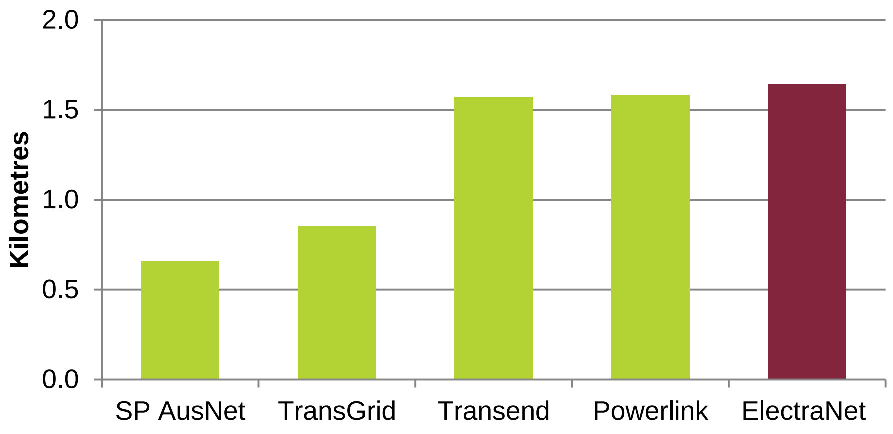

Figure 1.2: Length of transmission line required to supply each MW of peak demand[1]

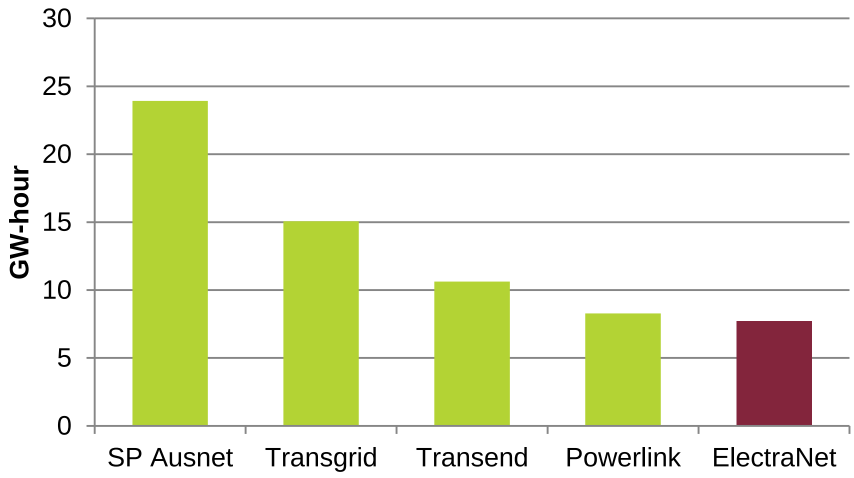

Figure 1.3: Comparative electricity transmitted per $1m of regulated assets[2]

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1 Annual 2010-11 Regulatory Accounts information provided by TNSPs.

2 Ibid

1.5 Cost drivers

A number of drivers are contributing to higher levels of efficient transmission costs in the forthcoming period.

Network limitations as the network approaches installed capability

There are several locations in South Australia where the transmission network is approaching its installed capability, notwithstanding continuing efforts to efficiently defer large augmentation requirements. Most of these are at the extremities of the transmission network and hence solutions are relatively more costly. Some of these locations also have potential new resource developments that would result in step increases in electricity demand.

Asset utilisation

Peak demand drives investment on the network to maintain adequate capacity and satisfy reliability standards. South Australia has the peakiest load profile in the country, and customer peak demand continues to outpace growth in energy consumption. This results in declining network utilisation and places pressure on unit prices. Responding to this challenge involves seeking opportunities and incentives to improve asset utilisation. Potential growth in base load demand from the resources sector may also assist.

Assets nearing the end of their useful lives

A range of South Australia's transmission network assets are now approaching the end of their service life, resulting in increased corrective and refurbishment maintenance expenditure requirements and asset replacement investment. This has important implications for the reliability of transmission services in the forthcoming and subsequent regulatory periods. Significantly, approximately 32 percent of ElectraNet's transformer assets and 42 percent of its transmission line assets will exceed their nominal lives (45 years and 55 years respectively) by the end of the 2013-14 to 2017-18 regulatory period.

Demand forecasts and development scenario studies for South Australia do not reveal any opportunities to manage the ageing asset base by reducing service capacity. Therefore, it is essential that ElectraNet maintains existing service capacity by undertaking prudent maintenance expenditure to efficiently prolong asset life as long as possible, and plan for the replacement of assets where this results in lowest long-run costs. If timely action is not taken, maintaining service reliability will become an insurmountable challenge as the risk of asset failures increases and the costs of maintenance in future will be considerably higher.

Managing safety risks

Recent bushfires in South Australia and Victoria have put the spotlight on safety systems and practices, to mitigate risks to the community from fires started by power lines. Maintaining a fire free environment in a globally warming world will become an increasing risk and challenge in the years ahead. South Eastern Australia is amongst the highest bushfire risk places in the world. In the near term, ElectraNet must continue to work to minimise the potential for fire start events to occur through sound asset management and vegetation clearance practices.

ElectraNet establishes and maintains physical security on all facilities to prevent unauthorised access and keep pace with public safety requirements. ElectraNet also supports national authorities in their increasing work to protect Australia's critical infrastructure.

Clean energy

The Australian Government has introduced the Clean Energy Plan which includes a carbon pricing mechanism and investments in renewable energy sources. While this may increase electricity prices and slightly dampen the growth in electricity demand, it is expected to encourage further investments in alternative fuel sources such as wind farms that would require investments in the shared transmission network (in addition to any negotiated or non-regulated investments in dedicated user assets).

Forecast economic growth in South Australia

Forecast economic growth in South Australia is expected to be driven by significant mining investment, which will impact on both the demand for electricity transmission services and the input costs for engineering-based activities. The recent Resources and Energy Infrastructure Demand Study published by the Resources and Energy Sector Infrastructure Council (RESIC) highlighted the positive economic outlook in the medium to longer term with a real prospect of significant new mining loads requiring connection to the transmission network. This will drive new investment because there is inadequate spare capacity to accommodate these significant new loads[3].

Labour cost increases are a further key driver of ElectraNet's costs. A widely publicised skills shortage exists in Australia, including in the electricity supply industry. Investment in the mining and resources sector is also a key factor strengthening employment demand. As a result of labour market conditions, wages growth in engineering-related fields is expected to be strong in the forthcoming regulatory control period.

Strong global demand has seen a number of commodity prices, as well as prices of key construction inputs, rising well above inflation in recent years.

Increasing community expectations

The community expects an increasingly reliable and secure electricity network. At the same time, there is increasing community and political sensitivity to rising electricity prices. This is driving an even stronger focus on efficient network development and delivery of lowest long-run cost solutions.

Technological changes

Technological change in transmission, power generation and patterns of end-use energy consumption will influence the network directly (e.g. smarter technology) and indirectly (e.g. new forms of electricity generation and end-use and possible large-scale and local energy storage)[4]. The increasing configurability of network devices, for example, creates opportunities for improved efficiencies and remote network management, but also requires specialist skills and systems to implement and maintain.

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[3] Resources and Energy Infrastructure Council (RESIC), *Resources and Energy Infrastructure Demand Study*, November 2011

[4] Examples include photovoltaic installations, electric vehicles and battery storage facilities

1.6 Capital and operating expenditure forecasts

ElectraNet has developed its capital and operating expenditure forecasts to meet the expenditure objectives specified in the Rules and is forecasting a capital expenditure requirement of $894m ($2012-13) and a controllable operating expenditure requirement of $423m[5] ($2012-13) for the forthcoming regulatory control period. Figure 1.4 and Figure 1.5 compare these expenditure forecasts with actual/forecast expenditure in the current regulatory control period.

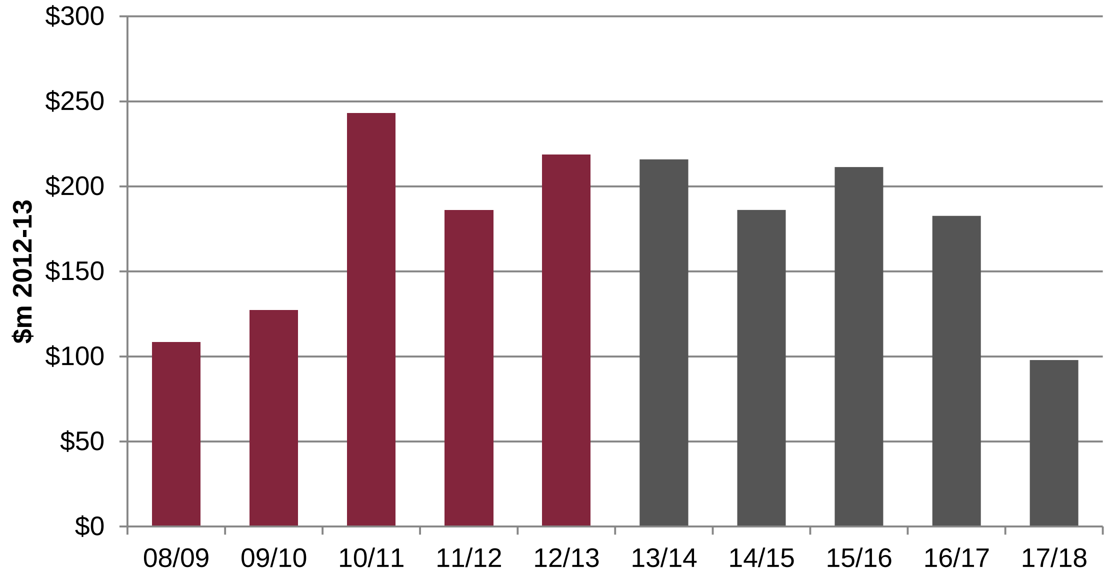

Figure 1.4: Historic and forecast capital expenditure 2008-09 to 2017-18 (as incurred basis)

The requirements for network capital expenditure have been developed in consultation with ETSA Utilities and the Australian Energy Market Operator (AEMO)[6]. At the request of the South Australian Government, AEMO has reviewed the load-driven investment underpinning this program. For each augmentation identified, AEMO has assessed that the need exists, that the timing is appropriate, and that the option being proposed appears reasonable. AEMO has also confirmed the consistency of the forecast with the National Transmission Network Development Plan (NTNDP) and with the requirements of the Electricity Transmission Code (ETC).

Operational expenditure requirements in the forthcoming period are driven by a continuation of existing service requirements, and additional cost pressures arising from new obligations and increased maintenance levels linked to asset condition and risk. ElectraNet maintains a comprehensive asset management program which reflects a risk-based approach, and seeks to deliver efficient and reliable network services to customers at lowest long-run cost.

5 Controllable operating expenditure excludes network support, self-insurance and debt raising costs

6 ETSA Utilities is the distributor in South Australia and AEMO provides independent oversight of transmission planning in South Australia

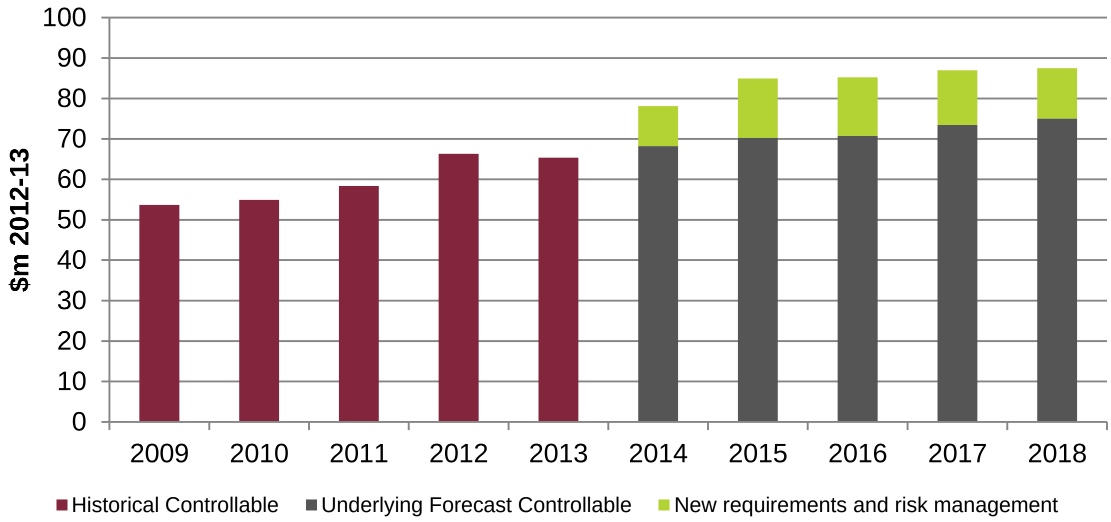

Figure 1.5: Controllable operating expenditure 2008-09 to 2017-18

1.7 Revenue requirement and average price path

ElectraNet has followed the requirements in the Rules and AER Guidelines and used the AER's Post Tax Revenue Model (PTRM) to calculate the revenue required for ElectraNet to meet growing customer demand, maintain reliability of supply and meet its regulatory obligations (see Table 1.2).

ElectraNet has been conscious of community concern over the impact of rising electricity prices in developing its Revenue Proposal. ElectraNet has actively managed its expenditure plans to minimise any increases in transmission costs over the next regulatory period as far as possible, while meeting its safety and reliability obligations.

ElectraNet estimates that its Revenue Proposal would result in an increase in average transmission prices of less than 3 percent per annum (nominal) over the next regulatory period (see Figure 1.6) and that this average increase will add approximately $5.85 to the average residential customer's annual bill of $1,384 (0.4 percent)[7]. This equates to an average annual increase at or near CPI from 2012-13 to 2017-18.

The revenue requirement is directly related to the ongoing levels of capital investment required, the asset-condition driven need for higher levels of operating expenditure and the input cost drivers discussed previously.

It should be noted that neither the forecast capital expenditure nor the forecast energy consumption used in these calculations include the effects of potential new mining loads. Whilst those loads would trigger further transmission development (contingent projects), they would also lead to large increases in energy consumption. The overall effect would tend to reduce the unit cost of electricity transmission in South Australia for existing customers.

7 Customer billing data from ESCOSA, *Electricity Annual Performance Report - SA Energy Supply Industry*, November 2011, Statistical Appendix 120410

Table 1.2: Revenue requirement 1 July 2013 to 30 June 2018 ($m nominal)

Component	2013-14	2014-15	2015-16	2016-17	2017-18	Total
Return on capital	162.3	177.4	190.1	204.4	216.6	950.8
Return of capital	35.1	39.3	50.4	51.4	57.4	233.6
Operating expenses	92.1	101.9	104.9	109.9	113.4	522.2
Opex efficiency payment	(2.8)	(4.8)	(4.6)	(2.7)	1.9	(12.9)
Net tax allowance	5.5	5.8	6.2	7.0	6.2	30.7
Total Revenue Requirement	**292.0**	**319.5**	**347.0**	**370.0**	**395.6**	**1,724.4**
X factor	(5.7%)	(5.7%)	(5.7%)	(5.7%)	(5.7%)	
Smoothed Revenue	**292.2**	**316.6**	**342.9**	**371.5**	**402.5**	**1,725.7**
Energy (GWh)	15.5	15.6	15.8	16.1	16.4	
Average Trans. Price ($/MWh)	18.8	20.3	21.7	23.0	24.6	

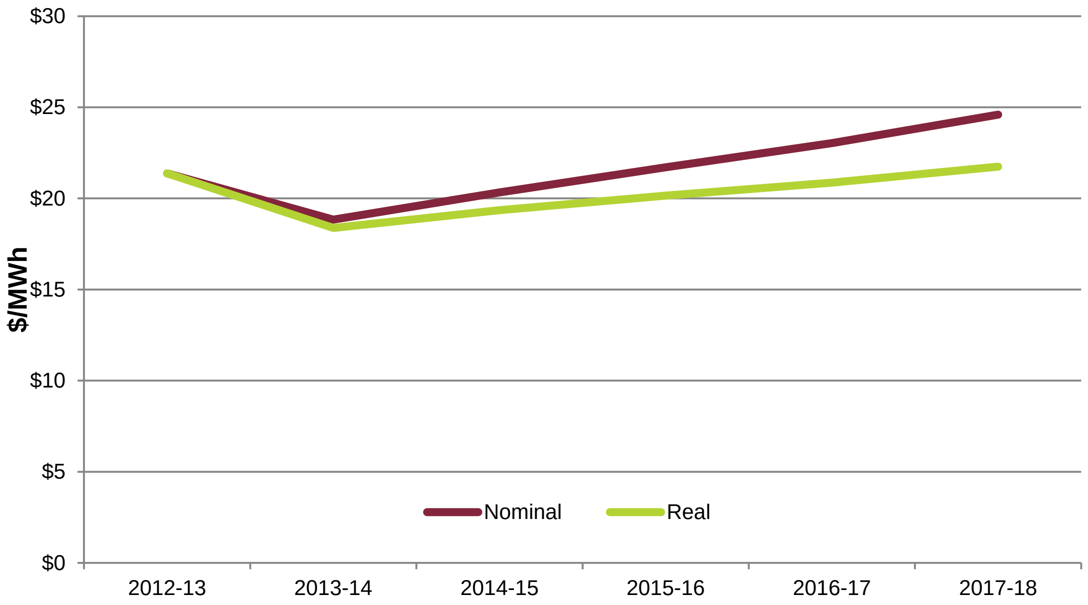

Figure 1.6: Average transmission price path ($/MWh nominal and $2012-13)

ElectraNet has also taken steps to improve incentives for major customers to efficiently manage their peak demand requirements through proposed amendments to its Transmission Pricing Methodology. This will create an ability to reduce demands on the network at peak times and corresponding transmission charges, and reduce future network augmentation requirements to the benefit of customers more broadly. The forecast capital expenditure in this proposal assumes that those amendments are accepted.

2. Introduction

2.1 Background

ElectraNet Pty Ltd (ElectraNet) is the principal electricity transmission network service provider (TNSP) in South Australia. ElectraNet owns, operates, maintains and manages South Australia's high-voltage transmission network to enable safe and reliable transfer of electrical power from electricity generators to connection points with the distribution network and customers connected directly to the transmission network.

The Australian Energy Regulator (AER) is responsible for the economic regulation of transmission networks under Chapter 6A of the National Electricity Rules (the Rules).

ElectraNet is presently subject to a revenue cap in accordance with a final decision made by the AER in April 2008[8]. That revenue cap expires on 30 June 2013.

ElectraNet is required to submit a Revenue Proposal to the AER and a proposed pricing methodology relating to the provision of prescribed transmission services 13 months before the expiry of the current regulatory control period[9]. At the same time, ElectraNet must also submit to the AER a proposed negotiating framework[10] in relation to negotiated transmission services.

This document is ElectraNet's Revenue Proposal for the forthcoming regulatory period from 1 July 2013 to 30 June 2018, which is submitted in accordance with, and complies with the requirements of, Chapter 6A of the Rules, and the relevant Guidelines issued by the AER pursuant to Chapter 6A. ElectraNet is confident that its Revenue Proposal fully satisfies the requirements of the Rules and Guidelines.

During the next regulatory control period, South Australia's transmission network will require continued investment to provide safe, secure and reliable transmission services to customers at the lowest long-run cost.

The remainder of this chapter is structured as follows:

- Section 2.2 specifies the commencement date and length of the regulatory control period proposed by ElectraNet;
- Section 2.3 describes the services provided by ElectraNet that are the subject of this Revenue Proposal;
- Section 2.4 provides an overview of the National Electricity Law (NEL) and Rules, and identifies a number of regulatory matters that are relevant to this Revenue Proposal;

8 AER, *Final Decision: ElectraNet Transmission Determination 2008-09 – 2012-13*, 11 April 2008, as subsequently amended by the AER in accordance with orders of the Australian Competition Tribunal of 28 January 2009, and the subsequent AER approvals of the Adelaide Central Reinforcement and Munno Para Contingent Projects in November 2009 and March 2011 respectively

9 *National Electricity Rules*, clause 6A.10.1

10 ElectraNet, *Proposed Negotiating Framework for Provision of Negotiated Transmission Service, 1 July 2013 – 30 June 2018,* Appendix G

- Section 2.5 outlines the requirements of the South Australian Electricity Transmission Code (the ETC), which requires ElectraNet to plan and operate its transmission system in accordance with specified standards;
- Section 2.6 explains the roles of AEMO and ElectraNet in planning the South Australian transmission network;
- Section 2.7 provides an overview of ElectraNet's corporate governance framework; and
- Section 2.8 explains the overall structure of the Revenue Proposal.

2.2 Length of regulatory control period

ElectraNet's Revenue Proposal is for a five-year regulatory control period commencing on 1 July 2013 and finishing on 30 June 2018.

2.3 Services provided by ElectraNet

As required by Section 4.3.22 of the Submission Guidelines, ElectraNet's Revenue Proposal relates to the provision of prescribed transmission services. These services include:

- Shared transmission services provided to customers directly connected to the transmission network and connected network service providers (prescribed Transmission use of System (TUOS) services);
- Connection services provided to connect the ETSA Utilities distribution network to the transmission network (prescribed exit services);
- Grandfathered connection services provided to generators and customers directly connected to the transmission network that were in place on 9 February 2006 under clause 11.6.11 of the Rules (prescribed entry and exit services); and
- Services required under the Rules or in accordance with jurisdictional electricity legislation that are necessary to ensure the integrity of the transmission network, including through the maintenance of power system security and assisting in the planning of the power system (prescribed common transmission services).

The reliability, quality and security of supply requirements of the prescribed transmission services provided by ElectraNet are set out in the Rules, the ETC and customer connection agreements. The required reliability, safety and security requirements of the transmission system are also prescribed in the Rules and the ETC as well as jurisdictional electricity legislation and instruments.

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

Other transmission services provided by ElectraNet (non-regulated transmission services) are not subject to economic regulation under Chapter 6A of the Rules and are also not dealt with in this Revenue Proposal.

2.4 National electricity framework

ElectraNet operates within the National Electricity Market (NEM) and is bound by the Rules which have the force of law in South Australia and which are made under the National Electricity Law (NEL). The National Electricity Objective as set out in the NEL is:

> *to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to (a) price, quality, safety, reliability and security of supply of electricity; and (b) the reliability, safety and security of the national electricity system*[11]*.*

The AER regulates network service providers. Under section 16 of the NEL, the AER must perform its regulatory functions and exercise its power in a manner that will or is likely to contribute to the achievement of the National Electricity Objective. The AER must also take into account the revenue and pricing principles set out in section 7A of the NEL. Those principles state, among other things, that a regulated network service provider should be provided with a reasonable opportunity to recover at least the efficient costs incurred in providing regulated network services and complying with a regulatory obligation.[12]

The Rules set out the detailed framework governing the regulation of prices and services provided by network service providers. Within these Rules, TNSPs must comply with the network performance requirements of Schedule 5.1 and “applicable regulatory instruments”. Regulatory instruments for South Australia include the *Electricity Act 1996* and all licences made and regulations issued under that Act.

Chapter 6A of the Rules prescribes the framework for the AER to assess the revenue requirements of transmission network businesses.

ElectraNet must ensure that its Revenue Proposal complies with the relevant guidelines published by the AER. Consistent with the requirements of clauses 6A.10.1 and 6A.10.2 of the Rules, the AER has published Guidelines on the following matters:

- the post-tax revenue model referred to in clause 6A.5.2;
- the roll forward model referred to in clause 6A.6.1;
- an efficiency benefit sharing scheme referred to in clause 6A.6.5;
- a service target performance incentive scheme referred to in clause 6A.7.4;
- pricing methodology guidelines referred to in clause 6A.10.1;
- transmission ring-fencing guidelines referred to in clause 6A.21.2;
- information guidelines referred to in clause 6A.17.2; and
- cost allocation guidelines referred to in clause 6A.19.3.

In all respects, ElectraNet believes that this Revenue Proposal complies with the requirements of the Rules, including:

- Chapter 6A;
- the Guidelines published by the AER; and

[11] *National Electricity Law*, Section 7

[12] *National Electricity Law,* Section 7A(2)

- the planning and operational requirements of Schedule 5.1.

Relevant aspects of the Rules requirements are explained in further detail and addressed in subsequent chapters of this Revenue Proposal.

A number of rule change proposals are currently being considered and consulted on by the Australian Energy Market Commission (AEMC) which, if approved, are assumed by ElectraNet to apply to ElectraNet for the purposes of the forthcoming regulatory period. For the purposes of this Revenue Proposal, these comprise Grid Australia's October 2011 Rule change proposal on cost pass through arrangements[13], and ElectraNet's Rule change proposal to correct the value for gamma applied in calculating the cost of corporate income tax[14]. However, this Revenue Proposal has been, necessarily, based on the Rules currently in force.

ElectraNet will continue to liaise with the AER in relation to these Rule change proposals and their impact on ElectraNet's regulatory proposal.

2.5 South Australian Electricity Transmission Code

Under the *Electricity Act 1996*, the activity of operating of a transmission network (including all powerlines, substations and switchyards) in South Australia is required to be licensed by the Essential Services Commission of South Australia (ESCOSA)[15]. A central part of ESCOSA's licensing function is to set standards of service under the terms of each licence.[16] ESCOSA undertakes this task through the provisions of an industry code, the Electricity Transmission Code (ETC or the code)[17], made pursuant to Part 4 of the *Essential Services Commission Act 2002* (ESC Act). Compliance with the ETC is a mandatory licence condition for ElectraNet as well as a regulatory obligation in accordance with clauses 6A.6.6 and 6A.6.7 of the Rules.

Section 1.6.1 of the ETC makes it clear that any obligations imposed under the ETC are in addition to those imposed under the Rules and the *Electricity Act 1996* (and regulations). ElectraNet must therefore comply with both the ETC and the Rules.

The ETC forms part of a broader regulatory scheme for transmission in the NEM, with regulation of the system occurring at two levels: the Rules establish technical standards dealing with matters such as frequency, system stability, voltage and fault clearance[18] whilst jurisdictional standards, such as those set out under the ETC, provide for security and reliability standards which align with technical standards set out under the Rules. In particular, the ETC contains provisions relating to:

- service standards;
- interruptions;
- design requirements;
- technical requirements;

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[13] Grid Australia, *Rule Change Proposal: Cost Pass Through*, October 2011

[14] ElectraNet Rule Change Proposal - Gamma, 30 November 2011

[15] *Electricity Act 1996 (SA)*, Part 3, Division 1, s23

[16] ESCOSA, *Electricity Transmission Licence, ElectraNet Pty Ltd,* issued on 31 October 2000, as varied on 1 July 2008

[17] ESCOSA, *Electricity Transmission Code TC/07,* 1 July 2013

[18] *National Electricity Rules*, Schedule 5.1

- general requirements;
- access to sites;
- telecommunications access; and
- emergencies.

A key point of interaction between the ETC and the Rules arises from the requirement under the Rules that any relevant asset constructed by ElectraNet, including those required to meet a standard mandated by the ETC, must satisfy the Regulatory Investment Test for Transmission (RIT-T)[19], which took effect on 1 August 2010.

The ETC applies to all licensed transmission entities; however the exit point reliability standards established under clause 2 apply only to ElectraNet. These exit point reliability standards have a significant impact on electricity supply reliability in the State and are one of the fundamental drivers of ElectraNet's revenue requirements. As such, any changes to exit point reliability standards will have cost implications for ElectraNet and price implications for the South Australian community.

In anticipation of a new regulatory control period to commence from 1 July 2013 for ElectraNet, ESCOSA has reviewed and amended the conditions of the ETC. In its Final Decision, ESCOSA explained the rationale for, and scope of its review as follows[20]:

> *'It is important that standards appropriately balance the need for reliability of supply and the costs of operating and maintaining the transmission system. A periodic review must consider load growth and the means by which ElectraNet can provide flexible solutions to reliability augmentations at the lowest possible cost to South Australians. The new standards set under the amended code will allow the efficient costs of ElectraNet's reliability obligations to be taken into account by the AER.'*

As a key input into the Commission's review, the Commission requested AEMO to investigate the transmission network exit point reliability standards specified in the code to determine their appropriateness for the regulatory period from 1 July 2013 to 30 June 2018. Specifically, AEMO was asked to consider[21]:

- How should connection point reliability be established?
- Is the current reliability standard for each connection point appropriate?
- Should the reliability standards for any connection points be amended, taking into consideration load growth, demographic changes, and/or network developments (transmission and distribution) etc.?
- If the reliability standard of any connection point is considered to be inappropriate, what should the standard be and what network extension and/or augmentation would be required to meet such a standard in a cost effective and efficient way (transmission and/or distribution)? What would be the indicative capital cost required to meet the new standard?

AEMO's report was provided to the Commission in December 2010 and published in the course of the review.

19 ESCOSA, *Review of the Electricity Transmission Code - Final Decision*' 6 March 2012, p6

20 Ibid, p 8

21 Ibid, pp 8-9

The new ETC resulted in the reclassification of the reliability standards at a small number of connection points. The new ETC also strengthens delivery timeframes, and specifies that required project timing is based on the agreed forecast maximum demand (contracted demand) for connection points and requires compliance within 12 months of this date. Project timing under the current code is based upon agreed maximum or contracted demand, and provides for an implementation timeframe of 12 months on a best endeavours basis or in any event, three years from the limitation date. This change to the ETC will bring forward the requirement for capital investments to meet ETC reliability standards.

The new ETC also includes strengthened requirements for obtaining land and planning approvals in advance of forecast requirements.

The new code[22] comes into operation on 1 July 2013.

ElectraNet's capital and operating expenditure plans take full account of its obligations under the ETC that will apply from 1 July 2013. Further information in relation to the requirements of the ETC is provided in Chapters 3, 5 and 6 of this Revenue Proposal.

2.6 Planning responsibilities in South Australia

Key features of the transmission planning arrangements in South Australia include:

- ElectraNet is responsible for investment decision making and service delivery, and as a "for profit" entity responds to financial incentives to deliver efficient outcomes;
- reliability standards are set independently of ElectraNet on an economic basis and expressed deterministically (thereby promoting both efficiency and transparency);
- demand forecasts used for transmission planning are independently oversighted by the Australian Energy Market Operator (AEMO)[23]; and
- AEMO provides independent planning oversight through its involvement in joint planning, revenue reset and RIT-T processes and though the development of the National Transmission Network Development Plan (NTNDP).

Responsibility for network planning in South Australia was transferred from the Electricity Supply Industry Planning Council (ESIPC) on 1 July 2009. At that time, ElectraNet was appointed as the South Australian Jurisdictional Planning Body (JPB) by the South Australian Energy Minister. Other ESIPC functions were transferred to AEMO. As part of this role under the NEL, AEMO also provides certain advisory functions to the South Australian jurisdiction.

ElectraNet's Annual Planning Report (APR) is published under clause 5.6.2A(a) of the Rules to provide information to market participants on the current capacity and emerging limitations of the South Australian transmission network. The APR considers forecast loads, future generation opportunities, market network services, demand side participation solutions and transmission developments over a 20-year planning period in accordance with the requirements of clause 5.6.2A of the Rules.

[22] ESCOSA, *Electricity Transmission Code TC/07*, 1 July 2013

[23] The State-wide peak demand forecasts used by ElectraNet for main grid planning of the transmission network were published by AEMO in the South Australian Supply and Demand Outlook (SASDO) 2011, as discussed in Chapter 5

The information contained in the APR assists in the preparation of AEMO's NTNDP which provides information on the strategic and long-term development of the national transmission system.[24] This Revenue Proposal is consistent with AEMO's 2011 NTNDP, as required under clause 6A.10.1.1(f) of the Rules and as addressed in Section 5.9.1.

ElectraNet works closely with AEMO and other TNSPs through a joint planning process to plan works required on major flow paths of the national transmission network, including interconnectors.

ElectraNet also works closely with South Australia's Distribution Network Service Provider (DNSP), ETSA Utilities, through a joint planning process to plan and implement new connection points or connection point upgrades between the transmission and distribution networks in a coordinated manner to maximise the cost effectiveness of these investments.

In relation to the 2013-14 to 2017-18 regulatory period, the South Australian Government specifically requested AEMO to assess:

- the validity of the individual augmentation capital expenditure projects proposed by ElectraNet;
- the need and triggers for contingent projects, and
- whether the South Australian transmission network will meet the requirements set out in the ETC at the end of the regulatory period.

AEMO's assessment included consideration of shared network augmentations, connection asset augmentations and asset management (including replacement) capital expenditure, to the extent that the proposed work program may impact on longer term network developments.

ElectraNet worked closely with AEMO during the course of the above assessment. AEMO's analysis concurs with ElectraNet's identification of emerging network limitations, the timing of those limitations, and the validity of the options proposed to address them. AEMO has concluded that the requirements of the ETC will be satisfied, and has confirmed the consistency of the forecast with the NTNDP. AEMO's assessment also supports the identified needs and triggers for contingent projects.

2.7 Corporate governance

Consistent with good business practice, ElectraNet has established and maintained a corporate governance framework that provides accountability and enhances sustainable business performance. The framework enables ElectraNet to deliver efficient and timely investment outcomes and services at lowest long-run cost.

Central to this framework is a Network 2035 Vision developed and published by ElectraNet in collaboration with stakeholders to guide the long-term development and operation of South Australia's transmission network. The Vision establishes a set of high level objectives and embodies a set of guiding principles that drive the decision making process for network planning and operational activities throughout the business.

The implementation of these principles is further defined in a series of complementary Board-approved strategies which encompass network development, asset management (maintenance and replacement) and Information Technology. These strategies enshrine

[24] ElectraNet, *South Australian Annual Planning Report 2011*, June 2011 pxi

'continuous improvement' in all aspects of network management through their alignment with the Vision and commitment to least cost service delivery and innovation. These strategies are discussed further in Chapter 3.

The Safety, Reliability, Maintenance and Technical Management Plan (SRMTMP) demonstrates that ElectraNet has management practices in place to ensure safety in design, operation and maintenance of equipment and infrastructure. The SRMTMP also demonstrates ElectraNet's commitment to compliance with safety and technical requirements in all applicable legislation, and the adoption of good industry practice, in accordance with the requirements of the Technical Regulator[25].

The governance framework established by the Vision and strategies mentioned above, and ElectraNet's operational activities within the framework, demonstrate ElectraNet's robust corporate governance and decision making framework, which is focussed on maximising the long-term benefits provided by the South Australian transmission network to the community it serves.

2.8 Structure of the document

The remainder of this Revenue Proposal is structured as follows:

- Chapter 3 describes ElectraNet's business environment, the transmission network in South Australia and the key challenges faced in the forthcoming regulatory period;
- Chapter 4 explains ElectraNet's recent cost and service performance;
- Chapters 5 and 6 describe ElectraNet's capital and operating expenditure forecasts, respectively;
- Chapter 7 calculates the regulated asset base for the forthcoming regulatory control period;
- Chapter 8 describes the depreciation allowance;
- Chapter 9 explains capital financing costs and taxation;
- Chapter 10 presents ElectraNet's proposed service target performance incentive scheme;
- Chapter 11 describes the application of the efficiency benefit sharing scheme in the current and forthcoming regulatory period;
- Chapter 12 presents an overview of the revenue and average price outcomes that will be delivered under this Revenue Proposal, including a summary of each revenue building block component;
- Chapter 13 provides a glossary of terms; and
- Chapter 14 presents a table of Appendices to the Revenue Proposal.

25 A statutory authority established under the *Electricity Act (SA) 1996*, responsible for technical and safety regulation of the electricity supply industry

To assist the AER in assessing this Revenue Proposal's compliance with the Rules and Submission Guidelines, ElectraNet has provided a Submission Guidelines Compliance Checklist in Appendix B. The checklist provides guidance as to the relevant sections of the Revenue Proposal which address each of the Submission Guideline requirements.

Key reference material cited in the Revenue Proposal has been provided to the AER, and any further supporting documentation required will be available on request.

3. Business Environment and Key Challenges

3.1 Summary

This chapter provides a brief overview of ElectraNet's business environment and the key challenges facing the company in the forthcoming regulatory period. This background information provides a foundation for consideration of ElectraNet's recent cost and service performance, and its future expenditure requirements that are set out in subsequent chapters of this Revenue Proposal.

There is increasing community and political sensitivity to rising electricity prices, engendering an ever stronger focus on efficient asset management and delivery of lowest long-run cost solutions by extending asset life, increasing asset utilisation and maximising network performance.

External factors are continuing to shape the cost and prices of electricity transmission services in South Australia, and these inevitably lead to efficient transmission service costs in South Australia being higher than those in other states. These external factors – and their associated costs – reflect the unique characteristics and requirements of South Australia's electricity supply system, including the location of customer load and the demand for energy at peak times.

The key characteristics driving a relatively higher level of efficient costs in South Australia include:

- **Scale** – the overall size of the network and smaller population limit the scope for economies of scale in service delivery relative to larger networks;
- **Customer density** – South Australia has the lowest energy density in the NEM, reflecting the small population and large geographical size, increasing the amount of network that must be maintained to supply each customer;
- **Load factor** – South Australia has the lowest load factor in the NEM, as measured by maximum demand relative to average consumption, increasing the level of capacity required to deliver each unit of energy, pushing up unit costs; and
- **Topology** – given the dispersion of load, the network has a relatively large number of substations that must be maintained for its size relative to comparable networks, and includes a range of smaller voltage assets more typically found in distribution systems (for example long 132 kV radial lines servicing country areas), increasing the cost of transmission.

A number of cost drivers will increase efficient transmission costs in the forthcoming regulatory period including:

- emerging limitations where the network is approaching its installed capability;
- strengthened ETC requirements regarding the required timing for remedial action to be taken to address network limitations;
- peaky and geographically spread loads increasing network demand with lower average utilisation across the network than in other states;

- assets nearing the end of their useful lives resulting in increasing corrective and refurbishment maintenance and asset replacement expenditure requirements;
- increased maintenance activities, driven by fire start risk management and safety programs;
- the drive to extend asset lives, improve asset utilisation, maximise network performance and capability, in order to defer the need for capital investment and deliver lowest long-run cost solutions;
- real wages growth and volatility caused by a projected strengthening in employment demand in the mining and construction sectors in South Australia; and
- technological changes in transmission, power generation and patterns of end-use energy consumption, requiring higher levels of network optimisation and supporting investments in information technology.

The remainder of this chapter is structured as follows:

- Section 3.2 provides a brief description of ElectraNet's transmission system and the cost implications of its physical characteristics for transmission services in South Australia; it also describes ElectraNet's customer base;
- Section 3.3 describes the mandated reliability standards that drive the planning, development and maintenance of ElectraNet's transmission system;
- Section 3.4 focuses on the key challenges and cost drivers facing ElectraNet in the forthcoming regulatory period;
- Section 3.5 describes ElectraNet's strategic framework for responding to these challenges and outlines ElectraNet's strategic priorities for the forthcoming regulatory control period; and
- Section 3.6 provides concluding comments.

3.2 Transmission service delivery

As already noted, there is increasing community and political sensitivity to rising electricity prices, increasing the importance of efficient asset management and delivery of lowest sustainable long-run cost solutions. These factors are driving a stronger ongoing focus on extending asset life, increasing asset utilisation and maximising network performance. ElectraNet applies a risk-based approach to its decision making to achieve an efficient balance between maintaining safety, security and reliability of supply, at the lowest sustainable long-run costs of supplying services.

3.2.1 Benefits to customers

South Australia's electricity transmission network is a strategic asset that underpins the State's economic and regional development, and generates a number of significant benefits for the South Australian community.

The network provides reliability and security of supply

The network links multiple power generators to multiple load centres, and connects the State to the rest of the NEM. The security this provides can be seen on the hottest days in summer, when transmission assets work at their limits as large amounts of electricity are imported from interstate to meet South Australia's power demand. At other times, the network carries electricity exports interstate.

The network also plays a vital role in the State's water security by supplying power to SA Water pumping stations along the River Murray.

The network facilitates sourcing of least-cost electricity

The electricity transmission network enables competition in the National Electricity Market operated by AEMO. Electricity retailers can buy power from competing generators, and a reliable electricity network enables retailers' energy requirements to be sourced and delivered efficiently, even when supply is short.

The network supports economic development and community prosperity

An efficient and reliable electricity transmission network is one of the reasons South Australians can enjoy a high level of prosperity and quality of life. All South Australians rely on the safety, quality and cost-efficiency of transmission services.

The network supports economic development and employment in remote and regional areas by transporting electricity over long distances across South Australia. Without it, many regional locations would have to resort to more costly on-site local power generation. Many regional industry projects would not proceed without direct access to the transmission network.

The network supports development of lower emission energy sources

South Australia has some of the best low emission energy resources in Australia, mostly in remote locations. Wind power is already a major industry, and development of geothermal power is a promising longer-term prospect. The transmission network connects these and other generators to the NEM.

3.2.2 Physical characteristics of the transmission system

ElectraNet's transmission network comprises approximately 5,600 km of transmission lines connecting 86 high-voltage substations and covers a service area of approximately 200,000 km^2.

Figure 3.1 provides an overview of the transmission system and the metropolitan network.

Figure 3.1: South Australian transmission network

The lengths of line for each voltage are given in Table 3.1.

Table 3.1: Circuit kilometres of line

Voltage	Overhead Lines (Circuit km)	Underground Cables (Circuit km)
275 kV	2,543	26
132 kV	3,005	–
66 kV	23	2
Total	**5,571**	**28**

ElectraNet operates and maintains 86 substations, which include 10,673 MVA of installed transformer capacity. Details of ElectraNet's substation assets are summarised by voltage level in Table 3.2.

Table 3.2: Summary of substation assets

Voltage	Number of Substations	Circuit Breakers	Transformers	
			Number	MVA
275 kV	28	181	42	7,557
132 kV	55	194	104	3,116
66 kV	3	66	0	0
Total	**86**	**441**	**146**	**10,673**

3.2.3 Emerging network limitations

Major transmission network augmentations tend to be "lumpy" in nature such that a significant investment may be required to address a certain limitation or constraint, and this additional capacity is then sufficient to meet the demand growth for many years to come.

Where it is feasible and economic to do so, these major investments are deferred for as long as possible by operational measures, non-network solutions (e.g. Port Lincoln generation network support contract) or smaller network investments (e.g. capacitor banks) The range of alternative options considered to defer investment are discussed in Section 5.7.

There are several locations in South Australia where the transmission network is approaching its installed capability. Most of these are at the extremities of the transmission network, and hence solutions are relatively more costly. Some of these locations also have potential mineral resource developments that would result in step increases in electricity demand.

Figure 3.2 illustrates the most significant emerging limitations. Given the uncertainty associated with the proposed large mining investment requirements at this point in time, these projects are treated as contingent projects for the purposes of this Revenue Proposal.

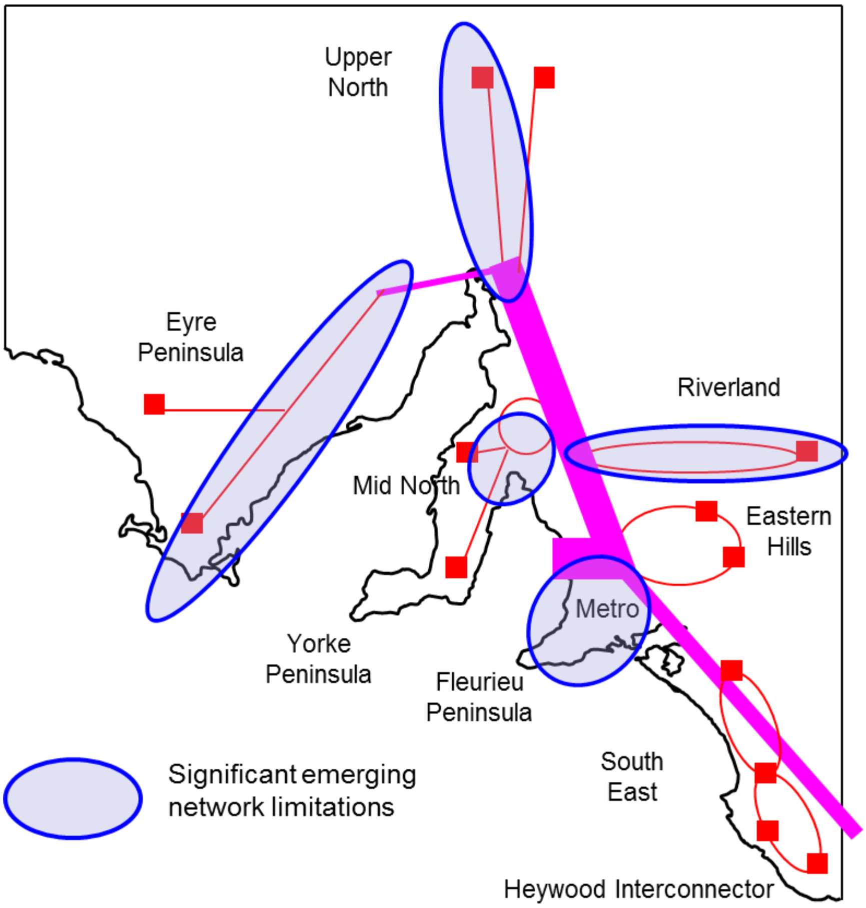

Figure 3.2: Significant emerging network limitations

3.2.4 Cost implications for transmission services in South Australia

South Australia's unique network characteristics drive a number of factors that influence the efficient cost of providing transmission services.

Peak power demand drives investment and it is rising faster than total consumption

Because reliable supply must be maintained even at times of peak power demand, investments are made to meet growth in peak power demand, rather than growth in overall energy consumption.

South Australia has very 'peaky' demand (see Figure 3.3) as measured by maximum power demand relative to average consumption levels. With the State's hot summers and widespread use of air conditioning and a relatively lower level of heavy base load industry accounting for the consumption of electricity throughout the year (such as smelters), the transmission network must have the capacity to supply very large peak electricity demands, notwithstanding the much lower average demand for much of the year.

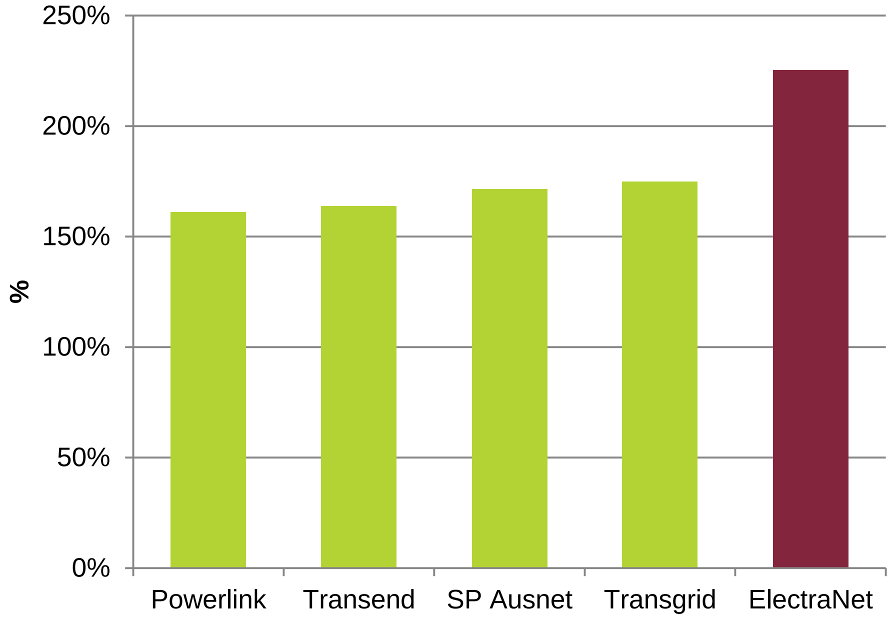

Figure 3.3: Comparative ratio of peak to average electricity demand across Australia[26]

South Australia's electricity demand is spread across a wide geographic area

South Australia's population and load centres are spread over 200,000 km^2 of land area and thus require more power line investment per unit of peak demand serviced than many other areas of Australia. South Australia shares this challenge with Queensland and Tasmania, while Victoria and New South Wales enjoy greater geographic concentration of demand. These characteristics are shown in the two figures below.

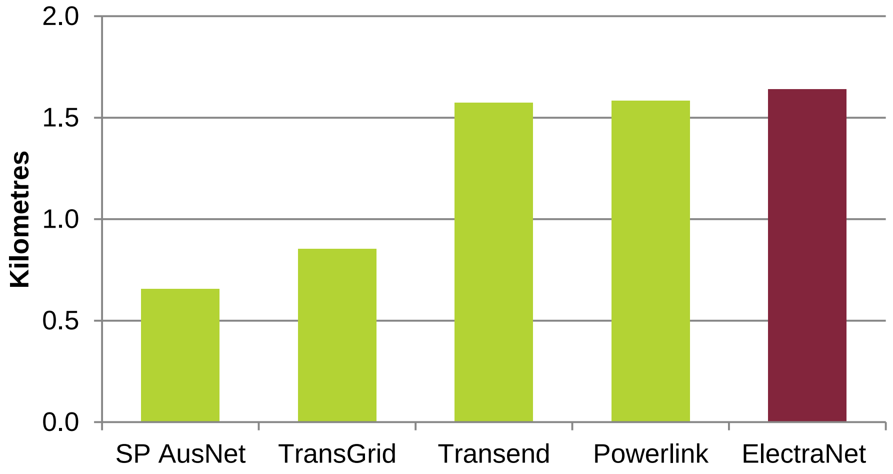

Figure 3.4: Length of transmission line required to supply each MW of peak demand[27]

[26] Source: *Annual 2010-11 Regulatory Accounts information provided by TNSPs*

[27] Ibid

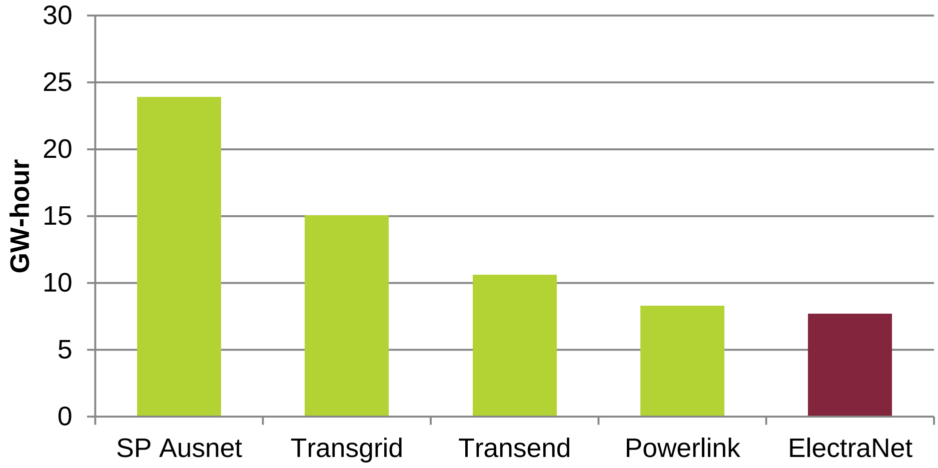

Figure 3.5: Comparative electricity transmitted per $1m of regulated assets[28]

The peakiness of power demand and the geographic spread of South Australia's electricity consumers mean that efficient service prices in South Australia will be higher than in other areas of Australia. Ultimately, network utilisation determines the cost recovered for each MW-hour of energy supplied.

It is the greater investment demands of these external factors and operating conditions that impose a higher cost base on ElectraNet, and inevitably lead to efficient transmission service costs in South Australia being higher than those in other states.

The features identified above that drive the costs of supplying electricity transmission services in South Australia are important when it comes to assessing ElectraNet's costs and expenditure forecasts against the "costs that of a prudent operator in the *circumstances* of the relevant Transmission Network Service Provider" would require to achieve the operating and capital expenditure objectives. [29]

3.2.5 ElectraNet's customers

ElectraNet's customers comprise the South Australian distributor ETSA Utilities, 18 generators and seven directly connected customer loads. ElectraNet's customers and the number of connection points associated with each customer group are summarised in Table 3.3.

Table 3.3: ElectraNet's customer base

Customer Type	No. of Customers	No. of Connection Points
Distributors	1	55
Generators	18	23
Direct connect loads	7	18
TNSPs	2	2
Total	**28**	**98**

28 Ibid

29 As the AER is required to do in accordance with clauses 6A.6.6 and 6A.6.7 of the Rules

ElectraNet's transmission connection agreements with its customers set out the specific terms and conditions that have been agreed for the provision of connection and transmission network services. The services required by the customer are specified in the relevant transmission connection agreement, including the agreed maximum demand for each connection point.

3.3 Mandated reliability standards

ElectraNet is subject to a range of mandated reliability standards as outlined below.

3.3.1 ElectraNet's obligations

Under its licence conditions and the requirements of the National Electricity Rules (NER), ElectraNet must meet a range of statutory obligations such as the following:

- maintain connection point reliability standards;
- maintain regulated voltage levels and reactive margins;
- manage fault levels;
- manage equipment ratings;
- manage system stability and security; and
- manage quality of supply (frequency, harmonics and flicker).[30]

Reliability standards in South Australia are determined by ESCOSA and are published in the ETC as outlined in Section 2.5. clause 2 of the ETC mandates specific reliability standards at each transmission exit point (a customer connection point) or group of exit points, and supply restoration standards.

The terms "N", "N-1" and so forth are commonly used within the electricity industry to categorise reliability standards, and hence are used in clause 2 of the ETC to specify required reliability for the ElectraNet transmission system.

- **N reliability** means that the transmission system is planned and developed to supply the maximum demand, provided that all network elements are in service. This means that the loss of a single transmission element (a line, a transformer or other associated equipment) could cause supply interruption to some customers.
- **N-1 reliability** provides a higher level of reliability**.** It means that no customers would be affected even with any one network element out of service.

The ETC specifies reliability standards for N and N-1 capacity for a number of load categories (and additional requirements for the Adelaide CBD) and allocates each transmission exit point to one of these categories.

As load increases, the ETC requires ElectraNet to augment the relevant connection point and, where necessary, the transmission network either by providing additional transmission capacity or by implementing network support arrangements.

[30] ElectraNet Electricity Transmission Licence, clauses 6.1 and 22.1 (issued by the South Australian Independent Industry Regulator on 31 October 2000 and last varied by the Essential Services Commission of South Australia on 1 July 2008). In respect of reliability standards see clause 2.3, 2.5 – 2.9 of the ETC. In respect of power system performance and quality of supply standards see schedule 5.1 of the Rules.

In the case of a new connection point, ElectraNet is required by clause 2.13 of the ETC to seek the approval of ESCOSA for the applicable reliability standards. Those standards must be developed having regard to a range of factors, including size of the load, value of lost load, types and numbers of customers supplied through the connection point, and location.

As explained above, growth in customer demand together with the ETC clause 2 reliability standards are a key driver of connection point reinforcement and transmission system augmentation.

3.3.2 New ETC standards

ESCOSA completed a public review of the ETC reliability standards in March 2012. As part of this review, AEMO was engaged to undertake an economic assessment and, on the basis of this assessment, recommend changes to reliability standards. The resulting ETC includes minor changes in reliability standards from 1 July 2013, which include:

- upgrading Dalrymple and Baroota connection points to Category 2, requiring N-1 transformer capacity;
- increasing fault restoration requirements; and
- bringing forward required project delivery timeframes to within 12 months of the trigger date.

The new ETC specifies that required project timing is based on the agreed forecast maximum demand (contracted demand) for connection points (currently the agreed maximum demand or contracted demand).

The impact of this change is to reduce timing flexibility, and to bring forward the requirement for capital investments to meet the ETC reliability standards.

ElectraNet is also required by the new ETC to:

- plan, develop and operate the transmission network so as to avoid shedding load under reasonably foreseeable operating conditions; and
- complete all necessary design work, planning approvals and acquire all necessary land and easements to ensure that it is in a position to meet its reliability obligations on the basis of projected demand.

3.4 Key challenges and cost drivers

Development of the transmission network has previously been managed in an environment that is largely predictable. The review of our Network 2035 Vision, as discussed in Section 3.5, indicates a less predictable and more dynamic environment in the future. Consequently, the network faces a range of challenges driven by economic factors, policy changes and evolving technologies. In short, the next 25 years will not be 'business as usual'.

A key challenge for ElectraNet in the forthcoming regulatory period is continuing to pursue lowest long-run cost outcomes and manage costs at a time when a number of drivers are creating upward cost pressures. A brief discussion of the key drivers impacting on ElectraNet's costs follows.

3.4.1 Assets nearing the end of their useful lives

The overall age, and more relevantly the asset condition, of the transmission network in South Australia affects the costs of service delivery.

A range of South Australia's transmission network assets are now approaching the end of their service lives. This has most important implications for the reliability of transmission services in the forthcoming and subsequent regulatory periods. Significantly, approximately 32 percent of ElectraNet's transformer assets and 42 percent of its transmission line assets will exceed their nominal lives (45 years and 55 years respectively) by the end of the 2013-2018 regulatory period. The current age profile of these assets is shown in Figure 3.6 below.

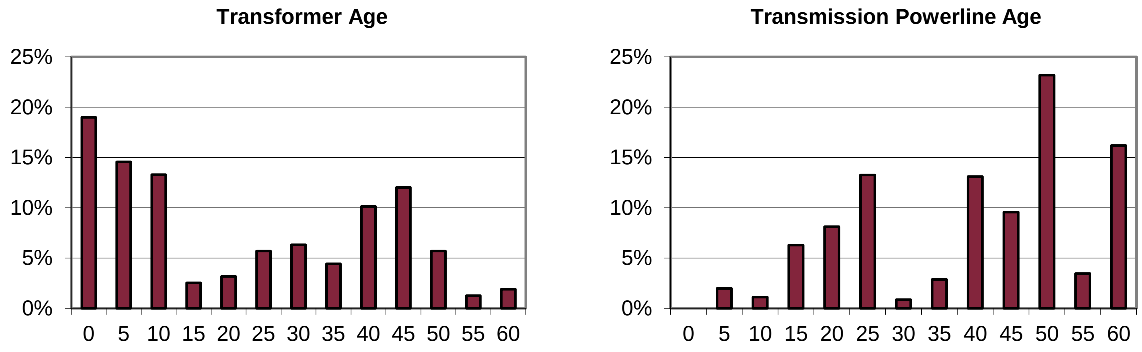

Figure 3.6: Transmission network asset age profiles

While age itself is not the prime factor in developing asset replacement programs, it does provide a trigger for analysis, including condition assessment, and is a good indicator of the assets nearing the end of their useful lives and overall asset replacement needs.

Demand forecasts and development scenario studies for South Australia do not reveal any opportunities to manage the ageing asset base by reducing service capacity. Therefore, it is essential that ElectraNet maintains existing service capacity and acts now to plan for the replacement of those aged assets. If timely action is not taken, maintaining service reliability will become an insurmountable challenge as the risk of asset failures increases and the costs of maintenance in future will be considerably higher.

3.4.2 Safety

Recent bushfires in South Australia and Victoria have put the spotlight on safety systems and practices to mitigate the risk to the community from fires started by power lines. Climate change is anticipated to make this challenge greater over the long-term. Initiatives to mitigate this risk form part of the operating cost forecasts in this proposal.

In that context, while analysis of current transmission line asset inspection and maintenance history provides some data to predict how and when failures on the network could occur, prediction of potential failures can be improved by having a full set of inspection data that is collected over relevant maintenance cycles.

Appropriate physical security is established and maintained on all transmission facilities to prevent unauthorised access. ElectraNet also supports national authorities in their work to protect Australia's critical infrastructure.

3.4.3 Clean Energy

The Australian Government has introduced the Clean Energy Plan which includes a carbon pricing mechanism and investments in renewable energy sources. While this may increase electricity prices and slightly reduce the growth in electricity demand, it is also expected to encourage further investments in alternative energy sources such as wind farms that would require investments in the shared transmission network, in addition to negotiated and non-regulated investments in new dedicated transmission assets.

3.4.4 Demand growth

Various government initiatives aimed at modifying energy usage (such as solar PV, demand management and energy efficiency initiatives) primarily impact on energy consumption rather than peak demand. Therefore, despite these initiatives there is a continuing need for transmission investment driven by forecast growth in peak demand as a consequence of economic growth.

The latest demand forecasts provided by ETSA Utilities and transmission customers at the connection point level and diversified forecasts provided by AEMO at a State-wide level all indicate ongoing growth in peak demand over the forthcoming period and beyond. This continues to drive the need for ongoing investment in the transmission network to meet the standards specified in the Rules and the ETC.

Furthermore, the 2011 Resources and Energy Infrastructure Demand Study published in November 2011 by the Resources and Energy Sector Infrastructure Council highlighted a positive economic outlook in the medium to longer term with the real prospect of significant new mining loads needing to connect to the transmission network.

For example, it found that the proposed mines on the Eyre Peninsula will require electricity for their large scale crushing plants, slurry pipeline pumping operations and water desalination plants. The survey data estimates that about 450 MW of additional total peak load electricity will be required by 2017 in this region.

3.4.5 Labour costs

Labour cost increases are a key driver of ElectraNet's costs. A marked strengthening in employment demand in the mining and construction sectors in South Australia is driving a scarcity of skilled resources in the technical/ engineering disciplines. ElectraNet has increasingly turned to international recruitment in recent years to secure the specialist skills and expertise it requires. Investment in mining and resource development is a key factor in this strengthening of employment demand.

As a result of these labour market conditions, wages growth has been strong in the current regulatory period, and labour costs are expected to continue to increase ahead of the rate of inflation over the next regulatory period and beyond. The labour cost assumptions underpinning the capital and operating expenditure forecasts are presented in Sections 5.8.8and 6.7.4 respectively.

3.4.6 Technological change

Technological change in transmission, power generation and patterns of energy consumption will influence the network directly (e.g. smarter technology) and indirectly (e.g. new forms of electricity generation and electricity usage and possible large-scale and local energy storage).

For example, small-scale solar PV generation has the potential to slightly reduce summer maximum demand, while plug-in electric vehicles may lead to an increase in demand if there is sufficient uptake. Although there are currently few plug-in electric vehicles in Australia, several major car companies are planning to release all-electric models in the next few years.

In addition, a number of IT developments are necessitating investments in the systems that support the business:

- Increasingly ubiquitous internet connectivity has created a rapid increase in availability of data and information underpinned by advances in telecommunication, computing, geospatial, automation, protection and asset management technology, creating both risks and opportunities from a network management perspective.
- Computer networks and computer systems are under increasing attack from terrorist, criminal and ideological groups with operational risks amplified by the increasing amount of Operational Technology that is connected to internet-based computer networks, increasing the security measures ElectraNet must implement to protect its assets and systems.
- Configurability of devices provides greater capability for remote monitoring, diagnosis and control of network equipment, offering scope to improve network performance and reliability, while also increasing the challenges of configuration management.

3.5 Strategic framework

In responding to the challenges ahead, ElectraNet has worked with its key stakeholders to develop and implement its Board-approved Network 2035 Vision as a framework for the long-term development and operation of South Australia's electricity transmission network.

Development of this updated Vision followed an extensive engagement process with stakeholders. This included initial consultation and research on key future challenges impacting on the network, and public consultation on the proposed Vision in late 2011.

This Vision establishes a set of clear objectives and guiding principles which inform decision making on the management and operation of the network. These objectives are implemented through an integrated framework which is described further below.

3.5.1 Network 2035 Vision and guiding principles

The Network 2035 Vision sets out a future vision of safe, secure and reliable transmission services delivered to customers at lowest long-run cost in a way that supports South Australia's economic development and contributes to reducing carbon emissions. The vision sets out four key objectives to meet South Australia's electricity transmission needs in an increasingly dynamic and changing environment:

- **Ensure safe, secure, reliable supply** – A safe, secure and reliable network focused on resilience against natural disasters and extreme weather events that ensures both community safety and secure electricity supply for South Australia.
- **Deliver transmission services at lowest long-run cost** – Continued delivery of lowest long-run cost network services by intelligent network planning and use of smart grid technology to increase network asset utilisation. ElectraNet will manage input cost pressures and work with others to seek ways to reduce the growing gap between base-load and peak power demand.

- **Support South Australia's economic development** – Economically efficient network investment that supports South Australia's development. ElectraNet will align its plans with industry needs and continue to explore opportunities for more interstate interconnection to increase price competition in the local electricity market.
- **Support development of lower emission energy sources** - A network to support the continued development of South Australia's low emission energy resources by providing the link between remote generation sources and major load centres.

Associated with the Network 2035 Vision is a set of guiding principles and Board-approved strategies which guide network development and asset management and associated plans.

3.5.2 Network 2035 Vision implementation framework

The Board-approved framework for implementation of the Vision[31], guiding principles and objectives drives integrated decision making on the long-term management and development of the network at all levels. The relationship between the Network 2035 Vision and network planning and operational activities is outlined in Figure 3.7 below.

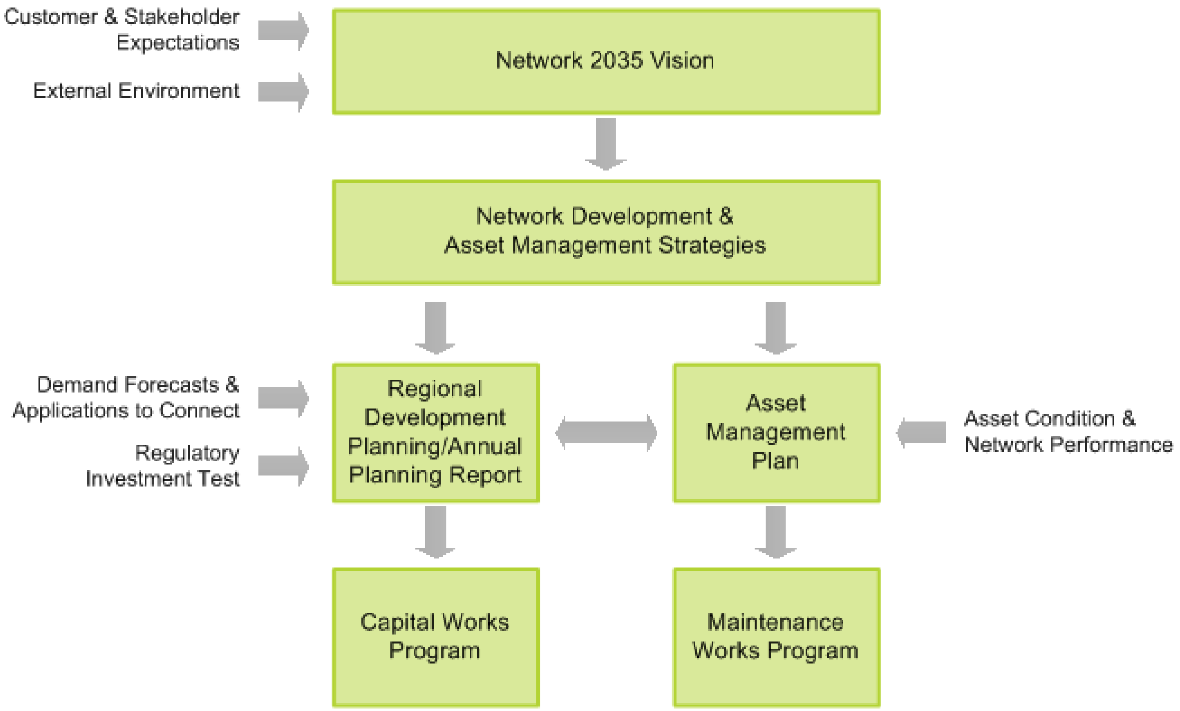

Figure 3.7: Network 2035 Vision – Strategic Framework

3.5.3 Network development

The focus of the Board-approved network development strategy[32] is on meeting customer demand for transmission services and delivering net market benefits in the most cost effective manner, while meeting prescribed reliability and quality of supply standards. This includes consideration of non-network solution options and the use of contingent projects to manage uncertainty (e.g. in relation to the cost and timing of augmentations to serve potential new large loads).

31 ElectraNet, *Network 2035 Vision Strategy,* April 2012, Appendix C

32 ElectraNet, *Network Development Strategy,* May 2012, Appendix D

The strategic priorities for network development are:

- apply future network development scenarios (including load and generation) consistent with the NTNDP to model and assess network capability to meet forecast demand increases;
- identify emerging electricity and telecommunications network limitations and develop lowest long-run cost solution options including non-network options;
- defer capital investments for as long as possible by adopting, where it is feasible and economic, operational, non-network (e.g. demand side response or generation network support) or lower cost network solution options;
- maximise efficiency by aligning replacement capital expenditure with connection and augmentation requirements, wherever possible;
- acquire strategic land and easements in advance of asset construction (consistent with ETC requirements) in order to enable timely delivery of future new transmission lines and substations; and
- ensure adherence to regulatory obligations with regard to security and compliance (e.g. through control schemes and substation upgrades to reduce outage impacts).

The Board-approved network development strategy provides more information on the context for the above strategic priorities and how ElectraNet is delivering on them.

3.5.4 Asset management

The efficient and effective management of ElectraNet's assets is critical to managing risk and optimising the balance of lowest whole-of-life cost against net long term benefits, in order to deliver reliable and efficient transmission services to the South Australian community. This forms the basis of the Board-approved asset management strategy[33], underpinned by a risk-based approach to decision making and guided by the objectives and principles of the Network 2035 Vision.

The strategic priorities for asset management are:

- Develop an integrated asset management platform, supported by robust data and information management processes to deliver safe, secure and reliable transmission services;
- Employ smarter asset maintenance practices and new technology to increase asset life, network utilisation and performance to deliver services at lowest long-run cost;
- Maintain the condition of the transmission network to meet the supply requirements of consumers and industry, thereby facilitating economic development; and
- Manage the risk of transmission assets to maximise the capability and capacity of the network through line rating initiatives and responsive maintenance.

The Board-approved asset management strategy provides more information on the context for the above strategic priorities and how ElectraNet is delivering on them.

[33] ElectraNet, *Asset Management Strategy,* May 2012, Appendix E

3.5.5 Information technology

Safe, secure and reliable electricity transmission services depend critically on information technology (IT) infrastructure to provide accurate, reliable and detailed information on the condition of assets and status of the network to support real time operational decision making and long-term investment and asset management planning.

The IT environment in which ElectraNet operates presents a range of challenges and opportunities. These include introduction of new technologies, increasing risk of cyber-attacks, increasing flexibility among the workforce requiring more flexible IT services and greater demands on the performance and usability of IT assets.

The strategic priorities for the Board-approved information technology strategy[34] are:

- Ensure safe, secure and reliable supply:
    - reduce network configuration change management risks;
    - reduce Transmission System Operator “information overload”;
    - enable safe, secure, reliable transmission system operation; and
    - ensure availability and security of IT assets.
- Deliver transmission services at lowest long-run cost:
    - enable remote configuration and control of network assets;
    - enable remote access at any time;
    - improve the quality and accessibility of operational and corporate information;
    - improve the way in which systems streamline business processes; and
    - minimise whole of life costs and risks.

The Board-approved information technology strategy provides more information on the context for the above strategic priorities and how ElectraNet is delivering on them.

3.6 Concluding comments

South Australia’s transmission network faces a number of challenges due to its particular physical characteristics that inevitably lead to efficient transmission service costs in South Australia being higher than those in other states. These physical characteristics include limited potential for economies of scale, the lowest energy density in the NEM, the large number of substations and lower voltage assets, and the lowest load factor in Australia.

Consequently, a number of drivers are creating upward cost pressures in the forthcoming regulatory period including:

- a number of identified network limitations, where the network is approaching its installed capability, will require ElectraNet to take corrective action;
- peaky and geographically spread loads increasing network demand, while average utilisation across the network will continue to be lower than in other states;
- assets are nearing the end of their useful lives, resulting in increasing requirements for corrective and refurbishment maintenance and asset replacement expenditure;

[34] ElectraNet, *Information Technology Strategy,* April 2012, Appendix F

- increased maintenance activities will be driven by fire start risk management and continued safety programs;
- real wages growth and volatility caused by a projected strengthening in employment demand in the mining and construction sectors in South Australia; and
- technological changes in transmission, power generation and patterns of energy consumption requiring higher levels of network optimisation and supporting investments in information technology.

ElectraNet has responded to these challenges by working with its stakeholders in the development of the Network 2035 Vision which sets out a future vision of safe, secure and reliable transmission services delivered to customers at lowest long-run cost, in a way that supports customers' future needs, thereby facilitating South Australia's economic development and contributing to reduced carbon emissions.

Together with its objectives, guiding principles and supporting strategies, the Vision establishes a comprehensive framework that enables ElectraNet to meet its mandated reliability and quality of service obligations while delivering services to customers at the lowest long-run cost.

ElectraNet's plans for delivering on these commitments in the forthcoming regulatory period are set out in this Revenue Proposal.

4. Historic Cost and Service Performance

4.1 Summary

This chapter describes ElectraNet's actual and expected capital and operating costs and service performance for the current regulatory period (2008-09 to 2012-13). ElectraNet has used audited results for available years and forecasts of expected costs for the remainder of the period (2011-12 and 2012-13 financial years). The analysis includes the comparison of ElectraNet's capital and operating expenditure performance against the AER allowance. This is followed by a review of ElectraNet's performance under the Service Target Performance Incentive Scheme (STPIS) including the Market Impact Parameter (MIP).

The remainder of this chapter is structured as follows:

- Section 4.2 summarises the key requirements of the Rules that relate to historical capital and operating expenditure;
- Section 4.3 presents an analysis of ElectraNet's capital expenditure performance during the current regulatory period. This section also discusses the prudence of ElectraNet's capital expenditure over the current regulatory period;
- Section 4.4 presents an analysis of ElectraNet's operating expenditure performance during the current regulatory period;
- Section 4.5 explains ElectraNet's service target performance during the current regulatory period, including the market impact of transmission congestion parameter; and
- Section 4.6 provides some concluding observations.

4.2 Rules requirements

Clauses 6A.6.6(e)(5) and 6A.6.7(e)(5) of the Rules require the AER, when assessing expenditure forecasts, to have regard to the actual and expected capital and operating expenditure of the TNSP during any preceding regulatory control periods. This chapter is intended to provide the information that the AER needs to address this Rule requirement.

Clause S6A.1.1(6) requires ElectraNet to provide an annual summary of capital expenditure for the current regulatory period categorised in the same way as for the capital expenditure forecast. Similarly clause S6A.1.2(7) requires ElectraNet to provide an annual summary of operating expenditure categorised in the same way as the operating expenditure forecast. The information provided in this chapter fulfils this requirement.

Under clause 6A.10.2(b) the AER may require any information contained in or accompanying a Revenue Proposal to be audited or otherwise verified. The historic expenditures reported below are consistent with the regulatory financial statements submitted to the AER on an annual basis, and have been subject to audit assurance provided on each occasion, thereby fulfilling this requirement.

4.3 Analysis of historic capital expenditure

As required under clause S6A.1.1 of the Rules, this section provides a high level analysis of ElectraNet's best estimate of capital expenditure for the current regulatory period 2008-09 to 2012-13, categorised consistently with forecast capital expenditure, along with an explanation of significant variations between historical and forecast capital expenditure. This information also satisfies the requirements of the applicable Submission Guidelines.[35]

During the current regulatory period, the triggers for two contingent projects, the Adelaide Central Reinforcement (line component) and the Munno Para reinforcement, were realised[36]. In accordance with the procedures specified under 6A.8 of the Rules and the AER's Contingent Project Guidelines[37], the AER's 2008 revenue allowance was amended to reflect the forecast efficient costs associated with these projects. This has resulted in a final approved capital expenditure allowance of $851m (nominal).

ElectraNet has actively managed changing network investment priorities within this amended capital expenditure allowance and is confident that it has made prudent investment decisions in the light of the actual circumstances that eventuated over the course of the regulatory period.

During the period, ElectraNet has applied a continuous improvement approach to the management of its capital expenditure. These improvements include the implementation of a multi-staged estimation and approvals process, the optimisation of delivery of complementary projects and the implementation of tighter controls on project delivery. These initiatives have contributed to the overall outcome of prudent investment within the allowance.

Table 4.1 presents ElectraNet's actual and estimated capital expenditure by year relative to the AER allowance for the current period. While there have been some year-on-year variations relative to the AER allowance, the table indicates that ElectraNet is forecasting to spend to within 1 percent of its approved allowance.

Table 4.1: Capital expenditure as incurred ($m nominal)

	2008-09	2009-10	2010-11	2011-12	2012-13	Total
AER allowance* ($2007-08)	129.9	178.0	226.9	175.0	78.5	**788.3**
AER allowance (CPI escalated)	133.1	187.7	247.2	193.6	89.5	**851.0**
Actual/ forecast (net disposals)	97.4	117.6	232.2	180.6	218.7	**846.5**
Variation	(35.7)	(70.1)	(14.9)	(13.0)	129.2	**(4.6)**

* Including approved contingent projects

35 Clauses 2.8, 4.3.3(a)(6), 4.3.3(a)(7) and 4.3.3(b)

36 In the case of the Munno Para Reinforcement Project, the approved capital expenditure extends over two regulatory periods, with a $9m allowance provided for the current period and $34m approved for the forthcoming period in accordance with clause 6A.8.2 of the Rules (in $12-13)

37 AER, *Final Process Guideline for contingent project applications under the National Energy Rules*, September 2007

The following factors have contributed to the variation in capital expenditure profiles:

- a shift in the required timing of major projects (see explanation below); and
- some unexpected difficulties and delays in securing external approvals.

Table 4.2 shows actual and expected annual capital expenditure in the current period by category. This same categorisation is used to present ElectraNet's capital expenditure forecast for the 1 July 2013 to 30 June 2018 regulatory period in Chapter 5 of this Revenue Proposal.[38]

Table 4.2: Actual and expected capital expenditure as incurred by category ($m nominal)[39]

Category	2008-09	2009-10	2010-11	2011-12	2012-13	Total
Augmentation	14.3	42.5	161.8	72.1	56.4	**347.1**
Connection	11.8	20.8	28.9	23.7	35.6	**120.9**
Replacement	55.3	35.0	19.2	47.0	69.5	**226.0**
Strategic land/ easements	1.2	0.2	1.2	12.3	14.5	**29.4**
Security/compliance	3.7	8.0	11.0	14.1	23.8	**60.6**
Inventory/spares	3.8	2.4	2.2	2.4	4.1	**15.0**
Business IT	6.4	5.8	7.3	7.7	12.7	**39.9**
Buildings/facilities	0.9	2.8	0.7	1.2	1.9	**7.5**
Total	**97.4**	**117.6**	**232.2**	**180.6**	**218.7**	**846.5**

Table 4.3 compares ElectraNet's actual and expected capital expenditure during the current regulatory period with the AER's capital expenditure allowance by category.

Table 4.3: Comparison of capital expenditure in current period by category ($m nominal)

Category	AER Decision	Actual/Forecast	Variance
Augmentation	304.0	347.1	43.1
Connection	141.5	120.9	(20.6)
Replacement	271.2	226.0	(45.2)
Strategic land/easements	15.8	29.4	13.5
Security/compliance	56.8	60.6	3.8
Inventory/spares	17.1	15.0	(2.1)
Business IT	30.6	39.9	9.2
Buildings/facilities	13.8	7.5	(6.3)
Total	**851.0**	**846.5**	**(4.6)**

38 In accordance with clause S6A.1.1 (6) of the Rules. For completeness it is also noted that ElectraNet has reintroduced the Refurbishment category in the forthcoming regulatory period, for which there was no spend in the current period

39 Figures for 2011-12 and 2012-13 are expected capitalisations

In summary, ElectraNet's expected actual capital expenditure for the current regulatory control period is $846m (on an as-incurred basis). Achieving this 'within-allowance' outcome in the face of changing priorities is the result of proactive and prudent capital management, together with continuous improvement initiatives:

- savings were achieved by further combining some replacement works with existing projects already at those sites, whilst other replacement projects were rescheduled to align with later augmentation projects at those sites;
- Southern Inner Metropolitan and Adelaide Central Reinforcement augmentation and connection projects were combined, and significant efficiencies were achieved in project delivery and cable procurement;
- some forecast connection projects were able to be deferred due to local demand forecast reductions and network configuration changes; and
- the need to construct office buildings was deferred through use of commercial buildings obtained in the course of a substation land purchase, and short-term office space leasing options.

The above initiatives have enabled ElectraNet to manage its expenditure priorities within the capital allowance despite upward cost pressures:

- there were increases in project costs due to complexities and unforeseen scope items which arose in some projects, in particular civil works and telecommunications assets and project land costs (e.g. the Mount Barker South Substation Augmentation);
- there were delays in completion of some replacement projects from the previous regulatory period resulting in carry-over expenditure in this period (e.g. Playford Substation relocation);
- additional strategic land acquisition was required to prepare for future network projects due to increasing acquisition risks which emerged during the period;
- load increases above forecasts required some augmentation projects to be brought forward; and
- there was an increase in complexity and cost of several secondary system replacement projects.

Despite these challenges, ElectraNet successfully managed the delivery of its capital investment program during the period, including on time completion of the significant number of reliability standard upgrades required by the ETC.

Of note, ElectraNet successfully delivered the $180m Adelaide Central Reinforcement project during the period, providing the biggest upgrade to supply reliability for the Adelaide CBD in 25 years. This represents the largest project undertaken to date by ElectraNet and was delivered on time and within the approved allowance, and in the context of a challenging overall timeframe. A contributor to this positive outcome was the application of refined project management techniques that emerged from ElectraNet's continuous improvement initiatives. These productivity measures are continuing into the forthcoming regulatory control period.

ElectraNet has formulated and delivered its capital projects to address the most pressing network issues that eventuated during the regulatory period. Differences between the composition and timing of actual capital expenditure and the allowance reflect a prudent response to the changing circumstances that arose during this period.

4.4 Analysis of operating expenditure performance

As required under clause S6A.1.2 of the Rules, this section provides a high level analysis of ElectraNet's best estimate of operating expenditure for the current period 2008-09 to 2012-13, categorised consistently with forecast operating expenditure, along with an explanation of significant variations between historical and forecast operating expenditure. This information also satisfies the requirements of the applicable Submission Guidelines.[40]

ElectraNet's approved operating expenditure allowance for the 2008-09 to 2012-13 regulatory period comprises a total controllable operating expenditure allowance of $283.5m (nominal) and total operating expenditure allowance of $325.7m. This includes the incremental operating expenditure associated with the two contingent project approvals noted in section 4.3.

Table 4.4 and Figure 4.1 below present ElectraNet's actual and estimated operating expenditure by year relative to the approved allowance for the current period. ElectraNet has used actual expenditure incurred to date and forecast figures for the remainder of the period.

Table 4.4: Controllable operating expenditure in current regulatory period ($m nominal)

	2008-09	2009-10	2010-11	2011-12	2012-13	Total
AER allowance	50.0	53.1	56.7	60.2	63.6	**283.5**
Actual/forecast	48.4	51.0	56.0	64.5	65.3	**285.3**
Variation	1.6	2.1	0.6	(4.3)	(1.8)	**(1.8)**

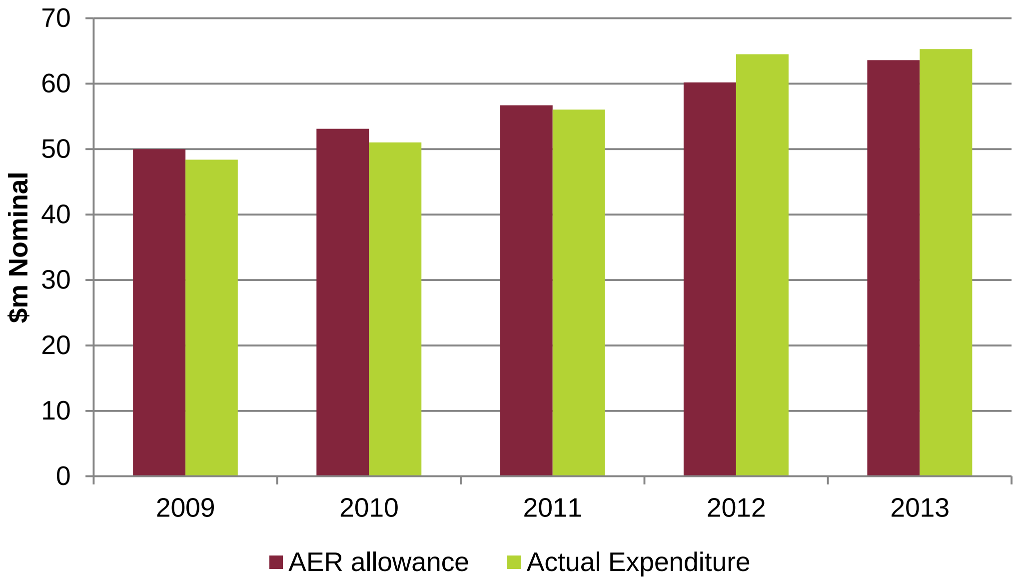

Figure 4.1: Comparison of 2008 decision and actual/ forecast controllable opex ($m nominal)

[40] 4.3.4(a)(7), 4.3.4(a)(8) and 4.3.4(c)(1)

The approved allowance for the period was very close to the Revised Proposal put forward by ElectraNet in 2008. ElectraNet has been able to actively manage its business operations within this allowance, demonstrating the effectiveness of its operational expenditure management and providing confidence that its forecasting processes are robust.

ElectraNet has responded positively to regulatory incentives and was able to achieve overall cost savings (relative to the revenue cap allowance) in the early years of the regulatory period. Savings, primarily in corporate costs, have been achieved through the restructuring of business operations to achieve efficiencies, and a reduction in insurance premiums.

The purpose of the restructure of business operations undertaken in 2010 was to create a corporate structure to better position ElectraNet for increased demand for transmission services, efficient asset delivery and process optimisation initiatives.

However, the cost savings realised in the earlier years have been overtaken by cost increases resulting from increased asset management requirements that have emerged during the latter years of the period. ElectraNet's continuous improvement approach to asset management resulted in the identification of a number of areas which required additional expenditure.

In particular, the following factors increased the cost of compliance and resulted in overall maintenance costs in the current period exceeding the relevant allowance:

- the continued implementation of the established maintenance regime to address fire start risk and revealed asset condition;
- an increase in the aerial inspection program; and
- a change in the Technical Regulator's vegetation management requirements.

Despite these emerging cost pressures, in aggregate terms ElectraNet has been able to manage its expenditures to within 0.6 percent of the total controllable operating expenditure allowance over the period. However, ElectraNet expects the underlying cost drivers that arose in the latter years of the current regulatory control period to continue in the immediate future, impacting on costs in the forecast period.

Audit assurances of historic operating expenditure information have been provided to the AER as part of ElectraNet's annual regulatory financial statements reporting process[41].

Table 4.5 shows ElectraNet's annual operating expenditure in the current regulatory period by category. This same categorisation is used to present ElectraNet's operating expenditure forecast for the forthcoming regulatory period in Chapter 6 of this Revenue Proposal, with the introduction of a new expenditure category (Network Optimisation) as explained in Section 6.7.2.

For completeness, it is noted that ElectraNet has previously incorporated self-insurance in its controllable operating expenditure allowance. However, given that this operates as an accumulation fund to manage uninsured risks that arise during the period, ElectraNet has not included self-insurance in the controllable operating expenditure allowance for the forthcoming regulatory period, consistent with the accepted treatment adopted by other

41 Further, as required by the Submission Guidelines, ElectraNet has prepared and lodged pro forma statements in relation to historic operating expenditure

TNSPs. Self-insurance has therefore been removed from both the controllable operating expenditure allowance and the actual/estimated controllable operating expenditure.

Table 4.5: Operating expenditure in current regulatory period by category ($m nominal)

Category	2008-09	2009-10	2010-11	2011-12	2012-13	Total
Field maintenance	19.3	22.9	26.0	30.5	27.6	**126.2**
Maintenance support	9.3	8.1	9.2	11.4	11.7	**49.7**
Network Operations	2.3	2.1	2.1	3.8	4.1	**14.4**
Asset manager support	6.3	6.0	7.1	7.7	8.3	**35.4**
Corporate support	11.2	11.9	11.6	11.2	13.7	**59.6**
Total controllable	**48.4**	**51.0**	**56.0**	**64.5**	**65.3**	**285.3**
Other opex*	6.5	6.6	8.2	8.6	9.2	**39.1**
Total	**54.9**	**57.6**	**64.3**	**73.1**	**74.5**	**324.4**

* Includes self-insurance, network support payments and debt raising costs

Table 4.6 provides a brief description and explanation of ElectraNet's operating expenditure by category during the current regulatory period.

Table 4.6: Description of operating expenditure in current regulatory period by category

Category	Description and explanation of operating expenditure
Field Maintenance	Field maintenance includes routine and corrective maintenance activities and operational refurbishment projects. ElectraNet has continued to implement its established maintenance regime across all asset types, within a continuous improvement framework. Implementation of improved data collection and condition assessment, along with a more structured inspection regime, has revealed more clearly the underlying condition of the network and seen an ongoing increase in maintenance requirements over the period: • **Routine –** increased inspection and maintenance effort for transmission lines, including an expanded aerial inspection program driven by asset condition and fire start risk has seen a cost increase over the period. New regulatory vegetation clearance requirements have also increased costs. • **Corrective –** implementation of a System Condition and Asset Risk (SCAR) coding framework has revealed a large volume of defects, leading to several large scale corrective projects and confirming the need for a significant increase in corrective maintenance, particularly for transmission line assets. • **Refurbishment –** expanding condition assessment, asset refurbishment and replacement requirements have led to an emerging increase in costs in order to manage fire start and other high priority risks.
Maintenance Support	This activity includes monitoring and managing the delivery of field maintenance services delivered by external service providers under contract. The costs of this activity have been relatively stable, and are driven by the overall maintenance program.
Network Operations	This activity refers to network control centre functions and other network operations activities. The costs of this activity have been relatively stable.

Category	Description and explanation of operating expenditure
Asset manager Support	Asset Manager Support includes operations that support the strategic development and ongoing management of the network, including network planning, network support, customer and regulatory support and IT support. The costs of this activity have been relatively stable, although ElectraNet has obtained some long-term efficiency improvements by restructuring support services.
Corporate Support	Corporate Support includes activities required to ensure adequate and effective corporate governance and business administration. This includes financial and HR management, employee relations, OHS, internal audit and external insurance. Long term sustainable savings have been achieved through implementation of a new organisation structure and lower insurance premiums.

The analysis presented in this section demonstrates that despite internal efficiencies achieved early in the period, a number of emerging factors will continue to place significant upward pressure on efficient costs, as asset management and corrective programs are applied to a growing and ageing asset base. The increased expenditure required on remedial work and routine inspection to manage identified asset risk will remain relevant for the forthcoming and following regulatory periods.

4.5 Service performance

The AER's STPIS aims to provide further incentives for TNSPs to improve or maintain levels of availability, reliability and restoration time after unplanned outages in the delivery of transmission services, and to minimise the impact of planned outages.

The AER's 2008 revenue cap decision for the current 2008-09 to 2012-13 regulatory period requires ElectraNet to measure its network performance against six parameters:

- transmission circuit availability;
- transmission circuit availability – critical peak;
- transmission circuit availability – critical non-peak;
- average outage duration;
- frequency of loss of supply events < 0.2 system minutes; and
- frequency of loss of supply events < 0.05 system minutes.

The indicators were modified by the AER in its 2008 revenue cap decision to introduce the critical peak availability parameter, which seeks to incentivise the reduction in unavailable hours during peak times. Further, the AER reduced the thresholds applicable to the supply event frequency parameters from 1.0 and 0.2 to 0.2 and 0.05 system minutes respectively.

In addition, the AER approved ElectraNet's application for the early implementation of the Market Impact of Transmission Congestion (MITC) parameter in October 2010. ElectraNet commenced participating in this element of the scheme on 1 January 2011.

ElectraNet's performance against these indicators during the current regulatory control period exhibits an overall trend of high performance, as shown in the remainder of this section. Performance against the average outage duration and supply event frequency parameters has been influenced by low probability high impact events, highlighting the radial nature of ElectraNet's transmission network.

The analysis of service performance is presented for the most recent five year period below.

Table 4.7: Performance against AER service standards scheme

	2007	2008	2009	2010	2011
Availability (%)	99.37	99.27	99.94	99.64	99.59
Availability Critical Peak (%)	99.03	97.80	99.86	99.75	99.30
Availability Critical Non-Peak (%)	99.53	99.82	99.84	99.71	99.41
Average Outage Duration (Minutes)	270	199	161	127	256
No of events >0.2 System minutes	2	1	2	6	1
No of events >0.05 System minutes	7	5	4	10	7
Market Impact Parameter (Dispatch Intervals)	2,427	1,834	515	1,789	1,375

Table 4.7 above shows that ElectraNet has responded positively to incentives to improve network availability and reliability, as is demonstrated by the high percentage of transmission line availability and low number of loss of supply events in most years.

This has been achieved in part by ElectraNet's proactive continuous improvement approach to asset management, with initiatives targeted at improving network performance including:

- real time optimisation tools to provide linkages between systems and therefore enable efficient and effective responses to outages in a complex and dynamic environment;
- live line work practices, specifically for transmission line works, to enable maintenance and project works to be completed without taking assets out of service; and
- expansion of the condition assessment program into a full lifecycle assessment involving analysis of a wide range of factors affecting overall performance of assets, such as defect and capability analysis to provide key inputs into asset replacement and maintenance planning.

The following sections discuss ElectraNet's performance against each of the service performance indicators in Table 4.7 above, and compare this performance with the performance targets set by the AER.

4.5.1 Transmission line availability

ElectraNet's transmission circuit availability from 2007 to 2011 for critical, peak and non-peak circuits is presented in Figure 4.2, 4.3 and 4.4 respectively.

The progressive implementation of performance management initiatives has resulted in improvements in this indicator over the last five years, from an already high base as shown in Figure 4.2 below.

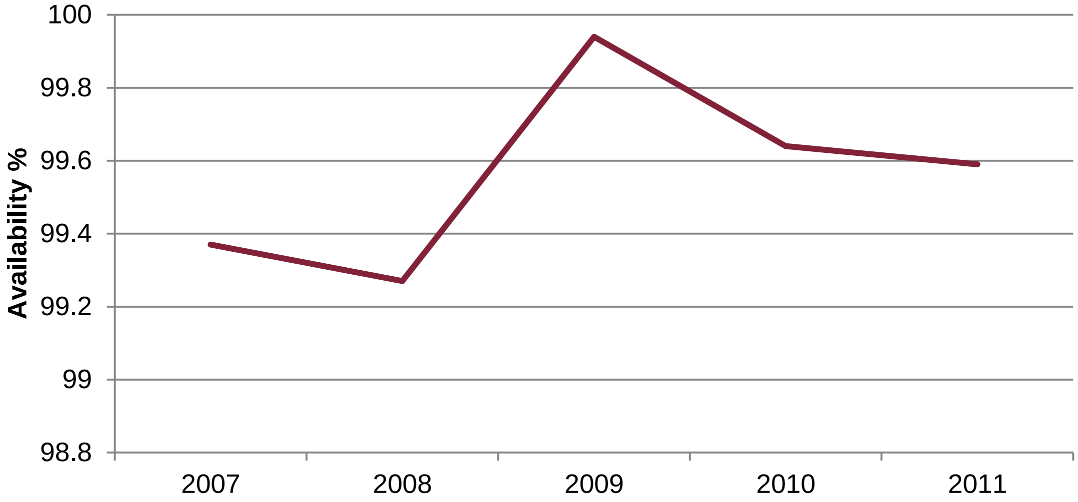

Figure 4.2: Transmission line availability from 2007-11

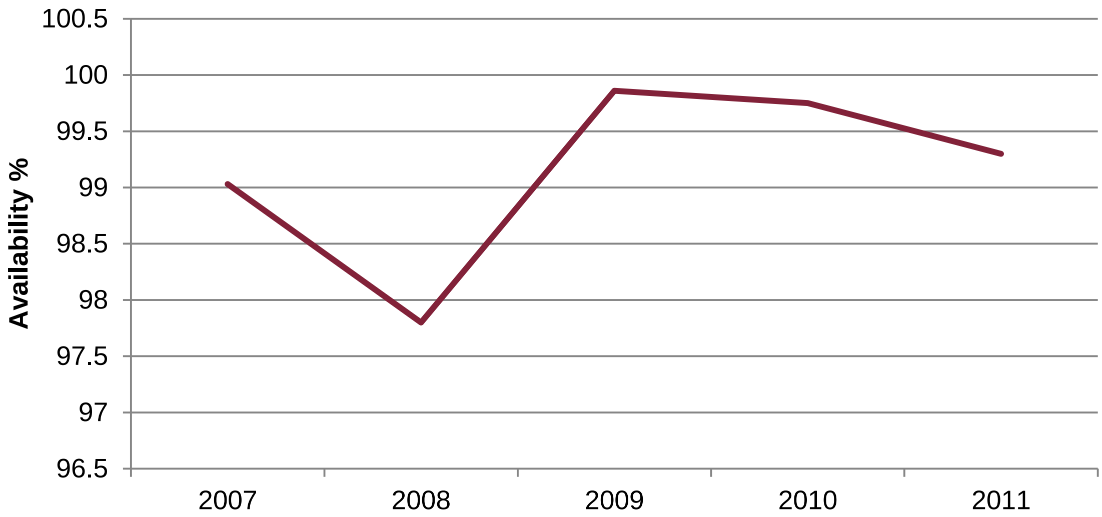

Figure 4.3: Critical peak transmission line availability from 2007-11

Figure 4.4: Critical non-peak transmission line availability from 2007-11

Most outages on transmission lines during the period have been for planned capital works and scheduled maintenance. It should be noted that customer supply has not been negatively impacted by these works.

Although planned works impacted on reported performance against these parameters during the period, ElectraNet has taken steps to maximise its performance against the AER's availability targets. This has been achieved through improved field and support practices, including live line work methods to enable maintenance and project works to be completed without taking assets out of service.

However, ElectraNet anticipates further improvements will be difficult and costly to achieve, as ElectraNet has already realised the available and feasible cost-effective opportunities to minimise outage durations. This should be recognised in the setting of caps and collars in the STPIS to apply during the next regulatory period, particularly given the complexity and number of projects that lie ahead.

4.5.2 Average outage duration

ElectraNet's outage and incident management is at 'best practice' level. ElectraNet works within a strict jurisdictional regulatory framework including vegetation clearance management requirements and the maintenance of the transmission network in accordance with the ESCOSA-approved SRMTMP and licensing arrangements.

Performance against the average outage duration parameter during the current regulatory period has been dominated by low probability high impact outages on the radial network. Figure 4.5 below shows the trend in average outage duration from 2007 to 2011.

A number of extended unplanned outages were experienced due to:

- clustered events of extreme weather (severe wind and storms) which resulted in major outages; and
- the radial nature and geographical dispersion of the network.

This is consistent with the concerns raised in ElectraNet's 2007 Revenue Proposal which noted that outages involving transmission lines north of Port Augusta or south of Whyalla, as experienced during the current period, may take many hours to restore due to the remote locations and lengths of these lines, and the prudent (public safety) requirement to patrol affected lines following an unplanned outage. Such outages could result in significant variations in measured outcomes from year to year.

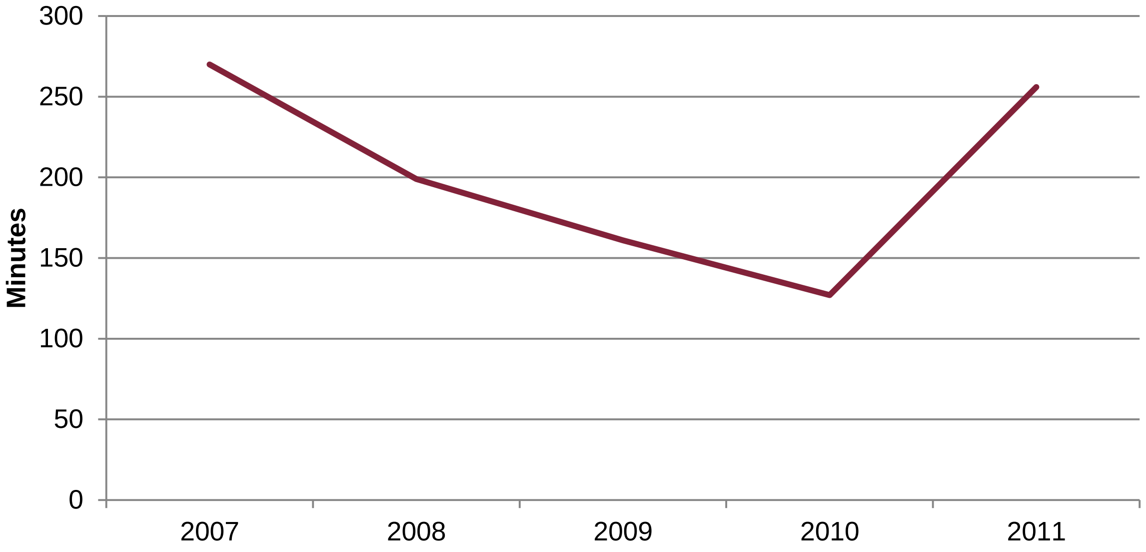

Figure 4.5: Average outage duration from 2007-11

4.5.3 Loss of supply event frequency

ElectraNet's frequency of loss of supply for moderate and large events from 2007 to 2011 is shown in Figure 4.6 below.

Performance against this measure has improved due to the implementation of enhanced outage risk assessments for scheduled capital and operational work to identify modes of failure and, more importantly, remediation. As shown in Figure 4.6, the Events >0.2 System Minutes has improved marginally, but is also impacted by variability due to factors such as extreme weather events, as observed in 2010.

However, like the availability parameter, it is expected that the scope for further improvements to the Loss of Supply parameter is limited as all readily identifiable improvements have been achieved.

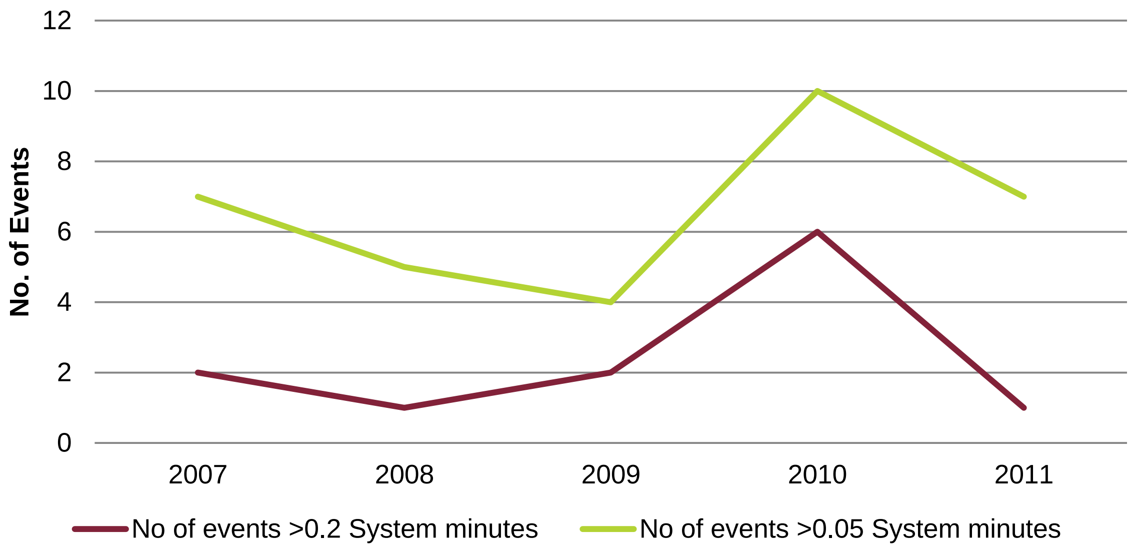

Figure 4.6: Outage event frequency from 2007 to 2011

ElectraNet has been the subject of performance incentive schemes since 1 April 2000 and is operating at or near 'best practice' levels for a network with its characteristics.

As already noted:

- ElectraNet has realised the most feasible and cost-effective opportunities to minimise outage durations and believes that there are limited opportunities to make further cost-effective improvements; and
- in designing future service incentive schemes it is therefore appropriate to recognise the asymmetric nature of performance risk (i.e. there is more chance of a deterioration in performance than of an improvement).

Accordingly it is appropriate to set caps and collars to recognise the inherent difficultly faced by ElectraNet in improving from an already extremely high base, where performance can be dominated by unpredictable events beyond its reasonable control. This would involve setting the cap for achieving the full bonus closer to the target than the collar for maximum penalty recognising that improvement opportunities are principally due to management effort whilst degradation is driven by random events. ElectraNet provides details of its proposed service incentive scheme for the forthcoming regulatory control period in Chapter 10 of this Revenue Proposal.

For the purpose of this section of the Revenue Proposal, however, it is important to note that ElectraNet has consistently delivered a high level of performance over the current regulatory period. This should provide the AER and other stakeholders with confidence that the company has been focussed on maintaining service performance levels whilst also managing total expenditure efficiently.

4.5.4 Market impact of transmission congestion

On 11 March 2010, the AEMC approved the addition of clause 11.32 of the Electricity Rules which enabled the early application of a MIP.

On 1 October 2010, ElectraNet applied to the AER for the early application of the MIP. Subsequently the AER approved the early application of the MIP to ElectraNet commencing on 1 January 2011 with a target of 1862 dispatch intervals. ElectraNet's early application demonstrates a willingness and preparedness to actively manage and minimise the customer and market impacts of its actions, and to respond positively to the available performance incentives.

Despite having only been subject to the MIP for one full calendar year, ElectraNet has implemented management and operational systems to analyse and reduce outage impacts on transmission users.

The variability of ElectraNet's performance against this measure is reflective of the timing of capital works associated with maintenance and development of the network and is substantially influenced by market activity and the unpredictable nature of wind generation in South Australia.

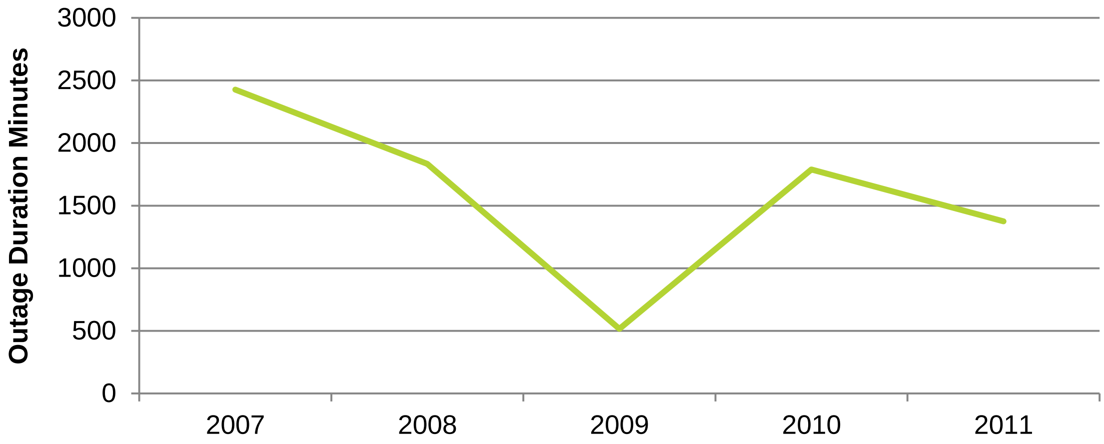

Figure 4.7: Market Impact Parameter from 2007-11

4.6 Concluding comments

This chapter has described ElectraNet's capital and operating expenditure and service performance during the current regulatory period. ElectraNet's performance reflects a proactive continuous improvement approach to network development and asset management leading to achievement of cost efficiencies and efficient management of expenditures despite emerging cost pressures.

In addition, the chapter demonstrates that ElectraNet has performed well under the STPIS, reducing the frequency of loss of supply events and maintaining high transmission circuit availability. These results are noteworthy, given the period involved severe weather effects and significant capital works on the transmission network.

5. Forecast Capital Expenditure

5.1 Summary

This chapter presents ElectraNet's capital expenditure forecast for the regulatory control period from 1 July 2013 to 30 June 2018.

As discussed in previous chapters, ElectraNet is conscious of community and political concerns over rising electricity prices, and continues a strong focus on prudent management and development of the network, and efficient delivery of solutions with the greatest market benefit at the lowest long-run cost. ElectraNet's governance framework for network development incorporates a continuous improvement approach, initiatives to ensure efficient deferral of network investments wherever possible, and when network augmentations have to be developed, an efficient process for scoping, estimating, and delivering projects.

As a result, the capital expenditure forecast represents the minimum necessary to ensure ElectraNet can meet its mandated service obligations at the lowest long-run cost.

In situations where there is uncertainty regarding large network augmentation requirements (e.g. for potential new mining loads), ElectraNet has sought to manage this risk through the framework for contingent projects. This enables the deferral of decisions to commit expenditure until the need for, and the timing and scope of, such investment can be evaluated with a higher degree of certainty.

For the forthcoming regulatory control period, ElectraNet is forecasting a minor increase in capital expenditure in real terms (in the order of 1 percent). The key drivers contributing to the levels of forecast capital expenditure are:

- continuing growth in peak demand and strengthened ETC delivery requirements, which drive the need for ongoing transmission investment to meet mandated reliability standards;
- an increase in the volume of assets nearing the end of their useful lives, which requires increased levels of asset replacement expenditure;
- additional investment required to refurbish and extend the life of transmission lines based on asset condition and risk mitigation;
- an increase in land and easement acquisition requirements in order to secure land and easements in a timely and prudent manner, to meet emerging new transmission line investment needs; and
- real wages growth and related cost pressures caused by a projected strengthening in employment demand in the mining and construction sectors in South Australia.

ElectraNet has developed its network capital expenditure plans in consultation with AEMO which has reviewed the load-driven investments underpinning this program. For each project identified, AEMO has assessed that the need exists, that the timing is appropriate and that the solution being proposed appears reasonable. AEMO has also confirmed the consistency of the forecast with the NTNDP and concluded that the network will remain compliant with the reliability requirements of the ETC at the end of the regulatory period.

ElectraNet is confident that its capital expenditure forecast is both efficient and prudent, and that it meets all of the required expenditure objectives set out in the Rules.

The remainder of this chapter is structured as follows:

- Section 5.2 summarises the key requirements of the Rules that relate to the forecasting of capital expenditure;
- Section 5.3 describes ElectraNet's compliance obligations which relate to the Rules' capital expenditure objectives;
- Section 5.4 describes ElectraNet's Cost Allocation Methodology;
- Section 5.5 describes ElectraNet's Capitalisation Policy;
- Section 5.6 describes ElectraNet's capital expenditure categories used in presenting the capital expenditure forecast;
- Section 5.7 explains the capital expenditure forecasting methodology;
- Section 5.8 describes the key inputs and assumptions underlying the capital expenditure forecast and provides substantiation for these inputs and assumptions;
- Section 5.9 presents and explains ElectraNet's capital expenditure forecast;
- Section 5.10 presents information relating to proposed contingent projects;
- Section 5.11 outlines the benefits to customers that arise from the proposed capex program; and
- Section 5.12 provides concluding comments.

5.2 Submission requirements

ElectraNet's Revenue Proposal must contain a capital expenditure forecast which ElectraNet considers is required to achieve each of the following capital expenditure objectives[42]:

- 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 Rules provide that the forecast of required capital expenditure must:

- comply with the requirements of the AER's submission guidelines;

[42] Clause 6A.6.7 of the Rules

- be for expenditure that is properly allocated to prescribed transmission services in accordance with the principles and policies set out in the Cost Allocation Methodology for the TNSP;
- include both the total of the forecast capital expenditure for the relevant regulatory control period and the forecast of the capital expenditure for each regulatory year of the relevant regulatory control period; and
- identify any forecast capital expenditure that is for a reliability augmentation or that is for an option that has satisfied the Regulatory Test or RIT-T (as the case may be).

The Rules state that the AER must accept the forecast of capital expenditure that is included in a Revenue Proposal if it is satisfied that the total of the forecast capital expenditure for the regulatory control period reasonably reflects the following capital expenditure 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.

Schedule 6A.1.1 specifies other minimum information that must be provided to explain and substantiate the forecast of required capital expenditure, including, amongst other things, an appropriate categorisation of the capital expenditure forecast, the methodology used for developing the forecast, key input variables and assumptions that underlie the forecast and a certification of the reasonableness of the key assumptions by the Directors of ElectraNet.

In addition to the capital expenditure forecast, a Revenue Proposal may also include proposed contingent capital expenditure, which the TNSP considers is reasonably required for the purpose of undertaking a proposed contingent project. Contingent projects must satisfy the following criteria[43]:

- the proposed contingent project must be reasonably required to be undertaken in order to achieve any of the capital expenditure objectives;
- the proposed contingent capital expenditure must not be otherwise provided for (either in part or in whole) in the total of the forecast capital expenditure, must reasonably reflect the capital expenditure criteria and exceed either $10m or 5 percent of the TNSP's maximum allowed revenue (MAR) for the first year of the regulatory control period, whichever is the larger amount;
- information provided in relation to proposed contingent projects must satisfy the AER's submission guidelines; and
- the trigger event for the proposed contingent project must be reasonably specific and capable of objective verification, must relate to a specific location rather than a condition or event that affects the transmission network as a whole, and must be probable but not sufficiently certain with respect to the likelihood of occurrence or the associated cost.

[43] Clause 6A.8.1 of the Rules

5.3 Compliance obligations

This section describes ElectraNet's compliance obligations, which relate to the capital expenditure objectives set out in the Rules.

5.3.1 Obligations under ElectraNet's electricity transmission licence

ElectraNet holds a licence issued pursuant to section 15 of the *Electricity Act 1996* (SA) (South Australian Electricity Act).[44] ElectraNet's licence authorises ElectraNet to carry on the operation of the transmission network in accordance with the terms and conditions of the licence.[45] ESCOSA is required to make a licence subject to conditions determined by ESCOSA, including a condition requiring compliance with applicable codes or rules made under the *Essential Services Commission Act 2002* (SA).[46] Licence condition 6.1(a) of ElectraNet's licence provides that ElectraNet must comply with all applicable provisions of the ETC (including any service standards).[47] The matters dealt with in the ETC are therefore regulatory obligations or requirements with which ElectraNet must comply.[48]

5.3.2 Obligations under the Rules

As noted in Chapter 2, ElectraNet must also plan and operate its transmission system in accordance with the mandated reliability and security standards set out in the Rules. The Rules require ElectraNet to comply with the power system performance and quality of supply standards set out in schedule 5.1. The Rules mandate system security requirements (e.g. secure operation allowing for the next contingency event under clause 4.2.4) and reliability requirements (e.g. N-1 for the meshed network). For example, clause S5.1.2.1 states:

> *"Network Service Providers must plan, design, maintain and operate their transmission and distribution networks to allow the transfer of power from generating units to Customers with all facilities or equipment associated with the power system in service and may be required by a Registered Participant under a connection agreement to continue to allow the transfer of power with certain facilities or plant associated with the power system out of service, whether or not accompanied by the occurrence of certain faults (called credible contingency events)."*

5.3.3 Amendments to the ETC

As discussed in Chapter 2 and section 3.3.2, ESCOSA has recently consulted on and reviewed the reliability standards in the ETC for the period commencing 1 July 2013 (i.e. the commencement of the forthcoming regulatory period) with the input and advice of AEMO. Inherent in the new connection point reliability standards is recognition of the economic cost of unserved customer energy. This translates directly into specific levels of required transformer and transmission line redundancy at each connection point; ranging from no redundancy to full redundancy.

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44 Section 15 of the South Australian Electricity Act provides that a person must not carry on operations in the electricity supply industry for which a licence is required unless the person holds a licence under Part 3 of that Act authorising the relevant operations. Subsection 15(2) provides that one of the operations in the electricity supply industry for which a licence is required is the operation of a transmission network

45 Section 18 of the *South Australian Electricity Act*

46 Section 21(1)(a) of the *South Australian Electricity Act*

47 ElectraNet's Electricity Transmission Licence, issued by ESCOSA on 31 October 2000, last varied by ESCOSA on 1 July 2008

48 The term "regulatory obligation or requirement" is defined in the NEL as including a transmission system safety duty, a transmission reliability standard, or a transmission service standard (section 2D). These terms are defined in section 2 of the NEL

Clause 2.3.1 of the ETC (which will apply from 1 July 2013) states:

> *"A transmission entity must plan and develop its transmission system such that each exit point or group of exit points allocated to a category in accordance with clause 2.4 meets the relevant standards for that category as set out in clauses 2.5 to 2.9."*

Clause 2.11 of the new ETC has strengthened the timing requirements for meeting these standards, with reliability projects now to be delivered within 12 months of the forecast limitation date:

> *"…in the event that a change in forecast agreed maximum demand at an exit point or group of exit points will result in a future breach of a standard specified in this clause 2, a transmission entity must ensure that the equivalent capacity at the exit point or group of exit points is sufficient to meet the required standard within 12 months of the identified future breach date."*

The "forecast agreed maximum demand" is defined as:

> *"the agreed maximum demand forecast for a given year that is agreed with the customer three years prior to when the agreed maximum demand is contracted."*

Previously a delivery timeframe of 12 months on a best endeavours basis or three years in any event applied, which provided greater flexibility in delivery. The impact of this change is to reduce timing flexibility and to bring forward the requirement for capital investments to meet ETC standards. This requirement also effectively locks in the reliability driven forecast three years in advance.

Clauses 2.1.1 and 2.1.2 of the ETC additionally impose specific obligations on ElectraNet in relation to planning, developing and operating the network (emphasis added):

> *"Subject to the service standards specified in this clause 2, a transmission entity must use its best endeavours to plan, develop and operate the transmission network to meet the standards imposed by the National Electricity Rules in relation to the <u>quality of transmission services</u> such that there will be no requirement to shed load to achieve these standards under normal and reasonably foreseeable operating conditions."*

> *"Subject to the service standards specified in this clause 2, a transmission entity must use its best endeavours to plan, develop and operate the transmission system to meet the standards imposed by the National Electricity Rules in relation to <u>transmission network reliability</u> such that there will be minimal requirement to shed load under normal and reasonably foreseeable operating conditions."*

The ETC standards are important drivers of the level of investment needed to deliver capacity at both the connection points and in the deeper transmission system. For example, as discussed in Section 3.3.2, the revised ETC requires ElectraNet to provide additional transformer capacity to supply the Dalrymple and Baroota exit points by 2016 and 2017 respectively.

The ETC also requires, for example, that sufficient spares of each type of transformer must be available to meet minimum restoration times in the event of a transformer failure. The minimum restoration times have been lowered in a number of areas, increasing the need to hold adequate spares. By standardising its fleet ElectraNet is able to efficiently minimise the number of spare transformers required to meet this clause.

In addition, clause 6.3.1 of the ETC now imposes more stringent requirements on ElectraNet to complete early planning approvals to prepare for emerging network limitations by extending these obligations to include design work and land acquisition prior to forecast breaches in reliability standards, again with reference to the strengthened timing requirements driven by forecast agreed maximum demand outlined above:

> *"A transmission entity must use its best endeavours to complete all necessary design work, obtain all necessary planning approvals and acquire all necessary land and easements on the basis of forecast agreed maximum demand prior to changes in forecast agreed maximum demand causing a breach of the reliability standards specified in this industry code so as to ensure that the transmission entity is in a position to meet its obligations."*

This clause requires ElectraNet to review longer-term needs and strategically purchase land and easements through a risk-based approach to ensure it will be in a position to meet the requirements of the ETC.

In addition to the requirements of the Rules and the ETC, ElectraNet complies with all applicable National and International Standards, Codes of Practice, Safety Standards and practices generally accepted as appropriate by the Australian electricity supply industry. These standards and guidelines determine for example, how assets are to be designed and operated (e.g. Loading Guide for Oil-Immersed Transformers AS2374.7:1997, Electromagnetic compatibility (EMC) AS61000.3.7:2001 and ESAA C(b)-1 Guideline for the Design and Maintenance of Overhead Distribution and Transmission Lines).

The ETC is an economically-derived set of reliability standards for connection points that is based on an evaluation of the benefits to customers of a reliable electricity supply. Accordingly, ElectraNet's compliance with the ETC should ensure the maximisation of net economic benefits to consumers of electricity.

5.4 Cost allocation methodology

As noted in Section 5.2, ElectraNet's capital expenditure forecast must comprise expenditure that is properly allocated to prescribed transmission services in accordance with the principles and policies set out in its approved Cost Allocation Methodology[49]. Under this methodology, ElectraNet's general ledger chart of accounts has been appropriately structured so that each category of transmission services can be separately identified. Labour costs are directly allocated to appropriate cost centres and account numbers reflecting the activities undertaken by staff members. Materials and service costs are directly allocated by appropriate coding of invoices. Corporate overheads that are not able to be directly attributed to a category of transmission services are allocated between categories of services using an appropriate causal allocator.

ElectraNet's capital expenditure forecast (and similarly its operating expenditure forecast, which is the subject of Chapter 6 of this Revenue Proposal) includes only that expenditure which has been properly allocated to prescribed transmission services in accordance with ElectraNet's existing Cost Allocation Methodology.

5.5 Capitalisation policy

Section 4.3.4(c) of the Submission Guidelines requires any changes to capitalisation policy to be described. ElectraNet's capitalisation policy has not changed in the current regulatory period.

However, a new asset class has been created for transmission line refit capital expenditure, to apply from 1 July 2013. The use of this new asset class is consistent with

[49] In accordance with clause 6A.6.7(b)(2)

the practice applied in the previous regulatory period from 1 January 2003 to 30 June 2008. Further details of the new asset class are contained in Chapter 8.

Some minor consequential amendments are proposed to ElectraNet's Capitalisation Policy as it will apply in the forthcoming period to reflect the capitalisation of expenditure on transmission line components.

These changes reflect an efficient and cost effective approach to refurbishing transmission lines, which involves replacing components that are in poor condition, rather than replacing the entire asset.

5.6 Capital expenditure categories

ElectraNet's capital expenditure forecast must be presented by reference to well accepted categories of capital expenditure[50]. For material assets, the location of the proposed asset, the anticipated or known cost of the proposed asset and the categories of prescribed transmission services to be provided by the proposed asset should also be identified.

ElectraNet's capital expenditure categories are shown in Table 5.1, together with the prescribed transmission services to which they relate. These categories are consistent with those approved by the AER for ElectraNet for the current regulatory period, with the addition of the refurbishment expenditure category, which caters for transmission line refit works.

Table 5.1: Capital expenditure categories

Category	Description	Prescribed Transmission Services
Network		
Augmentation	As defined in the Rules (by reference to the definition in the NEL), works to enlarge the system or to increase its capacity to transmit electricity. Includes projects to which the RIT-T applies. Projects generally involve the construction of new transmission lines or substations, and reinforcement or extension of the existing shared network and may be driven by reliability or market benefits requirements, and include the associated supporting communications infrastructure, land requirements and IT systems.	TUOS services
Connection	Works to either establish new customer connections or to increase the capacity of existing customer connections based on a specific customer requirement. Includes projects driven by ETC reliability standards. Under the Rules only new connection works between regulated networks are treated as prescribed services[51].	Exit services

50 *National Electricity Rules*, clause S6A.1.1

51 A request from a generator or a direct connect customer to increase the capacity of an existing prescribed entry or exit service would be treated as a negotiated transmission service under the *National Electricity Rules*, clause 11.6.11

Category	Description	Prescribed Transmission Services
Strategic land/ easements	Strategic land and easement acquisitions for projected augmentation, connection and replacement requirements. Typically these are long term requirements guided by Government strategic plans or to address risks over future availability of land.	Common transmission services
Replacement	Works to replace transmission lines, substation primary plant, secondary systems, communications equipment and other transmission system assets in order to maintain reliability of supply. Replacement projects are generally undertaken due to the increased risk of plant failure as assets age, based on assessed asset condition, obsolescence or safety issues.	Exit services and TUOS services
Refurbishment	Works to replace relevant components of transmission lines to mitigate risk of failure of the whole asset. Refurbishment works are generally undertaken based on the assessed condition, performance and risk of the assets and they enable efficient deferral of whole asset replacement.	TUOS services
Security/ compliance	Projects that address compliance requirements associated with Government Acts and Regulations and Standards. Projects required to ensure the physical and system security of critical infrastructure assets.	Entry services, exit services, TUOS services and common transmission services
Inventory/ spares	Spare holdings required to respond to asset failures in accordance with restoration times specified in the ETC and good electricity industry practice.	Common transmission services
Non-Network		
Business IT	Projects to develop and maintain IT capacity and to improve the functionality of business systems to support business operation.	Common transmission services
Buildings/ facilities	Projects to replace and upgrade office accommodation and services to meet business needs.	Common transmission services

Section 5.9 presents ElectraNet's capital expenditure forecast against the categories described in Table 5.1, including details of material assets, their estimated cost and location.

5.7 Forecasting methodology

This section describes ElectraNet's capital expenditure forecasting methodology as required by clause S6A.1.1 of the Rules. The methodology is represented diagrammatically in Figure 5.1.

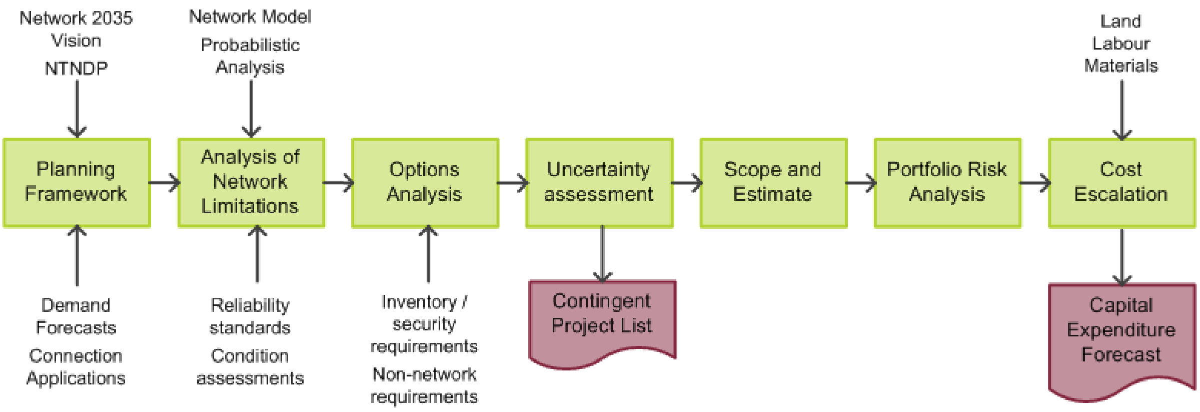

Figure 5.1: Capital expenditure forecasting methodology

Planning framework

ElectraNet follows a systematic planning process to develop plans and initiate projects to deliver a reliable, secure and sustainable transmission network that meets customer demand and maximises net market benefit. The network development process operates within a strategic framework informed by industry planning documents prepared by AEMO (e.g. the NTNDP), ElectraNet's Network 2035 Vision and the Board-approved network development strategy and follows a risk-based approach.

The development of planning scenarios and assumptions take account of ETC standards, NTNDP scenarios, demand forecasts, customer connection applications, generation locations, planning standards and criteria, asset condition and other relevant inputs.

Assessment of limitations

In developing the capital expenditure forecast, it is necessary to take into account the projected limitations of the network, the condition of the existing assets and the associated supporting facilities and business systems required to efficiently operate the network over the forecast period.

For load-driven network requirements, this involves modelling of future power system capability, based on an established network model and detailed plant data, and analysis of network constraints.

Non-load driven network investment requirements are primarily determined in accordance with ElectraNet's Board-approved Asset Management Strategy. This continues the long-term practice of progressively replacing high risk assets based on assessed condition and performance. Wherever possible, asset replacement and augmentation requirements are aligned to minimise long-run costs.

Non-network investment requirements are largely determined in accordance with the strategic priorities for information technology identified in Section 3.5.5. This provides the framework for the efficient development and operation of the business systems and supporting facilities required to facilitate efficient overall management of the network.

Options analysis

A hierarchy of solutions is considered (based generally on increasing order of cost) in order to address identified network limitations, and to efficiently defer the need for major capital investments for as long as possible, where feasible and economic to do so. The options considered may include:

- **Operational solutions** – includes options at the transmission level such as operational switching solutions and manual tap changing on transformers to shift reactive loading, and options at the distribution level such as transferring loads to other transmission connection points;
- **Control systems** – includes automatic runback and tripping schemes based on voltage or frequency to alter power flows and generation dispatch;
- **Network reconfiguration** – for example physical network reconfiguration to reduce fault level, or minor substation layout improvements;
- **Demand side management initiatives** – contracted services for demand response from demand aggregators or larger customers. Such solutions tend to be most competitive in circumstances where the load at risk is relatively small and growing slowly, or where the network augmentation is relatively high cost (for example where investment in long transmission lines would be required);
- **Network support services** – use of generation network support and distribution network support to defer or reduce the need for network augmentation; for example through contracting support from existing generators, or installation of new small localised generation. A prominent example in the South Australian transmission network is the Port Lincoln network support arrangement, which has enabled the deferral of significant line augmentation on the Eyre Peninsula for many years;
- **Distribution augmentation** – smaller investments in the distribution network may defer larger scale transmission investments in relation to connection point reinforcement in particular. This underlines the importance of the joint planning process ElectraNet engages in with ETSA utilities and other NSPs to take a holistic view of network requirements in order to find least cost solutions;
- **Small scale transmission augmentation** – in some cases, smaller network investments can efficiently defer or avoid the need for major augmentations. A typical example of a small network investment is the installation of capacitor banks which provide reactive support and increase the utilisation of the existing network. This enables the deferral of larger network augmentation projects. A number of such investments are included in ElectraNet's capital expenditure forecast;
- **Significant transmission augmentation** – ultimately, when all technically feasible and economic non-network solutions or smaller network investments have been exhausted, more significant network augmentation becomes necessary, such as new transformers, substations or transmission lines. These projects usually involve greater cost, are usually more complex and require longer lead times, especially when new transmission lines are involved.

The option selected must be technically feasible, be deliverable in the timeframe required and minimise long-run costs. Application of the RIT-T plays a central role in investigating and consulting on technically and economically feasible options to address identified network limitations in order to find solutions which maximise net benefit over the long-term.

Scope and estimate

All network solutions are developed with reference to a comprehensive set of design and construction standards which comply with legislated safety and technical obligations. These solutions reflect scopes of work which identify the inputs required to deliver each project. Project cost estimates are developed for each solution based on a detailed database of materials and transmission construction costs.

Uncertainty assessment

As part of its forecasting methodology, ElectraNet has excluded from the capital expenditure forecast significant network projects that are presently not considered sufficiently certain in terms of timing, scope or cost. However, where the requirement for such a project is considered probable during the regulatory period, that project is included in this Revenue Proposal as a Contingent Project (in accordance with clause 6A.8.1 of the Rules). Contingent Projects are presented in Section 5.10.

Risk analysis

Cost estimation risk analysis is based on a statistical approach to understanding the uncertainties and probabilities associated with project cost estimates. Cost estimation risk analysis recognises the inherent uncertainties in the cost estimating process and the well-established principle in project management that there is generally a higher probability that costs will increase rather than decrease due to unforeseen factors.

The cost estimation risk analysis process therefore recognises that there exists, on average, an asymmetric cost outcome on projects between an initial concept level cost estimate, and final outturn cost. Portfolio risk analysis captures the average cost impact of risk diversified at a portfolio level across the overall capital expenditure forecast.

Cost escalation

Cost escalation involves escalating or de-escalating cost estimates for expected changes in input costs, including wages growth and expected changes to non-labour construction cost, including commodity inputs such as copper, aluminium, steel and plant and equipment price variations. Forecasts of cost escalation rates are derived from independent expert sources.

Additional information about the application of the forecasting methodology is provided in Table 5.2.

Section 5.8 describes in more detail the key inputs and assumptions used in the forecasting methodology.

Appendix I describes the capital expenditure modelling process in more detail.

Table 5.2: Identification of investment requirements by capital expenditure category

Expenditure Category	Overview of approach to identifying investment requirements
Augmentation and Connection	Connection point and network limitations are identified by static load-flow analysis. Typically concentrating on the thermal capacity of lines and transformers as well as connection point delivery voltages under normal and contingent operating conditions. Consideration is also given to the outputs of dynamic analysis and other asset performance information such as: • Voltage stability – concerned with ensuring sufficient reactive power support to maintain voltage levels under normal and contingent operating conditions; • Transient stability – concerned with large disturbances due to faults causing generation and power system instability; • Small signal stability – concerned with small switching disturbances causing oscillations across the interconnected power system; and • Fault capacity – concerned with the fault rupturing capability of circuit breakers, mechanical strength of substation infrastructure and earth potential rise. Regular joint planning with other TNSPs and ETSA Utilities is undertaken to ensure that both transmission and distribution performance issues are taken into account, in accordance with clause 5.6.2 of the Rules. As the transmission and distribution systems are electrically connected, either may be in a position to provide a means of addressing system performance issues, enabling overall lowest long-run cost solutions to be identified.
Strategic land/ easements	Prudent planning in preparation for projected network development requirements demonstrates the need for early investigation and in some cases early acquisition of strategic land and future line easements. Strategic acquisitions relate to identified developments that will be required in subsequent regulatory periods. In some cases, strategic acquisition is a prudent course of action because ElectraNet's experience has shown that a lack of action now will lead to: • the most efficient sites for land and easements not being available at all in the future due to the development of alternative land uses; or • significant additional expense being incurred due to the need to re-zone land or select less efficient sites.
Replacement	ElectraNet's asset replacement strategy is based on condition assessment and risk management. Where it is considered prudent and cost effective, replacement expenditure is deferred by installing asset condition monitoring systems and related maintenance regimes. Factors contributing to asset replacement decisions include lack of functionality to meet operational requirements, lack of availability of spares and expertise to service equipment, and deterioration of asset condition resulting in an unacceptable risk of unpredictable failure and/or uneconomic ongoing maintenance costs. Decisions to undertake major asset replacement projects are based on detailed condition assessment, economic reliability analysis and consideration of network augmentation plans. The detailed methodology for determining asset replacement requirements is set out in ElectraNet's Asset Management Plan.

Expenditure Category	Overview of approach to identifying investment requirements
Refurbishment	ElectraNet's capital refurbishment program is based on asset condition assessment and risk management. Factors contributing to capital refurbishment decisions include safety hazard issues and deterioration of asset condition resulting in an unacceptable risk of unpredictable failure. Decisions to undertake major refurbishment projects are based on condition assessment, economic reliability analysis and consideration of network augmentation plans. The detailed methodology for determining capital refurbishment requirements is set out in ElectraNet's Asset Management Plan.
Security/ compliance	ElectraNet has identified projects required to improve the physical and system security of ElectraNet's critical infrastructure. The need for additional electronic and physical barrier security as well as critical improvements to nodal substation layout and radial supply points are included in this category. These have been identified through processes outlined in ElectraNet's Asset Management Plan. Other expenditure is required to meet various technical, safety and environmental compliance requirements, which is also identified in ElectraNet's Asset Management Plan.
Inventory/spares	The ETC specifies restoration times that drive the requirements for spare transformer holdings and other equipment. The Asset Management Plan outlines the overall strategy for the efficient levels of inventory and spares holdings.
Business IT	Business IT requirements are identified in ElectraNet's IT strategy and plan.
Buildings/ facilities	Buildings and facilities requirements are identified in ElectraNet's facilities plan.

5.8 Key inputs and assumptions

The purpose of this section is to describe the key inputs and assumptions underlying the capital expenditure forecast, and to provide substantiation for these inputs and assumptions. These comprise:

- demand forecasts;
- network development scenarios;
- asset condition assessments;
- network model;
- planning and design standards;
- project cost estimates;
- portfolio risk analysis;
- wages growth;
- land value escalation; and
- materials cost escalation.

5.8.1 Demand forecasts

Growth in customer peak demand is the principal driver of transmission system augmentation and connection point reinforcement. In determining its capital expenditure forecast, ElectraNet has relied upon demand forecasts independently provided by AEMO, ETSA Utilities and ElectraNet's direct-connect customers in accordance with clause 5.6.1 and Schedule 5.7 of the Rules.

AEMO publishes state-wide diversified maximum demand forecasts for South Australia on an annual basis. As part of its planning processes, ElectraNet uses the AEMO forecasts to plan main grid augmentations, as well as main grid reactive requirements, both of which are driven by total demand levels across the network.

Table 5.3 sets out the AEMO 2011 medium growth 10 percent probability of exceedance forecasts which have been used to develop main grid augmentation plans, including reactive requirements.

Table 5.3: AEMO state-wide medium growth 10% probability of exceedance forecasts (MW)[52]

2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
3,570	3,630	3,700	3,780	3,840	3,920	3,960	4,030	4,090	4,170

Annual growth in the diversified connection point maximum demand is forecast at around 2.7 percent across the period, compared with a projected annual increase in energy consumption of around 1.6 percent, based on AEMO's forecasts.

The AEMO state-wide forecasts are diversified, which means that they are top down forecasts that reflect the fact that peak demand does not occur simultaneously at each connection point on the transmission network at the time of system peak demand. These forecasts are appropriate to be used for main grid planning based on the 10 percent probability of exceedance forecast as the accepted standard for main grid transmission planning.

Peak demand forecasts at individual connection points are, by necessity, used for connection point planning and local regional planning. This is due to the minimal diversity at a regional level during peak demand times; i.e. in most cases, heat wave conditions simultaneously affect the entire area in question. This is in line with the ETC requirement that requires project timing to be based on the customer forecast Agreed Maximum Demand (AMD).

Peak demand forecasts at a connection point level are provided each year by ETSA Utilities (the distribution network service provider) and direct-connect customers. These are aggregated to create undiversified demand forecasts for the various transmission planning regions within South Australia.

The 2012 connection point peak demand forecasts that have been used for connection point and local regional planning are provided at Appendix J and will be published in ElectraNet's forthcoming APR, due for release by 30 June 2012[53]. By definition, the sum of the undiversified peak demand forecasts used for connection point and regional

52 AEMO, *South Australian Supply and Demand Outlook*, 2011

53 These forecasts have been aggregated where necessary to protect customer confidentiality, as required by the Rules

development planning will be above the state-wide diversified 10 percent probability of exceedance forecasts.

5.8.2 Network development scenarios

To test the robustness of its forecasts, ElectraNet engaged ROAM Consulting to conduct an assessment of potential generation and load developments for South Australia through the application of its established probabilistic scenario analysis methodology.

The key inputs to this analysis build on the scenarios developed by AEMO in its NTNDP analysis and comprise:

- carbon price assumptions;
- peak demand assumptions; and
- interconnector expansion assumptions.

These variables were assigned various probabilities which in combination provided a range of 18 plausible market development scenarios, which were developed in consultation with AEMO. These were combined with a bottom-up generation planting assessment to provide a final set of weighted scenarios representing different potential patterns of generation and load development across the South Australian transmission network for the forecast period.

These scenarios were then applied as a sensitivity to test the robustness of the demand driven network project forecast. The impact of a probabilistic scenario based approach is somewhat limited by the exclusion of large and uncertain projects from the forecast as contingent projects, and by the requirement in the ETC[54] to commit three years in advance to addressing forecast breaches in reliability standards.

Further details of the analysis undertaken by ROAM Consulting, including underlying assumptions, can be found in the report included as Appendix K of this Revenue Proposal.

5.8.3 Asset condition assessments

During the current regulatory period, and in line with the continuous improvement approach set out in the Asset Management Strategy, ElectraNet has implemented a systematic process for collecting, recording and analysing detailed information on the condition of its network assets. This has resulted in the development of a sophisticated System Condition and Asset Risk (SCAR) system.

Through this process, ElectraNet has systematically undertaken asset condition assessments for all substations, and is progressively undertaking condition assessments across all of its transmission line assets.

ElectraNet has also expanded and further developed its asset condition assessment program into a full Transmission Asset Life Cycle (TALC) assessment framework. This assessment considers a range of factors affecting the overall performance of an asset, and provides a framework for systematically identifying where an asset is in its life cycle in order to make the most effective asset management decisions. This assessment considers both the technical health of the asset and its strategic importance in the network (related to the value of load at risk).

[54] 2013 ETC Clause 2.11

These condition assessments and the resulting improved understanding of asset condition are key inputs to the development of asset replacement plans and maintenance plans, as discussed in Chapter 6. These processes are described in further detail in the Asset Management Plan provided at Appendix S.

5.8.4 Network model

ElectraNet uses the Siemens Energy, Inc. Siemens Power Technologies International PSS/E suite of power system analysis programs as the platform for identifying both operational and future network limitations, as is the case for most other Australian TNSPs, DNSPs and AEMO.

The network model used to develop ElectraNet's capital expenditure forecast is the same as that provided by ElectraNet to AEMO and is, therefore, subject to regular scrutiny by power industry experts external to, and independent of, ElectraNet.

Plant data is based on primary sources such as transmission line impedance tests, generator commissioning and compliance tests, power transformer test certificates and on secondary sources such as line impedances calculated from first principles.

5.8.5 Planning and design standards

ElectraNet's planning standards are derived from the Rules and the ETC and are presented in more detail in ElectraNet's APR[55]. These standards relate to the compliance obligations described in section 5.3 and the performance issues described in the augmentation and connection section of Table 5.2. Planning standards such as connection point power factor requirements are also reflected in customer connection agreements.

ElectraNet has developed and maintains a comprehensive set of design and construction standards in order to comply with the requirements of its SRMTMP. This Plan is required by section 15 of the *Electricity Act 1996 (SA)* to demonstrate that ElectraNet's infrastructure complies with good electricity industry practice and the standards referred to in the Act and to achieve to the satisfaction of the Technical Regulator the same or better safety and technical outcomes.

5.8.6 Project cost estimates

ElectraNet's continuous improvement approach has resulted in a refined process for developing its project cost estimates, as outlined below.

Project scope

When a project cost estimate is required, the first step is the preparation of a scope of works. This is followed by a scope review process involving consultation with all relevant internal stakeholders to ensure optimal project definition, based on the best available information at the time.

Cost estimate

The projects included in the capital expenditure forecast are at different stages of development. Approved projects that are currently in progress have been subject to a more detailed cost assessment than those in the concept phase that have yet to commence.

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55 www.electranet.com.au

Initial project cost estimates are by necessity high-level concept estimates. For network projects, these estimates are produced using the proprietary tool 'Success Enterprise' to generate a detailed breakdown of the cost elements involved in each project, drawing on a comprehensive cost library containing detailed information and benchmarks from external sources and informed by actual costs from recent projects.

The estimates are then subject to a peer review and a further internal consultation process with the relevant parties. Site visits are also undertaken for key projects, and a sample of estimates are subject to external review.

For non-network projects, cost estimates are generally developed based on independent expert advice and market cost information.

For projects in the concept phase, detailed aspects of the delivery of the project cannot be known with any certainty up to seven years or more in advance, and the associated uncertainty in the estimates is therefore high. The accuracy of these cost estimates at the project concept phase is generally considered to be within 30 percent of the actual delivered cost, but likely outcomes are expected to be asymmetric.

Check estimates

ElectraNet has obtained independent check estimates from Power Systems Consultants to verify the accuracy of its network project cost estimates. A comparison of cost estimates was made based on a sample of eight projects that are representative of approximately 70 percent of ElectraNet's connection, augmentation, replacement and security/compliance expenditure forecast. This analysis showed that the variations in the individual check estimates are generally within the range of accuracy expected of ElectraNet's cost estimates[56]. The total variation across the sample of projects was approximately 3 percent. A copy of the PSC report is attached in Appendix L.

5.8.7 Portfolio risk analysis

A key risk factor in estimating the cost of capital projects is the lead time between creating an initial concept level (pre-project) cost estimate, and the final outturn cost following project delivery, a period that can span eight years or more in the circumstances of ElectraNet. Notwithstanding ongoing improvements in cost estimation accuracy, forecasting capital project costs a number of years into the future will always carry with it an element of risk.

The concept of portfolio risk reflects the asymmetric risk inherent in capital project cost estimation, whereby outturn costs are more likely to exceed than fall below initial cost estimates due to unforeseen factors.

Rather than include an individual contingency allowance within each project, ElectraNet applies an average risk factor across its capital forecast. This captures the benefits of diversifying this risk across the portfolio, and results in a more efficient allowance for project risk.

The inclusion of a portfolio risk allowance is consistent with the practice applied by ElectraNet for the current regulatory period[57] and with the AER's Powerlink Transmission Determination.

[56] The expected accuracy range is 30 percent.

[57] AER, *ElectraNet Final Decision,* Appendix A, p51

Evans & Peck was engaged to conduct a cost estimation risk analysis and provide expert opinion on the appropriate risk factor to apply to ElectraNet's portfolio of forecast capital projects.[58]

Evans & Peck examined the full record of network projects during the current regulatory period and selected those projects that had been either completed or advanced to a sufficient stage in order to construct a statistically robust set of data. This comprised 59 projects in total.

For completed projects, Evans & Peck examined the variation between the original cost estimate and actual outturn project cost. For advanced projects, Evans & Peck examined the variation between the original cost estimate and the more detailed bottom-up business case cost estimate prepared closer to implementation. For completeness, the historic variation between business case cost estimates and actual outturn project cost was also examined.

Evans & Peck then undertook statistical modelling of the risk distribution observed from these cost outcomes to derive a cost estimation risk factor. From this analysis a cost estimation risk factor of 4.9% has been established. ElectraNet has applied this risk factor to cost estimates for those projects in its capital expenditure forecast that have not yet progressed to the point at which a detailed bottom-up cost forecast has been developed.

The risk factor has been applied to only those forecast network projects that would present a significant risk to the portfolio of capital projects. Thus, projects such as telecommunications, land and easement acquisition and information technology have been excluded from the application of the risk allowance. Based on this methodology, this estimate reflects a reasonable expectation of the impact of portfolio risk on the capital costs of ElectraNet in the forthcoming regulatory period.

5.8.8 Wages growth

Capital and operating expenditure programs are delivered using both internal ElectraNet resources as well as external contract labour. Labour cost increases are thus a key driver of ElectraNet's capital and operating expenditure forecast. The wages growth outlook remains strong for the forthcoming regulatory period.

ElectraNet's forecast for internal labour costs reflects ElectraNet's Enterprise Agreement in force to the period ending June 2015. ElectraNet engaged BIS Shrapnel to provide an expert opinion regarding the outlook for labour costs and labour market issues relevant to electricity networks for the remainder of the forecast period.

BIS Shrapnel considers average weekly ordinary time earnings (AWOTE) to be the best measure of forecast labour cost movements for the purpose of escalating ElectraNet's labour costs because it captures workforce compositional changes over time, and is therefore considered the best measure for capturing the change in total labour costs.

Despite this reasoning, in recent determinations the AER has expressed a preference for use of the Labour Price Index (LPI) to escalate labour costs. On this basis, ElectraNet has applied the LPI measure for the purposes of estimating wage cost movements in its capital and operating expenditure[59].

[58] Evans & Peck *Capital Program Estimating Risk Analysis*, May 2012, Appendix M

[59] The use of the LPI for the purposes of ElectraNet's expenditure forecasts should not be taken as agreement to the LPI as the most appropriate measure, as ElectraNet remains concerned that the use of LPI ignores a potentially important source of growth in its labour costs

BIS Shrapnel has forecast underlying wages growth in the utilities sector, expressed in LPI terms, to average 4.9 percent per annum over the next regulatory period.[60] This is 0.7 percentage points higher than the national average of 4.2 percent per annum. The faster wage growth in the South Australian utilities sector is due to an ongoing shortage of skilled labour relevant to the utilities sector, with marked strengthening in employment demand in the mining and construction sectors in the state. Employment growth in these key competing sectors in South Australia is collectively expected to outpace the Australian average, particularly in light of major mining investments, including the proposed[61] expansion of the Olympic Dam mine.

BIS Shrapnel also provided forecasts of productivity in the utilities sector relying on the Australian Bureau of Statistics (ABS) measure of gross value added per worker (which is a measure of total output (e.g. MWh) divided by total workforce). Going forward, BIS Shrapnel considers that productivity in the utilities sector will remain weak in the next six years for three key reasons: higher utilities prices (including the imposition of a carbon tax) will keep per capita demand muted; population growth will be slower over the next five years; and with the policy changes to the price of carbon, there is unlikely to be a significant increase in energy intensive projects. This muted output means productivity growth will remain weak in the utilities sector for the coming decade.

In support of BIS Shrapnel's view, the Productivity Commission's March 2012 Working Paper[62] shows that multifactor productivity (MFP) growth in Australia's utilities sector has been falling by 3.2 percent per annum, due largely to an increase in the ratio of peak to average electricity demand, which lowered average rates of capacity utilisation. Other contributors included cyclical investment in lumpy capital assets, which increased inputs ahead of outputs; greater undergrounding of electricity cabling which increased costs but not the volume of output; and policy shifts away from coal-fired to less-polluting but higher-cost sources of electricity supply.

ElectraNet also notes that expected negative productivity growth in the sector follows predominantly from declining demand (or demand that is more costly to serve, such as peakier demand) and does not imply a lack of technical efficiency in providing services.

Productivity adjustment to labour cost forecasts would therefore result in significantly higher escalation of unit labour costs.

However, ElectraNet does not consider that any productivity adjustment is required, for the following reasons.

Firstly, at a sector level, the prices that result from the combined building block and demand modelling process already take into account the impact of demand forecasts on costs (i.e. rising demand reduces unit prices under a revenue cap regime).

More specifically, at a business level, ElectraNet has applied specific scale factors in its operating expenditure forecast to reflect economies of scale realised through increased labour productivity and other factors as the network and business expand in size. This process gives rise to an ElectraNet specific estimate of total output and the labour force and other costs required to deliver it. Adding to that cost an amount that reflected a

60 BIS Shrapnel, *Labour Cost Escalation Forecasts to 2017/18 – Australia and South Australia*, April 2012, Appendix N

61 Independent Deutsche Bank valuation. Government of South Australia, *South Australian Major Developments Directory 2011/12,* p25

62 Australian Government Productivity Commission, *Productivity in Electricity, Gas and Water: Measurement and Interpretation*, Staff Working Paper, March 2012

measure of output based productivity would involve double counting of costs already compensated for in ElectraNet's proposal.

Finally, ElectraNet notes that the AER justification for using the lower LPI forecasts rather than AWOTE forecasts is that the difference between these two is automatically offset by productivity gains. If this justification holds, then this would be a further basis for concluding that the building block proposal already captures any productivity associated with having a more highly skilled workforce.

Accordingly, the LPI forecast has not been specifically adjusted for expected falls in output based productivity as measured using ABS data.

Table 5.4 shows the wages growth escalation factors that have been applied to the internal labour components of the capital expenditure forecast. ElectraNet believes that this reflects a realistic expectation of its forecast labour costs.

Table 5.4: Wages growth forecast for SA utilities sector (% real in LPI terms)

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Labour escalation	2.9	1.5	2.0	2.0	2.3	2.5	2.8

Source: ElectraNet Enterprise Agreement outcomes and BIS Shrapnel advice

Similarly, BIS Shrapnel has forecast underlying wages growth in the construction sector, expressed in LPI terms, to average 5.1 percent per annum in nominal terms over the next regulatory period.[63] Table 5.5 below shows the wages growth escalation factors that have been applied to the external labour component of the capital expenditure forecast.

Table 5.5: Wages growth forecast for SA construction sector (% real in LPI terms)

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Wages growth	1.9	1.2	3.3	2.4	1.8	2.5	3.0

Source: ElectraNet Enterprise Agreement outcomes and BIS Shrapnel advice

5.8.9 Land value escalation

ElectraNet's network extends over a service area of approximately 200,000 km^2, spanning the urban area of Adelaide, north to Leigh Creek, west to the middle of the Eyre Peninsula and east to the NSW and Victorian borders.

Based on long-term historical trends, land values continue to increase at a rate above CPI. ElectraNet engaged independent expert Maloney Field Services (MFS) to forecast land value escalation factors based on statistics from the ABS on unimproved land values in South Australia.

The use of extrapolated long-term ABS data in deriving land escalators is consistent with the methodology approved by the AER in the Powerlink Transmission Determination.

63 BIS Shrapnel, *Labour Cost Escalation Forecasts to 2017/18 – Australia and South Australia*, April 2012, Appendix N

MFS determined that the ABS 'Total Land' factor, derived from a time series on value and broken down into categories of use (residential, commercial, rural and other) represents the most reliable escalator for site values of the ElectraNet portfolio.

Table 5.6 below shows the average annual increase in residential, commercial and rural land values over the period from June 1989 to June 2010, and corresponding 'Total Land' factor applied in the capital expenditure forecast.

Table 5.6: Land value escalation factors (% nominal pa)

Land Valuation Index	Average annual increase (Jun 1989 - Jun 2010)
Residential	10.7
Commercial	8.1
Rural land	7.6
Other land	7.7
Total land	9.5

Source: ABS statistics for South Australia

5.8.10 Materials cost escalation

In order to incorporate the effects of materials cost escalation into its capital expenditure forecast, ElectraNet has examined the price paths of the key inputs used in the production of the material inputs that make up the resource components of the forecast.

The method for materials cost escalation adopted in this proposal is based on the same robust and transparent methodology adopted in ElectraNet's (2008) Revised Revenue Proposal[64], which was approved by the AER.

ElectraNet engaged Competition Economists Group (CEG) to estimate real escalation rates for aluminium, copper, steel, crude oil and construction. The approach and methodology applied by CEG provides a high degree of transparency over the use of input data and is consistent with the methodology applied by the AER in its calculation of escalation factors for other regulated network businesses[65].

In developing its estimates of ElectraNet's escalation factors, CEG has reviewed various predictions as to how prices may change in the future with the predictions obtained from two general sources: futures market prices and expert forecasts[66].

In CEG's opinion, the most reliable forecast for input prices is derived from prices determined in the futures market. Where futures prices were available and sufficiently liquid, CEG used these in preference to expert forecasts on the basis that they represent the best forecast of prices by informed market participants.

The material prices and indices were calculated in $US, as the majority of the materials are either procured in $US or in currencies that are significantly influenced by the $US. The exchange rate forecasts adopted are shown in Table 5.7 below.

64 ElectraNet, *Transmission Network Revised Revenue Proposal 1 July 2008 to 30 June 2013*, 18 January 2008

65 The approach proposed by CEG has subsequently been accepted by the AER in its Final Determinations for Transend and Jemena

66 CEG, *Escalation factors affecting expenditure forecasts*, May 2012, Appendix O

Table 5.7: Australian dollar to US dollar exchange rate forecast ($AU)

	2013-14	2014-15	2015-16	2016-17	2017-18
$AU-$US exchange rate	0.98	0.95	0.92	0.89	0.87

Source: Competition Economists Group

The escalation factors applied to the various project cost components in ElectraNet's capital expenditure forecast are summarised in Table 5.8. These are presented as real annual escalators to financial year end.

Table 5.8: Non-labour materials escalation factors (% real)

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Aluminium	-11.3	2.5	5.3	3.9	2.9	2.5	2.0
Copper	-5.9	1.2	0.4	-1.5	-3.4	-3.9	-4.5
Steel	-3.8	-4.1	3.5	1.8	0.3	-0.1	-0.6
Crude oil	3.9	7.5	-2.2	-3.4	-2.4	-1.5	-1.2
Construction	-0.5	-1.8	-0.6	-0.3	0.1	0.6	0.9

Source: Competition Economists Group

Table 5.9 presents the overall weighted average annual escalators applied across the cost components in the capital expenditure forecast.

Table 5.9: Weighted average annual escalation (% real)

	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Annual escalation	0.009	0.021	0.017	0.015	0.017	0.019

5.8.11 Efficiency improvement

In line with its continuous improvement approach, ElectraNet is implementing an ongoing program of initiatives to improve the efficiency and effectiveness of its project delivery. Key elements include the following.

Contracting arrangements

ElectraNet has recently undergone a comprehensive competitive tendering process to pre-qualify and engage construction contractors for the delivery of its capital works program. This process has resulted in an expanded range of contractors being engaged under term contract arrangements that provide for a balance of allocated work and individual tendering for larger projects.

Organisational structure

ElectraNet has implemented a new internal organisational structure, with one of the primary aims being to better align its internal functions with core responsibilities, such as capital project implementation. This is resulting in ongoing improvements in capital project delivery performance and improved accountability for the various aspects of project governance.

Project cost estimation

ElectraNet has established the internal capability to develop robust capital project cost estimates. This allows the business to produce forecasts of the expenditure required to efficiently deliver transmission investments in a South Australian context, and to continuously improve the accuracy of these forecasts over time.

Project governance

Over the current period ElectraNet has made a number of improvements to its project management processes. This has included measures to improve the governance of its capital projects including the implementation of a comprehensive project management methodology based on international standards.

On the basis of these and other ongoing improvement initiatives, ElectraNet has factored a 1% efficiency saving into its capital expenditure forecast for the forthcoming regulatory period to ensure customers receive immediate benefits from these improvements[67].

5.9 Forecast capital expenditure

This section presents ElectraNet's forecast capital expenditure for the forthcoming regulatory period. The forecast is the result of applying ElectraNet's forecasting methodology described in section 5.7, and the key inputs and assumptions described in section 5.8[68].

5.9.1 Summary of forecast capital expenditure

A summary of the capital expenditure forecast by category is shown in Table 5.10[69].

Table 5.10: Capital expenditure forecast by category ($m 2012-13)

	2013-14	2014-15	2015-16	2016-17	2017-18	Total
Augmentation	41.9	35.1	20.8	14.2	5.9	**117.9**
Connection*	51.8	21.2	34.2	20.4	5.6	**133.3**
Replacement	84.8	81.5	81.3	98.6	51.8	**398.0**
Refurbishment	1.2	6.3	29.8	14.8	2.1	**54.1**
Strategic Land/Easements	11.9	15.3	10.3	12.2	16.1	**65.8**
Security/Compliance	10.0	10.8	16.8	11.6	8.1	**57.3**
Inventory/Spares	4.7	3.8	4.8	3.0	2.1	**18.4**
Total Network	**206.3**	**174.0**	**197.9**	**174.9**	**91.8**	**844.9**

67 On the basis of the benefits expected to flow from ongoing continuous improvement initiatives, this saving commences in the second year of the forthcoming regulatory period at approximately 1%, rising to 2% by the final year

68 By convention, all forecasts throughout this Revenue Proposal are reported in mid-year terms ($Dec real) unless otherwise indicated

69 The capital expenditure categories are explained in section 5.5 of this Revenue Proposal

	2013-14	2014-15	2015-16	2016-17	2017-18	Total
Business IT	8.9	10.7	11.4	7.2	5.5	**43.7**
Buildings/Facilities	0.7	1.4	2.1	0.6	0.6	**5.6**
Total Non-network	**9.6**	**12.2**	**13.5**	**7.9**	**6.1**	**49.3**
Total Capex	**215.9**	**186.2**	**211.4**	**182.7**	**97.9**	**894.1**

* Includes the remaining balance of the capital expenditure for the Munno Para contingent project allowance of $34m previously approved by the AER, as required under clause 6A.6.7 of the Rules

Augmentation, connection and replacement projects make up the majority (over 70 percent) of ElectraNet's capital expenditure forecast. Augmentation projects are centred on substation related works driven by reliability requirements, reactive plant projects enabling deferral of major augmentation, and expansion of telecommunication capacity to meet growing bandwidth requirements.

For the majority of larger projects included in the forecast, the least cost option has been identified in the latest Annual Planning Report. For more advanced projects, the preferred option has been identified through the RIT-T process (or its precursor the Regulatory Test)[70].

Connection projects are required to increase the capacity of existing distribution connections, including substation upgrades required under the ETC at Baroota and Dalrymple, and the establishment of a new distribution connection point requested by ETSA Utilities at Munno Para. The profile of the capital expenditure forecast for reliability augmentations and connection projects are driven largely by ETC mandated timing requirements.

Major replacement projects reflect assets approaching the end of their lives. These comprise substation projects (water pumping station sites and a number of radial sites) together with a number of telecommunication projects and secondary system replacements. The expenditure forecast for this category reflects the asset management strategy of replacing assets based on assessed condition and performance.

Land acquisitions represent the next most significant category of expenditure. The proposed acquisitions are required to enable the timely and cost-effective development of network projects that will be undertaken in either the forthcoming or, in some cases, subsequent regulatory periods. ElectraNet considers this expenditure to be the minimum necessary to meet its obligations under the ETC and NER in a manner that is both:

- Efficient – by securing land and easements in a timeframe that minimises long-run land acquisition costs and enables timely network project delivery; and
- Prudent – by securing land and easements where there is a high risk that land will not be available in future periods, and failure to acquire it will drive less efficient network investment (e.g. more circuitous routing or underground cable or substation duplication).

Table 5.11 summarises the material assets (projects) included in the capital expenditure forecast, their estimated cost and location in accordance with clause S6A.1.1(1) of the Rules. For this purpose, the term 'material assets' (projects) has been taken to mean

70 For the purposes of Clause 6A.6.7(b)(4) of the Rules it is noted that these include the Cultana 275/132 kV Augmentation and Munno Para New 275/66 kV Substation

capital projects with estimated expenditure in the forthcoming regulatory period exceeding $20m. The categories of prescribed transmission services to which these projects relate are shown in Table 5.11 by project category.

Table 5.11: Forecast capital projects greater than $20 million ($2012-13)

Project	Description	Category	($m)
Kincraig Substation Replacement and Transformer Upgrade	Condition based substation replacement and capacity upgrade	Replacement	41
Unit Asset Replacement	Condition based replacement of selected assets	Replacement	35
Munno Para New 275/66 kV Substation*	Establishment of new connection point	Connection	34
Para-Davenport Line Refit	Refurbishment of transmission line	Refurbishment	34
Para Secondary Systems Replacement*	Replacement of secondary systems	Replacement	32
Dalrymple North*	Installation of second transformer	Connection	25
East Terrace Second Transformer*	Demand driven transformer augmentation	Connection	23
Morgan Whyalla Pump Station No 1*	Condition based replacement of substation	Replacement	23
Cultana 275/132 kV Augmentation*	Installation of second transformer and associated line reconfiguration	Augmentation	21

* Projects continuing from the current regulatory period (figures represent in period spend only).

Details of the projects included in the capital expenditure forecast, including those summarised in Table 5.11, are contained in the templates accompanying this Revenue Proposal. In order to provide further information, project summaries for augmentation, connection and replacement projects involving expenditure in the period of amounts greater than $10m are included in Appendix P. The project summaries identify the project need and solution options considered, and provide an explanation of the reasoning for the selection of the projects which have been included in the capital expenditure forecast.

ElectraNet has developed its network capital expenditure plans in consultation with AEMO which has reviewed the load-driven investments underpinning this program. For each project identified, AEMO has assessed that the need exists, that the timing is appropriate and that the solution being proposed appears reasonable. AEMO has also confirmed the consistency of the forecast with the NTNDP and concluded that the network will remain compliant with the reliability requirements of the ETC at the end of the regulatory period.

Section 5.8.2 describes the plausible market development scenarios with varying demand and external generation development assumptions which ElectraNet has used to test the sensitivity of the network limitations it has identified, and corresponding load driven reliability augmentations and distribution connection works.

A notable feature of the transmission network capital expenditure forecast for 2013-14 to 2017-18 is that the augmentation and distribution connection point projects identified are largely independent of the generation development and demand forecast assumptions considered in the various scenarios modelled.

The large majority of network projects included in the capital expenditure forecast are required to be completed within the forthcoming regulatory period irrespective of whether demand growth follows the high, medium or low demand forecast and irrespective of where new generation sources locate to meet the growth in demand. This demonstrates the robustness of the forecasts to a range of reasonable scenarios, reflective of those in the NTNDP.

5.9.2 Comparison of forecast and historical capital expenditure

In accordance with clause S6A1.1(7) of the Rules, this section presents:

- a comparison of the capital expenditure forecast with historical capital expenditure in the current regulatory period by category; and
- an explanation of significant variations in the forecast capital expenditure from historical capital expenditure.

The comparison is shown in Table 5.12.

Table 5.12: Comparison of forecast and annual historical capital expenditure ($m 2012-13)

	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18
Augmentation	15.9	45.9	169.3	74.3	56.4	41.9	35.1	20.8	14.2	5.9
Connection	13.2	22.5	30.2	24.4	35.6	51.8	21.2	34.2	20.4	5.6
Replacement	61.5	37.8	20.1	48.5	69.5	84.8	81.5	81.3	98.6	51.8
Refurbishment	0.0	0.0	0.0	0.0	0.0	1.2	6.3	29.8	14.8	2.1
Strategic Land/ Easements	1.3	0.2	1.2	12.6	14.5	11.9	15.3	10.3	12.2	16.1
Security/ Compliance	4.1	8.7	11.5	14.5	23.8	10.0	10.8	16.8	11.6	8.1
Inventory/ Spares	4.3	2.6	2.3	2.5	4.1	4.7	3.8	4.8	3.0	2.1
Total Network	**100.3**	**117.8**	**234.6**	**176.8**	**204.0**	**206.3**	**174.0**	**197.9**	**174.9**	**91.8**
Business IT	7.1	6.3	7.6	7.9	12.7	8.9	10.7	11.4	7.2	5.5
Building/ Facilities	1.0	3.1	0.8	1.2	1.9	0.7	1.4	2.1	0.6	0.6
Total Non-network	**8.1**	**9.3**	**8.4**	**9.1**	**14.6**	**9.6**	**12.2**	**13.5**	**7.9**	**6.1**
TOTAL Capex	**108.4**	**127.1**	**243.0**	**186.0**	**218.7**	**215.9**	**186.2**	**211.4**	**182.7**	**97.9**
					883.1					**894.1**

Figure 5.2 also compares the total annual capital expenditure forecast with the total annual historical capital expenditure in the current regulatory period.

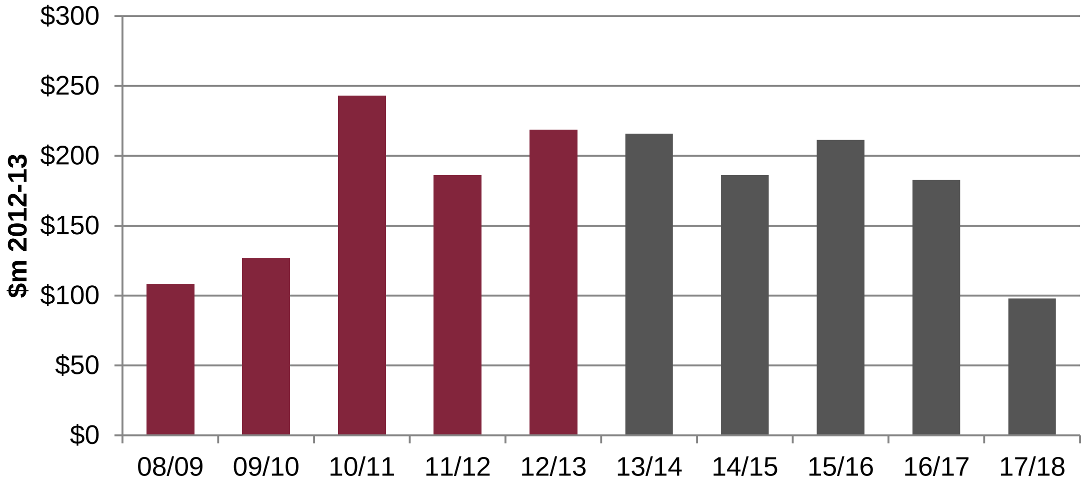

Figure 5.2: Capital expenditure 2008-09 to 2017-18 ($m 2012-13)

It is important to recognise that transmission investment is inherently lumpy in nature when reviewing actual expenditure in the current period and the forecasts for the upcoming period. While work programs are developed to allow some smoothing of work effort, expenditure will be subject to significant annual variation as major plant items are purchased, for example. Table 5.13 compares the total forecast and historical capital expenditure by category, and provides an explanation of significant variations.

Table 5.13: Comparison of forecast and historical capital expenditure ($m 2012-13)

Category	Historic	Forecast	Explanation of significant variations
Augmentation	361.8	117.9	Decrease from current period reflecting uncertainty in major new loads, and focus on small projects such as capacitor banks and line component refurbishment to defer major augmentations
Connection	126.0	133.3	No significant variation
Strategic land/ Easements	30.0	65.8	Increased expenditure required to meet future development requirements based on ETC obligations and projected need for major new transmission line projects in the future
Replacement	237.4	398.0	Increased expenditure on asset replacement is required to address the increasing number of assets nearing the end of their useful lives. Increased number of medium sized substation replacements (pumping stations and radial sites) telecommunications replacements and continuing projects
Refurbishment	-	54.1	New expenditure category. Expenditure relates to line refit projects driven by asset condition and risk, where refit is more efficient than full replacement
Security/Compliance	62.7	57.3	No significant variation
Inventory/Spares	15.8	18.4	No significant variation
Total Network	**833.6**	**844.9**	

Category	Historic	Forecast	Explanation of significant variations
Business IT	41.6	43.7	No significant variation
Buildings/Facilities	7.9	5.6	No significant variation
Total Non-network	**49.5**	**49.3**	
Total Capex	**883.1**	**894.1**	

As can be seen, ElectraNet's overall forecast represents a minor increase (of 1.2 percent) over the historical capital expenditure in the current period in real terms.

ElectraNet is confident that its capital expenditure forecast is both efficient and prudent and that it meets the capital expenditure objectives set out in the Rules.

5.9.3 Directors' responsibility statement

In accordance with clause S6A.1.2(6) of the Rules, this Revenue Proposal must contain a certification of the reasonableness of the key assumptions that underlie the capital expenditure forecast by the Directors of ElectraNet.

The Directors' Responsibility Statement is included in Appendix A.

5.10 Proposed contingent capital expenditure projects

This section presents ElectraNet's proposed contingent capital expenditure in accordance with rule 6A.8 of the Rules.

Pursuant to clause 6A.8.1(b) of the Rules, contingent projects may be proposed where:

- They are reasonably required to be undertaken in order to achieve the capital expenditure objectives specified in clause 6A.6.7(a) of the Rules;
- They are not otherwise provided for (either in part or in whole) in the total of the forecast capital expenditure;
- They reasonably reflect the capital expenditure criteria specified in clause 6A.6.7(c) of the Rules, representing efficient costs of a prudent operator; and
- They exceed the threshold of either $10m or 5 percent of the value of the MAR for the first year of the regulatory period, whichever is the larger amount.

ElectraNet's MAR for the first year of the regulatory period is $292m (see Table 12.7). Five percent of the MAR is $14.6m, which makes this amount the threshold for contingent projects for the purpose of this Revenue Proposal.

ElectraNet has proposed contingent projects that:

- are expected to be required in the forecast regulatory period, but the scope, timing and cost of the projects are uncertain;
- reduce network congestion and support future generation and interconnection requirements, where the project is dependent on demonstrating a net market benefit; and

- based on current demand forecasts are required in future regulatory periods, but would need to be advanced into this coming period if an unanticipated step increase in demand of sufficient magnitude occurs during the coming period.

ElectraNet's proposed contingent projects are summarised in Table 5.14 below and are described in more detail in Appendix Q, including an explanation of how each project satisfies the requirements of clause 6A.8.1 of the Rules.

ElectraNet has identified specific trigger events that are capable of objective verification as required by the Rules, all of which must be satisfied in each instance.

ElectraNet notes that by definition it is generally not possible to accurately define the scope of proposed contingent projects at this early stage. Therefore, the proposed contingent projects are described in general terms based on the best information that is currently available and the estimated cost of the projects is indicative only. Should the specified trigger event for a proposed contingent project occur during the regulatory period, a detailed project scope and cost estimate will be required to be submitted to the AER pursuant to clause 6A.8.2(b)(3)(ii) of the Rules, before any amendment to the revenue determination is considered by the AER. This is also consistent with the practice adopted by the AER and ElectraNet in the current regulatory period.

Table 5.14: Proposed contingent projects

Project Name	Trigger	Indicative Cost ($m Nominal)
Eyre Peninsula Connection Point	1. Customer commitment to connect OR an increase of 5 MW in load forecast above the forecast published in the 2011 APR for 2018-19 on the transmission network south of Cultana 2. Successful completion of the RIT-T showing a new connection point in the region is justified	33
Lower Eyre Peninsula Reinforcement	1. Demand forecast at Port Lincoln exceeding 49 MW 2. Successful completion of the RIT-T showing transmission investment is justified	588
Upper Eyre Peninsula Reinforcement	1. Customer commitment to connect increasing the total forecast demand supplied from Cultana to above 590 MW 2. Successful completion of the RIT-T showing network development is justified	113
Riverland Reinforcement	1. An increase of 12.5 MW in load forecast above the forecast published in the 2011 APR for 2018-19 for the North West Bend and Berri connection points OR publication by AEMO of available Murraylink dispatch into South Australia that is insufficient to provide the necessary network support to meet ETC reliability standards in the Riverland region. 2. Successful completion of the RIT-T showing transmission investment is justified.	407

Project Name	Trigger	Indicative Cost ($m Nominal)
Fleurieu Peninsula Reinforcement	1. Formal request for a new regulated connection point from the DNSP 2. Successful completion of the Regulatory Test demonstrating a transmission solution is economically justified	210
Yorke Peninsula Reinforcement	1. Aggregate demand forecast for the Hummocks, Kadina East, Ardrossan West and Dalrymple connection points exceeding 90 MW 2. Successful completion of the RIT-T showing a new connection point in the region is justified	191
Para - Brinkworth/Bungama - Davenport 275 kV Transmission Upgrade	1. Successful completion of the RIT-T demonstrating positive net market benefits	50
South East to Heywood Interconnection Upgrade	1. Successful completion of the RIT-T demonstrating positive net market benefits	96
Northern Transmission Reinforcement - Load	1. Customer commitment to connect increasing the total forecast demand supplied from Davenport to above 260 MW 2. Successful completion of the RIT-T showing network development in the region is justified	247
Davenport Reactive Support	1. Commitment to the retirement of the Playford Power Station 2. Successful completion of the RIT-T showing installation of additional reactive support at Davenport is justified	42
Upper South East Generation Expansion	1. Successful completion of the RIT-T demonstrating positive net market benefits	48
Western Suburbs Reinforcement	1. Formal request for a new regulated connection point from the DNSP 2. Successful completion of the RIT-T showing a new or modified connection point in the region is justified	20
Southern Suburbs Reinforcement	1. An increase in demand exceeding the forecast load published in the 2011 APR for 2018-19 by 60 MW for the aggregate of the Southern Suburbs connection points 2. Successful completion of the RIT-T showing that modifying the existing connection points is justified	171
Northern Suburbs Reinforcement	1. Formal request for a new regulated connection point from the DNSP OR Formal request to modify an existing connection point from the DNSP 2. Successful completion of the RIT-T showing a new or modified connection point in the region is justified	48
Torrens Island Switchyard Development	1. Successful completion of the RIT-T demonstrating positive net market benefits	54

Project Name	Trigger	Indicative Cost ($m Nominal)
Mid North Connection Point	1. Formal request for a new regulated connection point from the DNSP 2. Successful completion of the RIT-T showing a new connection point in the region is justified	59
Port Pirie System Reinforcement	1. Formal request for a new regulated connection point from the DNSP 2. Successful completion of the RIT-T showing a new connection point in the region is justified	36
South East Connection Point Reinforcement	1. Formal request for a new regulated connection point from the DNSP 2. Successful application of the RIT-T showing a new or modified connection point in the region is justified	25
South East Region Augmentation	1. An increase in the forecast demand exceeding the forecast published in the 2011 APR for 2018-19 by 4 MW at Keith, 3 MW at Kincraig or 3 MW at Penola West connection points 2. Successful application of the RIT-T showing a new or modified connection point is justified	28
Lower South East Region Transformer Reinforcement	1. An increase in the forecast demand exceeding the forecast published in the 2011 APR for 2018-19 by 25 MW for the aggregate of the Snuggery, Blanche and Mount Gambier connection points 2. Successful application of the RIT-T showing a new or modified connection point is justified	19
Upper North Region Line Reinforcement	1. Customer commitment to connect and/or an increase in forecast demand of 10 MW above the forecast published in the 2011 APR for 2018-19 at a distance of more than 10 km from Davenport 2. Successful application of the RIT-T showing a new connection point and line upgrade is justified	62

5.11 Benefits for customers

Delivery of ElectraNet's capital expenditure program will provide the following benefits for customers:

- The delivery of network safety, reliability and security of supply through integrated long-term network development planning. This is achieved by investing in an efficient mix of transmission network capacity, non-network solutions, telecommunications infrastructure and smarter technology to continue to meet growing customer demand and supply quality requirements and to be able to respond to network outages to restore supply in an acceptable timeframe;
- The delivery of network services to customers at lowest long-run cost through the use of options to defer major network augmentations, alignment of network replacement and augmentation projects, and strategic purchase of land and easements to enable more efficient and timely future network development;

- Identifying overall least cost long-run solutions from a whole-of-network perspective through coordinated planning with other network service providers;
- Improving network utilisation and providing more cost effective supply options through use of innovative solutions and new technology;
- Use of contingent projects to reduce risks and up-front price impacts for customers by not committing major investment funds until the need for such investment has been established with certainty, whilst preserving the capability for timely delivery when that level of certainty is reached;
- Facilitating economic development and community prosperity by delivering an efficient and reliable electricity transmission network; and
- Facilitating regional development by transporting electricity over long distances across South Australia, including contingent projects for significant investments on the Eyre Peninsula, Yorke Peninsula and at Olympic Dam to address future demand created by forecast mining growth.

5.12 Concluding comments

This Chapter has presented ElectraNet's capital expenditure forecast for the 1 July 2013 to 30 June 2018 regulatory period. The capital expenditure forecast represents a minor increase (1.2 percent in real terms) over the capital expenditure allowance in the current regulatory period.

The key drivers of this investment program are as follows:

- Continuing growth in peak demand and strengthened ETC delivery requirements are driving the need for ongoing transmission investment to meet mandated reliability standards within prescribed timeframes. For example, the Baroota and Dalrymple connection point upgrades, expected to cost approximately $40m in the forecast period;
- Assets nearing the end of their useful lives, which requires increased levels of asset replacement expenditure;
- An increase in land and easement acquisition requirements in order to secure land in a timely and prudent manner to meet emerging transmission line investment needs;
- Additional investment required to efficiently refurbish and extend the life of transmission lines based on asset condition and risk; and
- Real wages growth and other cost pressures caused by a projected strengthening in employment demand in the mining and construction sectors in South Australia.

The focus of the capital expenditure forecast is on meeting customer demand for transmission services and delivering net market benefits at lowest long-run cost, while meeting prescribed standards of reliability and quality of supply. ElectraNet's approach includes consideration of non-network solution options, and the use of contingent projects to manage uncertainty.

ElectraNet has sought to minimise the level of required capital expenditure by efficient deferral of network investment wherever economical to do so, while maintaining reliability standards, in order to minimise customer price impacts.

The combined effect of these cost drivers is a slight increase in the capital expenditure requirement in the forecast period (approximately 1.2 percent in real terms).

ElectraNet has developed its capital expenditure forecast to:

- meet the expected demand for prescribed transmission services set out in section 5.8.1 – demand forecasts that have been independently provided by AEMO, ETSA Utilities and ElectraNet's direct-connect customers in accordance with clause 5.6.1 and Schedule 5.7 of the Rules;
- comply with all applicable regulatory obligations associated with the provision of prescribed transmission services – the applicable regulatory obligations are set out in section 5.3;
- maintain the quality, reliability and security of supply of prescribed transmission services and the reliability, safety and security of the transmission system – the applicable quality, reliability, safety and security of supply standards are set out in section 5.3.

Delivery of this capital expenditure program will enable the South Australian transmission network to deliver the following benefits for customers:

- provide ongoing reliability and security of electricity supply;
- deliver transmission services at lowest long-run cost; and
- facilitate economic development and community prosperity.

ElectraNet has developed the requirements for network capital expenditure in consultation with ETSA Utilities and AEMO. AEMO has confirmed, on the basis of its own analysis, that taken together, the proposed network development projects address the network limitations that are reasonably expected to emerge over the regulatory period 2013-14 to 2017-18 for compliance with the South Australian ETC and the National Electricity Rules.

ElectraNet is confident, therefore, that its capital expenditure forecast reasonably reflects:

- the efficient cost of achieving the capital expenditure objectives set out in clause 6A.6.7(a) of the Rules;
- the costs that a prudent operator in ElectraNet's circumstances 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.

6. Forecast Operating Expenditure

6.1 Summary

This Chapter presents ElectraNet's operating expenditure forecast for the forthcoming regulatory control period from 1 July 2013 to 30 June 2018.

ElectraNet's operating expenditure performance in the current regulatory period is discussed in Section 4.4. ElectraNet has responded positively to the applicable regulatory incentives and was able to achieve cost savings (relative to the allowance) in the early years of the regulatory period, primarily through efficiencies in internal corporate costs. However, these cost savings have been overtaken by cost increases resulting from increased asset management requirements that have emerged during the latter half of the current regulatory control period. These underlying drivers are expected to continue in the immediate future, and will have an impact on costs in the forecast period.

As discussed in previous chapters, the efficient and effective management of ElectraNet's assets is critical to managing risk and optimising the balance of least whole-of-life cost against net long term benefits, in order to deliver reliable and efficient transmission services to the South Australian community.

The operating expenditure forecast presented represents the minimum necessary to ensure ElectraNet is able to recover the reasonable costs of meeting its service obligations based on the application of a risk-based approach to asset management.

The key cost drivers contributing to the level of forecast operating expenditure are:

- a growing asset base to meet increased customer demand requires higher levels of operating expenditure (net of scale efficiencies);
- continued implementation of a best practice asset management framework to encompass all network assets and manage the increased level of network risk revealed through improved asset condition information;
- the drive to improve asset utilisation, maximise network performance and capability in order to defer the need for capital investment and deliver lowest long-run cost solutions;
- real wages growth and related cost pressures caused by a projected strengthening in employment demand in the mining and construction sectors in South Australia; and
- a number of scope changes and new regulatory obligations imposing additional costs on the business.

The combined effect of these cost drivers is an increased operating expenditure requirement in the forecast period. ElectraNet is confident, however, that its operating expenditure forecast is both efficient and prudent and that it meets the required expenditure objectives set out in the Rules.

The remainder of this Chapter is structured as follows:

- Section 6.2 summarises the Rules requirements in relation to operating expenditure;
- Section 6.3 describes ElectraNet's compliance obligations related to the Rules operating expenditure objectives;
- Section 6.4 describes ElectraNet's operating cost categories;
- Section 6.5 outlines ElectraNet's Asset Management Strategy and its relevance for operating expenditure forecasts;
- Section 6.6 explains the operating expenditure forecasting methodology;
- Section 6.7 describes the key inputs and assumptions underlying the operating expenditure forecast and provides substantiation for these inputs and assumptions;
- Section 6.8 presents and explains ElectraNet's operating expenditure forecast;
- Section 6.9 describes the benefits to customers to be achieved by executing this operating expenditure forecast; and
- Section 6.10 provides concluding comments.

6.2 Submission requirements

Clause 6A.6.6 of the Rules set out operating expenditure objectives. These state that ElectraNet's operating expenditure forecast must be for operating expenditure which it considers is required to:

- meet the expected demand for prescribed transmission services over the period;
- comply with all applicable regulatory obligations 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 operating expenditure must:

- comply with the requirements of the AER's Submission Guidelines.
- be for expenditure that is properly allocated to prescribed transmission services in accordance with the principles and policies set out in the Cost Allocation Methodology for the Transmission Network Service Provider; and
- include both the total of the forecast operating expenditure for the relevant regulatory control period and the forecast operating expenditure for each regulatory year of the regulatory control period.

Under the Rules, the AER must accept the forecast of required operating expenditure that is included in a Revenue Proposal if the AER is satisfied that the total of the forecast operating expenditure for the regulatory control period reasonably reflects the following operating expenditure criteria:

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

Schedule 6A.1.2 of the Rules specifies other minimum information that must be provided to explain and substantiate the operating expenditure forecast, including amongst other things, an appropriate categorisation of the opex forecast, the methodology used for developing the forecast, key input variables and assumptions that underlie the forecast and a certification of the reasonableness of the key assumptions by the Directors of ElectraNet.

6.3 Compliance obligations

This section describes ElectraNet's compliance obligations, which relate to the operating expenditure objectives set out in the Rules.

These compliance obligations include those described in Section 5.3 of this Revenue Proposal, which relate to the capital expenditure objectives.

In addition, ElectraNet is subject to a wide range of both general legislation and regulations and electricity industry specific instruments that impact on operating expenditure requirements. The general obligations include the Corporations Law and other corporate governance obligations, such as work health and safety legislation and WorkCover obligations.

Specific obligations under the Electricity Act and regulations include a range of technical requirements from general safety related provisions to more specific requirements, including managing public access to sites, entry to private property, working in the vicinity of transmission lines, and prescriptive vegetation clearance obligations to manage bushfire risks[71]. The Electricity Act and regulations make specific reference to accepted industry practices and standards.

As a condition of its Transmission Licence, ElectraNet maintains a Safety, Reliability, Maintenance and Technical Management Plan, which is reviewed on an annual basis and submitted to ESCOSA for approval on the recommendation of the Technical Regulator. ElectraNet must comply with the Plan, and its performance against the Plan is subject to annual audit. The following matters must be dealt with by the Plan:

- the safe design, installation, commissioning, operation, maintenance and decommissioning of electricity infrastructure;
- the maintenance of a supply of electricity of the quality required to be maintained by or under the Electricity Act and Regulations and the Transmission Licence;
- the implementation and conduct of safety measures and training programs for the purpose of reducing the risk of death or injury, or damage to property, arising out of the operation of electricity infrastructure and ensuring that employees performing work in respect of electricity infrastructure are competent and properly trained, perform their work safely and are provided with a safe system of work;

71 *Electricity Act 1996*, Part 5 - Clearance of Vegetation from Powerlines

- ensuring that contractors performing work in respect of electricity infrastructure have processes and procedures for ensuring that the persons personally performing the work are competent and properly trained, perform their work safely and are provided with a safe system of work;
- the manner in which accidents and unsafe situations are to be dealt with, reported and investigated;
- monitoring compliance with safety and technical requirements imposed by or under the Electricity Act and regulations and the Transmission Licence;
- monitoring electricity infrastructure for the purposes of identifying infrastructure that is unsafe or at risk of failing or malfunctioning;
- monitoring compliance with requirements for vegetation clearance;
- communication of information to the public for the purpose of reducing the risk of death or injury, or damage to property, arising out of the operation of electricity infrastructure; and
- the communication of information to existing and potential customers about the facilities that customers must provide for connection to the network and procedures that customers must follow in order to prevent damage to or interference with the network.

ElectraNet is confident that its operating expenditure forecast reflects the costs of complying with these obligations in accordance with clause 6A.6.6(2) of the Rules.

6.4 Operating cost categories

In accordance with the AER Submission Guidelines, ElectraNet's operating expenditure forecast must be presented by reference to well accepted categories. This section describes the operating cost categories used to present ElectraNet's operating expenditure forecast, and also identifies the transmission services to which these forecast expenditure categories relate.

ElectraNet's operating expenditure forecast methodology separates operating expenditure into three clearly defined high level cost categories. The first two of these relate to ElectraNet's controllable operating costs, while the third category is impacted by external factors outside ElectraNet's control:

- direct operating and maintenance;
- other controllable costs; and
- other operating costs.

The composition of these major cost categories is illustrated in Figure 6.1.

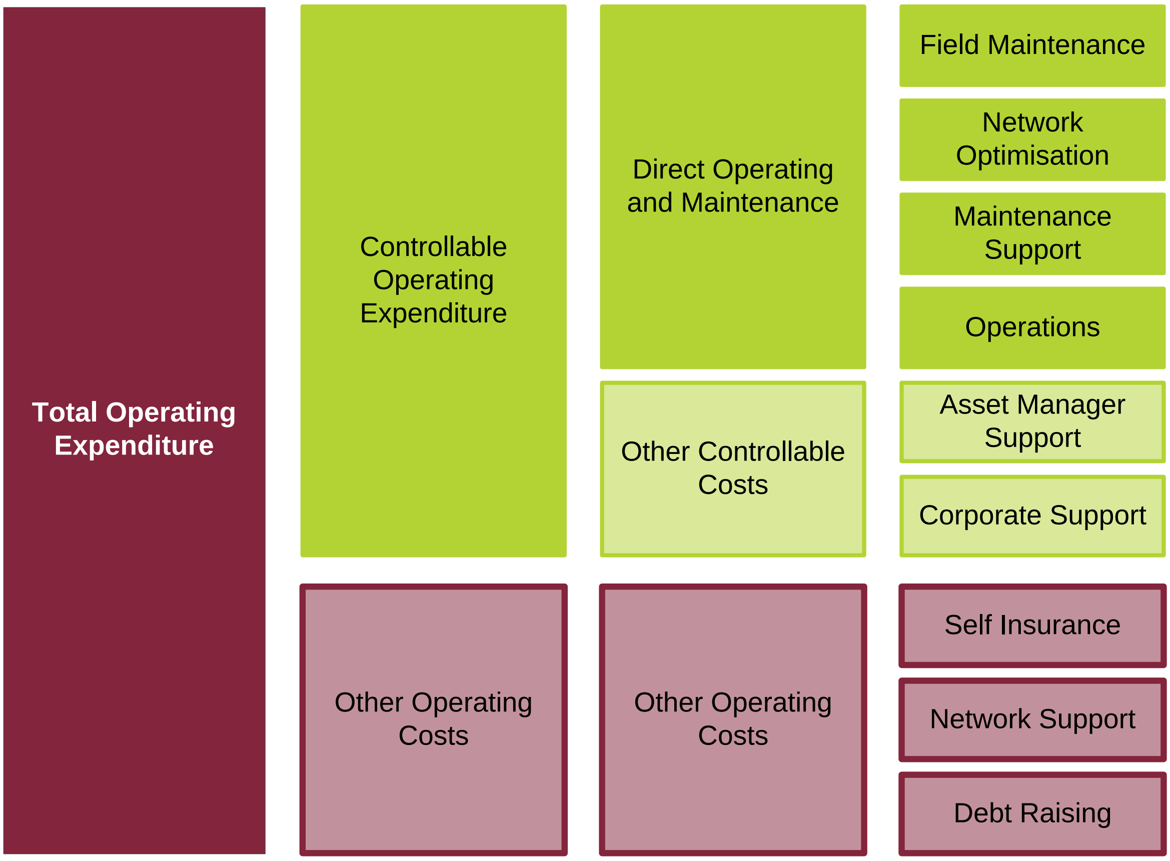

Figure 6.1: ElectraNet's Operating Cost Categories

These expenditure categories are largely unchanged from those in the 2008-13 revenue control period, with the addition of the new network optimisation category and identification of self-insurance as a separate non-controllable cost item. The cost categories are described in further detail below. Equity raising costs are described separately in Section 12.3.

6.4.1 Controllable – Direct operating and maintenance costs

Direct operating and maintenance costs refer to costs directly attributable to the maintenance and operation of the transmission network and account for the largest proportion of the operating expenditure allowance across four cost components.

Field maintenance

Field maintenance refers to expenditure associated with all field-based activities undertaken by ElectraNet. This includes the following functions:

- **Routine maintenance**: Field inspections and maintenance activities that are completed to a predetermined schedule and scope[72];

[72] Asset condition inspection functions have now been fully integrated into routine maintenance activity and are no longer reported as a separate allowance category

- **Corrective maintenance**: Field activities to mitigate short term risks and restore the condition or function of a transmission system asset, or component, to a satisfactory operational state; and
- **Operational refurbishment**: Planned maintenance project activities to mitigate medium term risks identified through asset condition assessments and to provide asset information required to manage compliance with legal obligations and good electricity industry practice.

ElectraNet competitively outsources all field maintenance activities. Field maintenance contracts are performance-based with financial incentives linked to the achievement of specified targets. ElectraNet has recently undertaken a competitive process to engage contractors for the delivery of its maintenance program. Contract costs generally include all labour and materials required to perform these activities.

Costs for field maintenance are driven by the need to appropriately manage asset risk. As these activities are predominantly labour-based, labour cost movements have a significant impact on this cost component.

Network optimisation

This represents a new category of expenditure driven by the objective of improving the capability of the transmission network in order to release additional capacity and defer the need for capital investment.

It includes those assets, asset information systems and asset management practices required to improve power flows, asset utilisation and asset management.

Maintenance support

This cost category relates to all of ElectraNet's internal costs of managing field operating and maintenance contracts, environment and safety management, asset condition monitoring and analysis, works planning and coordination.

Field support costs also include expenditure associated with business processes and systems that directly support the field maintenance activities such as geospatial information systems, maintenance management systems and maintenance field tools, and the direct costs associated with the management and support of external maintenance service contracts and direct charges such as land taxes, water and council rates.

Network operations

These are costs associated with the control centre function and other network operations activities. The costs included in this category include:

- Real-time control room function – this is a 24-hour continuous requirement. Network operators provide the functions of network operation, coordination and switching sheet preparation for all plant outages;
- Off-line system security support – this function involves network security analysis, including an ongoing need to perform contingency planning;
- Technical support for the Energy Management System (EMS) and SCADA systems – support functions such as EMS configuration, upgrade, hardware installation, software upgrade and maintenance; and

- Asset Monitoring – Monitoring asset performance and condition, which includes auditing network configurations and performing fault diagnosis and response management.

The key cost drivers in this category are labour-based. As the network increases in size and complexity, the required amount of switching, analysis, support and monitoring also increases, requiring a higher resourcing requirement.

6.4.2 Controllable – other controllable costs

Other controllable costs are those associated with the management of the network business which are not directly attributable to maintaining or operating the transmission network, but are incurred in providing prescribed transmission services. These comprise two primary cost categories, as described below.

Asset manager support

Asset manager support includes the cost of functional activities that support the strategic development and ongoing management of the network, including network planning, network support, customer and regulatory support and IT support.

Corporate support

Corporate support includes the cost of activities required to ensure adequate and effective corporate governance and business administration, including finance, accounting, administration, legal counsel, employee relations, occupational health and safety and internal audit.

Insurance costs are also included. Insurance expenditure includes insurance premiums and the associated costs of commercially available insurance cover obtained from external sources by ElectraNet for its assets and other key risk exposures (excluding self-insurance, reported separately below).

6.4.3 Non-controllable – other operating costs

Non-controllable costs comprise the following main cost categories.

Self-insurance

Where external insurance cover is not available or not cost effective for certain risk events, ElectraNet manages the risk exposure and cost impact of these events internally through a self-insurance allowance based on the identification and quantification of the asymmetric risks faced by the business. As these costs relate to risk factors beyond its direct control, ElectraNet has re-categorised this as non-controllable expenditure for the purposes of its forecast allowances.

Network support

Network support payments fund non-network solutions contracted by ElectraNet as cost-effective alternatives to network augmentation, such as local generation or demand management arrangements. The Rules require the pass through of network support costs subject to the relevant factors set out in clause 6A.7.2 of the NER.

Debt raising

In order to raise debt to fund its capital investments, a company has to incur debt financing costs or transaction costs over and above the debt margin allowed in the cost of capital. Such costs tend to vary between each debt issue, are dependent on market conditions, and have risen substantially since the Global Financial Crisis. The Debt Raising cost category therefore provides an allowance for the costs incurred by ElectraNet when new debt is raised, or current lines of credit are refinanced or extended.

6.4.4 Categories of prescribed transmission service

Table 6.1 identifies the prescribed transmission services to which the forecast expenditure categories relate (as required by clause S6A.1.2 of the Rules).

Table 6.1: Categories of Prescribed Transmission Services

Operating Expenditure Category	Service Category			
	Prescribed Exit Services	Prescribed Entry Services	TUOS Services	Common Services
Field Maintenance	✓	✓	✓	✓
Network Optimisation	✓	✓	✓	✓
Maintenance Support	✓	✓	✓	✓
Operations	✓	✓	✓	✓
Asset Manager Support	✓	✓	✓	✓
Corporate Support	✓	✓	✓	✓
Self-insurance	✓	✓	✓	✓
Network Support*			✓	
Debt Raising	✓	✓	✓	✓

* Network Support is generally an alternative to augmentation of the shared network thereby providing TUOS services

6.5 Asset management priorities

The objective of ElectraNet's Board-approved asset management strategy is to manage asset risk and optimise the balance of least whole-of-life cost against net long-term benefits, in order to deliver reliable and efficient transmission services to the South Australian community.

ElectraNet's Revenue Proposal for the 2008-09 to 2012-13 regulatory period identified an emerging network reliability risk and that the prevailing asset maintenance regime was no longer adequate for an ageing asset base. It therefore proposed a longer-term strategy that extended over a number of periods, focusing on more immediate risks in the first instance.

The resulting strategic priorities for asset management in the current regulatory period and delivery of associated outcomes are set out in Table 6.2.

Table 6.2: Asset management strategic priorities 2008-09 to 2012-13

1. Focus on managing substation asset risk through condition-based maintenance	
Responses:	• Manage asset risk to limit further increase in maintenance effort and associated reliability risk, replacing substation assets where unacceptable levels of asset safety or defect performance are identified • Implement substation routine maintenance plans based on industry best practice and undertake planned maintenance on asset types not previously covered by the maintenance plan for substation plant • Improve overall network functionality by replacing substation secondary systems with digital control and protection schemes and deployment of an Operations Wide Area Network (OPSWAN) that allows interrogation of substation equipment without the need to travel to site. • Meet the requirements of the SA Electricity Transmission Code
Outcomes:	The increases to planned maintenance and replacement of poorly performing assets in this program produced a clear understanding of substation asset performance and future asset risk. This in turn provides the basis for future risk mitigation work: • corrective maintenance • opex refurbishment • asset replacement
2. Transition from defect inspection to condition-based maintenance of lines	
Responses:	• Develop and implement condition-based maintenance plans for transmission lines based on industry best practice • Undertake condition assessment of high risk lines • Improve understanding of transmission line asset life cycle analysis
Outcomes:	This program revealed an increasing requirement for transmission line refurbishment projects. Due to long inspection cycles, the full extent of transmission line risk and associated mitigation strategies will not be fully understood until work has been completed during the 2013-14 to 2017-18 regulatory period.
3. Drive improvements to quality of asset data, life cycle assessment and risk management	
Responses:	• Asset Data Improvement – including improving quality of asset condition data and information through tools, policies and procedures • Improved Risk Management – including documenting risk frameworks and verifying line ratings and easement vegetation profiles • Improved Condition Assessment – including developing and implementing condition assessment guides and component condition assessment and testing • Transmission Asset Life Cycle Analysis – including assessing overall condition of transmission assets during the asset life cycle
Outcomes:	A significant improvement to the quality and availability of asset condition and defect data has been achieved through the implementation of a systematic System Condition and Asset Risk (SCAR) coding process. Data collection, analysis and reporting tools have been developed to assess asset life cycle, asset failure modes, consequence of failure and to identify the appropriate risk based response using the SCAR process.

Building on these long-term strategies and the improved level of asset condition information available, the strategic priorities for the forthcoming 2013-14 to 2017-18 regulatory control period are summarised functionally as follows:

- Data and Information Management – increase focus on improving data and information management systems;
- Network Management – improve line rating and system automation through network optimisation projects;
- Substation Asset Management – maintain the scope of routine maintenance, refurbishment, corrective maintenance and asset replacement programs based on improved asset condition information;
- Transmission Line Asset Management – maintain the scope of routine maintenance and refurbishment programs, but increase the scope of corrective maintenance and asset replacement to mitigate fire start risk and safety hazards based on improving asset condition information; and
- Telecommunications Asset Management – increase the scope of routine maintenance and asset replacement programs while maintaining the scope of corrective maintenance and refurbishment programs.

In order to deliver on these strategic priorities, a comprehensive Asset Management Plan has been developed. This plan is built on a risk-based approach to managing the lifecycle of each transmission network asset in order to maintain acceptable levels of reliability and performance at the lowest possible long-run cost.

The asset lifecycle is illustrated in Figure 6.2 below. This demonstrates that initially asset management focuses on routine maintenance, transitioning to refurbishment and ultimately replacement as asset condition deteriorates over time.

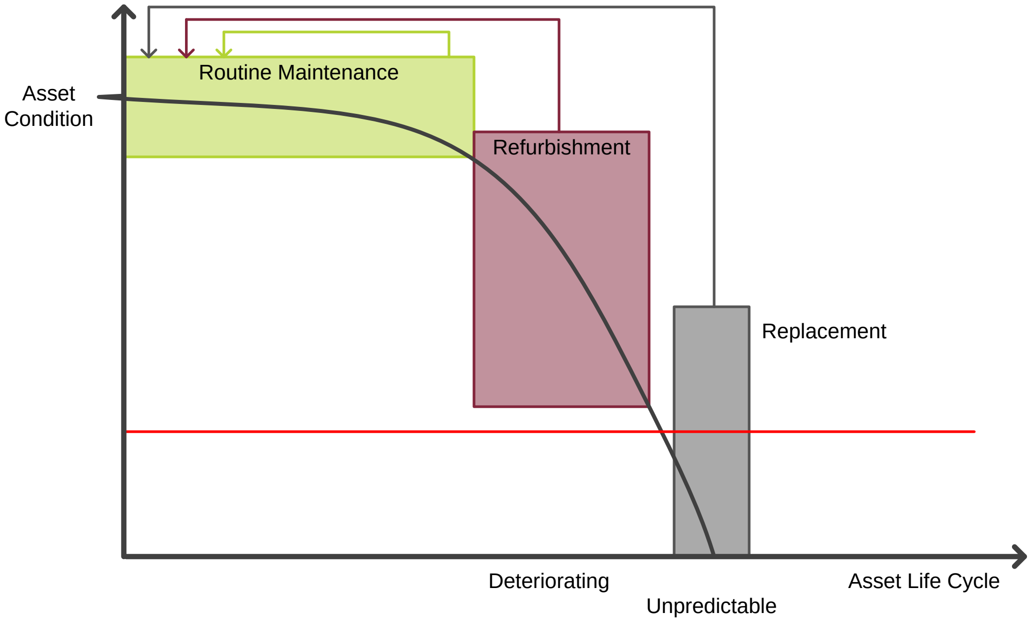

Figure 6.2: Asset management life cycle

The Asset Management Plan is based on understanding asset condition and defining a coordinated response for future asset management, and provides the basis for the operating expenditure forecast for routine, corrective and maintenance projects for the forthcoming regulatory period.

6.6 Forecasting methodology

This section describes ElectraNet's operating expenditure forecasting methodology as required by clause 6A.1.2 of the Rules. The methodology is shown diagrammatically in Figure 6.3. Appendix R describes the operating expenditure modelling process in more detail.

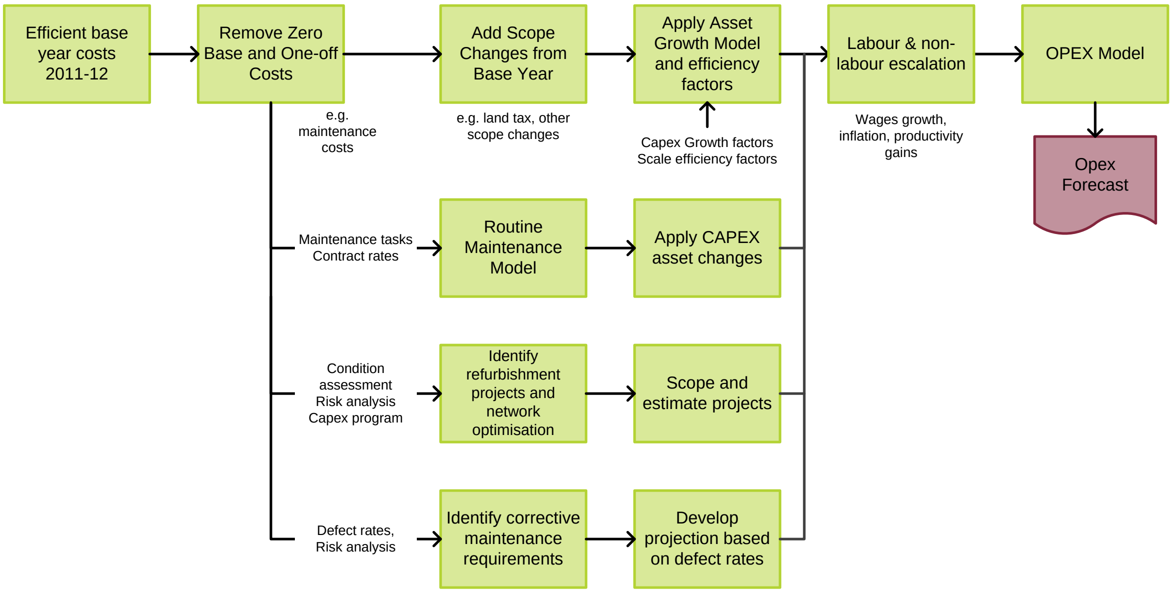

Figure 6.3: Operating expenditure forecasting methodology

ElectraNet has developed its operating expenditure forecast by determining an efficient base year level of controllable operating expenditure, then modelling the impact of future cost drivers and efficiency factors on each of the components of its base year expenditure. The most recent year for which current cost information is available, 2011-12, has been used as the base year from which to forecast operating expenditure over the 2013-14 to 2018-19 regulatory control period.

ElectraNet considers that its expected 2011-12 opex outcomes are representative of current costs, and provide an efficient base level from which to forecast future expenditure requirements (see Section 6.7.1), with the exception of a number of specific cost components identified below.

The base year forecasting methodology involves:

- removing one-off costs and zero-based costs from the base year (base year costs are summarised in Table 6.4);
- adding the cost of scope changes in future years that are not represented in the base year (discussed in section 6.7.2);
- escalating costs for asset growth and wages growth (discussed in sections 6.7.3 and 6.7.4);
- applying efficiency factors (discussed in section 6.7.3); and
- developing a 'bottom up' forecast for zero-based cost categories (discussed in Sections 6.7.5 to 6.7.7).

ElectraNet has identified the following cost components for which 2011-12 does not provide an efficient base level from which to forecast future expenditure requirements. These categories of cost have been removed from the base year, and a zero-based forecast developed:

- Field maintenance – comprising routine, corrective and refurbishment expenditure. As explained in more detail in section 6.7.5, ElectraNet is continuing to implement its established asset management strategies, informed by more detailed information now available on the condition and performance of its assets. Current expenditure levels are not fully representative of the extent of these future requirements. A forecast has therefore been developed from a detailed model of maintenance tasks, outsourced contract rates and equipment head counts;
- Insurance – Insurance premiums are not well aligned to the escalators that ElectraNet applies to other operating cost components. ElectraNet has received advice regarding the predicted costs of insurance over the regulatory control period.

Other cost components that are forecast separately to the base year approach include an allowance for self-insurance based on actuarial advice, benchmark debt raising costs, superannuation and land tax liabilities, and network support.

The operating expenditure forecasts in this Revenue Proposal are for the provision of prescribed transmission services only, and will be impacted by a range of factors during the coming regulatory period. For the purposes of the Submission Guidelines, all operating expenses are therefore considered to be variable.

Table 6.3 sets out the forecast approach adopted for each operating expenditure category in ElectraNet's forecasting methodology. Corrective maintenance is modelled using a combination of base year cost escalation and zero based forecasts.

Table 6.3: Operating expenditure cost category forecasting approach

Operating Expenditure Category	Base Year Extrapolated	Zero Based
Routine Maintenance		✓
Corrective Maintenance*	✓	✓
Operational Refurbishment		✓
Network Optimisation		✓
Maintenance Support	✓	
Operations	✓	
Asset Management Support	✓	
Corporate Support	✓	
Insurances		✓
Network Support		✓
Debt Raising		✓

* hybrid approach utilising zero base forecast of current incoming corrective effort extrapolated

6.7 Key inputs and assumptions

This section describes the key inputs and assumptions underlying the operating expenditure forecast, including the basis of the zero-based forecasts, and provides substantiation for these inputs and assumptions. These comprise:

- efficient base year;
- scope changes;
- asset growth;
- cost escalation;
- field maintenance;
- insurance and self-insurance;
- network support; and
- debt raising costs.

6.7.1 Efficient base year

As noted above, the current financial year 2011-12 has been adopted as an efficient base year for estimating future costs, as it contains the latest cost information available to the business. This comprises expenditure to date and forecast expenditure for the balance of the year[73].

This is consistent with previous regulatory practice established over many years which typically uses the penultimate year of the current regulatory control period as the base year from which appropriate adjustments may be made to forecast operating expenditure.

73 Final audited actual operating expenditure for 2011-12 will be available prior to the making of a determination on the Revenue Proposal

Such an approach is particularly appropriate in circumstances where incentive schemes operate to provide an assurance that historical performance can be used as an efficient base from which to forecast efficient costs in the future, provided that appropriate adjustments are made to reflect material differences in that base year from the years of the forthcoming regulatory control period.

Table 6.4 below details 2011-12 controllable operating expenditure by cost category.

Table 6.4: Operating Expenditure for 2011-12 ($m 2012-13)

Operating Expenditure Category	Actual/Forecast Expenditure
Routine Maintenance	13.4
Corrective Maintenance	11.9
Operational Refurbishment	7.0
Maintenance Support	11.0
Network Operations	8.3
Asset Manager Support	9.1
Corporate Support	5.8
Total Controllable Operating Expenditure	**66.4**

Note: excludes self-insurance costs and network support, consistent with the forecast of controllable opex

Table 6.5 compares ElectraNet's 2011-12 forecast controllable operating expenditure with the AER's revenue cap allowance. It shows that ElectraNet's actual base year operating expenditure is approximately 7 percent ($4.3m) higher than the expenditure allowance.

Table 6.5: Actual and Allowed Controllable Opex for 2011-12 ($m 2012-13)

Opex Category	Opex Base
AER Operating Expenditure Allowance ($2007-08)	54.4
AER Operating Expenditure Allowance (CPI adjusted)	62.1
ElectraNet's Forecast Opex ($2012-13)	66.4
Difference	(4.3)

The expenditure variance incurred in 2011-12 relates to cost components for which a bottom-up forecast is being developed, primarily driven by maintanance cost pressures, as discussed in Section 4.4. The key drivers of these increased requirements include:

- Routine maintenance – increased lines aerial inspection resulting from the implementation of condition-based maintenance plans to improve the management of fire start risk, and increased regulatory vegetation clearance requirements;
- Corrective maintenance – ongoing increase in lines maintenance effort and large scale corrective projects to manage revelase asset risk identified thorugh improved condition and risk; and

- Operational refurbishment – expanding condition assessment, asset refurbishment and replacement requirements to manage high priority line asset risks.

This has resulted in the expenditure level for external field maintenance activities exceeding the corresponding allowance for 2011-12 by approximately $8m. ElectraNet has managed its remaining internal cost categories, for which a base year forecast applies, well within the applicable allowance.

ElectraNet therefore believes that its 2011-12 operating expenditure outcome provides an efficient base level from which appropriate adjustments can be made in order to forecast Rule-compliant expenditure requirements.

As explained in section 6.6, one-off costs are removed from the base year costs in Table 6.4 as part of the forecasting methodology.

Those cost components for which a zero based forecasting methodology has been applied – namely routine maintenance, corrective maintenance, operational refurbishment, insurance costs, superannuation costs and land tax liabilities – are also removed from the controllable base year costs as part of the forecasting methodology. The use of a zero-based forecasting methodology for these components is reflective of past practice and is consistent with the approved approach adopted by other TNSPs such as TransGrid.

6.7.2 Scope changes

This section describes scope changes, which are adding material costs to the operating expenditure forecast over and above those represented in the base year. In some cases the scope changes relate to a new regulatory obligation for which no costs were incurred in the base year, and in other cases they relate to cost items for which costs in the base year are not representative of the efficient level of cost that is forecast to be incurred over the five year forecast period.

Network optimisation

ElectraNet understands the need to improve network utilisation and performance in order to deliver reliable transmission services at lowest long-run cost.

Network optimisation is a new expenditure category and includes those assets, asset information systems or asset management practices required to improve the operation and management of transmission power flows, asset utilisation or asset management. This allows improved efficiency of network operation and enables the efficient deferral of augmentation expenditure.

A number of projects have been identified to improve network optimisation and risk management in the next regulatory period. High priority projects include:

- Improvement in the management of network power flows by improving automation of voltage control schemes;
- Improvement in network asset utilisation by improving automation of transformer dynamic ratings and carrying out minor primary plant and secondary systems (protection) works to remove ‘bottlenecks’, thereby releasing additional capacity and deferring the need for capital investment; and
- Improvements in transmission line asset utilisation by improving the static/dynamic line rating process and addressing line rating non-compliance issues using a risk-

based approach on high impact assets, in order to improve available capacity and defer large capital investments.

These investments have only become possible in recent years with the advent of technological advancements in remote sensing, now available to the business on a cost effective basis, such as digital imaging, and Light Detection and Ranging (LiDAR) data collection and analysis. These changes in the external operating environment therefore drive an increased level of operating expenditure to efficiently defer capital investment.

The additional expenditure requirement in order to effectively implement these projects is shown in Table 6.6.

Table 6.6: Network optimisation forecast ($m 2012-13)

	2013-14	2014-15	2015-16	2016-17	2017-18	Total
Network Optimisation	0.8	2.8	2.5	3.5	3.7	**13.3**

Once the high priority tasks outlined above are addressed in the forthcoming period, it is envisaged that ongoing network optimisation and risk management expenditure will be relatively minor in nature, and become fully incorporated into business-as-usual processes.

Accommodation requirements

Increases in demand for office accommodation space over and above the capacity of ElectraNet's existing office accommodation have been efficiently managed to date using a number of options including:

- reconfiguration and refit of existing office space;
- converting and utilising commercial buildings obtained in the course of a substation land acquisition for office accommodation;
- expanding site accommodation through temporary 'hut-style' accommodation; and
- leasing additional office space.

Through this approach, ElectraNet has been able to efficiently defer the need for major capital investment in office premises to accommodate its growing workforce. In order to deal with further requirements for office space during the next regulatory period, and continue to defer the need for significant investment in accommodation, ElectraNet considers that ongoing leasing of additional office space is the most prudent and efficient means of accommodating its expanding workforce in the short to medium term.

The additional leasing costs have been estimated based on existing leasing commitments and forecast lease costs that are not reflected in the base year based on market rates as shown in Table 6.7.

Table 6.7: Additional accommodation costs ($m 2012-13)

	2013-14	2014-15	2015-16	2016-17	2017-18	Total
Additional office accommodation	0.1	0.1	0.6	0.6	0.6	**2.1**

Superannuation costs

Recent changes to the Superannuation Guarantee (Administration) Act 1992 will see the current superannuation guarantee (SG) contribution rate of 9 percent increase in increments from 1 July 2013 to 1 July 2019 when the SG rate will be set at 12 percent. The legislated timeline for SG contribution increases is shown in Table 6.8.

Table 6.8: Superannuation guarantee legislative increases

Financial Year	Rate Increase %	New SG Rate %
2013-14	0.25	9.25
2014-15	0.25	9.5
2015-16	0.50	10.0
2016-17	0.50	10.5
2017-18	0.50	11.0
2018-19	0.50	11.5
2019-20	0.50	12.0

Source: www.futuretax.gov.au

ElectraNet successfully negotiated a new Enterprise Agreement which entitles all employees covered by the Agreement to a 4.5 percent per annum wage increase effective from 2012 through until 2014-15. Negotiations for the Agreement were conducted prior to the changes to the Act, and therefore additional superannuation contributions were not factored into the agreed wage outcomes.

Accordingly, these costs have been added to the forecast on the basis of the percentage increases above. Future costs beyond this are expected to be absorbed in agreed wage outcomes, and accordingly no further costs have been factored into the forecast.

Other scope changes

ElectraNet has included in its operating expenditure forecasts only material scope changes that are increasing the efficient level of costs based on new regulatory obligations and changes in the external operating environment, as outlined above.

ElectraNet has absorbed the cost impact of remaining scope changes in its forecasts. An example is the harmonisation of work health and safety legislation as part of the Council of Australian Governments (COAG) National Reform Agenda. These reforms will abolish the existing old employee/employer relationship under State law, and extend ElectraNet's formal obligations to include contractors, sub-contractors, employees of contractors and sub-contractors, visitors and volunteers.

ElectraNet will require additional internal resources of approximately two to three FTEs to comply with the impending legislation[74], specifically to undertake the following;

- an increased inspection regime to ensure health and safety across all of ElectraNet's sites for all persons for which it will be held responsible; and
- expanded auditing requirements to ensure ElectraNet will meet its obligations to all workers as a 'person conducting a business or undertaking'.

6.7.3 Asset growth

Asset growth does not result in a one for one increase in operating expenditure requirement for all operating cost categories. This is due to economies of scale, which allow ElectraNet to obtain efficiencies resulting from an expanded network.

ElectraNet has applied a forecasting methodology that utilises the approach most recently accepted by the AER in its Powerlink Transmission Determination and applied economy of scale factors in Table 6.9 to determine the increased operating expenditure requirement for underlying growth in asset replacement value. The scale factors are based on ElectraNet's experience and judgement and have been largely consistent over time.

The demand forecasts which form the basis of the operating expenditure forecast are those described in section 5.8.1.

Table 6.9: Economy of scale factors for asset growth (%)

Activity	Scale Factor	Rationale
Corrective Maintenance	95%	One-for-one increase in maintenance effort but some efficiency should be achievable through common overhead of service providers and use of existing systems.
Maintenance Support	25%	By using standard systems and processes to extract and analyse data, significant economies of scale are possible through efficient management of maintenance support activities.
Direct charges	100%	Direct charges such as land tax have no efficiencies available as they are externally driven and directly proportional to asset growth.
Operations	40%	Increased planned and corrective maintenance activities impact directly on the level of switching, and outage co-ordination that is required to gain access to plant. Economies of scale are possible through efficient management of this activity.
Asset Manager Support	25%	Large economies of scale and efficiencies are available and recognised.
Insurances	–	Not applicable as costs are based on an external broker estimate.

74 The Work Health and Safety Bill (SA) 2011 is currently before the South Australian Parliament

Activity	Scale Factor	Rationale
Corporate Support	10%	For corporate support large economies of scale are available and recognised.
Other Operational Expenditure	–	Not applicable as other operational expenditure such as network support forecasts are based on a zero based estimate

These efficiency factors are considered to be low (i.e. resulting in a greater scale adjustment) for a small TNSP, on the basis that the relative cost efficiency of ElectraNet is less than larger network businesses due to ElectraNet's smaller scale, lower energy density, lower load factor and high proportion of lower voltage radial lines, as discussed in Chapter 3. ElectraNet has applied the asset growth factors in its forecast of operating expenditure as follows:

- Base year cost categories – The asset growth factor applied is derived for base year calculated cost categories by dividing the load driven capital expenditure during the period by total asset replacement cost and multiplying by the relevant scale factor identified in Table 6.9. Load driven capital expenditure excludes asset replacement to ensure that only additional assets are accounted for when applying the asset growth factors.

- Zero base cost categories – The routine maintenance requirements of new equipment will generally be less than those of older equipment. Consequently, ElectraNet's routine maintenance model specifically accounts for asset growth at a detailed level recognising the changing equipment head counts and equipment types resulting from forecast capital additions during the regulatory period.

6.7.4 Cost escalation

ElectraNet's proposed approach to cost escalation for the operating expenditure forecast is discussed below, as summarised in Figure 6.4.

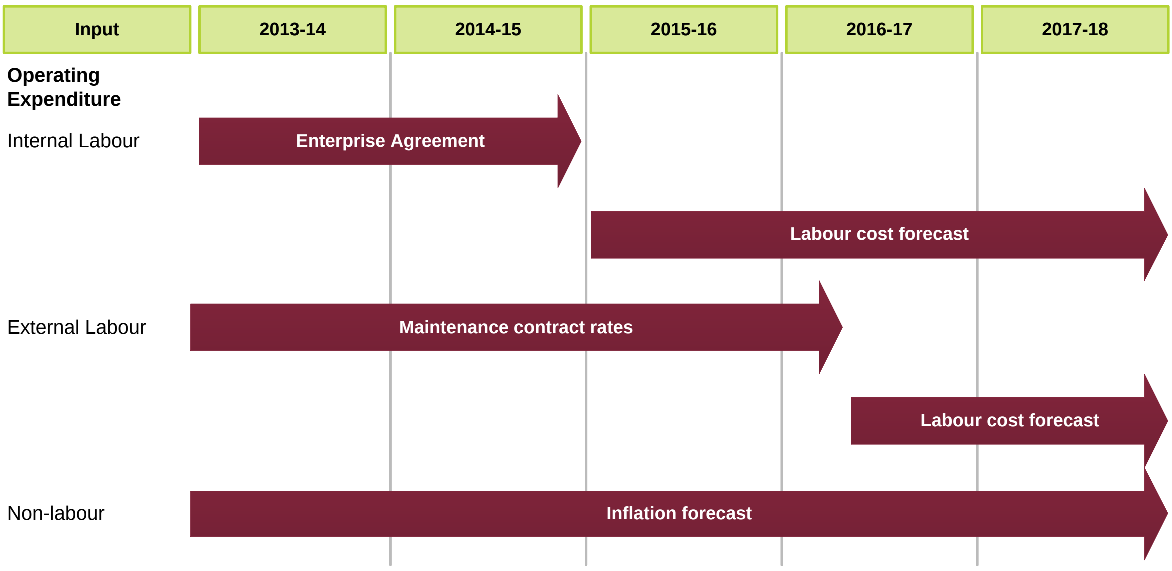

Figure 6.4: Cost escalation drivers

Wages growth

As discussed in detail in Chapter 5, labour cost increases are a key driver of ElectraNet's capital and operating expenditure forecasts.

Table 6.10 shows the wages growth escalation factors that have been applied to the internal and external labour components of the operating expenditure forecast based on independent expert advice from BIS Shrapnel[75] and CEG[76].

In accordance with the methodology outlined in Figure 6.4 above, the labour cost escalation forecast comprises:

- the annual wage increases included in ElectraNet's 2012 Enterprise Agreement[77], which applies until end 2014-15; and
- LPI forecasts from 2015-16.

Table 6.10: Wages growth forecast for SA utilities sector (% real in LPI terms)

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Labour escalation	2.9	1.5	2.0	2.0	2.3	2.5	2.8

Source: ElectraNet Enterprise Agreement outcomes and BIS Shrapnel advice

In relation to the above escalators it is noted that:

- the LPI forecasts align closely to the wage increases in ElectraNet's Enterprise Agreement; and
- the operational expenditure forecast includes labour efficiency improvements through the economies of scale applied in the network growth escalation of ElectraNet's operational expenditure, as discussed in Section 6.7.3.

ElectraNet believes that the approach adopted provides a conservative low-end estimate based on forecast wages growth and the subdued productivity outlook, and believes this reflects a realistic expectation of its forecast labour costs for the forthcoming period.

Non-labour escalation

Non-labour costs reflect a range of costs and materials associated with operating expenditure activities. ElectraNet has applied a consumer price index (CPI) measure to escalate the non-labour component of operating expenditure. The CPI assumptions applied in this Revenue Proposal are outlined in Chapter 9.

6.7.5 Field maintenance

This section outlines the basis of the zero based Field Maintenance forecast, comprising routine and corrective maintenance and operational refurbishment projects.

75 BIS Shrapnel, *Labour Cost Escalation Forecasts to 2017/18 - Australia and South Australia*", April 2012, Appendix N

76 CEG, *Escalation factors affecting expenditure forecasts*, May 2012, Appendix O

77 The ElectraNet Enterprise Agreement 2012 was approved by Fair Work Australia to commence on 13 March 2012

Routine maintenance costs

ElectraNet has used a detailed routine maintenance model to develop its routine maintenance forecast. ElectraNet's routine maintenance forecast considers a number of activity drivers including:

- detailed information on the size and condition of the asset base;
- the capital expenditure program;
- maintenance standards; and
- maintenance service contracts.

ElectraNet has been progressively implementing a maintenance regime better suited to understanding and managing asset risk associated with substations and transmission lines. This regime places greater emphasis on building asset condition assessment into normal maintenance practices, enabling ElectraNet to better forecast and manage asset risk.

ElectraNet has developed a detailed routine maintenance model based on maintenance plans built into ElectraNet's enterprise management system. This model is linked to ElectraNet's capital expenditure plans for the network, to provide an accurate forecast of the required routine maintenance expenditure for new and existing equipment.

The routine maintenance model is driven by ElectraNet's Asset Management Plan. Key inputs include maintenance tasks, standard pricing from outsourced maintenance agreements and equipment head counts from ElectraNet's asset register.

The majority of the routine maintenance forecast is calculated based on the level of maintenance effort required to perform each task (defined as work unit) multiplied by the work unit rate and the frequency of the work. The remaining specific routine maintenance tasks are contracted on a fee for service basis.

Specific priorities in the implementation of the routine maintenance program in the forthcoming period include:

- Continued rollout of the established maintenance regime for primary plant and secondary systems and the extension of these tasks to new substation assets commissioned in the current period;
- Progressive implementation of the maintenance regime for transmission lines, including new ground and aerial based inspection and testing procedures, and maintenance tasks for new cable assets;
- Consolidation of vegetation clearance activities following the introduction of increased regulatory requirements in the current period; and
- Progressive implementation of a best practice maintenance program for communication assets.

These priorities result in an incremental increase in forecast expenditure in the forthcoming period, as presented in Table 6.11.

Table 6.11: Forecast Routine Maintenance ($m 2012-13)

	2013-14	2014-15	2015-16	2016-17	2017-18	Total
Routine Maintenance	15.0	15.5	15.7	17.0	17.8	**80.9**

Corrective maintenance costs

Corrective maintenance is a response to those assets identified as having an unacceptable risk of failure.

ElectraNet has established a structured and comprehensive risk-based process for assessing and coding the condition of assets through the System Condition and Asset Risk (SCAR) management process.

The progressive implementation of this approach has provided ElectraNet with a comprehensive set of data on the condition and risks associated with its substation assets, and is progressively revealing the full condition of its transmission line assets.

Improved asset condition data linked to a clear risk framework has placed ElectraNet in a better position to analyse the incoming rate of defects, allowing it to estimate forward asset risk of failure and thus corrective maintenance requirements.

This has revealed a large number of defects that have exceeded available resources to respond (being progressively managed to 2015-16) and confirmed the need for a significant ongoing increase in corrective maintenance effort, particularly in relation to transmission line assets.

Priority corrective maintenance tasks to be managed in the forecast period include:

- Correction of asset defects (e.g. broken insulator assemblies that could cause a conductor to fall to the ground);
- Correction of high risk defects (e.g. third party unauthorised building or temporary structures or objects close to transmission line assets that may breach safety clearances to high voltage conductors);
- Correction of assets or components that have been functionally impaired (e.g. broken conductor or earth wire components); and
- Correction of assets or components at material risk of failure (e.g. advanced tower corrosion).

This results in a significant increase in corrective maintenance expenditure requirements in order to address known and emerging risks, particularly related to transmission line assets, as shown in Table 6.12.

Table 6.12: Forecast Corrective Maintenance ($m 2012-13)

	2013-14	2014-15	2015-16	2016-17	2017-18	Total
Corrective Maintenance	14.9	15.2	14.1	12.2	12.5	**68.8**

Operational refurbishment

Operational refurbishment projects are generally required where the need for additional maintenance effort, over and above ongoing routine and short-term corrective maintenance, has been identified.

ElectraNet has relied upon detailed asset condition and risk information to develop specific plans for operational refurbishment projects for different asset categories and key risk areas, such as asset operational integrity, and safety and environmental issues. Efficiencies are also achieved through this approach by packaging individual works into larger projects.

Where a need is identified, an operating expenditure project brief is developed for the purpose of:

- determining the most efficient project framework and timing;
- developing a project scope and cost estimate; and
- scheduling and allocating the work for completion.

ElectraNet has confined its refurbishment forecast to high priority projects that must be delivered in the forthcoming regulatory period in order to address critical risk areas and defer the need for significant capital investments. Major priorities include:

- Condition assessment – prioritised assessments of the detailed asset condition of transmission lines through aerial and ground based assessments;
- Refurbishment and replacement projects – prioritised works to address risks on high risk plant including isolator refurbishment, transformer oil containment and transmission line tower, footing and insulator refurbishments;
- Asset overhauls – one-off major activities typically undertaken mid-life to ensure asset performance to end of technical life, including gas insulation switchgear refurbishment, remedial civil and drainage works at substation sites and substation building rectification works;
- Asset decommissioning – removal of high risk de-energised and surplus equipment, including disused transmission lines in urban areas and oil filled cables; and
- Network risk mitigation – works to address network management risks, including review of aerial line hazard marker identification against Australian standards to ensure mandated safety of aerial inspection tasks.

The operational refurbishment expenditure required to address these risks is shown in Table 6.13.

Table 6.13: Operational Refurbishment forecast ($m 2012-13)

	2013-14	2014-15	2015-16	2016-17	2017-18	Total
Operational Refurbishment	11.8	14.7	14.4	12.4	11.5	**64.9**

These refurbishment maintenance requirements result in a significant increase in expenditure over the current period. Further details of these projects are contained in the Asset Management Plan (provided at Appendix S).

Performance incentive scheme

ElectraNet's maintenance programs are undertaken to meet all of ElectraNet's operating expenditure objectives and not to meet any specific performance target. The programs are designed to ensure continued reliability, availability and quality of electricity supply to all consumers. However, they do not include any specific expenditures designed to improve the performance of the transmission system for the purpose of the Service Target Performance Incentive Scheme that will apply to ElectraNet in the 2013-14 to 2017-18 regulatory period.

6.7.6 Insurance and self-insurance

Insurance

Variations in insurance premiums do not necessarily follow similar escalation profiles to other costs and are influenced by a range of factors beyond the control of ElectraNet.

For this reason, ElectraNet has not projected forward base year costs but has sourced an expert estimate of the forecast premiums from a qualified insurance broker, taking into account ElectraNet's insurance renewals, claims history, risk profile, recent trends in the insurance market and forecast business growth (see Table 6.14)[78].

Table 6.14: Forecast insurance premiums ($m 2012-13)

	2013-14	2014-15	2015-16	2016-17	2017-18	Total
Insurance	2.6	2.8	3.0	3.3	3.4	**15.1**

Self-insurance allowance

Section 4.3.21 of the Submission Guidelines requires that a Revenue Proposal contain detailed requirements in relation to proposed self-insurance costs. These include the details of all self-insurance amounts with an explanation of the amounts, a Board resolution to self-insure, confirmation that the TNSP is in a position to undertake credible self-insurance and a range of administrative requirements.

The ElectraNet Board has again resolved to self-insure[79] against the following specific risks:

- Network related events greater than $20,000 as defined below:
  - losses for which insurance is commercially unavailable, uneconomic or excluded under a policy of insurance (e.g. transmission lines);
  - loss events for insured risks below the existing property insurance policy deductible, and deductible payments;
  - costs incurred through emergency actions to mitigate losses;

[78] Marsh Pty Ltd, *Premium Projections (2013/14 to 2017/18) - Extract,* May 2012, Appendix T

[79] ElectraNet, *Board's Resolution to Self-Insure,* Appendix U

- losses exceeding insurance limits;

- Non-network property risks such as vandalism, theft and damage (loss events for insured risks below existing insurance policy deductibles, and deductible payments); and

- Workers compensation costs (ElectraNet is a WorkCover SA exempt employer).

ElectraNet engaged a qualified insurance broker, Aon Risk Solutions to undertake an actuarial assessment to calculate the above risks (except workers compensation) and the corresponding self-insurance premium[80]. Brett and Watson: Consulting actuaries were engaged to assess the risks for workers compensation losses[81].

It is noted that ElectraNet is party to a Rule change put forward by Grid Australia aimed at improving the efficiency of cost pass through arrangements under the Rules[82]. The AEMC has issued a Draft Decision proposing to approve elements of the rule change[83].

If approved, this Rule would be expected to impact on the uninsured risk profile faced by ElectraNet. However, the self-insurance forecast contained in this Revenue Proposal is, necessarily, based on the Rules currently in force, and therefore does not take these potential impacts into account.

The AEMC's Draft Decision on the Rule change proposal notes that transitional provisions to allow ElectraNet to nominate additional pass through events in its Revised Revenue Proposal may be included in the Final Rule, if necessary. ElectraNet therefore reserves the right to act in accordance with that Rule, if approved, for the purposes of the current transmission determination process. This could include, for example, the nomination of defined pass-through events, and any corresponding adjustments to the self-insurance allowance.

ElectraNet will continue to engage with the AER on the impact that this Rule change may have on ElectraNet's regulatory proposal. In relation to cost pass through events, ElectraNet will seek to nominate additional pass through events as soon as practicable after any enabling Rule change takes effect, and may seek to adjust the self-insurance forecast accordingly. Additional pass through events are likely to include those identified in the Grid Australia Rule change proposal, such as natural disaster events.

The total self-insurance premium for the purposes of this Revenue Proposal (based on the Rules currently in force) is shown in Table 6.15. The AON report includes full details of the amounts, values and other inputs used to calculate this proposed premium, and an explanation of the calculations involved.

Table 6.15: Self-insurance allowance ($m 2012-13)

	2013-14	2014-15	2015-16	2016-17	2017-18	Total
Self-insurance	1.4	1.5	1.5	1.5	1.6	**7.5**

Source: Aon Risk Solutions Self Insurance Risk Quantification, ElectraNet Pty Ltd, May 2012

80 AON, *Self Insurance Risk Quantification,* May 2012, Appendix V

81 Brett & Watson report *Workers Compensation – Outstanding Claims Investigation and Amount Required for a Guarantee as at 30 June 2011*, December 2011, Appendix V

82 Grid Australia, *Cost Pass Through Arrangements for Network Service Providers, Rule change request*, 14 October 2011

83 AEMC, *Draft Determination: Cost Pass-Through Arrangements for Network Service Providers*, 12 May 2012

Whilst it is noted that in its report AON has recommended the inclusion of additional margins for risk, expenses and profit in its estimates, ElectraNet has chosen not to incorporate these costs in its forecast in the interests of ensuring a prudent and efficient self-insurance allowance.

6.7.7 Other costs

Land tax

Land tax has been estimated by applying the statutory fixed formula for land tax to the portfolio of land held by ElectraNet as assessed by the Valuer General, and the estimated value of land to be acquired during the regulatory period. Land values have been escalated based on average land value growth factors (residential, commercial and rural) that have been derived from ABS data for different categories of land use based on independent expert advice[84]. The factors applied were presented earlier in Table 5.6.

The estimated cost of the land tax during the regulatory period is calculated in ElectraNet's operating expenditure forecast model as shown in Table 6.16.

Table 6.16: Land tax forecast ($m 2012-13)

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
ElectraNet property valuation estimate	51.0	63.7	69.8	74.6	80.4	87.3	93.4
Land tax obligation	1.2	2.3	2.5	2.7	2.9	3.2	3.4

Superannuation contribution shortfall

A portion of ElectraNet's workforce is subject to a defined benefits superannuation scheme. The unfunded liabilities for ElectraNet have increased in the current market environment. These additional costs have also been factored into the forecast based on expert actuarial assessment.[85]

The forecast shortfall over and above current employer contribution levels established following the actuarial investigation of the Scheme as at 30 June 2011 over the period July 2013 to 30 June 2018 is presented below.

Table 6.17: Forecast superannuation contribution shortfall ($m 2012-13)

	2013-14	2014-15	2015-16	2016-17	2017-18	Total
Superannuation contribution shortfall	0.9	0.7	0.4	0.4	0.0	**2.4**

[84] Maloney Field Services, *Assessment of Site Values for Land Tax,* May 2012, Appendix W

[85] Mercer Consulting, *Employer Contribution Projections 2013-18*, Letter dated 18 April 2012, Electricity Industry Superannuation Scheme

Revenue reset costs

The costs incurred in preparing ElectraNet's Revenue Proposal have been removed from the base year costs as they are not an ongoing expenditure during the period. ElectraNet has estimated revenue reset costs for the forthcoming regulatory period based on the actual and expected costs of its current revenue reset process.

6.7.8 Network support

Network support is an alternative to transmission network augmentation. The Rules require the pass through of network support costs subject to the relevant factors set out in clause 6A.7.2 of the NER and recent Guidelines published by the AER.

ElectraNet's network support forecast for the regulatory period is based on a forecast of the cost of network support services contracted to be provided at Port Lincoln on the Eyre Peninsula. The estimate for the new regulated revenue control period is shown in Table 6.18 and includes both fixed and variable costs based on an existing service provider agreement.

ElectraNet has not at this stage identified any other network support services that could defer capital investment during the regulatory period. However, ElectraNet is required through the RIT-T process under the Rules and the ETC to consider non-network options before committing to any capital investment in the network. Should a viable and cost effective non-network alternative to a capital project included in the capital expenditure forecast be identified during the regulatory period then ElectraNet will be required to:

- enter into a network support agreement for the provision of the relevant network support services; and
- fund the cost of these network support services from the revenue cap provided by the AER for delivery of such services in accordance with the original capital project timeframe – ElectraNet will not be able to seek a pass through of these costs for the period for which it has a corresponding capital expenditure allowance in the next regulatory period.

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

Table 6.18: Forecast network support costs ($m 2012-13)

	2013-14	2014-15	2015-16	2016-17	2017-18	Total
Network support	8.1	8.2	8.2	8.5	8.6	**41.6**

6.7.9 Debt raising costs

The AER allows benchmark debt raising costs based on a methodology developed by the Allen consulting Group. The calculation of this allowance is included in the PTRM.

In its recent Powerlink Transmission Determination, the AER has made updates to certain inputs to reflect current costs. On this basis, it has determined that a benchmark debt raising unit rate of 9.2 basis points per annum represents the efficient and prudent costs under current market conditions.

Accordingly, and on the basis of the material and reasons set out by the AER in the Powerlink Transmission Determination, ElectraNet has applied this unit rate for estimating its allowance for debt raising costs for the forthcoming regulatory period as shown in Table 6.19.

Table 6.19: Debt Raising costs ($m 2012-13)

	2013-14	2014-15	2015-16	2016-17	2017-18	Total
Debt Raising costs	1.1	1.2	1.3	1.3	1.4	**6.3**

6.8 Forecast operating expenditure

This section presents ElectraNet's operating expenditure forecast for the forthcoming regulatory period. The forecast is the result of applying ElectraNet's forecasting methodology as is described in Section 6.6, and the key inputs and assumptions described in section 6.7[86].

During the course of the regulatory period ElectraNet has restructured its organisation and implemented a new chart of accounts. It has therefore taken the opportunity to realign its cost centres with the operational expenditure allowances. While this does not alter the functional structure of the allowances, it does result in a revised underlying cost profile across these established categories. ElectraNet has therefore presented its forecast and historic expenditure in this section in accordance with the new cost centre mapping to ensure a like-for-like for comparison.

6.8.1 Summary of forecast operating expenditure

ElectraNet's operating expenditure forecast is shown by category in Table 6.20. The table summarises the forecast by cost category for the upcoming regulatory period from 2013-14 to 2017-18.

Table 6.20: Operating expenditure forecast ($m 2012-13)

Category	2013-14	2014-15	2015-16	2016-17	2017-18	Total
Routine Maintenance	15.0	15.5	15.7	17.0	17.8	**80.9**
Corrective Maintenance	14.9	15.2	14.1	12.2	12.5	**68.8**
Operational Refurbishment	11.8	14.7	14.4	12.4	11.5	**64.9**
Network Optimisation	0.8	2.8	2.5	3.5	3.7	**13.3**
Maintenance Support	13.0	13.5	13.9	14.6	15.0	**69.9**
Network Operations	8.8	9.1	9.4	9.8	10.1	**47.3**
Asset Manager Support	7.8	8.0	8.1	10.3	9.5	**43.8**
Corporate Support	6.0	6.2	7.0	7.3	7.4	**33.8**

86 By convention, all forecasts throughout this Revenue Proposal are reported in mid-year terms ($Dec real) unless otherwise indicated

Total Controllable	**78.1**	**85.0**	**85.2**	**87.0**	**87.5**	**422.8**
Self-Insurance	1.4	1.5	1.5	1.5	1.6	**7.5**
Network Support	8.1	8.2	8.2	8.5	8.6	**41.6**
Debt Raising costs	1.1	1.2	1.3	1.3	1.4	**6.3**
Total	**88.8**	**95.8**	**96.2**	**98.3**	**99.0**	**478.1**

6.8.2 Comparison of forecast and historical operating expenditure

Overall ElectraNet is forecasting a higher operating expenditure requirement than was allowed in the current regulatory period. This has resulted from the impact of the cost drivers described in Section 6.7.1.

In accordance with clause 6A1.2 (8) of the Rules, this section presents:

- a comparison of the operating expenditure forecast with historical operating expenditure in the current regulatory period by category; and
- an explanation of significant variations in the forecast operating expenditure from historical operating expenditure.

The comparison of forecast and historical operating expenditure is shown in Table 6.21.

Table 6.21: Comparison of forecast and historical operating expenditure ($m 2012-13)

Category	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Routine Maintenance	9.8	9.3	12.0	13.4	13.4	15.0	15.5	15.7	17.0	17.8
Corrective Maintenance	6.7	7.6	7.4	11.9	9.2	14.9	15.2	14.1	12.2	12.5
Operational Refurbishment	6.5	8.1	8.2	7.0	6.0	11.8	14.7	14.4	12.4	11.5
Network Optimisation	0.0	0.0	0.0	0.0	0.0	0.8	2.8	2.5	3.5	3.7
Maintenance Support	9.2	8.8	8.8	11.0	10.9	13.0	13.5	13.9	14.6	15.0
Network Operations	8.1	7.2	7.2	8.3	8.9	8.8	9.1	9.4	9.8	10.1
Asset Manager Support *	8.3	8.2	8.9	9.1	10.2	7.8	8.0	8.1	10.3	9.5
Corporate Support	5.1	5.8	5.8	5.8	6.7	6.0	6.2	7.0	7.3	7.4
Total Controllable	**53.8**	**55.1**	**58.4**	**66.4**	**65.3**	**78.1**	**85.0**	**85.2**	**87.0**	**87.5**
Self-Insurance	1.9	2.0	2.0	2.0	2.1	1.4	1.5	1.5	1.5	1.6
Network Support	5.3	5.2	6.9	6.9	7.1	8.1	8.2	8.2	8.5	8.6
Debt Raising	0.0	0.0	0.0	0.0	0.0	1.1	1.2	1.3	1.3	1.4
Total	**61.0**	**62.3**	**67.3**	**75.3**	**74.5**	**88.8**	**95.8**	**96.2**	**98.3**	**99.0**

* Forecast adjusted for revenue reset costs incurred in 2011-12 and 2012-13

Figure 6.5 compares the annual controllable operating expenditure forecast with annual historical operating expenditure in the current regulatory period.

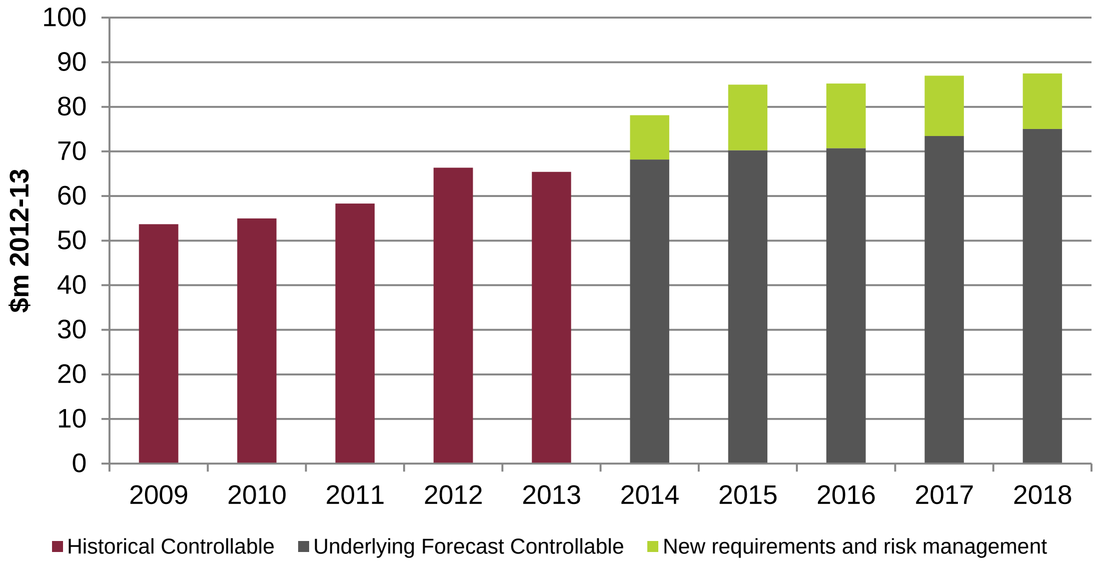

Figure 6.5: Controllable operating expenditure 2008-09 to 2017-18 ($m 2012-13)

The forecast contains a range of additional expenditure requirements, driven by new obligations and an increase in risk-based maintenance requirements, as discussed above. A comparison of forecast and historical controllable operating expenditure is shown in Table 6.22 by operating expenditure category together with explanations of significant variations.

Table 6.22: Comparison of forecast and historical controllable operating expenditure ($m 2012-13)

Category	Historic	Forecast	Explanation of Significant Variations
Routine Maintenance	58	81	Ongoing implementation of maintenance program on growing asset base
Corrective Maintenance	43	69	Increase in line maintenance effort based on revealed asset risk
Operational Refurbishment	36	65	Expanded program to address areas of major risk including asset overhauls, asset decommissioning/removal and network risk mitigation
Network Optimisation	–	13	New expenditure driven by the objective to improve the capability of the transmission network in relation to power flows, asset utilisation and asset management
Maintenance Support	49	70	Management of additional maintenance volumes, and increased land tax payments
Network Operations	40	47	Management of network optimisation initiatives

Category	Historic	Forecast	Explanation of Significant Variations
Asset Manager Support	45	44	No significant variation
Corporate Support (inc. insurance)	29	34	No significant variation
Total Controllable	**299**	**423**	

ElectraNet has continued the progressive implementation of its established long-term asset management strategy. Growing expectations of the existing transmission network are driving a stronger ongoing focus on extending asset life, increasing asset utilisation and maximising network performance.

This has revealed a need for significant additional corrective maintenance effort on transmission lines to manage critical defects, additional operational refurbishment expenditure to address identified risks based on asset condition, and network optimisation measures to improve utilisation and performance and efficiently defer augmentation expenditure. These requirements have driven variations in efficient expenditure levels from year to year, and require an increase in expenditure in the next regulatory period. A more detailed rationale for the program is provided in ElectraNet's Asset Management Plan.

ElectraNet is confident that its operating expenditure forecast is both efficient and prudent and that it meets the required expenditure objectives set out in the Rules.

6.8.3 Operating expenditure benchmarking

As one of the factors to which the AER must have regard under the Rules, ElectraNet undertook a high level benchmarking analysis to compare its projected operating expenditure with that of other TNSPs.

Figure 6.6 below shows ElectraNet's forecast operating expenditure to RAB ratio for 2013-14 compared with that of other TNSPs. ElectraNet's operating expenditure over RAB is 3.8 percent which compares favourably with like TNSPs for the same period.

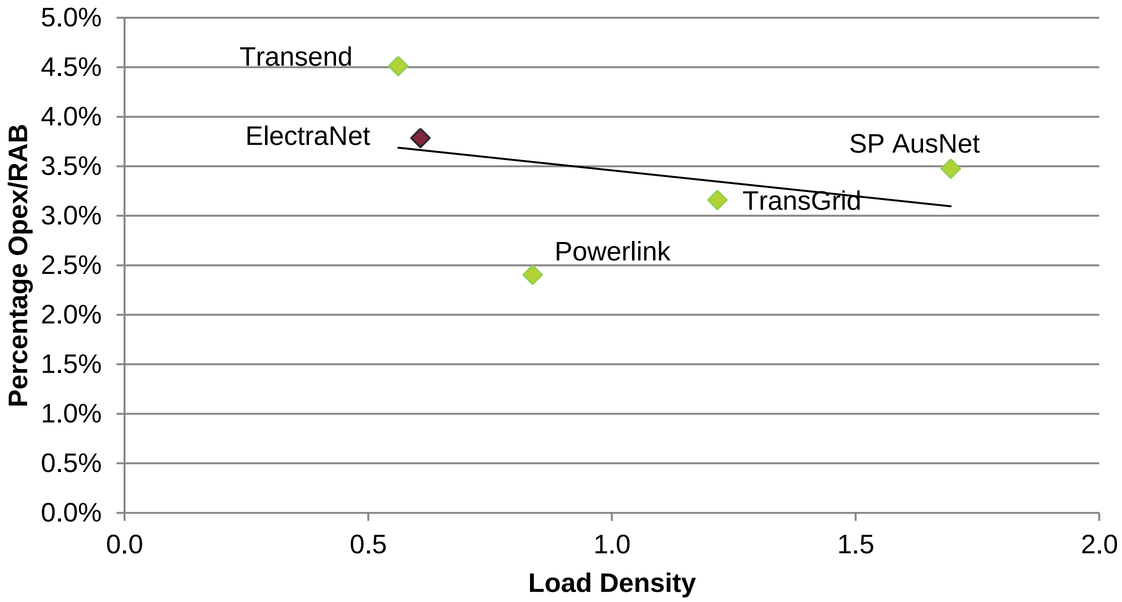

Figure 6.6: Forecast Operating Expenditure as a proportion of RAB 2013-14[87]

Any comparisons must take into account the unique cost drivers facing the South Australian transmission network, as outlined in Section 3.1. Where Powerlink and TransGrid have outperformed ElectraNet, this can be largely attributed to economies of scale due to significant differences in network size. Relatively low customer density also acts to increase the amount of network that must be maintained to supply each customer.

It should also be noted that load density does not take into account other drivers of network cost and performance such as variations in network configuration, functionality or condition.

6.8.4 Interaction between operating and capital expenditure

Operating and capital expenditure and system performance are intrinsically linked, which is why these factors are considered together in ElectraNet's approach to asset management (as discussed in Section 3.5.4). Consistent with the requirements of the Submission Guidelines, some of the more specific linkages between these factors are described below:

- ElectraNet uses the maintenance project program, where practical, to manage non-immediate asset risks while deferring asset replacement projects to align with augmentation projects (e.g. transformer refurbishment and removal of high risk instrument transformers at sites where larger scale replacement can be aligned with later augmentation needs);
- Delivery of the capital program is critical to maintaining control of operating expenditure because replacement of aged, obsolete and/or unsupported equipment manages the risk of increasing corrective maintenance costs associated with the deteriorating reliability of assets nearing the end of their useful lives. The impact of asset replacement has been directly modelled in the routine maintenance forecast discussed in Section 6.7.5;
- The capital program delivers new technology (e.g. communications capability, remote access relays and power system monitoring) which in turn drives improvements in real time operations capability and capacity. Improved network designs (e.g. the deployment of the IEC 61850 design standard for substation automation) provides a platform to improve future network performance and over time reduces ongoing maintenance requirements;
- As the network grows through capital investment, the costs of operating and maintaining the network also grows. This is directly modelled in the routine maintenance model as explained above and indirectly through the asset growth and scale factors discussed in Section 6.7.3;
- Operational refurbishment projects and network optimisation initiatives (e.g. real time rating of transmission lines) can defer the need for significant capital investment by restoring design capacity, improving utilisation of the network, and enabling assets to reach their full service life before capital replacement becomes necessary; and
- As noted in section 6.4.3, network support arrangements can be an economic alternative to delay or avoid the need for network augmentation. These costs are generally funded as non-controllable operating expenditure (under pass through arrangements) unless the service is an alternative to an investment for which

[87] Source: AER Revenue Determinations and AEMO Statement of Opportunities 2011

ElectraNet has a capital expenditure allowance, in which case the costs are funded as capital expenditure.

6.8.5 Directors' responsibility statement

In accordance with clause S6A.1.2(6) of the Rules, this Revenue Proposal must contain a certification of the reasonableness of the key assumptions that underlie the operating expenditure forecast by the Directors of ElectraNet.

The Directors' responsibility statement is included in Appendix A.

6.9 Benefits to customers

Delivery of ElectraNet's forecast operating expenditure program will provide the following benefits for customers – linked to the Network 2035 Vision objectives:

- the delivery of safety, reliability and security of supply through integrated long-term asset management planning, supported by robust data and information management processes, and investing in maintenance and capital replacement programs in order to manage risk and meet customer service requirements.
- the delivery of network services at lowest long-run cost, through the use of optimised asset maintenance practices and efficient asset replacement decisions, aligned where possible with augmentation projects.
- use of innovative solutions and new technology to extend asset life and improve network utilisation and performance to deliver transmission services at lowest long-run cost.
- facilitating economic development and community prosperity by maintaining the condition of the transmission network to meet the supply requirements of consumers and industry and delivering efficient and reliable electricity transmission services.
- supporting development of a lower emission energy future by managing asset risk in order to maximise the capacity and capability of the network through responsive maintenance and innovative asset management practices.

6.10 Concluding comments

This chapter has presented ElectraNet's operating expenditure forecast for the forthcoming regulatory control period from 1 July 2013 to 30 June 2018. The key cost drivers contributing to higher levels of forecast operating expenditure include:

- a growing asset base to meet increased customer demand requires higher levels of operating expenditure (net of scale efficiencies);
- continued implementation of a best practice asset management framework to encompass all network assets and manage the increased level of network risk revealed through improved asset condition information;
- the drive to improve asset utilisation, maximise network performance and capability in order to defer the need for capital investment and deliver lowest long-run cost solutions;

- real wages growth and related cost pressures caused by a projected strengthening in employment demand in the mining and construction sectors in South Australia; and
- a number of scope changes and new regulatory obligations imposing additional costs on the business.

The combined effect of these cost drivers is an increased operating expenditure requirement in the forecast period.

ElectraNet has developed its operating expenditure forecast to:

- Meet the expected demand for prescribed transmission services set out in Section 5.8.1 – demand forecasts that have been independently provided by AEMO, ETSA Utilities and ElectraNet's direct-connect customers in accordance with clause 5.6.1 and Schedule 5.7 of the Rules;
- Comply with all applicable regulatory obligations associated with the provision of prescribed transmission services – the applicable regulatory obligations are set out in Section 6.2; and
- Maintain the quality, reliability and security of supply of prescribed transmission services and the reliability, safety and security of the transmission system – the applicable quality, reliability, safety and security of supply standards are set out in Section 5.3.

ElectraNet is confident that its operating expenditure forecast is both efficient and prudent and that it meets the required expenditure objectives set out in the Rules.

7. Regulatory Asset Base

7.1 Summary

This Chapter presents information relating to ElectraNet's regulatory asset base (RAB) in accordance with the Rules and AER guidelines. The Chapter is structured as follows:

- Section 7.2 describes the roll forward methodology used to establish the opening asset base as at 1 July 2013; and
- Section 7.3 provides a summary of the derivation of the regulatory asset base as at 1 July 2013.

7.2 Roll forward methodology

ElectraNet has used the AER's Asset Base Roll Forward Model to roll forward its asset base and establish the opening RAB as at 1 July 2013.

In accordance with the AER's Asset Base Roll Forward Model, the opening RAB (nominal) for each year of the regulatory period is calculated by:

- adding incurred capex for each year of the regulatory control period up to 30 June 2011 and thereafter adding forecast incurred capex up to 30 June 2013, net of the value of assets disposed of during the current regulatory control period, adjusted for actual CPI;
- applying regulatory depreciation on a straight line basis, using the prescribed methodology; and
- adjusting the opening RAB for actual inflation.

The final steps in establishing the opening RAB are to recognise adjustments for the following as at 1 July 2013:

- adjustment for the difference between the estimated and actual capital expenditure during the last year of the previous regulatory period (1 July 2007 to 30 June 2008); and
- applying the return on difference for that year.

These calculations are summarised in the following section.

7.3 Regulatory asset base as at 1 July 2013

ElectraNet's opening RAB as at 1 July 2013 is derived by using the Asset Base Roll Forward Model, provided by the AER to:

- adjust the RAB value as at 1 July 2008 for differences between forecast and actual capital expenditure for the year to 30 June 2008;

- roll forward the RAB value as at 1 July 2008 for actual additions, disposals[88], revaluation and depreciation to 30 June, 2011, using the Asset Base Roll Forward Model provided by the AER; and
- add forecast capex and disposals for years ending June 2012 and June 2013.

Table 7.1 below shows the derivation of the regulatory asset base value as at 1 July 2013.

Table 7.1: Derivation of Opening RAB as at 1 July 2013 ($m nominal)

	2008-09	2009-10	2010-11	2011-12	2012-13
Opening RAB	1,311.8	1,394.7	1,501.9	1,735.6	1,888.7
Capital Expenditure as incurred	102.4	123.8	243.7	189.0	230.4
Straight line depreciation	(51.9)	(56.9)	(60.1)	(63.4)	(70.7)
Inflation adjustment	32.4	40.3	50.1	27.5	56.7
Closing RAB	1,394.7	1,501.9	1,735.6	1,888.7	2,105.1
Adjust for difference in 2007-08 actual capex (and disposals)					(3.1)
Adjust for return on difference in 2007-08 actual capex (and disposals)					(2.1)
Opening RAB at 1 July 2013					**2,099.9**

A completed Asset Base Roll Forward Model accompanies this Revenue Proposal for the current regulatory control period 2008-09 to 2012-13.

The roll forward of the RAB during the forthcoming regulatory control period 2013-14 to 2017-18 is presented in section 12.2.

88 As in previous regulatory periods, ElectraNet has adopted book value for disposals within the PTRM. In this Revenue Proposal, capital expenditure is reported net of disposals

8. Depreciation

8.1 Summary

This Chapter presents ElectraNet's assessment of the allowable depreciation on regulated assets during the forthcoming regulatory period.

Clause 6A.6.3 of the Rules requires that the nominated depreciation schedules must use a profile that reflects the nature of the category of assets (which must be classified into well accepted categories) over the economic life of that category of assets. ElectraNet has depreciated each asset category in the RAB on a straight-line basis over its economic life, in accordance with the requirements of clause 6A.6.3.

The remainder of this chapter is structured as follows:

- Section 8.2 describes ElectraNet's depreciation methodology;
- Section 8.3 sets out ElectraNet's standard asset lives;
- Section 8.4 presents ElectraNet's nominated depreciation schedules for the forthcoming regulatory period; and
- Section 8.5 provides some concluding comments.

8.2 Depreciation methodology

The Accounting Standard AASB 116 Property, Plant and Equipment, defines depreciation as the systematic allocation of the depreciable amount of an asset over its useful life. The accounting standard requires depreciation to be charged on a systematic basis over the life of the asset. In addition, asset lives are required to be reviewed at least once each annual reporting period.

ElectraNet has used the remaining asset lives recorded in its fixed asset register and rolled forward the remaining asset life to the end of the forthcoming regulatory period. Assets capitalised in each asset class have been included, taking into account the actual year of capitalisation and the value of the assets. Where asset classes have been aggregated for efficiency, a weighted average life approach has been used to determine the remaining life of each asset class.

Where assets are forecast to be decommissioned, asset lives have been adjusted to depreciate over the remaining economic life of the asset. Other assets depreciate from their commissioning date using ElectraNet's standard asset life.

ElectraNet has used the AER's PTRM to calculate depreciation. Opening assets have been calculated in accordance with the AER's asset base roll forward model. The depreciation profile chosen is a straight-line depreciation profile from the asset commissioning date.

8.3 Standard asset lives

Accounting standards recognise that a characteristic common to all physical assets held on a long-term basis, with the exception generally of land and easements, is that their useful lives are limited because their service potential declines over time.

This decline can occur due to factors such as wear and tear, technical obsolescence and commercial obsolescence. The possibility of obsolescence, both technical and commercial, is a factor which exists regardless of the physical use of an asset.

The useful life of an asset is "*the period over which an asset is expected to be available for use by an entity*"[89] usually assessed and expressed on a time basis defined in terms of the asset's expected utility to the entity. In determining the useful life, the following factors need to be considered:

- the expected usage of the asset assessed by reference to the asset's expected capacity or physical output;
- expected physical wear and tear, which depends on operational factors such as the environmental conditions in which the asset is to be used and the repair and maintenance program;
- the anticipated technical life of the asset, that is, the period of time over which the asset can be expected to remain efficient having regard to technical obsolescence;
- the expected commercial life of the asset, corresponding to the commercial life of its product or output; and
- in the case of certain rights and entitlements, the legal life of the asset, that is, the period of time during which the right or entitlement exists.

The standard asset lives applied by ElectraNet for existing asset classes have not changed in the current regulatory period. However, ElectraNet has reintroduced an asset class for transmission line refit expenditure.

Following such works, the remaining life of the refitted transmission line will be extended beyond the remaining term (if any) of the standard asset life of 55 years. ElectraNet has adopted an asset life for this asset class of 15 years, which reflects the average life extension period for the assets in question, assessed on a case by case basis. The remaining life of the underlying transmission asset (where applicable) is then adjusted to align with the extended asset life, and depreciated over the same timeframe on a straight line basis.

This approach is supported by advice from ElectraNet's company auditor, PricewaterhouseCoopers[90].

ElectraNet's asset categories, standard asset lives and average remaining lives are shown in Table 8.1 below. These asset categories have been used to forecast ElectraNet's revenue requirement in the AER's PTRM.

89 Accounting Standard AASB 116 Property, Plant and Equipment

90 Provided to the AER on a confidential basis

Table 8.1: Asset Categories and Asset Lives (years)

Asset Category	Standard Life	Average Remaining Life
Substation Primary	45	33
Substation Establishment	55	53
Substation Demountable Buildings	15	9
Substation Fences	35	35
Substation Secondary Systems – Electromechanical	27	17
Substation Secondary Systems – Electronic	15	13
Transmission Lines – Overhead	55	31
Transmission Lines – Underground	40	35
Refurbishment – Transmission Lines - Overhead Refit	15	n/a
Network Switching Centres (e.g. SCADA)	3	4
Communication – Civil	55	45
Communication – Other	15	12
Commercial Buildings	30	24
Computers, Software and Office Machines	4	3
Office Furniture, Movable Plant and Miscellaneous	10	9
Easements	n/a	n/a
Land	n/a	n/a

These standard and average remaining asset lives are applied in the PTRM to assets commissioned in the regulatory period from 1 July 2013 to 30 June 2018.

8.4 Depreciation forecast

ElectraNet has forecast its depreciation schedules for the regulatory period based on the roll forward of the opening asset base and forecast asset additions and disposals.

Asset class lives included in the opening asset base (as at 1 July 2013) have been calculated using a weighted average life. The PTRM has been used to calculate the depreciation forecast on a straight-line-basis.

Clause 6A.6.3(b)(1) of the Rules requires ElectraNet to use a profile that reflects the nature of the assets or category of assets over the economic life of that asset or category of assets. Straight-line depreciation is a well-established method used to reflect the economic life of an asset.

Clause S6A.1.3(7) of the Rules requires ElectraNet to provide depreciation schedules that categorise the relevant assets by reference to well accepted categories. ElectraNet has provided depreciation schedules by asset class (e.g. transmission lines, substation primary plant etc.) in the relevant Submission Guideline Templates. The sum total of the required regulatory accounting depreciation allowance is shown in Table 8.2.

Clause S6A.1.3(7) also requires ElectraNet to provide the depreciation schedules by location. ElectraNet understands this requirement relates to clause 6A.6.3, which requires special treatment of assets dedicated to one user or a small group of users (not being a DNSP) with value exceeding $20m. ElectraNet does not have any assets that fall within this category.

Table 8.2: Forecast regulatory depreciation schedule ($m nominal)

	2013-14	2014-15	2015-16	2016-17	2017-18	Total
Straight line depreciation	87.6	96.7	111.9	117.5	127.5	**541.2**
Inflation adjustment on RAB	(52.5)	(57.4)	(61.5)	(66.1)	(70.1)	**(307.6)**
Regulatory depreciation	35.1	39.3	50.4	51.4	57.4	**233.6**

For the purpose of estimating the cost of corporate income tax pursuant to clause 6A.6.4 of the Rules, ElectraNet has calculated tax depreciation in accordance with tax law on a straight-line basis. Different asset lives apply for taxation purposes.

Table 8.3 shows the forecast tax depreciation schedule for the forthcoming regulatory period, which has been used to calculate ElectraNet's allowance for corporate income tax. Further details of this are provided in section 9.3.

Table 8.3: Forecast tax depreciation schedule ($m nominal)

	2013-14	2014-15	2015-16	2016-17	2017-18	Total
Straight-line tax depreciation	59.7	67.7	80.6	81.4	99.0	**388.3**

8.5 Concluding comments

ElectraNet has modelled and forecast its depreciation allowance at an asset category level using straight-line depreciation with all assets within a class assigned a weighted average standard and remaining life. Where assets are to be decommissioned during the regulatory control period, those assets are written-off over the regulatory period on a straight-line depreciation basis.

The AER's PTRM has been used to calculate both the regulatory and tax depreciation allowances. This approach is consistent with the requirements set out in clauses 6A.6.3 and S6A.1.3 of the Rules.

9. Cost of Capital and Taxation

9.1 Summary

The assessment of an adequate rate of return is of critical importance to ElectraNet, as it directly affects the incentive for the owners to undertake investments in the network, and this, in turn, impacts outcomes for customers. It is noted that the regulatory regime is intended to provide commercial incentives for efficient investment.

This Chapter is structured as follows:

- Section 9.2 presents ElectraNet's estimate of the WACC in accordance with the requirements of clause 6A.6.2 of the Rules and the Statement of the revised WACC parameters (transmission). This WACC is used to determine the return on capital component of the Revenue Proposal. It is noted that, for the purposes of the Proposal, some parameters (e.g. risk free rate) are sampled/ estimated just before the time of submission of the Proposal, whereas the value which is used in the AER's final decision will be sampled closer to the time of the decision based on an averaging period nominated by ElectraNet (on a confidential basis).
- Section 9.3 provides details of the net tax allowance calculated for inclusion in the Revenue Proposal in accordance with the WACC methodology and parameter values specified in clause 6A.6.2 and the requirements of the AER's PTRM.

9.2 Estimation of WACC

As noted above, clause 6A.6.2 sets out that the post-tax nominal vanilla Weighted Average Cost of Capital (WACC) is to be estimated in accordance with the following formula:

$$WACC = k_E \frac{E}{V} + k_D \frac{D}{V}$$

where:

- k_E is the nominal return on equity (determined using the Capital Asset Pricing Model (CAPM)) and is calculated as:

$k_E = r_f + \beta_e$ x MRP where:

  - r_f is the nominal risk free rate for the regulatory control period;
  - β_e is the equity beta; and
  - MRP is the market risk premium;

- k_D is the nominal return on debt and is calculated as:

$k_D = r_f$ + DRP where

  - DRP is the debt risk premium for the regulatory control period.

- E/V is the equity share in total value (equal to 1 - D/V); and
- D/V is the debt share in total value.

In May 2009, the AER released its Statement of the revised WACC parameters (transmission), which applies to transmission revenue building block determinations made under chapter 6A of the NER in respect of which the relevant revenue proposal is lodged between 1 May 2009 and 1 April 2014[91]. For transmission networks, these values, methods and credit rating levels are 'locked-in'. The Statement specifies that the following parameter values must be applied:

- benchmark gearing (D/V) is set at 60 percent;
- the market risk premium (MRP) is 6.5 percent;
- the equity beta (β_e) is 0.80;
- the assumed utilisation of imputation credits (γ) is 0.65; and
- the benchmark credit rating used to estimate the debt risk premium is BBB+.

To calculate the WACC, ElectraNet is required to estimate the remaining WACC parameters:

- the nominal risk free rate;
- the debt risk premium; and
- forecast inflation.

Each of these parameters is addressed in turn in the remainder of this section.

9.2.1 Nominal risk free rate

The risk free rate represents the rate of return on an asset with zero default risk and is a key component of both the cost of equity and cost of debt.

In accordance with the Statement of the revised WACC parameters (transmission), the nominal risk free rate is the rate determined by the AER on a moving average basis from the annualised yield on Commonwealth Government bonds with a maturity of ten years.[92] The Statement of the revised WACC parameters (transmission) provides that the period of time over which the risk free rate is to be calculated is a period chosen by the transmission network service provider (and agreed to by the AER) that is as close as practically possible to the commencement of the regulatory control period, or a period that is specified by the AER if the period notified by the provider is not agreed by the AER.

The cost of debt estimate is effectively determined by reference to reported cost of debt benchmarks.[93]

The cost of equity cannot be observed or estimated as readily as the cost of debt, and under the Chapter 6A provisions of the NER, must be estimated by applying the CAPM. The nominal risk free rate enters the CAPM formula as an independent component of the estimate of the cost of equity, with the other components being the estimated risk premium

91 AER (May, 2009), *Statement of the revised WACC parameters – transmission, p.3*

92 AER (May, 2009), *Statement of the revised WACC parameters - transmission*

93 Under clause 6A.6.2(b), the cost of debt is the sum of the nominal risk free rate and debt risk premium. However since the nominal risk free rate is subtracted from the benchmark corporate bond yield to derive the debt risk premium, the cost of debt in total is effectively determined by the benchmark corporate bond yield

above the risk free rate that is demanded by investors in order to accept the systematic risk associated with the investment, and the equity beta.

This methodology is presently inherently problematic. In recent times, the Commonwealth Government bond rate has fallen significantly to the lowest levels observed for over 60 years, due to, inter alia, the current turmoil in international financial markets associated with defaulting European debt. In these circumstances financial investors seek safe havens, and as a result there has been increased demand for Commonwealth Government bonds, which has increased their price and reduced yields.

The challenge for the estimation of the cost of equity is that, during times of financial crisis, when government bond rates fall, the MRP does not remain at the long term average (or normal market levels), but increases by an amount that is at least necessary for the estimated cost of equity not to be lower during the crisis. Consequently, an even larger increase in the MRP is expected to occur in line with the intuition that the cost of equity should rise during a crisis.

There are three possible combinations of the MRP and the risk free rate that could be applied in such circumstances:

- the current (spot rate) MRP and current (spot rate) risk free rate – this would, in combination, provide an appropriate estimate of the cost of equity over time if applied consistently;
- the long term average MRP and the long term average risk free rate – this would, in combination, provide an appropriate estimate of the cost of equity over time if applied consistently; and
- a combination of the long term average MRP and the spot measure of the risk free rate – this would not provide an appropriate estimate of the cost of equity if the spot measure of the risk free rate is at abnormally low levels (as is presently the case).

The application of a risk free rate based on the current abnormally low yield on ten year Commonwealth Government bonds in accordance with the Statement of the revised WACC parameters (transmission) means that for every ten basis points that the risk free rate is depressed compared with its long run average value, the WACC will be reduced by four basis points.[94]

Whilst it is noted that the AER stated that it undertook a ‘reasonableness test’ on the calculated WACC in its recent Final Decision for Powerlink, the risk free rate at the nominated sampling period was considerably higher than it is at present.

The AER should be cognisant of the above issues in making its determination in respect of ElectraNet and in making future cost of capital decisions. In particular, it is critical that the AER has regard to the overarching requirements of the Rules and the Law, that the return on capital:

- reflect the return required by investors in a commercial enterprise with a similar nature and degree of non-diversifiable risk as that faced by the regulated business;[95]

[94] This is because the cost of debt, accounting for 60 percent of the WACC, will not be affected by the depressed risk free rate, while the cost of equity (accounting for 40 percent of the WACC) will be affected directly through the CAPM formula

[95] *National Electricity Rules*, clause 6A.6.2(b)

- allow for a return commensurate with the regulatory and commercial risks involved in providing network services;[96] and
- provide a reasonable opportunity for the business to recover at least the efficient costs it incurs in providing network services.[97]

For the purposes of this Revenue Proposal ElectraNet has applied an indicative risk free rate calculated based on a ten day sampling period as close as reasonably possible to the timing of finalising the proposal for submission by end May. This leads to a current estimate of the risk free rate of 3.26 percent.

As required, ElectraNet has nominated a reference period for the calculation of the risk free rate for the purposes of its Final Decision on a confidential basis to the AER.

9.2.2 Debt risk premium

The cost of debt is estimated by adding a debt risk premium (DRP) to the risk free rate of return. Clause 6A.6.2(e) of the Rules states:

> *"The debt risk premium for a regulatory control period is the premium determined for that regulatory control period by the AER as 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 and Poors and a maturity equal to that used to derive the nominal risk free rate."*

ElectraNet engaged PricewaterhouseCoopers (PwC) to assist ElectraNet in formulating a methodology for estimating the debt risk premium based on the use of the extrapolated Bloomberg curve.[98] This methodology is consistent with that applied in the AER's most recent revenue determinations[99] and is consistent with recent Tribunal decisions.[100][101][102]

In its report for ElectraNet, PwC undertook detailed analsyis to estimate the debt risk premium for a test averaging period covering the 20 business days up to and including 18 November 2011 based on the seven year Bloomberg BBB fair value curve, extrapolated to ten years. In parallel PwC applied an econometric analysis based on a sample of bonds to validate this analysis in order to demonstrate the robustness of its methodology. Based on this evidence, PwC recommended that the extrapolated Bloomberg curve be applied to estimate the debt risk premium.

For the purposes of this Revenue Proposal, an updated estimate was produced based on a 10-day averaging period up to and including 22 May 2012, representing the latest period for which market data was available a the time of submission.

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96 *National Electricity Law*, s 7A(5)

97 *National Electricity Law*, s 7A(2)

98 PricewaterhouseCoopers, *ElectraNet – Estimating the benchmark debt risk premium and equity costs,* May 2012, Appendix X

99 AER, *Final Decision: Powerlink Transmission determination 2012–13 to 2016–17, April 2012, p 34; AER, Final Distribution Determination: Aurora Energy Pty Ltd 2012–13 to 2016–17*, April 2012 p 31

100 Application by Jemena Gas Networks NSW) Ltd (No 5) [2011] ACompT 10 (9 June 2011), paras. 88-90

101 Application by United Energy Distribution Pty Limited (No 2) [2012] ACompT 4 (6 January 2012), para. 434. This was a joint appeal including five parties: United Energy Distribution Pty Limited; SPI Electricity Pty Limited; Citipower Pty Limited and Powercor Australia Limited. Other similar Tribunal decisions at this time included: Application by Envestra Limited (No 2) [2012] ACompT 3 (11 January 2012); and Application by APT Allgas Energy Limited (no 2) [2012] A CompT 5 (11 January 2012)

102 Application by Envestra Limited (No 2) [2012] ACompT 3 (11 January 2012), para. 123

ElectraNet notes that the AER will determine the actual debt risk premium from market data closer to the date of its determination, based on the averaging period nominated by ElectraNet on a confidential basis. While it is also noted that the AER intends to undertake a wider review and public consultation on alternative approaches to estimating the DRP, the prevailing methodology at the time of lodgement should be applied for the purposes of this Revenue Proposal.

9.2.3 Forecast inflation

The expected inflation rate is an inherent aspect of the nominal risk free rate and is also implicit in the nominal cost of debt. For this Revenue Proposal, ElectraNet has adopted an inflation rate of 2.5 percent for the forecast period.

This forecast reflects the AER approach to forecasting CPI using the RBA's short-term inflation forecasts extending out to two years and the mid-point of the RBA's target inflation band of 2.5 percent for the remaining eight years. An implied ten year forecast of the annual expected inflation rate is derived by averaging (geometrically) the individual forecasts as shown in Table 9.1.

Table 9.1: Inflation forecast (% pa)

	2013-14 to 2022-23	Geometric Average
Forecast Inflation	2.50	2.50

For the 2012-13 financial year ElectraNet has adopted a carbon price adjusted CPI as published by the RBA of 3.0%.

9.2.4 Summary

ElectraNet has calculated, for the purposes of this Revenue Proposal, a post-tax nominal vanilla WACC of 7.73 percent in accordance with the requirements of the Rules. This is an indicative estimate based on a ten business day draft reference period ending on 22 May 2012, and is as close to the date of submission as is practicable. ElectraNet recognises that the nominal risk free rate and debt risk premium will be determined based on the averaging date nominated for the purposes of the final determination.

The key parameters and variables underlying the cost of capital calculation are summarised in Table 9.2 below.

Table 9.2: WACC parameters used for the purpose of this Revenue Proposal

Parameter	ElectraNet Proposal
Nominal Risk Free Rate	3.26%
Inflation rate	2.50%
Cost of Debt margin over rf	3.98%
Market Risk Premium	6.50%
Corporate Tax rate	30.00%
Proportion of Equity Funding	40.00%
Proportion of Debt Funding	60.00%
Value of Imputation Credits	0.65
Equity Beta	0.80
Normal Vanilla WACC	7.73%

9.3 Taxation allowance

As part of the post-tax nominal approach to the revenue determination, a separate allowance must be made in the revenue cap for corporate income tax, net of the value ascribed to dividend imputation credits. Clause 6A.6.4 of the Rules sets out the methodology for calculating the allowance for corporate income tax in accordance with the following formula:

$$\mathbf{ETC_t} = (\mathbf{ETI_t} \times \mathbf{r_t})\,(1 - \boldsymbol{\gamma})$$

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, which is deemed to be 0.65.

In May 2009, the AER raised its gamma assumption from the previously applied value of 0.50, to a new higher value of 0.65. More recently, in its Energex decision, the Australian Competition Tribunal (Tribunal) has reviewed the AER's gamma assumption and determined that the AER was in error in determining a value for gamma of 0.65 and found that the correct value to be adopted for gamma is in fact 0.25[103].

In making a decision on the taxation allowance for ElectraNet, the AER remains required under the current Rules to use the value of 0.65 for gamma, as determined in the 2009 Statement of Revised WACC Parameters. ElectraNet has, therefore, used a value of 0.65 for gamma for the purposes of this Revenue Proposal, but notes that a proposed rule change is currently under consideration by the AEMC which would (if accepted) affect the

[103] Application by Energex Limited (Gamma) (No 5) [2011] ACompT (12 May 2011), para. 42

value for gamma to be used in the AER's final determination[104]. The effect of the proposed rule change would be to require the AER to use the value of 0.25 for gamma (as determined by the Tribunal in May 2011[105]) in its forthcoming transmission determination in respect of ElectraNet.

Based on current forecasts of bond rates and inflation, and the tax depreciation schedule shown in section 8.5, and adopting a gamma value of 0.65, ElectraNet's proposed net tax allowance for the regulatory period is as set out in Table 9.3 below.

Table 9.3: Tax allowance ($m nominal)

Tax Allowance	2013-14	2014-15	2015-16	2016-17	2017-18	Total
Tax payable	15.6	16.5	17.8	20.0	17.9	**87.7**
Less value of imputation credits	(10.1)	(10.7)	(11.6)	(13.0)	(11.6)	**(57.0)**
Net tax allowance	5.5	5.8	6.2	7.0	6.2	**30.7**

This tax allowance has been calculated using the AER's PTRM and the tax depreciation allowance summarised in section 8.4.

104 ElectraNet Rule Change Proposal - Gamma, 30 November 2011

105 *Application by Energex Limited (Gamma) (No 5)* [2011] ACompT 9. In that decision the Tribunal found error in the AER's decision in respect of gamma in the 2009 WACC Review. The Tribunal determined a value of 0.25, based on a distribution rate of 0.7 (this followed submissions from the AER that there was no evidence to support a distribution rate higher than 0.7) and a value for theta of 0.35 (this was based on a state-of-the-art dividend drop-off study which was undertaken as requested by the Tribunal)

10. Service Target Performance Incentive Scheme

10.1 Summary

This chapter presents ElectraNet's service target performance incentive scheme and the values proposed to be attributed to the scheme parameters in accordance with clause S6A.1.3(2) of the Rules and the provisions of the Service Targets Performance Incentive Scheme (STPIS) guideline of 31 March 2011 (the Guideline).

ElectraNet's service performance in the current regulatory period was discussed in section 4.5 of this Revenue Proposal.

ElectraNet has been subject to performance incentives since 1 April 2000, and is operating at or near 'best practice' levels for a network with its particular characteristics. Having responded positively to the incentives that have been in place since 1 April 2000, there are increasingly limited opportunities to make further improvements. Accordingly it is appropriate to recognise the inherent difficulty faced by ElectraNet in improving service performance from an already high base.

The STPIS is based on service standard measures that are common to all TNSPs. However, as has been recognised since the inception of the scheme, there must be flexibility in how these performance measures are implemented for each TNSP. The STPIS is based on the assumption that performance measurement will be consistent with the way in which historical performance was measured for target setting.

During the current period, ElectraNet sought early application of the Market Impact Parameter, which would have otherwise applied from the start of the forthcoming regulatory period, in order to gain experience under this measure and the additional incentives it provides. ElectraNet has participated in this element of the scheme since 1 January 2011.

Key features of ElectraNet's proposed STPIS target, caps, collars and values include:

- an adjustment to the transmission circuit availability targets and associated caps and collars for the increase in volume and complexity of network projects proposed for the 2013-14 to 2017-18 regulatory control period versus the 2008-09 to 2012-13 regulatory control period;
- performance targets based on performance over the most recent five years, consistent with clause 3.3(g) of the Guideline, and with the target setting period for the current regulatory period;
- caps and collars are set by reference to the proposed performance targets using sound methodologies which reflect the underlying distribution of risk; and
- rebalancing of the weightings between the average outage duration and the circuit availability critical peak to support an increased focus on the performance of the radial network.

The remainder of this Chapter is structured as follows:

- Section 10.2 describes the requirements of the Rules in relation to the service target performance incentive scheme;

- Section 10.3 sets out ElectraNet's service target performance incentive scheme parameters (or performance measures), and the proposed values to be applied to these parameters; and
- Section 10.4 provides concluding comments.

10.2 Rules requirements

In accordance with clause 6A.7.4 of the Rules, the AER has developed and published an incentive scheme. The Rules require that the incentive scheme should provide incentives for each Transmission Network Service Provider to:

- provide greater reliability of the transmission system that is owned, controlled or operated by it at all times when Transmission Network Users place greatest value on the reliability of the transmission system; and
- improve and maintain the reliability of those elements of the transmission system that are most important to determining spot prices;

while taking into account:

- the regulatory obligations with which TNSPs must comply;
- other incentives provided in the Rules that TNSPs have to minimise capital or operating expenditure; and
- the age and ratings of the assets comprising the relevant transmission system.

The current version of the incentive scheme is set out in the 'Service Target Performance Incentive Scheme' dated March 2011 (STPIS guideline). The STPIS guideline together with the targets, caps, collars and weightings proposed in this Revenue Proposal form the incentive scheme that ElectraNet proposes for the 2013-14 to 2017-18 regulatory control period.

The incentive scheme provides ElectraNet with an incentive or penalty of 1 percent of MAR under the service component, and an incentive of up to 2 percent of MAR under the market impact component.

10.3 Incentive scheme parameters

In accordance with the STPIS guideline, ElectraNet's performance incentive scheme will measure performance against the following parameters:

- transmission circuit availability;
- loss of supply event frequency;
- average outage duration; and
- market impact of transmission congestion.

Transmission circuit availability is comprised of three sub-parameters which seek to capture the overall level of transmission line availability together with the availability of those lines that are most important in determining spot prices:

- Transmission circuit availability applies to all prescribed transmission lines and is predominantly a measure of planned maintenance and construction outages on the network; and
- Critical circuit availability peak and non-peak applies to the 275 kV "backbone" transmission lines, including the Heywood interconnector between South Australia and Victoria. These transmission lines are the most critical transmission lines in determining spot prices. Consistent with the guideline, peak hours are defined as 8:00 am to 8:00 pm weekdays[106].

The loss of supply event frequency is a threshold-based, unserved energy measure which captures both the magnitude and duration of unplanned interruptions to customer supply. Two thresholds apply: 0.05 and 0.2 system minute levels[107].

Average outage duration (AOD) is a simple measure of the average time without transmission supply for those connection points that experience unplanned transmission outages during the reporting period.

The market component of the STPIS is a measure of the economic impact of planned and unplanned transmission network outages on the market. This component of the scheme has a single market impact parameter (MIP) that incentivises TNSPs to minimise transmission outages that can affect the dispatch of generation in the NEM. This is measured by a count of the number of five-minute dispatch intervals where a planned or unplanned outage on the transmission network results in a network outage constraint with a marginal value greater than $10/MWh.

The Scheme allows for particular elements relating to a parameter to be established in a transmission determination, where so specified. In the case of ElectraNet, all elements relating to its proposed scheme parameters are already established in Appendix B of the STPIS guideline, and hence none are required to be addressed in this Revenue Proposal[108].

Clause 3.3(a) of the STPIS Guideline requires that a TNSP must submit, in its revenue proposal, proposed values for the parameters applicable to the TNSP. These values are for performance targets, caps and collars. For the market congestion component, only a performance target and a cap need be set. ElectraNet's proposed values, weightings and other elements that are to be attributed to the performance incentive scheme parameters are specified in the following subsections.

10.3.1 Performance targets

Clause 3.3(g) of the STPIS Guideline sets out the basic requirement that proposed performance targets for the service component must be equal to the TNSP's average performance history over the most recent five years. 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.

106 STPIS Guideline Appendix B Part 1
107 STPIS Guideline Appendix B Part 1
108 Clause 3.2 of the STPIS Guideline

Consistent with this requirement, ElectraNet proposes to use performance data for the historic period 2007 to 2011, being the most recent 5-year period for which data is currently available. The parameters calculated from this data are consistent with the parameter definitions as set out in the STPIS guideline.

ElectraNet's proposal is consistent with the established practice of adopting the most recent five year period completed immediately prior to the lodgement of the Revenue Proposal. This approach also has the advantage that the data set has been fully reviewed, and subject to external audit in the course of the annual STPIS performance review process, with the corresponding performance outcomes and associated penalty/ bonus payments approved by the AER.

Clause 3.3(c) of the STPIS Guideline states that a proposed performance target may take the form of a performance deadband. Performance deadbands do not apply to the current incentive scheme and none are proposed for the 2013-14 to 2017-18 regulatory control period.

Clause 3.3(k) of the STPIS Guideline states that proposed performance targets may be subject to reasonable adjustment to allow for:

- statistical outliers;
- the expected effects on the TNSP's performance from any increases or decreases in the volume of capital works planned during the regulatory control period (compared with the volume of capital works undertaken during the period used to calculate the performance target);
- the expected material effects on the TNSP's performance from any changes to the age and ratings of the assets comprising the TNSP's transmission system during the TNSP's next regulatory control period (compared to the age and ratings of the TNSP's assets comprising the TNSP's transmission system during the period used to calculate performance targets); and
- material changes to an applicable regulatory obligation.

ElectraNet proposes adjustments relating to changes in the volume and composition of its forecast capital works. Changes to the volume of capital works only impact on the Transmission Circuit Availability parameters as all other parameters exclude the impact of planned work. Hence, an adjustment is proposed only in respect of the Transmission Circuit Availability parameters.

As noted in Chapter 5, ElectraNet is proposing to undertake a significant program of capital works in the 2013-14 to 2017-18 regulatory control period. These works will require a higher level of outages of transmission line circuits than has been required during the current regulatory control period. ElectraNet has calculated the annual availability impact of the higher volume of capital works and proposes to adjust the transmission line availability target by 0.062 percent, the transmission line critical peak availability by 0.020 percent, and the transmission line critical non-peak availability by 0.091 percent.

The adjustment methodology maps the dollar amounts of capital expenditure in defined categories of projects in the current period to the dollar amounts of capital expenditure projects in the next period on a consistent basis. The actual outage hours associated with those categories of project in the current period are then scaled according to the capital expenditure increase to arrive at an adjustment for the availability parameters for the next period. The performance target is thereby adjusted for the increase in the volume of capital works planned during the regulatory control period compared with the volume of capital works undertaken during the period.

Extending this principle to capital works that have not yet reached a sufficient level of certainty to warrant inclusion in the ex-ante forecast, ElectraNet also proposes to exclude the outage impact of any contingent projects that are triggered in the next regulatory control period. Clearly such projects can significantly increase the volume of capital works and materially impact on performance under the STPIS. The removal of these impacts is consistent with the principle of excluding the expected effects of any increase in the volume of planned capital works relative to the reference period.

Table 10.1 and Figures 10.1 to 10.3 present the adjusted performance targets and corresponding caps and collars proposed.

Table 10.1: Availability adjustment

Parameter	Availability Average 2007-11 (%)	Proposed Availability Adjustment (%)	Proposed Performance Target (%)
Transmission Circuit Availability	99.562	0.065	99.50
Critical Circuit Availability Peak	99.147	0.021	99.13
Critical Circuit Availability Non-Peak	99.664	0.040	99.62

Should the AER consider that the outage impact of contingent projects should be included in the incentive scheme, ElectraNet reserves the right to propose adjustments to the targets to take into account the likely impact of contingent projects.

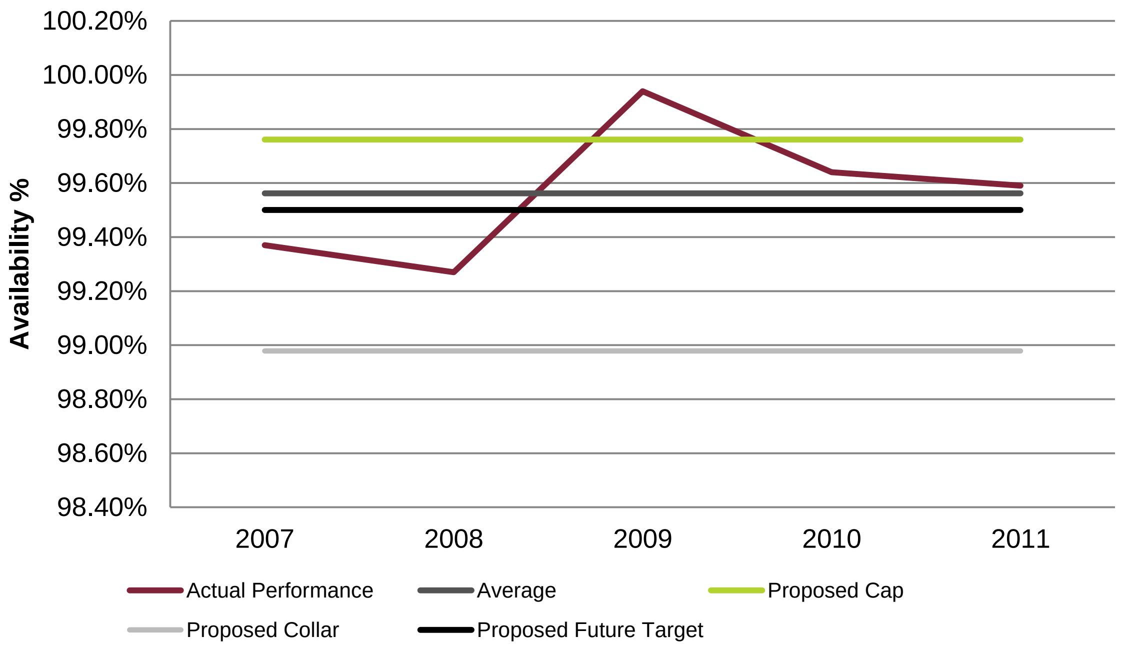

Figure 10.1: Transmission line availability performance 2007–11

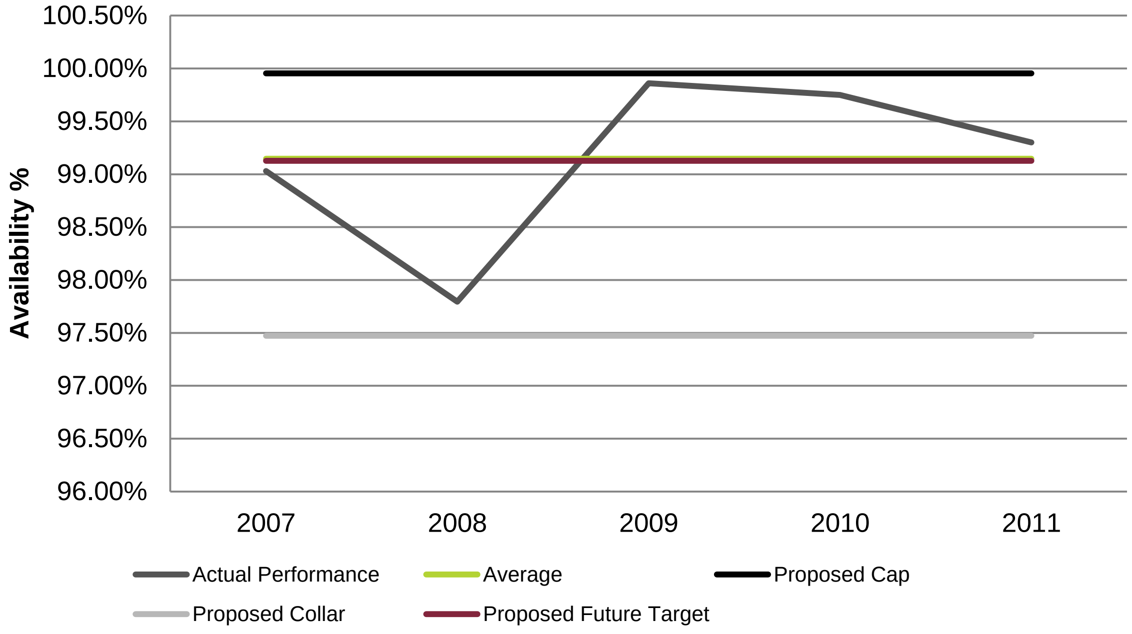

Figure 10.2: Transmission line critical peak availability performance 2007–11

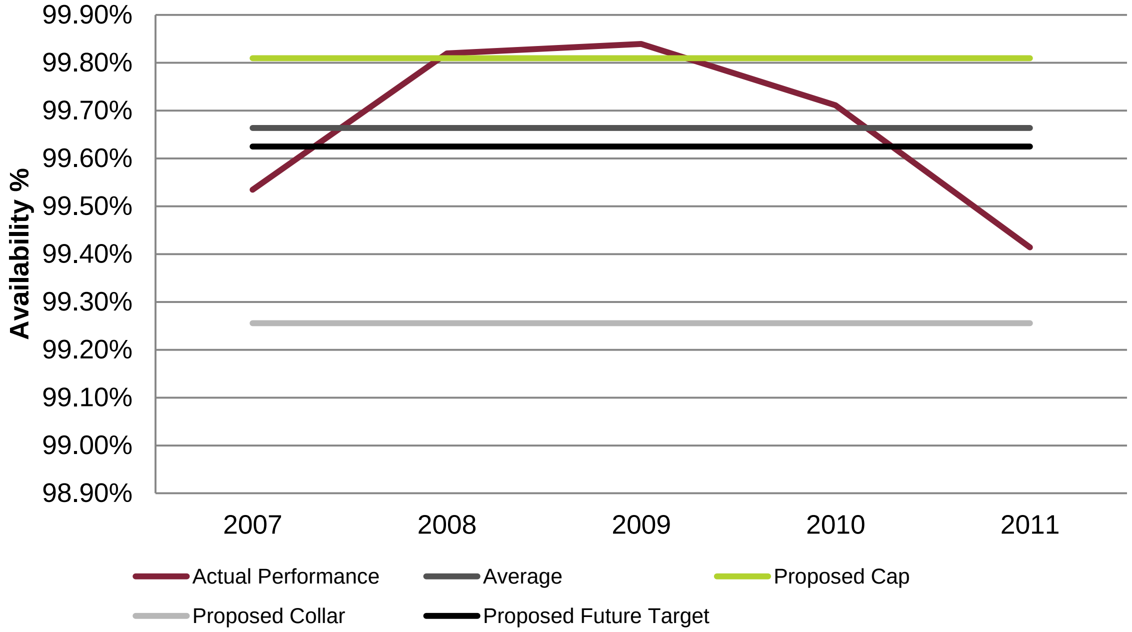

Figure 10.3: Transmission line critical non-peak availability performance 2007–11

Applying the proposed adjustment of 0.065 percent to the unadjusted circuit availability target of 99.562 percent results in a target for this parameter of 99.50 percent. The adjustment of 0.021 percent to the equivalent target for critical circuit peak parameter results in a performance target of 99.13 percent for this parameter. Similarly an adjustment of 0.040 percent to the critical circuit non-peak parameter of 99.664 percent results in a performance target of 99.62 percent.

Further information on the methodology applied in developing these adjusted targets is provided in Appendix Y.

The remainder of the performance targets are calculated without adjustment, as follows:

- The performance target for the loss of supply event frequency has been set equal to the average performance over the 2007-11 reference period, as measured by the number of events exceeding the applicable thresholds. ElectraNet proposes to maintain x and y values at the existing 0.05 and 0.2 system minute levels for this parameter.
- The performance target for average outage duration has been set equal to the average performance over the 2007-11 reference period, as measured by the average minutes without supply at all interrupted connection points.
- The performance target for the market congestion component has been set at the average of the 2007-11 performance, as measured by the number of affected dispatch intervals.

Table 10.2 specifies the proposed values, weightings and other elements related to ElectraNet's service target performance incentive scheme parameters.

Table 10.2: Proposed performance targets

Parameter	Sub Parameter	Performance target
Transmission Circuit Availability	Transmission Circuit Availability (%)	99.50
	Critical Circuit Availability Peak (%)	99.13
	Critical Circuit Availability Non-Peak (%)	99.62
Loss of Supply Event Frequency	Events > x System Minutes	7
	Events > y System Minutes	2
Average Outage	Duration (minutes)	202.60
Market Impact	Dispatch Intervals	1588

10.3.2 Caps and collars

Clause 3.3(e) of the STPIS guideline states that the proposed caps and collars must be calculated by reference to the proposed performance targets and using a sound methodology. Adjustments to the proposed performance targets may result in adjustments to the proposed caps and collars. Further, clause 3.3(f) of the STPIS guideline states that a proposed cap and collar may result in symmetric or asymmetric incentives to the TNSP.

In its final decision for the current incentive scheme, the AER accepted recommendations from Sinclair Knight Merz (SKM) that caps and collars for the transmission availability parameters and the average duration parameters should be determined by applying a curve of best fit to the performance data for each sub-parameter and setting the cap and collar at the 5 percent and 95 percent probability levels (equivalent to two standard deviations from the mean). A Weibull distribution was selected. The AER determined for the loss of supply parameters that caps and collars should be set to the nearest integer one standard deviation above and below the mean. ElectraNet proposes to adopt the same approach in proposing caps and collars for the 2013-14 to 2017-18 regulatory control period.

ElectraNet engaged consultants, Parsons Brinckerhoff, to develop and apply a sound methodology for calculating the averages, caps and collars for the parameters. A detailed description of the methodology used for the parameter values is included in the Parsons Brinckerhoff report included as Appendix Z.

The basis for the existing and proposed caps and collars are shown in Table 10.3.

Table 10.3: Statistical basis for cap and collar calculation

Sub-parameter	Existing scheme	Proposed scheme
Transmission Circuit Availability	Weibull, 5% and 95%	Normal, one standard deviation above and two below the mean
Critical Circuit Availability Peak	Weibull, 5% and 95%	Normal, one standard deviation above and two below the mean
Critical Circuit Availability Non-Peak	Weibull, 5% and 95%	Normal, one standard deviation above and two below the mean
Loss of Supply Events > x System Minutes	Chi-squared, nearest integer, one standard deviation above and below the mean	Logistic, nearest integer, one standard deviation above and below the mean
Loss of Supply Events > y System Minutes	Chi-squared, nearest integer, one standard deviation above and below the mean	Logistic, nearest integer, one standard deviation above and below the mean
Average Outage Duration	Weibull, 5% and 95%	Normal, two standard deviations above and two below the mean

For the transmission availability parameters, ElectraNet proposes to retain collars at two standard deviations below the mean but to tighten the caps to one standard deviation above the mean. The reasons for this are explained below.

ElectraNet is operating at or near ‘best practice’ levels for a network of its type, with consistently high levels of performance, as presented in section 4.5. There are very limited opportunities for further improvement in the coming regulatory control period without compromising regulatory obligations outlined in the capital expenditure and operating expenditure objectives of the National Electricity Rules.

This is demonstrated by the small improvements made in response to the current scheme, which are a 0.1 percent improvement in transmission circuit availability over the 5-year period 2007-11 and a 0.5 percent improvement in critical circuit availability peak. It is anticipated that further improvements would not be economic at the current incentive rates.

By virtue of these improvements in performance, it is also evident that applying a collar of two standard deviations above the mean would result in a collar that exceeds 100% on all three availability measures. This would clearly be unreasonable and would undermine the objectives of the STPIS by eliminating any incentive for ElectraNet to further improve performance on this parameter.

To meet the objectives for the scheme, ElectraNet believes that the incentive rate should be increased, by lowering the cap so that improved performance is able to be appropriately rewarded.

Accordingly, ElectraNet believes that it is appropriate for the design of the incentive scheme to reflect the asymmetry between the potential for service performance to deteriorate and the lesser potential for further service improvements by reducing the cap to the equivalent of one standard deviation above the mean. This would ensure that the scheme continues to provide incentives for ElectraNet to seek further service improvements, even though the opportunity for such improvement is increasingly limited. This is consistent with a recent determination by the AER in which “An asymmetric incentive may be appropriate where a TNSP is operating at a high level of performance or has limited ability to improve performance any further.”[109]

10.3.3 Weightings for service component parameters

ElectraNet proposes to substantially retain the weightings for each service component sub-parameter as exists for the current incentive scheme with the exception of the weighting applying to the critical circuit availability peak and average outage duration parameters as shown in Table 10.4.

Table 10.4: Proposed weightings

Sub-parameter weightings	Current scheme (%MAR)	Proposed scheme (%MAR)
Transmission Circuit Availability	0.3	0.3
Critical Circuit Availability Peak	0.2	0.1
Critical Circuit Availability Non-Peak	0	0
LOS Events > x System Minutes	0.1	0.1
LOS Events > y System Minutes	0.2	0.2
Average Outage Duration	0.2	0.3

As noted in Section 4.5, performance against the average outage duration parameter has been subject to an increased number of low probability, high impact outages in the radial network during the period. While a simplistic assessment may suggest deteriorating performance, a more rigorous assessment of the outage history does not support this view. Notwithstanding this, ElectraNet recognises the merit of increasing the weighting of this parameter by 50 percent to address the concerns that this performance may raise with some stakeholders.

In order to accommodate this increased focus on the average outage duration parameter, ElectraNet proposes an equivalent reduction in the weighting applied to the critical circuit availability peak parameter.

The critical circuit availability peak parameter substantially relates to the improvement and maintenance of reliability of those elements of the transmission system that are more likely to impact spot prices. With the introduction of the Market Impact Parameter, which provides a direct incentive to minimise such impacts, ElectraNet believes that a slight reduction in the weighting of the critical circuit availability peak parameter is now appropriate.

109 AER Draft Decision, *TransGrid Transmission Determination 2009-10 to 2013-14*, p176

It remains appropriate to maintain a zero weighting on the critical circuit availability non-peak parameter as to do otherwise would act against the incentive to move critical circuit outages from peak to non-peak times, and also reduce the weighting attached to other measures.

10.3.4 Market impact of transmission congestion

The market impact component of the STPIS has a single MIP that incentivises TNSPs to minimise transmission outages that can affect the dispatch of generation in the NEM. This is measured by a count of the number of five-minute dispatch intervals where a planned or unplanned outage on the transmission network results in a network outage constraint with a marginal value greater than $10/MWh. The market component is a bonus only scheme with up to 2 percent of MAR at risk.

Clause 4.2(c) of the STPIS Guideline requires that a cap is set at zero dispatch intervals.

Consistent with clause 4.2 (d) of the STPIS Guideline the performance target has been set equal to the average of the most recent five year performance history, 2007 to 2011.

10.3.5 Summary of service target parameters

Table 10.5 specifies the proposed values, weightings and other elements related to ElectraNet's service target performance incentive scheme parameters.

Table 10.5: Proposed values, weightings and other scheme elements

Parameter	Sub Parameter	Performance target	Cap (upper limit)	Collar (lower limit)	Weighting (%MAR)
Transmission Circuit Availability	Transmission Circuit Availability (%)	99.50	99.76	98.98	0.3
	Critical Circuit Availability Peak (%)	99.13	99.95	97.47	0.1
	Critical Circuit Availability Non-Peak (%)	99.62	99.81	99.25	0
Loss of Supply Event Frequency	Events > x System Minutes	7	4	9	0.1
	Events > y System Minutes	2	1	4	0.2
Average Outage	Duration (minutes)	202.60	80.73	324.47	0.3
Market Impact	Dispatch Intervals	1588	0	1588	2

Notes: x = 0.05 and y = 0.2
Critical circuits as defined in STPIS Guideline Appendix B Part 1
Peak is defined as 8am to 8pm Monday to Friday
Non-Peak is defined as all other times

These parameters are illustrated in Figure 10.4 to Figure 10.9.

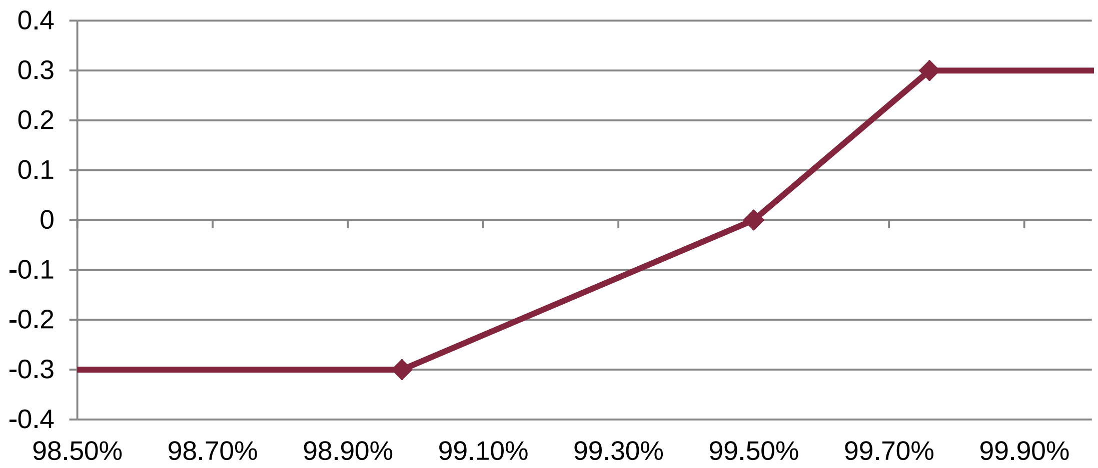

Figure 10.4: Transmission Circuit Availability parameter

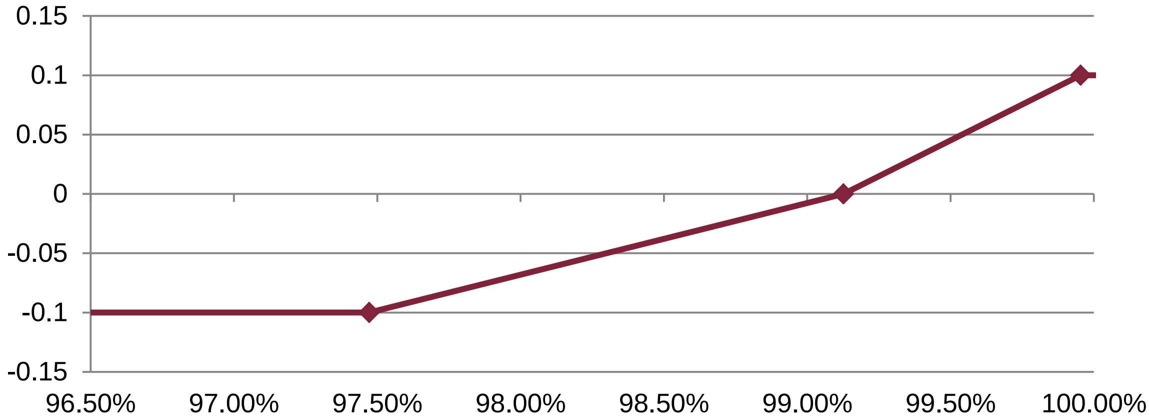

Figure 10.5: Critical Circuit Availability Peak parameter

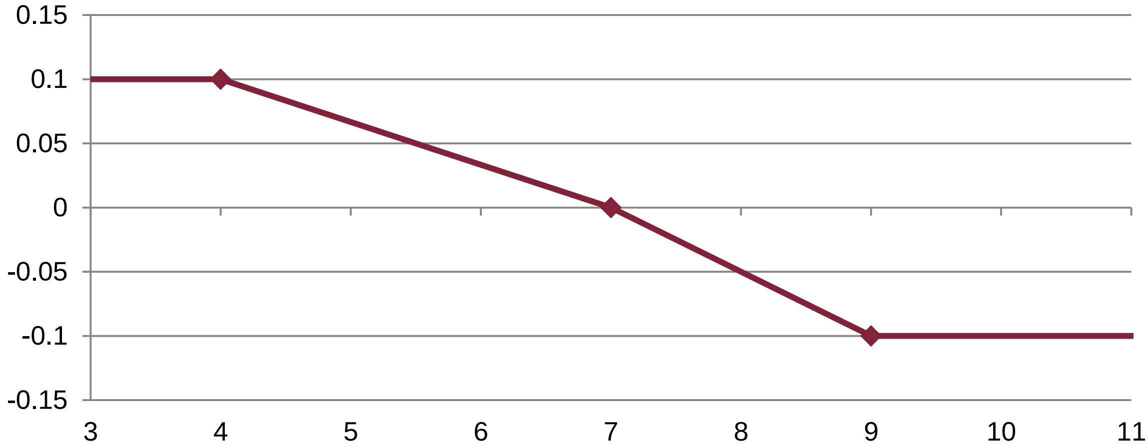

Figure 10.6: Loss of Supply Event Frequency > 0.05 System Minutes parameter

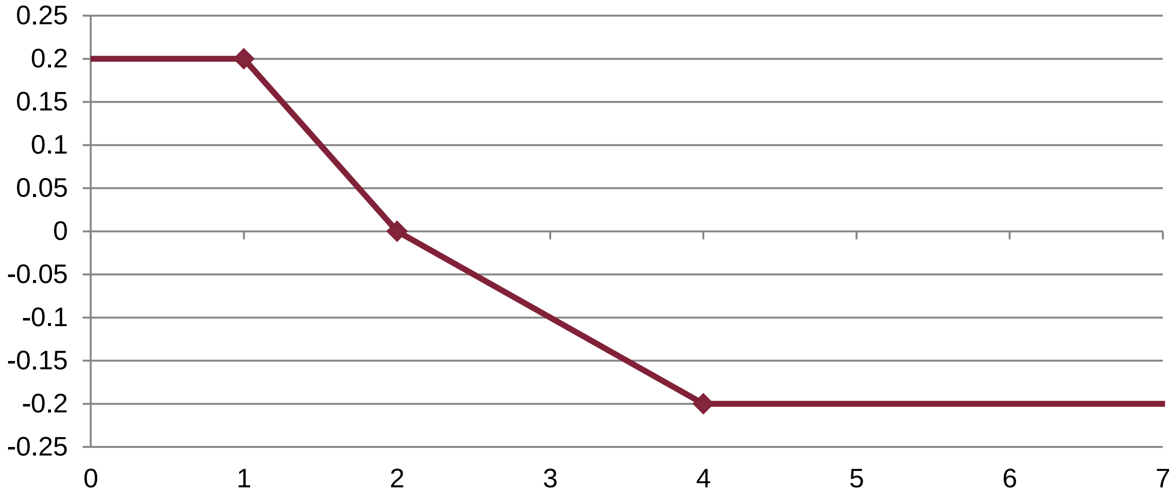

Figure 10.7: Loss of Supply Event Frequency > 0.2 System Minutes parameter

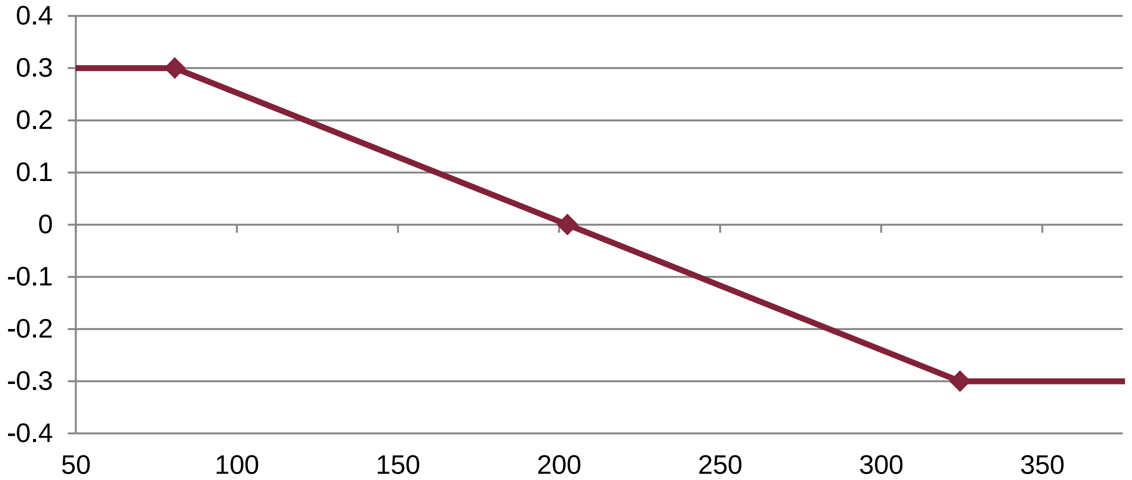

Figure 10.8: Average Outage Duration parameter (minutes)

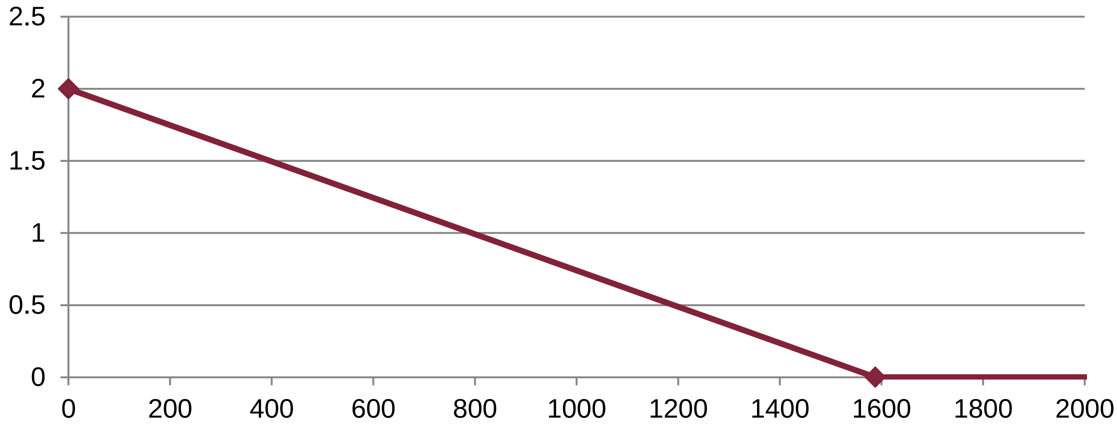

Figure 10.9: MITC Parameter (Dispatch Intervals)

10.4 Concluding comments

ElectraNet has been subject to service standard performance incentive schemes since 1 April 2000, and is operating at or near 'best practice' levels for a network with its characteristics and has limited opportunities to make further improvements on most measures.

The proposed caps and collars are calculated by reference to the proposed performance targets using a sound methodology which recognises the inherent difficultly faced by ElectraNet in improving from an already extremely high base.

ElectraNet's program of capital works in the 2013-14 to 2017-18 regulatory period will require substantial outages of the transmission network. ElectraNet proposes to adjust the performance target for the expected increase in the volume of capital works and to exclude the impact of any additional contingent projects that trigger during the period, for example, in response to customer requirements and additional demand for electricity. To take account of these works, ElectraNet has calculated the annual availability impact and proposes to apply this to the average five year target.

Further ElectraNet has sought to rebalance the weightings between the average outage duration and the circuit availability critical peak to support an increased focus on the performance of the radial network.

The targets and adjustments proposed by ElectraNet are consistent with the STPIS scheme established by the AER and the principles set out in the Rules.

11. Efficiency Benefit Sharing Scheme

11.1 Summary

The Efficiency Benefit Sharing Scheme (EBSS) is an incentive scheme that provides incentives for a TNSP to deliver cost efficiencies, and for efficiency gains and losses to be shared fairly between TNSPs and transmission network users.

In relation to the current regulatory period, pursuant to clause 11.6.18 of the Rules, ElectraNet is subject to the First Proposed EBSS as finalised by the AER under clause 6A.6.5(a) of the Rules in January 2007[110]. For the purposes of the forthcoming regulatory period, ElectraNet will be subject to the Final EBSS, promulgated by the AER in September 2007.[111]

The structure and purpose of this Chapter is as follows:

- Section 11.2 explains the EBSS mechanism as it applies in the current regulatory period, and ElectraNet's resulting carry-over amount to be recovered in the forthcoming regulatory period;
- Section 11.3 describes ElectraNet's proposed efficiency benefit sharing scheme, which will apply during the forthcoming regulatory period; and
- Section 11.4 provides some concluding comments.

11.2 Operation of the existing benefit sharing scheme

As required under the Rules and Section 4.3.7 of the Submission Guidelines, this section contains the carry forward amounts proposed to be attributed to the EBSS in relation to the current regulatory period and an explanation of how these proposed values comply with the scheme.

In accordance with the First Proposed EBSS, the carry forward amounts have been determined on the basis of actual and forecast expenditure incurred in the current period, with the expenditure for final year to be estimated by the AER based on this forecast.

11.2.1 Exclusions

The EBSS allows for certain cost categories to be excluded from the scheme. ElectraNet has excluded the following costs from its calculation of the net carryover for the current regulatory period:

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

[110] AER, *Electricity transmission network service providers efficiency benefit sharing scheme*' January 2007

[111] AER, *Electricity transmission network service providers efficiency benefit sharing scheme*, September 2007

These categories have been excluded on the basis that these costs are outside the control of the business, and/or driven by external events.[112]

These proposed exclusions are consistent with the EBSS requirements and previous AER determinations.[113]

11.2.2 Adjustments

Clause 2.4.2 of the scheme provides for adjustments to forecast operating expenditure allowances for the purposes of calculating carryover amounts to be made where necessary to correct for variations between forecast and actual demand growth or changes in capitalisation policy. ElectraNet confirms that during the current regulatory period, there were no material changes in demand, nor did it make any changes in capitalisation policy.

11.2.3 Net carryover amount

In calculating its net carryover for the current regulatory period, ElectraNet has included its actual and forecast controllable operating expenditures for the current regulatory period. Consistent with the scheme, the efficiency benefit in respect of the final year of the current regulatory period has been determined based on forecast expenditure for that year.

The net carryover calculated in accordance with the scheme is summarised in Table 11.1 below.

Table 11.1: EBSS carryover ($m June 2012-13)

	2008-09	2009-10	2010-11	2011-12	2012-13	Total
Opex allowance	63.6	63.1	68.7	75.3	75.6	**346.3**
Less network support	(5.4)	(5.6)	(5.8)	(6.1)	(7.2)	**(30.1)**
Less debt raising costs	(0.7)	(0.8)	(0.8)	(0.9)	(1.0)	**(4.3)**
Less self-insurance	(1.9)	(2.0)	(2.0)	(2.0)	(2.1)	**(9.9)**
Adjusted allowance	55.6	54.9	60.1	66.3	65.3	**302.1**
Controllable opex	53.7	55.9	59.6	66.5	66.3	**301.9**
Opex efficiency	1.9	(0.4)	(1.8)	(4.1)	1.7	
EBSS carry over amount						**(12.2)**

As required, the Submission Guidelines pro forma statement 7.4 has been prepared and lodged with this Revenue Proposal. An adjustment for the above amounts has been included in the PTRM for the forthcoming regulatory period.

112 For completeness, it is noted that equity raising costs are also excluded by definition as these are treated as a RAB item from which a corresponding reveneue stream is derived.

113 For example AER, *Final Decision: Powerlink transmission determination 2012-13 to 2016-17,* April 2012, pp 253-254, AER, *Final Decision: TransGrid transmission determination 2009-10 to 2013-14,* April 2009, p 105

11.3 ElectraNet's proposed benefit sharing scheme

As required under the Rules and Section 4.3.7 of the Submission Guidelines, this section contains the values proposed to be attributed to the EBSS in the next regulatory period and an explanation of how these proposed values comply with the scheme.

11.3.1 Exclusions

The EBSS allows for certain cost categories to be excluded from the scheme. For the next regulatory period, ElectraNet proposes to maintain all exclusions applied in the current regulatory period, as outlined in Section 11.2, namely:

- debt raising costs;
- network support costs; and
- self-insurance[114].

ElectraNet considers that these proposed exclusions are outside its control and/or driven by external events. These proposed exclusions are consistent with EBSS requirements and previous AER determinations[115]. Such exclusions apply in addition to pass through events, which are already recognised as exclusions under the scheme.

11.3.2 Adjustments

Clause 2.4.2 of the scheme provides for adjustments to forecast operating expenditure allowances for the purposes of calculating carryover amounts to be made where necessary to correct for variances, including changes in demand growth.

For the purposes of establishing the controllable operating expenditure forecasts applicable to the EBSS calculation for the forthcoming regulatory period, ElectraNet proposes the following values as outlined in Table 11.2 below.

Table 11.2: EBSS operating expenditure forecasts ($m 2012-13 mid-year)

	2013-14	2014-15	2015-16	2016-17	2017-18	Total
Forecast operating expenditure	88.8	95.9	96.2	98.3	99.9	**478.1**
Adjustment for debt raising costs	(1.1)	(1.2)	(1.2)	(1.3)	(1.3)	**(6.2)**
Adjustment for network support	(8.1)	(8.2)	(8.2)	(8.5)	(8.6)	**(41.6)**
Adjustment for self-insurance	(1.4)	(1.5)	(1.5)	(1.5)	(1.6)	**(7.5)**
Forecast operating expenditure for EBSS purposes	78.2	85.0	85.2	87.0	87.5	**422.8**

114 As above, it is noted that equity raising costs are also excluded by definition as these are treated as a RAB item from which a corresponding reveneue stream is derived.

115 For example: AER, *Final Decision: Powerlink transmission determination 2012–13 to 2016–17*, April 2012, pp 253-254; AER, *Final decision: TransGrid transmission determination 2009–10 to 2013–14*, April 2009, p 105

As set out in section 6.7.3, the impact of asset growth on operating expenditure requirements is determined through the use of scale efficiency factors reflecting the growth in the size of the network. ElectraNet notes that the capital expenditure forecast for the forthcoming regulatory period exhibits limited sensitivity to changes in demand outlook based on the probabilistic scenario analysis undertaken and augmentation timing requirements under the ETC, as explained in section 5.8.2.

It is therefore expected that the efficient operating expenditure level will not be highly sensitive to changes in demand in the forthcoming period. Neverthlelss, in accordance with the requirements of the EBSS, ElectraNet proposes that a demand adjustment should be applied for the purposes of the EBSS if:

- Demand growth is less than the aggregate summer connection point demand forecast in 2017-18 based on the 2012 low load forecasts provided by ETSA Utilities; or
- Demand growth is greater than the aggregate summer connection point demand forecast in 2017-18 based on the 2012 high load forecasts provided by ETSA Utilities.

The adjusted forecast operating expenditure will be applied to actual operating expenditure incurred in the forthcoming regulatory period net of the above exclusions in order to determine measured performance under the EBSS.

11.4 Concluding comments

This chapter has explained the application of the operating expenditure carryover mechanism for the current regulatory period. It shows that an efficiency adjustment of minus $12.2m ($2012-13) will be applied in the forthcoming regulatory period.

In relation to the forthcoming regulatory period, ElectraNet proposes to adopt the efficiency benefit sharing scheme outlined in the AER’s Final Efficiency Benefit Sharing Scheme, dated September 2007. ElectraNet’s efficiency benefit sharing scheme therefore complies with the requirements of the Rules.

12. Maximum Allowed Revenue

12.1 Summary

ElectraNet's Revenue Proposal is based on the post-tax building block approach outlined in Chapter 6A of the Rules and the AER PTRM and accompanying Handbook. The revenue building block components have been described in the preceding chapters.

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

MAR	=	return on capital + return of capital + Opex + Tax
	=	(WACC x RAB) + D + Opex + Tax
where:		
MAR	=	Maximum allowable revenue
WACC	=	post tax nominal weighted average cost of capital ('vanilla' WACC)
RAB	=	Regulatory Asset Base
D	=	economic depreciation (nominal depreciation – indexation of the RAB)
Opex	=	operating expenditure + EBSS payments
Tax	=	regulated business corporate tax allowance

This revenue is then smoothed with an X factor in accordance with the requirements of clause 6A.6.8 of the Rules.

A brief summary of each of the building blocks, the unsmoothed revenue and smoothed revenue is outlined in this Chapter.

12.2 Regulatory asset base

The movements in the regulatory asset base over the 2013-14 to 2017-18 regulatory period are set out in Table 12.1. These reflect the capital expenditure forecast set out in Chapter 5 and the expected depreciation over the period as set out in Chapter 8.

Table 12.1: Asset Base Roll-Forward from 1 July 2013 to 30 June 2018 ($m nominal)[116]

Regulatory Asset Base	2013-14	2014-15	2015-16	2016-17	2017-18
Opening RAB	2,099.9	2,295.6	2,459.3	2,645.2	2,803.2
Net capex	230.8	203.0	236.3	209.3	115.0
Straight line depreciation	(87.6)	(96.7)	(111.9)	(117.5)	(127.5)
Inflation adjustment on RAB	52.5	57.4	61.5	66.1	70.1
Closing RAB	2,295.6	2,459.3	2,645.2	2,803.2	2,860.7

116 The figures presented in this chapter are expressed in end of year ($June) terms.

12.3 Return on capital

The WACC calculation is detailed in Chapter 9 of this Revenue Proposal. The return on capital has been calculated by applying the post-tax nominal vanilla WACC[117] to the opening regulatory asset base consistent with the AER post tax revenue model. This calculation is shown in Table 12.2 below.

Table 12.2: Return on Capital from 1 July 2013 to 30 June 2018 ($m nominal)

Return on Capital	2013-14	2014-15	2015-16	2016-17	2017-18
Opening RAB	2,099.9	2,295.6	2,459.3	2,645.2	2,803.2
Return on capital	162.3	177.4	190.1	204.4	216.6

12.3.1 Equity raising costs

Equity raising costs must be funded by an entity when it raises equity capital. An allowance for these costs has been determined by applying the benchmark methodology approved by the AER in its recent Powerlink Transmission Determination and other recent decisions.

This approach involves a cash flow analysis based on the outputs of the PTRM and benchmark gearing assumptions to determine the level of new equity required, using a payout ratio approach to forecast the level of dividends available for reinvestment.

To estimate the costs involved in raising the required equity, benchmark costs are then applied to reflect the unit costs of dividend reinvestment plans (one percent) and seasoned equity offerings, as required (three percent).

Consistent with this methodology, ElectraNet has determined its required equity raising cost allowance of $0.98m for the 2013-14 to 2017-18 regulatory period, discounted back to $2012-13 using a 7.73 percent WACC. This amount has been included in the opening RAB listed in Table 12.2 above and amortised over the weighted average standard life of the RAB to provide the equity raising cost allowance over the period.

12.4 Depreciation

The calculation of depreciation is detailed in Chapter 8 of this Revenue Proposal. The AER's 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 Table 12.3 and Table 12.4.

117 As noted in Chapter 9, the WACC used for the purposes of this Revenue Proposal is based on an indicative averaging period for the risk-free rate and debt risk premium, and will need to be updated prior to the AER's final decision

Table 12.3: Regulatory Depreciation from 1 July 2013 to 30 June 2018 ($m nominal)

Depreciation	2013-14	2014-15	2015-16	2016-17	2017-18	Total
Straight line depreciation	87.6	96.7	111.9	117.5	127.5	**541.2**
Inflation adjustment on RAB	(52.5)	(57.4)	(61.5)	(66.1)	(70.1)	**(307.6)**
Regulatory depreciation	35.1	39.3	50.4	51.4	57.4	**233.6**

Table 12.4: Tax Depreciation from 1 July 2013 to 30 June 2018 ($m nominal)

Depreciation	2013-14	2014-15	2015-16	2016-17	2017-18	Total
Tax depreciation	59.7	67.7	80.6	81.4	99.0	**388.3**

12.5 Operating expenditure

The calculation of operating expenditure (opex) is detailed in Chapter 6 of this Revenue Proposal. The total opex including efficiency benefit sharing scheme, is shown in Table 12.5.

Table 12.5: Operating expenditure from 1 July 2013 to 30 June 2018 ($m Nominal)

Operating Expenditure	2013-14	2014-15	2015-16	2016-17	2017-18	Total
Controllable opex	81.1	90.4	92.9	97.2	100.2	**461.8**
Self-insurance	1.5	1.5	1.6	1.7	1.8	**8.2**
Network support costs	8.4	8.7	9.0	9.5	9.8	**45.4**
EBSS	(2.8)	(4.8)	(4.6)	(2.7)	1.9	**(12.9)**
Debt raising costs	1.2	1.3	1.4	1.5	1.5	**6.8**
Total	89.4	97.1	100.3	107.2	115.3	**509.3**

12.6 Tax allowance

The calculation of the corporate tax allowance is detailed in Chapter 9 of this Revenue Proposal. The corporate tax allowance is shown in Table 12.6.

Table 12.6: Tax allowance from 1 July 2013 to 30 June 2018 ($m nominal)

Tax Allowance	2013-14	2014-15	2015-16	2016-17	2017-18	Total
Tax payable	15.6	16.5	17.8	20.0	17.9	**87.7**
Less value of imputation credits	(10.1)	(10.7)	(11.6)	(13.0)	(11.6)	**(57.0)**
Net tax allowance	5.5	5.8	6.2	7.0	6.2	**30.7**

12.7 Maximum allowed revenue

The unsmoothed revenue requirement for each year of the period is calculated as the sum of return on capital, return of capital, operating expenditure, efficiency carry-over and corporate tax allowance. The outcomes are presented in Table 12.7 below.

Table 12.7: Unsmoothed revenue requirement 1 July 2013 to 30 June 2018 ($m nominal)

Unsmoothed Revenue	2013-14	2014-15	2015-16	2016-17	2017-18	Total
Return on capital	162.3	177.4	190.1	204.4	216.6	950.8
Return of capital	35.1	39.3	50.4	51.4	57.4	233.6
Operating expenses	92.1	101.9	104.9	109.9	113.4	522.2
Efficiency carry over	(2.8)	(4.8)	(4.6)	(2.7)	1.9	(12.9)
Net tax allowance	5.5	5.8	6.2	7.0	6.2	30.7
Unsmoothed revenue requirement	292.2	319.5	347.0	370.0	395.6	1,724.4

12.8 X factors

The X factor smoothing profile proposed by ElectraNet meets the requirements set out in clause 6A.6.8 of the Rules, which requires the MAR requirement to be equal to the NPV of the annual building block revenue requirement, while ensuring the expected MAR for the last regulatory year is as close as reasonably possible to the annual building block revenue requirement.

The proposed X factors are presented in Table 12.8 below.

Table 12.8: Smoothed revenue requirement, 1 July 2013 to 30 June 2018 ($m nominal)

	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Total
Unsmoothed revenue requirement	324.5	292.2	319.5	347.0	370.0	395.6	**1,724.4**
Smoothed revenue requirement	324.5	292.2	316.6	342.9	371.5	402.5	**1,725.7**
X factor		(5.7%)	(5.7%)	(5.7%)	(5.7%)	(5.7%)	

ElectraNet has determined the proposed X factors to achieve a smooth average price transition between the current and forthcoming regulatory periods. The same X factor has been applied in each year of the regulatory period. The proposed X factors deliver an expected MAR for the last regulatory year that is very close to the annual building block revenue requirement. The AER's PTRM has been used to calculate the X factors to ensure that the smoothed and unsmoothed revenue requirements are equal in NPV terms.

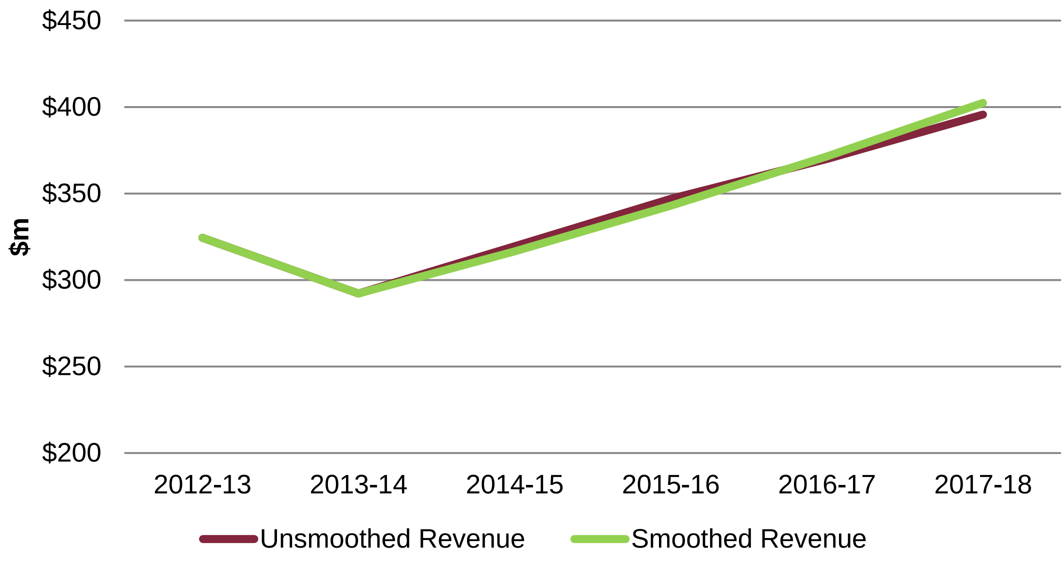

Figure 12.1: Revenue path ($m nominal)

12.9 Average price path

ElectraNet determines its transmission charges based on the AER's approved revenues and the pricing principles contained in the Rules. The effect of ElectraNet's Revenue Proposal on average transmission charges can be estimated by taking the maximum allowed revenues and dividing them by forecast energy delivered in South Australia. Based on this approach, ElectraNet estimates that its Revenue Proposal will result in an average increase of about 2.8 percent per annum (nominal) in transmission charges from the end of the current regulatory period[118].

Table 12.9 and Figure 12.2 show the average price path resulting from this revenue proposal during the next regulatory period compared with the average price for the final year of the current regulatory period (2012-13). Average transmission charges are estimated to increase from around $21.4 per MWh in 2012-13 to $24.6 per MWh in 2017-18. This equates to an annual real increase of 0.3 percent on average across this period, including an initial reduction of 14 percent in 2013-14, driven primarily by the reduction in WACC.

This results in a customer pricing outcome in line with CPI movements and reflects ElectraNet's focus on restraining expenditure increases to the minimum necessary to enable the business to efficiently operate and maintain the South Australian transmission network.

ElectraNet estimates that the (nominal) average increase above in transmission charges will add approximately $5.85 to the average residential customer's annual bill of $1,384 (0.4 percent)[119].

118 Forecast energy figures are medium growth figures taken from AEMO's 2011 South Australian Supply Demand Outlook

119 Customer billing data from ESCOSA, *Electricity Annual Performance Report - SA Energy Supply Industry*, November 2011, Statistical Appendix 120410

Table 12.9: Average price path ($m nominal)

	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Smoothed revenue requirement	324.5	292.2	316.6	342.9	371.5	402.5
Energy (GWh)	15.2	15.5	15.6	15.8	16.1	16.4
Average transmission price ($/MWh, nominal)	21.4	18.8	20.3	21.7	23.0	24.6
Average transmission price ($/MWh, real)	21.4	18.4	19.4	20.2	20.9	21.7

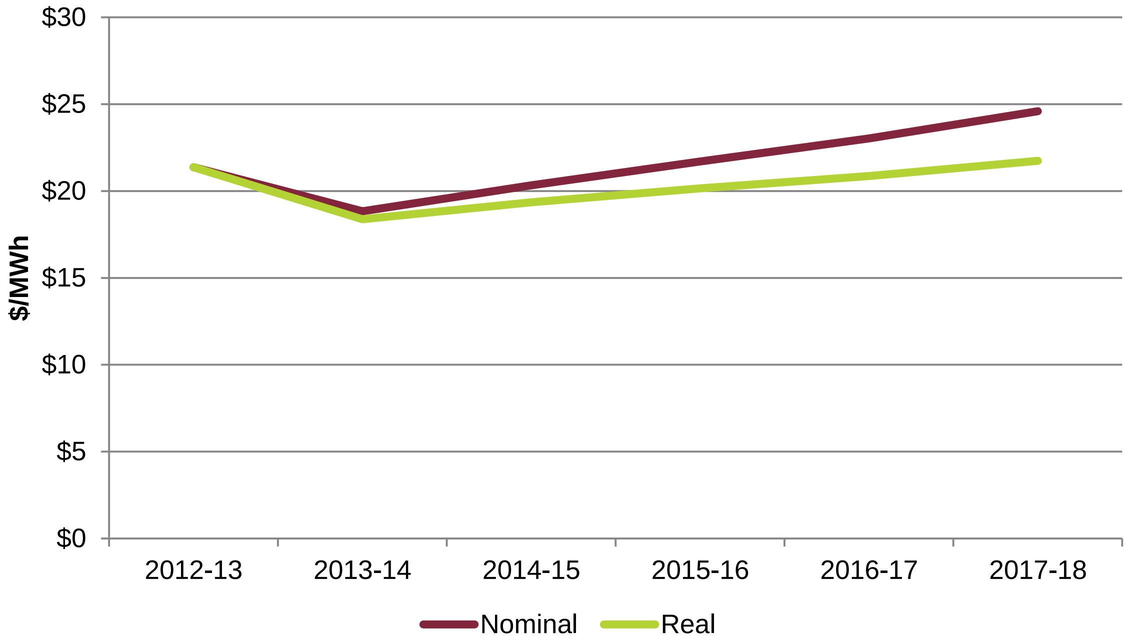

Figure 12.2: Average price path – nominal and real ($/MWh)

It should be noted that neither the forecast capital expenditure nor the forecast energy consumption used in these calculations include the effects of the potential new mining loads. Whilst those loads would trigger further transmission development (as contingent projects) they would also lead to large increases in energy consumption[120]. This would be expected to reduce the unit cost of electricity transmission in South Australia for existing customers.

120 These projects include the Lower Eyre Peninsula Reinforcement, Northern Transmission Reinforcement (Olympic Dam expansion) and Yorke Peninsula Reinforcement

12.10 Transmission pricing methodology

ElectraNet is conscious of the impact of electricity prices, and has reviewed its charging arrangements with a view to improving the incentives for customers to manage their peak demand requirements, subject to the requirements of the Rules and Pricing Methodology Guidelines.

Accordingly, ElectraNet's proposed Transmission Pricing Methodology, applicable from 1 July 2013 to 30 June 2018, has been prepared to satisfy the requirements of the pricing principles of part J of the Rules and the AER's Pricing Methodology Guidelines. It contains minor amendments to:

- reflect the changes to the Rules that have occurred subsequent to the approval of the current pricing methodology, specifically the Rule change of January 2010 which varied the provisions of clause 11.6.11 of the Rules; and
- modify the existing standby provisions of clause 6.12 to provide greater flexibility and incentive for customers to manage their peak demand requirements and reduce their firm network access requirements.

The modified standby provisions outlined above are proposed in order to provide a practical mechanism whereby:

- a customer would be permitted to contract for a firm level of demand;
- the customer would also have access to a higher, non-firm demand under emergency or strictly controlled circumstances under its transmission connection agreement;
- these non-firm demand excursions would be permitted under defined terms and conditions by prior agreement in each instance outside peak loading conditions;
- the network would continue to be planned and developed to satisfy the firm demand only; and
- the customer would incur a daily demand charge related to the firm demand only.

This option would be available to major customers on an equivalent basis, with specific terms to be negotiated with ElectraNet in each instance to ensure that specific network requirements are taken into consideration and the conditions for demand excursions are clearly defined. To give effect to this option the connection agreements for those seeking to access the standby arrangement would be renegotiated on a case by case basis.

ElectraNet's proposed Pricing Methodology is provided at Appendix AA. ElectraNet considers that the methodology meets all compliance requirements, given that it includes all relevant information prescribed under the Rules and identified in the *pricing methodology guidelines*.

12.11 Revenue cap adjustments

In accordance with the Rules, the revenue cap determined by the AER will be subject to adjustment during the regulatory control period as follows:

- The revenue cap will be calculated each year using actual CPI;
- Network support costs are treated as a pass through cost. As required by clause 6A.7.2 of the Rules, changes in network support costs will be subject to a pass through application. The application will seek to change the annual MAR allowance in each year based on the difference between forecast and actual network support expenditure;
- Clause 6A.7.3 of the National Electricity Rules allows the pass through of other approved costs related to an insurance event, a regulatory change event, a service standard event, a tax change event or a terrorism event as defined in the Rules[121]; and
- Contingent Projects have been included in section 5.9 of this proposal. If a trigger event for a contingent project occurs then ElectraNet will assess the projects using the RIT-T, where applicable, and lodge an application to the AER requesting a revised MAR stream in accordance with clause 6A.8.2 of the National Electricity Rules.

[121] These provisions of the Rules are currently the subject of a Cost Pass Through Rule change proposal lodged by Grid Australia which, if approved, would apply for the purposes of this Revenue Proposal

13. Glossary

AASB	Australian Accounting Standards Board
ABS	Australian Bureau of Statistics
ACCC	Australian Consumer Competition Commission
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AMD	Agreed Maximum Demand
AMP	Asset Management Plan
AOD	Average Outage Duration
APR	Annual Planning Report
AWOTE	Average Weekly Ordinary Time Earnings
CBD	Central Business District
CEG	Competition Economists Group
COAG	Council of Australian Governments
CPI	Consumer Price Index
DNSP	Distribution Network Service Provider
DRP	Debt Risk Premium
EBA	Enterprise Bargaining Agreement
EBSS	Efficiency Benefit Sharing Scheme
EMC	Electromagnetic compatibility
EMS	Energy Management System
ESCOSA	Essential Services Commission of South Australia
ESIPC	Electricity Supply Industry Planning Council
ETC	Electricity Transmission Code
IPART	Independent Pricing and Regulatory Tribunal
IT	Information Technology
JPB	Jurisdictional Planning Body
LiDAR	Light Detection and Ranging
LPI	Labour Price Index
MAR	Maximum Allowed Revenue
MFP	Multifactor Productivity
MFS	Maloney Field Services
MIP	Market Impact Parameter
MITC	Market Impact of Transmission Congestion
MRP	Market Risk Premium
MW	Megawatt
NEL	National Electricity Law
NEM	National Electricity Market

NER	National Electricity Rules
NERA	NERA Economic Consulting
NMP	Network Master Plans
NPV	Net Present Value
NTNDP	National Transmission Network Development Plan
ODRC	Optimised Depreciated Replacement Cost
OPSWAN	Operations Wide Area Network
PPI	Producer Price Index
PSC	Power Systems Consultants
PTRM	Post Tax Revenue Model
RAB	Regulatory Asset base
RBA	Reserve Bank of Australia
RDP	Regional Development Plan
RESIC	Resources and Energy Sector Infrastructure Council
RIT-T	Regulatory Investment Test for Transmission
Rules	National Electricity Rules
SASDO	South Australian Supply and Demand Outlook
SCADA	Supervisory Control and Data Acquisition
SCAR	System Condition and Asset Risk
SG	Superannuation Guarantee
SKM	Sinclair Knight Merz
SRMTMP	Safety, Reliability, Maintenance and Technical Management Plan
STPIS	Service Target Performance Incentive Scheme
TALC	Transmission Asset Life Cycle
TNSP	Transmission Network Service Provider
TUOS	Transmission use of system
WACC	Weighted Average Cost of Capital

14. Appendices

Appendix A	Directors' Responsibility Statement
Appendix B	Submission Guidelines Compliance Checklist
Appendix C	ElectraNet, *Network 2035 Vision Strategy*, April 2012
Appendix D	ElectraNet, *Network Development Strategy,* May 2012
Appendix E	ElectraNet, *Asset Management Strategy,* May 2012
Appendix F	ElectraNet, *Information Technology Strategy*, April 2012
Appendix G	ElectraNet, *Proposed Negotiating Framework for Provision of Negotiated Transmission Services*, 1 July 2013 - 30 June 2018
Appendix H	NOT USED
Appendix I	ElectraNet, *Capital Expenditure Forecasting Methodology*, May 2012
Appendix J	ETSA Utilities and Direct-Connect Customer Load Forecasts 2012
Appendix K	ROAM Consulting, *Generation Scenarios for Revenue Proposal*, 30 January 2012
Appendix L	PSC, *ElectraNet Project Cost Estimates – Comparison Report*, May 2012
Appendix M	Evans & Peck, *Capital Program Estimating Risk Analysis,* May 2012
Appendix N	BIS Shrapnel, *Labour Cost Escalation Forecasts to 2017-18 – Australia and South Australia,* April 2012
Appendix O	CEG, *Escalation factors affecting expenditure forecasts,* May 2012
Appendix P	Forecast Network Capital Projects
Appendix Q	Proposed Contingent Projects
Appendix R	ElectraNet, *Operating Expenditure Forecasting Methodology*, May 2012
Appendix S	ElectraNet, *Asset Management Plan,* May 2012
Appendix T	Marsh, *Premium Projection (2013/14 to 2017/18) Extract*, May 2012
Appendix U	Board resolution to undertake self-insurance
Appendix V	AON Risk Solutions, *Self Insurance Risk Quantification,* May 2012
Appendix W	Maloney Field Services, *Assessment of Site Values for Land Tax,* May 2012
Appendix X	PWC, *Electranet: Estimating the benchmark debt risk premium*, May 2012

Appendix Y	ElectraNet, *STPIS Capex Adjustment*, May 2012
Appendix Z	Parsons Brinckerhoff, *Fitting probability distribution to reliability data for calculation of STPIS values*, May 2012
Appendix AA	ElectraNet, *Proposed Pricing Methodology*, May 2012