4 Capital expenditure

4.1 Introduction

In setting ElectraNet's MAR, the Commission must form a view on the prudency of its proposed capex, with regard to future demand, service quality and the efficiency of past capex. The Commission is mindful that it is examining ElectraNet's proposed capex program for the purpose of establishing a revenue cap and for creating the appropriate economic drivers for investment. Under the code, the Commission is removed from the network planning processes. That process is now primarily the responsibility of the networks as a result of the introduction of the Network and Distributed Resources code changes.[19]

The Commission notes that alternatives to capex proposals can include improvements in opex programs, demand side management and new generation. It will consider whether or not ElectraNet has struck an appropriate balance between capex, opex and reliability.

The Commission is aware that a careful distinction needs to be made between ongoing opex programs on the one hand and the asset renewals (replacement and refurbishment) portion of capex on the other. Some judgement is needed as to whether such proposals should be expensed or capitalised.

These issues are included in the Commission's consideration of both the proposed capex and opex programs and their significance to the overall revenue cap.

The remainder of this chapter:

- sets out the code requirements relevant to the inclusion of capital expenditure in a transmission network's asset base
- summarises the Commission's decision concerning the inclusion of ElectraNet's projected capex into the present regulatory period as well as the information considered by the Commission in arriving at that conclusion. This includes:
  - ElectraNet's application
  - the views of interested parties
  - a summary of the major findings of Meritec's review.
- summarises the Commission's decision concerning ElectraNet's projected capex.

4.2 Code requirement

The Commission's task in assessing ElectraNet's capex is specified in the code. In particular, Part B of Chapter 6 of the code requires *inter alia* that:

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[19] ACCC, *Network and Distributed Resources*, 15 February 2002.

- in setting the revenue cap, the Commission must have regard to the potential for efficiency gains in expected operating, maintenance and capital costs, taking into account the expected demand growth and service standards
- the regulatory regime seeks to achieve an environment that fosters efficient use of existing infrastructure, efficient operating and maintenance practices and an efficient level of investment.

To undertake its task, the Commission needs to make informed decisions on the adequacy, efficiency and appropriateness of the capital expenditure planned by ElectraNet to meet its present and future service requirements. To this end the Commission engaged Meritec to review ElectraNet's proposed capex allowance. The results of Meritec's review are summarised in section 4.4 of this chapter.

4.3 ElectraNet's proposal

4.3.1 Requirement for regulated capital expenditure

ElectraNet has forecast a $374m ($409m in nominal terms) capital investment program for the regulatory period to upgrade its regulated transmission network. ElectraNet considers that the upgrade is required in order to:

- keep pace with independent forecasts of growth in electricity demand
- support new generation developments, including wind farms
- support new interconnector developments, including the South Australia – NSW interconnector (SNI) and upgrades to the South Australia-Victorian interconnector
- replace technologically obsolescent assets to ensure the ongoing reliability of the transmission network.

In general ElectraNet considers that its investment program will lower wholesale electricity prices in South Australia, ensure long-term network reliability and provide other flow-on impacts for the South Australia economy. It believes that these benefits will far outweigh the relatively small increase in transmission costs involved.

4.3.2 Probabilistic approach to capex forecasting

Due to the uncertainties involved in forecasting future customer demand, and generation and interconnection developments, ElectraNet has adopted a probabilistic approach to determine its capex requirement.

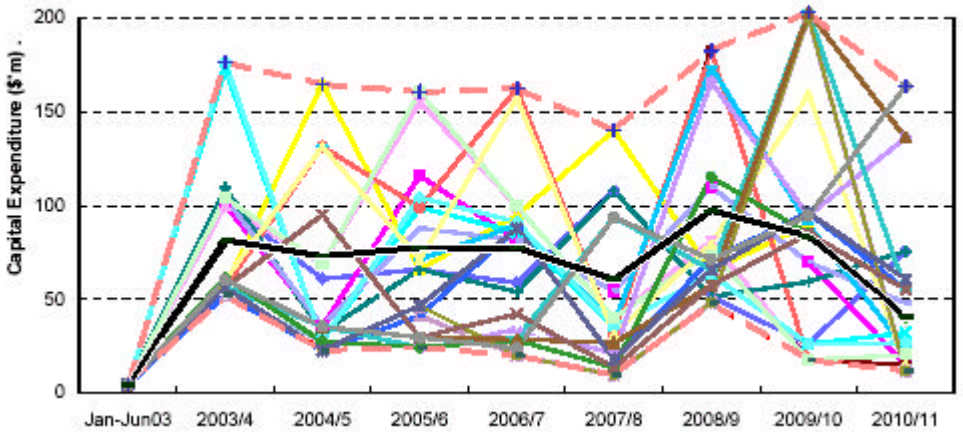
ElectraNet engaged ROAM Consulting (ROAM) to identify plausible generation, demand and interconnector scenarios over the next ten years. ROAM identified a total of 96 plausible generation/demand/interconnector scenarios and determined the probability of occurrence for each scenario. Three possible levels of wind generation developments were combined with these scenarios increasing the total number of scenarios to 288. Those scenarios expected to have similar transmission development outcomes were then merged to reduce the total number of scenarios to 24. The 24 scenarios represent all possible combinations of four main themes (ie 3x2x2x2). The scenarios identified and their assessed probabilities are set out in table 4.1.

Table 4.1 Possible scenarios identified by ROAM Consulting

Possible outcome	Notes	Probability
Additional Generation in the South of South Australia		
Low levels of additional generation	Only committed generation added (no wind generation).	20%
Medium levels of additional generation	340MW of additional generation (including wind)	40%
High levels of additional generation		40%
Additional Generation in the North and West of South Australia		
Low levels of additional generation	Only committed generation added (no wind generation).	80%
High levels of additional generation	490 MW of additional generation (including wind).	20%
Electricity Demand Growth		
Low demand growth	As in NEMMCO's 2001 Statement of Opportunities.	20%
Medium demand growth	As in NEMMCO's 2001 Statement of Opportunities.	80%
SAMAG Magnesium Smelter		
Proceeds	230 MW generation and between 20 MW and 170 MW load.	50%
Does not proceed		50%

Within each of the 24 scenarios for future electricity demand growth and new generation, a range of plausible generation and interconnection dispatch scenarios were developed. Each of these dispatch scenarios were then assessed using standard transmission planning techniques to determine a set of augmentations (a transmission plan) to ensure compliance with the South Australia Transmission Code, the national electricity code and other requirements. The 24 input scenarios resulted in 24 transmission plans being developed. Figure 4.1 shows the capex outcomes for each of the 24 scenarios identified. The dotted lines show the envelope of these outcomes while the thick black line shows the weighted average of these outcomes.

Figure 4.1 ElectraNet's proposed capital expenditure profile



ElectraNet states that while any one of the individual scenarios may occur in reality, a composite scenario represented by the probability-weighted average provides the expected capital expenditure over the period. It also states that the composite scenario does not have a list of projects with specific forecast commercial in service dates and that even when projects are common to many scenarios, different commercial in service dates will generally apply to different scenarios.

The outcome of the probabilistic capex forecasting approach undertaken by ElectraNet is a capital expenditure allowance for each year of the regulatory period. ElectraNet's probability weighted average capex requirement for each year of the regulatory period is shown in table 4.2.

Table 4.2 ElectraNet's scenario weighted average capex requirement[20]

	Jan-Jun 2003 ($m)	2003-04 ($m)	2004-05 ($m)	2005-06 ($m)	2006-07 ($m)	2007-08 ($m)
Lines	0.1	29.0	18.1	39.7	17.2	30.5
Substations	3.3	50.5	53.5	37.2	58.4	28.3
Other	0.9	2.0	1.3	0.4	1.6	1.7
Total capex	**4.3**	**81.5**	**72.9**	**77.4**	**77.3**	**60.5**

Using a probabilistic approach ElectraNet forecasts its total capex requirement during the regulatory period to be $374m. The numbers presented in table 4.2 represent the capex on assets forecast to come into service and to be rolled into the regulated asset base in each year of the regulatory period. The estimate is derived from the weighted average of 24 possible development scenarios and includes interest during construction.

[20] ElectraNet advised in their application that capital expenditure during the transitional period (January – June 2003) is low because most projects are commissioned prior to December in order to meet summer peak demands.

4.4 Meritec's capex report

4.4.1 Meritec's key findings

Meritec was engaged by the Commission to analyse and comment on the capital expenditure program contained in ElectraNet's application. It was also asked to assess and comment on the appropriateness of ElectraNet's use of a probabilistic methodology to forecast capex scenarios and budgets. Meritec's main conclusions are given below:

- ElectraNet has an established planning process, which adequately identifies new or increased load/generation requirements and models their impact on the network. The process also takes into account the review of a number of different possible solutions, leading to a recommendation of a preferred option. Planning criteria are applied based on the South Australia Transmission Code and code requirements. ElectraNet's planning processes are sound and consistent with transmission network planning practices elsewhere

- ElectraNet's approach to identifying and prioritising its refurbishment and replacement expenditure is sound and is based on an appropriate level of input regarding the age of the equipment, its condition and its operating conditions

- The probabilistic approach used by ElectraNet is sound, the scenarios considered are appropriate and that, in general, the probabilities applied to project timing were appropriate

- The project cost estimates developed by ElectraNet are generally appropriate and the total costs forming the capex program are within the bounds of accuracy of the estimating methodology, that is, less than five per cent overall

- Analysis of the different development scenarios and their associated probabilities shows that the main driver for the level of capital expenditure is load growth

- There is a potential risk of ElectraNet being unable to deliver the proposed capital expenditure program. This is due to large increases in electricity network expenditure nationally and the resulting increase in competition between electricity network service providers for limited resources. Meritec notes that this may be further compounded by delays associated with the regulatory approvals process for specific projects

- A number of changes to the capital expenditure forecast proposed by ElectraNet are recommended. Meritec calculates the impact of these changes is to reduce ElectraNet's capex program, in nominal terms, from $409m to $384m

Meritec recommended that ElectraNet's proposed capital expenditure should be accepted subject to the above adjustments.

4.4.2 Overview of Meritec capex review

The capex planning process

Load growth forecasts

Meritec notes that a significant proportion of ElectraNet's proposed capital expenditure is justified by the need to accommodate load growth on their transmission network and therefore that the underlying load forecast is of similar significance. Meritec considers that ElectraNet's approach to forecasting load growth is fair and reasonable and in accordance with industry practices.

Application of planning criteria

The South Australia Transmission Code specifies high-level reliability goals, which are measured and reported at a global level. Meritec notes that the figures provided to it indicate that ElectraNet is nominally meeting these goals, with some fluctuations due to weather. However, it notes that the supply security standards applicable to ElectraNet have much more of an influence on ElectraNet's capital expenditure. Meritec considers that the South Australia Transmission Code is quite prescriptive in terms of the level of supply security to be provided to transmission connected loads and allows ElectraNet little discretion.

Meritec found that the security of supply criteria had been used as the basis for justifying a number of network augmentations, both in terms of not exceeding the ratings of network assets and in the maintenance of acceptable voltage levels. It noted however that ElectraNet has applied these criteria appropriately.

Identification of limitations

Meritec found that ElectraNet has an established process for identifying the effects of future loads and generation on their network. It takes the forecast loads and generation and applies them to a model of its network. It then uses this information to identify any existing and future system limitations.

Limitations are typically identified in terms of unacceptable network voltage levels or in terms of exceeding the ratings of network components. Meritec considers that the methods used by ElectraNet for calculation of these ratings are generally in accordance with the relevant Australian standards. It also notes that when a shortcoming is found a number of solutions are identified and analysed to determine the most cost-effective outcome.

Consideration of alternatives to network expenditure

Meritec found that while there was evidence that ElectraNet does consider non-network alternatives these were primarily limited to grid support arrangements. Meritec however, considers that the approach taken by ElectraNet to the consideration of non-network alternatives is appropriate given the maturity of the market for these alternatives and ElectraNet's underlying obligations to provide an adequate standard of supply to its customers.

Meritec notes that it was able to carry out a high level review of ElectraNet's capex planning process and to identify evidence of the various stages, although not necessarily all for the same project. It believes that this is reasonable given that the projects are at various stages of completeness and have been driven by a variety of issues. On the basis of its review Meritec believes that the capex planning process followed by ElectraNet is satisfactory.

Review of major projects

As part of the review process Meritec was provided with a report listing all identified projects ElectraNet anticipated carrying out before June 2008.[21] These projects were developed through the use of a probabilistic approach. The Projects Report separates out the capex into seven categories, as can be seen in table 4.3. A summary of the major proposed projects (>$10m) is contained at appendix 4.1. It sets out each major proposed projects' total estimated cost, its probability of proceeding before 2008 and its probability weighted cost.

Table 4.3 ElectraNet's proposed capex by category

Project category	Number of project	Estimated total project cost ($m)	Estimated value of reg capex roll in ($m)
Network augmentations	57	548.4	255.7
ETSA Utilities-pre EPO	9	0.0	0.0
Strategic communications projects	18	16.5	8.7
Asset maintenance projects	6	4.3	4.3
Other engineering projects	9	0.0	0.0
Corporate capital expenditure	-	8.6	8.6
ETSA Utilities-post EPO	20	109.7	71.1
Total[1]	**119**	**687.5**	**349.0**

Note 1: Excludes interest during construction.

Meritec examined a number of significant projects that ElectraNet proposes for roll-in during the regulatory period in order to better understand their drivers. These projects accounted for $137m of ElectraNet's proposed roll in, or 39 per cent of the $349m figure in table 4.3. Meritec's analysis of three of these projects follows:

Bungama/Brinkworth 275kV Project (Project Report No.s 1.1 and 1.55)

Meritec notes that these two mutually exclusive projects of similar value have been included for augmentation of the Bungama/Brinkworth network each with a 50 per cent probability of proceeding within the regulatory period. In notes that only one of the two projects will be required during the regulatory period, depending on whether the SAMAG magnesium smelter proceeds. Project 1.1 has an estimated cost of $24.7m and Project 1.55 $28.5m.

[21] Network Analysis and Development Department, *Regulated Projects Report*, 15 April 2002.

Meritec notes that these projects are driven by the age and condition of the Playford - Bungama 132 kV lines. It states that these lines are in the worst condition of any in ElectraNet's system and that ElectraNet has determined that rebuilding these lines would be more expensive than the option proposed and would result in voltage collapse during an outage of the Hummocks to Waterloo line.

If the SAMAG smelter does not proceed, the project consists of the installation of one 275/132 kV, 160 MVA transformer at Bungama substation, and replacement of the existing 275/132 kV, 60 MVA transformer at Brinkworth with a 160 MVA unit. At the same time an existing 275 kV line would be turned into Bungama and the redundant sections of 132 kV line between Playford and Bungama removed. However, if SAMAG was to proceed, then 3 x 275/132 kV, 160 MVA transformers would be required at Bungama and the Brinkworth transformer would not be uprated.

ElectraNet proposes to commence either of the projects in the second half of 2002, for completion and roll-in during 2003-04. Meritec believes that this project is appropriate.

Playford – Davenport 132 kV Substation Supply Consolidation (Project No. 1.2)

This project has an estimated cost of $14m with a probability of 1.0 (i.e. certain) of occurring within the regulatory period. Meritec notes that this project is driven by the deteriorating condition of the Playford switchyard as well as the need to exit the site, which is part of the disused Playford A power station. It also notes that it would allow consolidation of activities at the nearby Davenport substation.

The project involves rebuilding the Playford 132 kV switchyard at the Davenport substation and installing new 275/132 kV, 160 MVA tie transformers at Davenport. The 132/33 kV transformers servicing ETSA Utilities would also be moved.

ElectraNet proposes to commence this project in the second half of 2002, for completion and roll-in during 2003-04. Meritec believes that this project is appropriate.

As a result of its review of ElectraNet's probabilistic planning process Meritec found the process to be fair and reasonable and consistent with accepted industry practices. Meritec, however, did recommend that a number of projects be excluded from ElectraNet's proposed capex forecast (see section 4.4.4).

Basis of cost estimates

In order to verify that the cost estimates used in ElectraNet's capex plan are realistic and appropriate Meritec selected and reviewed ten of these projects. Although Meritec's review found reductions totalling $6.8m, it notes that this is approximately four per cent of the total value of the ten projects considered and therefore is beneath the materiality threshold. Meritec also notes that accepted industry levels of accuracy for individual costs is in the vicinity of plus or minus 20 per cent. Meritec did, however, find that the methodology used in the preparation of ElectraNet's costings was flawed for those projects with a high plant content.

Overall Meritec believes that the project cost estimates developed by ElectraNet are generally appropriate and that the total costs forming the capex program are within the

bounds of accuracy of the estimating methodology, that is less than five per cent overall.

Review of the probabilistic approach

Meritec notes that ElectraNet have adopted a probabilistic method for deriving their capex projections. Meritec states that they have applied a methodology that is similar to that used by Powerlink in their revenue cap application and accepted by the Commission in its November 2001 determination. Meritec also notes that ElectraNet has used the same consultants as Powerlink, ROAM, to assist them in this regard.

Meritec considers that acceptance of a capex forecast prepared under a probabilistic approach essentially gives the proponent permission to spend that quantity on projects which are not necessarily identified at that stage, albeit subject to a regulatory test prior to preceding. It notes that the approach proposed by the Commission in its DRP for making adjustments of over estimates of capex is the clawback mechanism. Meritec believes that this is effective for relatively small variations between approved and actual expenditure, however, if large variations from the expected level are experienced it may be more difficult to recover these by clawback.

For example, if ElectraNet's expenditure was one standard deviation below its most likely expenditure over the regulatory period ($374m) then $120m would need to be clawed back at approximately $25m per annum. In the context of ongoing capital expenditure of approximately $80m per annum this would have significant cashflow effects on the business concerned.

Based on Meritec's understanding of the South Australian market and review of the research conducted by ROAM into future loads and generation it believes that the probabilistic approach is sound, that the scenarios considered and the probabilities applied to project timings are appropriate.

Asset management planning

Meritec found ElectraNet had been proactive in developing asset management techniques. It notes it has developed an asset management plan that contains information on: asset management drivers and the a planning process; details on performance and asset age profiles; proposals for asset augmentation and renewals; and risk profiles of all assets so as to identify those assets most needing attention.

Meritec noted that ElectraNet uses a whole of life-cycle approach to asset management based on the principle of reliability and risk management. This approach uses preventative, scheduled and condition-based maintenance techniques. Meritec also notes that ElectraNet also undertakes detailed analysis of power system faults to determine their cause and identify corrective or preventative actions required.

Refurbishment and replacement expenditure

Meritec found the percentage of ElectraNet's transformers, circuit breakers and transmission lines aged 35 years or older to be 50 per cent, 37 per cent and 50 per cent respectively. Meritec considers that these figures support ElectraNet's contention that a significant number of its assets are approaching the end of their nominal life.

Meritec notes that ElectraNet's Asset Management Plan for 2003-2008 states that it has 'set a target to reduce the percentage of assets > 40 years to 10 per cent or less over the next 10 years'. This strategy aims at progressively removing older assets from service thereby avoiding a sudden step change in expenditure when these assets simultaneously reach the end of their service lives. Although there is no industry standard on what constitutes an appropriate age profile for network assets, Meritec believes that this strategy is sound in seeking to optimise the cash flows of the business and thus minimise the potential for future price shocks. That is, the proposed expenditures on replacement and refurbishment will smooth out future capex and opex requirements.

Overall Meritec found ElectraNet's approach to identifying and prioritising its refurbishment and replacement expenditure to be robust and based on an appropriate level of data regarding the age of the equipment, its condition and its operating conditions.

ElectraNet's ability to meet the requested capex levels

Meritec noted that the annual capex allowances proposed by ElectraNet in its application represent a significant increase on historical levels. It notes that ElectraNet has proposed a capex allowance of approximately $80m per annum over the regulatory period compared to $22m for 1998-99, $45.3m in 1999-00 and a projected expenditure of $39.2m for 2001-02.

Meritec considers that there are a number of factors that may increase the risk of the capital program proposed by ElectraNet not being met.

- A number of TNSP's and distribution network service provider's (DNSP's) are also planning significant increases to their capex programs (and operating expenditure levels in some cases). Meritec believes that this is likely to lead to increased competition for the following limited resources: suitably qualified and experienced service providers; major plant items and project management personnel

- A number of projects are required to pass the Commission's regulatory test prior to being allowed. Meritec notes that there have been significant delays for some projects that have been subject to this process in the past.

Meritec investigated the status of a number of ElectraNet's proposed projects from 2003-04 and 2004-05 and determined that in the majority of cases it would be possible to complete the project definition and approval process without causing delays to the projects.

Treatment of refurbishment and replacement expenditure

Meritec notes that ElectraNet has decided to treat a number of refurbishment and replacement projects (such as transmission line rating upgrades) as operating expenditure in their application, in order to avoid the risk that these expenditures are not recognised when the network's assets are revalued at the next regulatory reset. It considers that in the past, expenditure of this nature would have been treated as capital.

Meritec notes that the Commission directed it to treat and assess these refurbishment expenditures as capital expenditures. It also notes that if such expenditures were treated as operating expenditure:

- customers would incur the full cost of these works over the regulatory period, instead of a charge for WACC and depreciation if they were capitalised
- a mechanism would be required to ensure that the resulting enhancements to the assets involved were not included as an increase in their value during subsequent asset base reviews.

4.4.3 Meritec's recommended capex allowance

Meritec found the probabilistic planning approach applied by ElectraNet to be fair and reasonable and consistent with broad industry practice. It has however, recommended a number of adjustments be made to the capital expenditure forecast proposed by ElectraNet. The changes are:

- the inclusion of refurbishment and some replacement expenditure as capex, when it had been presented as operating expenditure in ElectraNet's application (as directed by the Commission)
- adjustment of the probabilities associated with the load forecast from 20 per cent likelihood of a low forecast and 80 per cent of a medium forecast, to 25 per cent likelihood of low forecast and 75 per cent of a medium forecast
- removal of a number of specific projects.

Meritec recommended a total capex allowance over the regulatory period of $351.6M ($384.4m in nominal terms). Meritec's recommended adjustments to the capex program and its reasoning for such adjustments are set out in greater detail in section 4.4.4.

Table 4.4 Meritec's adjusted capex forecast

	Jan-Jun 03 ($m)	2003-04 ($m)	2004-05 ($m)	2005-06 ($m)	2006-07 ($m)	2007-08 ($m)	Total ($m)
Construction capex	4.3	56.2	47.2	64.4	64.8	37.3	274.2
Refurbishment[1]	6.8	14.8	14.3	14.1	14.3	13.2	77.4
Total capex	**11.1**	**71.0**	**61.5**	**78.5**	**79.1**	**50.5**	**351.6**

Note 1: Appears as opex in ElectraNet's application.
Source: Meritec capex report

4.4.4 Meritec adjustments to ElectraNet's proposed capex program

Treatment of refurbishment and replacement expenditure

ElectraNet has decided to treat a number of projects as opex in their application. These consist of a number of refurbishment and replacement projects (such as line rating upgrades) that are designed to increase the design temperature of equipment or replace restrictive terminal equipment such as current transformers.

ElectraNet has argued that refurbishment expenditure is subject to revaluation risk. That is, the mechanism used for determining the value of the asset base makes no distinction between a line that has had this type of expenditure and one that has not. Therefore ElectraNet claims that if such expenditure is capitalised it would be at risk of not being recognised when a modern equivalent asset valuation was applied at the next ODRC valuation. ElectraNet has decided to treat its refurbishment and replacement expenditure as opex in order to avoid this risk. ElectraNet's capitalisation policy (effective from 1 January 2003) contains this approach.

In its capex report Meritec note that:

- in many cases in the past, expenditure of this nature would have been treated as capital by TNSPs
- treatment of costs in the way proposed by ElectraNet will result in customers incurring the full costs of those works over the regulatory period, instead of a charge for WACC and depreciation if they were capitalised
- if these costs were to be allowed as opex then some mechanism would be required to ensure that the resulting enhancements to the assets involved were not included as an increase in their value during subsequent asset base revaluations.

As directed by the Commission, Meritec's capex report includes $77.4m of refurbishment and replacement projects that ElectraNet sought to have assessed as part of its opex forecast.

Probabilities associated with load forecast

ElectraNet's probabilistic capex program is based upon a load forecast. The load forecast used by ElectraNet is NEMMCO's ten per cent probability of excedence demand forecast from its 2001 Statement of Opportunities. ROAM, on behalf of ElectraNet, assessed the relative probabilities of the low, medium and high 2001 NEMMCO forecasts occurring to be 25 per cent, 60 per cent and 15 per cent respectively. Meritec notes however that in developing its probabilistic capital expenditure program that ElectraNet has used only the low and medium demand forecasts with 20 per cent and 80 per cent probabilities respectively.

Meritec has recommended that the probabilities applied to the various load forecasts be adjusted from ElectraNet's to ones more consistent with those developed by its consultant, that is 25 per cent probability of a low forecast and 75 per cent of a medium forecast. Meritec calculates that this adjustment has the effect of reducing the capex allowance by approximately $12m ($2001-02) over the regulatory period.

Removal of capex allowance for certain projects

Meritec has recommended that a number of specific projects be excluded from the capex program proposed by ElectraNet.

Augmentations to the Riverland network

This work consists of two main projects, Project 1.36 *Monash – Robertstown 275kV and Monash 275/132kV substation* and Project 1.52 *Monash – Victorian border component of SNI.*

Project No. 1.36

Meritec notes that this project has a total cost of $44.7m being comprised of $9.8m for a 275/132kV substation at Monash and $34.9m for a 275kV line from Monash to Robertstown. ElectraNet assigns this project a probability of 80 per cent of proceeding within the regulatory period.

Both ElectraNet and the ESIPC have identified a need to augment the supply to the Riverland area due to ongoing load growth. Meritec notes that this can be provided either by support from Murraylink (an unregulated interconnector between Victoria and South Australia) or by the establishment of a new 275/132kV injection point in the area. ElectraNet considers that by summer 2004-05 Murraylink will have insufficient capacity to support the existing 132kV Riverland network and as such have proposed the construction of a 275/132kV substation at Monash by 2004-05.

Meritec notes that, as the NEMMCO approved version of SNI goes directly to Robertstown and does not pass through Monash, ElectraNet has allowed for the construction of a 275kV connection from Robertstown to Monash by 2004-05. Meritec makes the following points in relation to this proposal.

- If a network support contract can be negotiated with the operators of Murraylink, then this can provide an adequate supply to the Riverlands area until 2007-08 when voltage limits would be experienced for outages of Murraylink (see Murraylink independent report for ESIPC *Technical Review of Submissions to the ESIPC on the Riverland Augmentation*, September 2001).

- In 2007-08 an additional 275/132kV injection point is required. ElectraNet has proposed the Monash 275/132kV substation for this purpose, albeit earlier in the regulatory period.

- ElectraNet's proposed 275kV connection from Robertstown to Monash has a length of 160km. In its submission to ESIPC, TransGrid (the proponent of SNI) have proposed a connection into SNI closer to Monash involving the construction of only 20km of dual circuit line. This was reviewed by Meritec (see above report) and found to be a robust technical solution. Meritec also consider that it would be significantly less expensive than the construction of a line from Robertstown to Monash.

Based on the above points Meritec has recommended to the Commission that:

- the substation component of Project No. 1.36 should be allowed, but deferred until 2007-2008, based on the use of Murraylink to support the network until then

- the Robertstown to Monash 275kV line component of Project No. 1.36 should be excluded on the basis that TransGrid's proposal for diverting SNI to Monash is

technically robust and less expensive than the alternative being put forward by ElectraNet.

Project 1.52

Meritec found that ElectraNet had included a project covering the section of SNI from the South Australian border to Monash in their capex program. This project has an estimated cost of $30.9m and a probability of 45 per cent of proceeding within the regulatory period. ElectraNet envisages that the project would be commenced in 2003-04 and be rolled into the capital asset base in 2004-05 or 2005-06. Meritec notes, however, that at present TransGrid is the proponent of SNI and as such there is currently no requirement for funding from ElectraNet.

Augmentations to facilitate connection of distributed generation

Meritec notes that ElectraNet has proposed a significant level of expenditure to facilitate the future connection of distributed generation, primarily wind driven. These projects are listed in table 4.5.

In its report Meritec questions whether, given the fact that generation of this nature is the catalyst for such high levels of expenditure, this should be funded by ElectraNet (and its customers) or by the proponents of the distributed generation proposals. Meritec believes that there is a risk that economic signals to the generators regarding their location would be lost if such expenditure is allowed.

Meritec recommends investment ElectraNet has nominated as necessary for the connection of distributed generation be excluded from its capex forecast on the basis that if there is no other need for it, then it should be largely funded by the proponent. Meritec also notes that all of the proposals relating to wind generation have relatively low probabilities of proceeding within the regulatory period.

Table 4.5 Capex to facilitate distributed generation.

Project	Estimated total project cost ($m)	Probability of proceeding before June 2008	Proposed construction date
Eyre Peninsula	67.5	0.33	July 02-2007/08
South East 3rd 275kV line to Tungkilla	101.4	0.13	2006/07-2007/08
Split Cult-Davenport	8.0	0.12	2006/07-2007/08
Mintaro Brinkworth 132kV uprate protection[1]	0.01	0.16	2007-08
Mintaro Waterloo 132kV uprate protection[1]	0.01	0.16	2007-08
Black Range	8.0	0.40	2006-07

Note 1: Appeared in ElectraNet's application as opex.
Source: Meritec capex report p26.

Other contingency amounts

Meritec identified two cases where ElectraNet has allowed contingency amounts for work that has not yet been identified. These were Project No. 5.10 – *Projects not identified* and Project 7.21 – *Other ETSA Utilities Connection Work from 2007-08*. Meritec considers these contingency amounts to be inconsistent with the probabilistic approach. It states that although it is known that not all of the events included in the probabilistic forecast will occur, it is this principle that provides for such contingencies. As such Meritec recommends that the Commission exclude these contingency amounts from ElectraNet's capex allowance.

Table 4.6 contains a complete listing of the projects that Meritec recommends be excluded from ElectraNet's forecast capex.

Table 4.6: Projects recommended for exclusion from ElectraNet's capex allowance

Project Number	Description	Roll in ($m)	Reason
Robertstown/Monash/SNI			
1.36b	Robertstown-Monash 275kV	27.910	Not required due to SNI connection
1.52	SNI Monash to VIC Border	13.840	Funded by TransGrid
Augmentation to facilitate the connection of distributed generation			
1.33	Eyre Peninsula	22.140	Wind generation driven
1.44	South East 3rd 275kV line to Tungkilla	12.970	Wind generation driven
1.47	Split Cult-Davenport	0.960	Wind generation driven
1.48	Mintaro Brinkworth 132kV uprate protection[1]	0.002	Generation driven
1.49	Mintaro Waterloo 132kV uprate protection[1]	0.002	Generation driven
1.53	Black Range	3.200	Wind generation driven
Other contingency amounts			
5.10	Projects not yet identified	2.500	Contingency not consistent with probabilistic methodology
7.21	Other ETSA Utilities work	5.000	
Total Exclusions		**88.523**	
The part project below was included, however deferred from 2003/04-2004/05 to 2007-08			
1.36a	Monash 275/132kV substation	7.840	Required by 2007-08
Total Deferrals		**7.840**	

Note 1:. Appeared in ElectraNet's application as opex.
Source: Meritec capex report

4.5 Submissions by interested parties

4.5.1 Responses from interested parties

Cost impact of capital expenditure program

A number of interested parties highlighted the significant size of the capex program being proposed by ElectraNet. They noted that once rolled in the program would add approximately 40 per cent to the initial regulatory asset base which ElectraNet is seeking and over 50 per cent to the rolled forward jurisdictional asset base over the regulatory period. Interested parties were particularly concerned about the cost impact of the program on end users, especially large end-users. For example, the EUAA believes that if the ElectraNet application was accepted, it would result in extraordinarily high transmission prices in South Australia, prices it believes cannot be supported in anyway.

Lack of detail provided in ElectraNet's application

A number of parties noted that ElectraNet's application was not supported by adequate detail to allow them to make a proper assessment of it. They consider that the application contains little information on:

- what the capex will achieve
- where it is to be spent
- the proportion of new investment versus replacement expenditure
- the relationship between current local capacity and forecast local growth
- the cost/benefit of the capital expenditure.

NRG considers that the capital investment program represents a largely unsubstantiated capital projects budget, lacking any specific detail on individual projects and their benefits. It believes that it is difficult to see how the substantial program can be reasonably justified and approved. It considers that a significant number of projects would be at an advanced state of development and therefore that greater detail should be available.

NRG considers that in the absence of significant increases in underlying peak demand levels or a demonstrable deterioration in network performance levels, the need for what amounts to a massive investment program remains unclear. It believes that further substantiation and project information needs to be provided in the form of a detailed forward project schedule to justify a capital budget of this magnitude.

SA Water considers that the substantial increase in capital expenditure sought by ElectraNet is not supported by adequate detail to make an assessment. It notes that no details are provided regarding the components for asset replacement, demand growth, generation connection, interconnection, code compliance, NEMMCO and system security; and that no details have been provided on the assumed lives of respective

asset classes, or the breakdown of expenditure into these asset classes. It notes that the SPI application has this breakdown.

Pool price benefits of capex program

NRG believes that additional investment is justified on the basis of delivering a lower pool price, reliability benefits and in order to relieve network constraints with flow-on benefits for the rest of the economy. However, it considers that little evidence has been provided to support these claims. It notes that a recent boundary analysis undertaken by NEMMCO has identified few network constraints in the South Australian region and that the pool price separation between South Australia and Victoria has declined dramatically in recent years.

Ageing asset profile

NRG notes that asset life alone cannot be taken as a reliable indicator of the need for asset replacement and that greater reliance should be placed on network performance over time. Unless this ageing asset profile can be linked directly to deteriorating performance levels, it is not clear that all aged assets automatically require replacement. The aim should be to replace worn assets not depreciated assets. NRG believes that experience in the market to date has shown that there is significant scope to challenge traditional assumptions over effective asset lives and performance levels. It considers that only limited evidence has been presented to suggest that network performance and reliability levels have deteriorated significantly or are reasonably expected to do so in the near future to justify the level of capital expenditure proposed.

Both AGL and WMC state that they would not expect that the average age of the South Australia transmission system to be significantly greater than that of NSW and Victoria. They believe that it seems highly anomalous that both TransGrid and SPI say that they can refurbish/replace their ageing asset base while still achieving a reduction in average real transmission tariffs, whereas ElectraNet feels obliged to seek a much increased revenue cap. WMC also finds it difficult to support the claim that the ElectraNet system has been robbed of attention and investment by past management and Government actions to any greater extent than has been experienced in the other states. It claims that SPI could make an equally valid claim but notes that it is not seeking an increase in its average real transmission price.

Greater information on load growth required.

ECCSA states that ElectraNet's application forecasts a 25 per cent increase in demand over the period of 2000 to 2008. It notes, however, that this increase is not spread evenly over the whole of the network. ECCSA seeks greater information on load growth by location and current capacity at each location in order to substantiate the need for capex to augment the system.

EAG is also concerned that although load growth is put forward as a major driver of network investment that ElectraNet's application fails to show what the costs of load growth are in terms of the total projected capital expenditure.

Probabilistic approach to capex forecasting

NRG notes that ElectraNet has used a probabilistic approach to a number of feasible transmission scenarios to derive a weighted average transmission investment requirement. However, it states that little detail has been provided on the assumptions adopted (for example, the probability applied to specific scenarios) and the specific projects that are required to be undertaken. It considers that extreme scenarios may be disproportionately impacting on the projected requirements.

Generation developments

AGL noted that the cost of any transmission augmentation necessary to allow connection of new generation is chargeable to the proponents of that generation under the code. This ensures that generators pay for the assets that they will directly benefit from. It also notes that a working group is currently examining code changes that will require generators to be charged for new shared network assets that benefit them. AGL considers that no allowance for expenditure to support generation connection should be made and that ElectraNet should use the provisions of the code to recover the costs of those augmentations from generators.

NRG considers that the impact of forecast wind generation developments on network investment needs to be closely scrutinised as only a proportion of mooted developments would actually reach the market over the regulatory period.

Allowance for required planning and consultation processes

NRG assumes that a significant proportion of the proposed capex would comprise projects which would be required to undergo the applicable planning and consultation processes in order to qualify for regulated status. It is concerned that insufficient time allowed for in the capex program for such consultation. This could result in some projects being delayed until after the regulatory period.

Insufficient consideration of non-network and non-regulated alternatives

NRG is concerned that insufficient allowance has been made for alternatives to transmission augmentation such as distribution augmentation, generation, demand-side measures and unregulated alternatives. In the later case it notes that should the SA-VIC interconnector upgrade proceed on an unregulated basis it would remove the requirement for approximately $50m of works from ElectraNet's capex program.

SA Water notes the potential for development of the South Australia transmission grid by new entrants has not been recognised. It believes that ElectraNet has assumed that it will supply all the demand growth when in fact elements of the system are potentially contestable and likely to be developer funded.

Importation of fossil fuelled generated electricity

The Conservation Council states that regulated funding should not be provided to import into South Australia highly greenhouse intensive electricity from NSW and Victorian Coal fired generators. It states that if greenhouse gas externalities were factored into the assessments of proposed regulated interconnectors such as SNI then it is most likely that they would fail such tests.

4.5.2 ElectraNet response to submissions by interested parties

ElectraNet's response to a number of the issues raised by interested parties is summarised below.[22]

Application provides little detail

In their response to interested parties ElectraNet accepted that its application did not provide detailed information concerning the proposed capex program. ElectraNet however contends that the Commission's consultant has reviewed all of the information and included the relevant findings in the capex report, which was made available on the Commission's website.

Probabilistic approach

ElectraNet notes that it has applied a probabilistic approach to determine a capex allowance for each year of the regulatory period and that this approach is based on an underlying set of network projects. It notes that these projects are consistent with the information recently published by the ESIPC in its 2002 Annual Planning Report.[23]

Increase in forecast demand growth

ElectraNet notes that ESIPC's 2002 Annual Planning Report updates the maximum demand forecasts for South Australia. ElectraNet states that the revised 10 per cent of probability of exceedance forecasts are significantly higher than the ones used by ElectraNet to develop its capex requirements (its states on average 190 MW higher in each year of the regulatory period). ElectraNet notes that although it has not had time to analyse the impact of this increase in forecast demand, it believes that it clearly indicates that its proposed capex program is conservative.

Checks and balances on planned investments

ElectraNet states that before any capital projects are built they will have to pass the regulatory test and undergo the public consultation processes required by the code. It believes that this process provides the necessary checks and balances to ensure that its investments are prudent and efficient and that non-network options are properly considered. It also notes that any capex underspend would be clawed back by the Commission at the end of the regulatory period.

Ageing asset profile

In responding to ElectraNet's application interested parties suggested that the age profile of ElectraNet's assets seemed to be the primary justification for the capex program. ElectraNet refutes this suggestion. It states that the large majority of its capex requirement is driven by load growth and the requirement to maintain the service standards.

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[22] ElectraNet SA, *Response to submissions from interested parties* (pp 20-22), 19 July 2002.

[23] ESIPC, *Annual Planning Report*, 15 July 2002

Pool price benefits of the capex program are limited

In responding to ElectraNet's application an interested party questioned the pool price benefits of the capex program. It noted that a recent regional boundary analysis, undertaken by NEMMCO, identified few network constraints in the South Australia region. It also noted the decline in pool price separation between South Australia and Victoria in recent times.

ElectraNet's response is given below:

- NEMMCO's boundary review identified enough constraints to justify a draft recommendation of an additional region within South Australia
- the regional boundary review relies on historical data and committed projects while ElectraNet is required to take a forward looking perspective in its assessment of network requirements. As such the capex program is primarily driven by load growth and the requirement to maintain service standards (although it does acknowledge that some of the proposed augmentations will assist in relieving network constraints)
- capex that is likely to reduce pool price differences are limited to the augmentation of the South Australia-Victorian interconnector and works associated with the SNI interconnector (ElectraNet states that the latter works are needed in any case during the forthcoming regulatory period to support load growth in the Riverland area).

Efficient delivery of the capex program

Interested parties stated that network construction costs must reflect the latest cost effective designs and modern construction industry practices. They also considered that individual capex projects must be of the right size and carried out at the most appropriate time. In response ElectraNet states that it must comply with such requirements under the current regulatory arrangements. For example, optimisation ensures that only an efficient asset base (of the appropriate size and efficiently constructed at the right time) is allowed for at the time of revenue reset.

4.6 Submissions by interested parties in response to Meritec's capex report

4.6.1 ElectraNet response to Meritec capex report

ElectraNet's response to Meritec's capex report[24] comments on the material adjustments to its capex allowance recommended by Meritec.

Probabilities associated with load forecasts

ElectraNet states that recently published figures in NEMMCO's 2002 SOO show that the current 10 per cent probability of exceedance forecasts are significantly higher than

[24] ElectraNet SA, *Response to Meritec Captial Expenditure Review*, 2 August 2002.

the forecasts used by ElectraNet in developing its capex requirements. It states that on average demand forecasts are 190 MW higher in each year of the regulatory period. ElectraNet considers that Meritec's recommendation to give additional weight to the low demand forecast and less to the medium scenario is inconsistent with the current increase in demand forecasts and should be rejected. ElectraNet considers that the lower revenue will result in inadequate investment to meet growth in customer demand and to ensure the ongoing reliability of the network.

Treatment of refurbishment and replacement expenditure

ElectraNet considers that it has proposed a prudent level of asset refurbishment and replacement expenditure in its application. It states that Meritec has reviewed in detail and generally endorsed the proposed expenditure. It notes that the Commission has directed Meritec to treat this expenditure as capex when it was included as opex in its application.

ElectraNet states that its proposed treatment of this expenditure:

- is consistent with Powerlink's current practice which was effectively endorsed by the Commission in its 2001 *Queensland* revenue cap decision
- is based on advice from asset valuation specialists SKM.

Based on SKM's advice ElectraNet has proposed a change in its capitalisation policy. The change results in some expenditure being treated as opex, when in the past it would have been treated as capex.

ElectraNet states that replacement of assets below the unit of property recognised in engineering consultant valuation databases will not be recognised in future asset valuations. ElectraNet believes that it cannot be expected to capitalise this expenditure and will not do so if it means that it cannot recoup the expenditure being made.

ElectraNet states that simply moving asset refurbishment and replacement expenditure from opex to capex without a firm guarantee that ElectraNet can recoup this expenditure will prevent ElectraNet from incurring the expenditure. It considers that this would have a serious detrimental impact on customer service and transmission network reliability. For example, it states that if it cannot proceed with expenditure to increase line clearances and thereby the rating of some older transmission lines then supply constraints would need to be applied during summer high load conditions.

Removal of capex allowances for certain projects

ElectraNet notes that Meritec has recommended removing from the capex program a number of projects due to uncertainty regarding whether these would proceed during the regulatory period and/or uncertainty regarding whether ElectraNet would be required to fund the projects.

Augmentations to the Robertstown/Monash/Berri network

ElectraNet states that Meritec has recommended excluding the Robertstown to Monash 275kV line component of Project 1.36. It believes that this recommendation is made on the basis that TransGrid's proposal for diverting SNI to Monash is technically robust,

less expensive and because TransGrid is the proponent of this work. ElectraNet believes that the Robertstown to Monash 275kV line component of Project 1.36 should not be excluded from the capex allowance for the following reasons:

- ElectraNet entered into a Heads of Agreement with TransGrid on 4 June 2002 under which ElectraNet is to build, own and operate the Robertstown to Monash section of SNI. ElectraNet state that this project has passed the regulatory test and is due for commissioning in 2004-05. Hence ElectraNet believes that funding should be provided to enable this project to proceed in accordance with the requirements of the code

- ESIPC and ElectraNet have identified the need for additional transmission support to the Riverland. The ESIPC work suggested 2007-08 as the required date. However, ElectraNet believe that this overlooked network limitations in Victoria, which bring the date forward to 2006-07 at the very latest, possibly 2005-06.

- the ESIPC work was based on a simplified model of the transmission network that did not adequately consider the impact on voltage levels in the Riverland. ElectraNet states that more detailed modelling shows the need to advance the necessary works still further

- current customer electricity demand forecasts as reported by ESIPC and NEMMCO have increased significantly over previous forecasts. ElectraNet believes that this confirms that an earlier rather than later date of construction is required.

Augmentation to facilitate connection of distributed generation

ElectraNet notes that Meritec has recommended that projects proposed to facilitate the future connection of distributed generation, primarily wind driven, be excluded from the capex allowance given uncertainty as to whether the projects will proceed and uncertainty regarding the source of their funding.

ElectraNet states that the probabilistic approach it has adopted to determine its proposed capex requirement explicitly takes into account the uncertainty associated with the proposed projects. ElectraNet considers that the projects have been assigned relatively low probabilities and hence only a small proportion of the estimated total project costs has been included in the proposed capex allowance.

ElectraNet states that excluding the projects altogether as Meritec has recommended amounts to saying that there is a zero probability that any of these projects will proceed during the regulatory period. ElectraNet does not believe this to be the case and refers to a multi-stage wind power project on the west coast of the Eyre Peninsula that has draft power purchase agreements in place and development approval for the first stage of the project. Hence ElectraNet considers that an allowance must be made for the eventuality that one or more of these projects will proceed.

ElectraNet considers that Meritec has confused the issue of funding projects through ElectraNet's revenue allowance with recovery of this revenue allowance through customer transmission charges. It considers that Meritec has not understood the requirements of the code in relation to transmission pricing.

ElectraNet states that generators will be required to pay a negotiated charge for the proposed augmentations to the network thereby preserving economic signals regarding their location. However ElectraNet states that the revenue recovered from these charges must be incorporated into its revenue cap. ElectraNet therefore believes that an allowance must be made for the cost of these projects in its capex allowance. It states that it will not commit expenditure that has not been allowed for in its revenue cap.

ElectraNet considers that while the proposed projects are required to facilitate connection of distributed generation, they may also provide other customer benefits.

4.6.2 Interested party responses to Meritec's capex review

Level of proposed capex

ECCSA considers that the review by Meritec essentially supports the capex claims made by ElectraNet but notes that Meritec does consider that there are risks to it being delivered. ECCSA also notes that the proposed capex represents a massive increase on previous years.

ECCSA has no view as to the amount of capex that should be included in the forward revenue calculation as long as the amount of capex rolled forward has been demonstrated to be prudent and economically efficient. It notes that the approach taken by ElectraNet in demonstrating the need for the capex does leave ElectraNet subject to future risks should the Commission decide that the capex expended does not meet the prudency and economic efficiency test. However the ECCSA would prefer that ElectraNet provide the Commission with all of the information necessary to give prior approval of the proposed capex as part of the revenue cap decision.

Refurbishment and replacement expenditure

ECCSA states that ElectraNet wants to include some capex as part of the opex program, as it is on this basis that the capex will be automatically accepted as a fully recoverable cost. ECCSA believes that Meritec rightly points out that capex should not be included in the opex budget. ECCSA states that capex must not be treated as opex.

Load growth

ECCSA is concerned about the planned massive investment program for such a relatively small amount of increase in load growth. It states that ElectraNet and Meritec make no attempt to identify where the growth is expected in the system with relation to the target expenditure. ECCSA believes that this is unacceptable and is an example of the paucity of the Meritec review in this area.

Smoothing of capex

ECCSA considers that the Commission should look closely at the capex proposed by ElectraNet to eliminate the unnecessary 'bow wave' effect and to require the approved capex to structured in such a way that smooths the capex requirement over the long-term and eliminates any future lumpiness in the age of assets.

Load forecasts

NRG notes that Meritec has recommended adjusting the probabilities that ElectraNet has assigned to the low and medium load growth forecasts to be more in line with those suggested by ROAM. NRG considers that this corrects what appears to be an undue emphasis on the medium scenario.

Probabilistic planning process

NRG notes that while statistically defensible it is unclear whether the averaging process inherent in the probabilistic planning approach might be disproportionately influenced by extreme scenarios.

Mutual exclusivity of generation proposals

NRG stated that it was unclear whether or not the mutual exclusivity of competing generation proposals had been taken into account in the alternative scenarios modelled. It notes that although a wide range of individual generation projects might be considered feasible, a scenario in which many or all competing proposals come to fruition simultaneously is clearly unrealistic. NRG believes that this needs to be borne in mind when assigning probabilities to generation scenarios, certain combinations of which are unlikely to be plausible for this reason.

Exclusion of wind generation projects

NRG notes that Meritec has proposed to exclude from the capex forecast certain expenditure driven by the prospect of significant wind generation development. NRG considers that while negotiated charges paid by generators for the required augmentations will form part of the annual regulated revenue requirement the exclusion of this expenditure appears appropriate because of the mutual exclusivity associated with competing generation proposals and the fact that network users would bear the uncertainty attached to these proposals if these projects were to be included in the ElectraNet's forecast.

Exclusion of general level of expenditure

NRG considers that a significant proportion of projects are being developed to satisfy 'market benefit' criteria under the regulatory test as opposed to reliability driven augmentations. NRG believes that the need to satisfy the market benefit test adds to the uncertainty associated with the likelihood and timing of these projects. It also states that code consultation has yet to commence for a single project at this time.

NRG notes Meritec's concerns over the feasibility of the proposed capex program, given the increasing demand for construction resources across the NEM and the magnitude of the increase in ElectraNet's capex levels from historical levels. NRG considers that this may increase the uncertainty of delivery and hence the risk of subsequent clawback. NRG considers that the above concerns suggest the need for conservatism and caution in the approval of a large step increase in capex. It also believes that in view of these issues the exclusion of the expenditure proposed by Meritec is appropriate.

Augmentations to the Riverlands area

Monash-Robertstown 275kV and Monash 275/132kV substation (Project No.136)

NRG states that it is unclear how ElectraNet can be required to fund network augmentation works for which another TNSP is the proponent of under the NEC. In the absence of clear rationale for this NRG believes that the exclusion of the Monash-Robertstown transmission line from ElectraNet's capex forecast appears appropriate.

TransEnergie notes that ElectraNet is seeking to include $44.7m in its capex program in order to augment capacity to supply the Riverland area. It states that this is based on evidence of ongoing load growth in the Riverland and a number of reviews undertaken by ESIPC. TransEnergie believes that the project should not be included in ElectraNet's capex program because the necessary support can be provided by the Murraylink interconnection (through a network support agreement) in combination with the existing network.

TransEnergie notes Meritec's recommendation that the substation component ($9.8m) of this project can be deferred until 2007-08 based on the use of Murraylink to support the network. TransEnergie, however, believes that two important factors indicate that Murraylink, in combination with a network support agreement and relatively low cost capital expenditure can adequately supply the Riverland beyond 2007-08. These factors are:

- the installation of shunt capacitors for enhanced reactive support
- that load forecasts in the Riverland region have been adjusted downwards since Meritec's analysis for the original Riverland review which formed the basis of the need for augmentation in 2007-08.

TransEnergie believes that these factors mean that the need for the assets proposed by ElectraNet under Project No. 1.36 can be deferred for at least five years from 2007-08 to 2012-13 (three years due to lower load forecasts and two years due to the use of shunt capacitors). TransEnergie considers that the cost to ElectraNet of any network support agreement with Murraylink Transmission Company (MTC) would form a legitimate cost for inclusion in the revenue cap determination.

Monash to South Australian Border Component of SNI (Project No. 1.52)

For the reasons stated by Meritec in its review, TransEnergie fully supports the conclusion of Meritec in relation to this project. It believes that as TransGrid is the proponent of SNI it is the party who should eventually seek funding for the project it should proceed on a regulated basis. TransEnergie also believes that irrespective of any arrangements that TransGrid and ElectraNet may have reached between themselves that it is highly concerning and imprudent for ElectraNet to seek funding for components of SNI.

4.7 Commission's considerations

4.7.1 Adjustments recommended by Meritec

Meritec has recommended a number of adjustments to ElectraNet's capex requirements including:

- the removal of a number of specific projects
- the inclusion of refurbishment and some replacement expenditure as capex, where they had been presented as opex in ElectraNet's application
- adjustment of the probabilities assigned by ElectraNet to the independent load forecast.

Meritec's proposed capex above adjustments are discussed in the following section.

4.7.2 Removal of capex allowance for specific projects

Augmentations to the Riverland network

Project No. 1.36 – Robertstown to Monash 275kV line and Monash substation

This project has a total cost of $44.7m being made up of $9.8m for a Monash 275/132kV substation and $34.9m for a 275kV line from Monash to Robertstown. ElectraNet has assigned this project a probability of 80 per cent of proceeding within the regulatory period.

Both ElectraNet and the ESIPC have identified a need to augment the supply to the Riverland area due to ongoing load growth. Meritec notes that this can be provided either by support from Murraylink or by the establishment of a new 275/132kV injection point in the area. ElectraNet considers that by summer 2004-05 Murraylink will have insufficient capacity to provide the level of support that is required and at the time of Meritec's review were proposing to construct a 275kV line from Robertstown to Monash and a 275/132kV substation at Monash by 2004-05.

In its capex report Meritec notes that the existing, approved version of SNI does not pass through Monash but goes from Buronga in NSW to Robertstown in South Australia. In a submission to ESIPC, TransGrid proposed, as part of the SNI project, a connection into Monash in order to provide the support to the Riverlands area. That solution involved the construction of a 20km of dual circuit line. Meritec notes that ElectraNet's proposed Robertstown to Monash 275kV line has a length of 160km. Meritec considered TransGrid's proposal for diverting SNI to Monash to be a technically robust and less expensive solution then a Robertstown to Monash line. It therefore recommended that the 275kV line component of this project should be excluded on that basis that TransGrid's proposal for diverting SNI to Monash is technically robust and significantly less expensive than the alternative being put forward by ElectraNet.

ElectraNet advised in its response to Meritec's capex report that both it and TransGrid, subsequent to Meritec's review, have entered into an agreement whereby ElectraNet is

to build, own and operate a Robertstown to Monash component of SNI. ElectraNet states that as the SNI project has already passed the regulatory test, funding for this project should be included in its capex allowance.

The Commission understands that the NEMMCO approved version of SNI does not pass through Monash but is to be constructed from Buronga in NSW to Robertstown in South Australia. As such the agreement with TransGrid to build, own and operate a Robertstown to Monash component of the SNI project does not appear to form part of the NEMMCO approved version of SNI. The Commission considers that the uncertainty exists as to whether or not this version of SNI, if modelled, would result in the same outcomes as the version approved by NEMMCO as passing the regulatory test. Unless it can be demonstrated to the Commission that this version of SNI is the version approved by NEMMCO, the Commission considers that TransGrid remains the sole proponent of SNI. Therefore, at this stage, the Commission considers that the Robertstown-Monash 275kV component of Project 1.36 should be excluded from ElectraNet's capex requirement.

In relation to the substation component of Project 1.36, ElectraNet proposes the construction of the substation by summer 2004-05 as it believes that Murraylink has insufficient capacity to provide the level of support that is required.

Meritec consider that the inclusion of the Monash substation should be allowed but that the work should be deferred until 2007-08 based on the use of Murraylink to support the network up until that date.

However TransEnergie, the owner of Murraylink, considers that the construction of the substation can be deferred for at least another five years until 2012-13. TransEnergie's proposal is based on lower load growth forecasts for the Riverland area (than that used by Meritec in their earlier analysis for ESIPC) and the installation of shunt capacitors to provide reactive support this region.

Given the significant amount of uncertainty regarding supply issues to the Riverland and the technical nature of the proposals put forward the Commission must rely on the advice of its expert consultant. As such the Commission accepts Meritec's recommendation that the substation component of Project 1.36 should be included in ElectraNet's capex allowance but deferred until 2007-08 based on the use of network support arrangements up until that time.

Project No. 1.52 - Monash to SA border component of SNI

Meritec found that ElectraNet had included a project covering the section of SNI from the South Australia border to Monash in their capex program. The project has an estimated cost of $30.9m and a probability of 45 per cent of proceeding within the regulatory period. ElectraNet envisages that the project would be commenced in 2003-04 and be rolled into the capital asset base in 2004-05 or 2005-06. Meritec notes that at present TransGrid is the proponent of SNI and therefore there is currently no requirement for funding from ElectraNet.

The Commission agrees with Meritec's recommendation that Project No.1.52 be removed from ElectraNet's forecast capex program as TransGrid is the proponent of SNI.

Augmentations to facilitate connection of distributed generation

ElectraNet's capex program includes a number of projects to facilitate distributed generation, primarily wind. These augmentation projects total $185m but based on the probabilities assigned by ElectraNet they have an expected roll-in value of $38m during the regulatory period. The probabilities of the projects proceeding during the regulatory period range from 12 - 40 per cent (see table 4.5).

The Commission considers that the projects identified by Meritec to facilitate distributed generation should be excluded from ElectraNet's proposed capex program for the following reasons.

- The high cost of such projects while their economic benefits are unclear. Given their high value the Commission considers that it is likely that they would have a significant impact on transmission prices but uncertain customer benefits
- The code is unclear about who is to actually pay for such augmentations. While generators are required to negotiate with a TNSP as to how much they pay for required augmentations to the shared network, the amount they will actually negotiate may not reflect the true cost imposed by the generator
- Locational signals may be lost if generators are not required to pay for all or a substantial amount of the augmentation projects required as a result of them being connected to the shared network
- The overall size of the program, even with these projects excluded, provides ElectraNet with the ability to re-prioritise its program should one of these generation projects proceed.

Other contingency amounts

Meritec identified two cases where ElectraNet has allowed contingency amounts for work that has not yet been identified. These were Project No. 5.10 – *Projects not identified* and Project 7.21 – *Other ETSA Utilities Connection Work from 2007-08*. Meritec considers these contingency amounts, totalling $7.5m, to be inconsistent with a probabilistic capex forecasting approach. It states that although it is known that not all of the events included in the probabilistic forecast will occur, it is this principle that provides for such contingencies. As such Meritec recommends that the Commission exclude these contingency amounts from ElectraNet's capex allowance.

The Commission agrees with Meritec's conclusion that an allowance for contingency amounts is inconsistent with the probabilistic planning approach. It therefore accepts Meritec's recommendation that these contingency amounts be excluded from ElectraNet's capex allowance.

4.7.3 Treatment of refurbishment and replacement expenditure

In its application ElectraNet has classified the expenses incurred on a number of refurbishment and replacement projects as opex. These projects are designed to increase the design temperature of equipment or to replace restrictive terminal equipment such as current transformers. During Meritec's review the Commission requested that it treat and assess ElectraNet's refurbishment and replacement

expenditures as a separate capex item rather than an opex item. Consequently, Meritec's capex report contains a figure of $77.4m for refurbishment and replacement projects.

In its opex report Meritec notes that the definition of a unit of plant forms ElectraNet's basis for determining whether expenditure should be classed as opex or capex. Meritec notes that ElectraNet classified the switchgear bay as the unit of plant with this including the circuit breaker, disconnectors, current transformer etc. It notes that in its application ElectraNet expensed all costs incurred on parts of the unit while the entire unit is capitalised. Meritec disagreed with this definition stating that the effect of this policy if implemented could be that any replacement less than the unit of property would be able to be expensed and not capitalised.

ElectraNet considers that it has proposed a prudent level of asset refurbishment and replacement expenditure and that Meritec has reviewed and generally endorsed this expenditure. It also notes that its proposed treatment of this expenditure is based on advice from asset valuation specialists SKM and is consistent with Powerlink's current practice (which it believes was effectively endorsed by the Commission as part of its *Queensland* revenue cap decision).

ElectraNet states that the replacement of assets below the unit of asset recognised in engineering consultant valuation databases will not be recognised in future valuations. It therefore believes that it cannot be expected to capitalise such expenditure for regulatory purposes and will not do so if it means that it cannot recoup the expenditure.. ElectraNet states that simply moving asset refurbishment an replacement expenditure from opex to capex without a firm guarantee that ElectraNet can recoup this expenditure will result in that expenditure not being made, with subsequent impacts on customer service and network reliability.

The Commission believes that refurbishment expenditures should be capitalised for the following reasons:

- Benefits of refurbishment are gained over a long period of time. By expensing refurbishment ElectraNet will expose its customers to a one-off impost in that year and (at their expense) benefit future customers. Inter-temporal equity is obtained by capitalising the expense and depreciating it over its useful life.

- If refurbishment is expensed it would be very difficult to identify the amount in the future. In contrast, capitalising leaves an audit trail in the form of an asset record. This is important during future valuations in subsequent revenue resets.

- Under the building block approach opex is treated as an allowance with limited opportunity to claw-back. There would be significant difficulties in monitoring actual amounts spent on refurbishment, under the light handed approach adopted by the Commission, if they are treated as an expense.

- Similar refurbishment expenses have been capitalised by ElectraNet and its predecessors (the previous owners of South Australia's transmission business) in the past.

The Commission, however, recognises the possible risk of optimisation. It therefore proposes to treat refurbishment as a separate line-item of capital expenditure and:

- quarantine the amount against optimisation for 15 years
- depreciate the amount over the same period, recognising that its value may be extinguished well before the life of the (original) asset.

The above treatment is subject to the condition that:

- ElectraNet undertakes appropriate regulatory evaluation procedures similar to those for other new investments before spending (for example, the regulatory test)
- maintains records in such a way that the refurbishment can be identified to the asset.

The Commission considers that the above approach balances its concerns with the requirements of ElectraNet, and is a fair solution.

As stated earlier the Commission directed Meritec to treat the refurbishment ($77.4m) as a separate capital item in its capex report. Meritec analysed the refurbishment and identified $15.3m of this expenditure as opex and recommended that this amount be treated as such. These 'other associated refurbishment projects' include the modification of existing assets in some minor way that will ensure the asset performs as originally designed. The Commission has accepted this recommendation and hence the amount to be quarantined as capital expenditure under the above approach is $62.1m.

4.7.4 Probabilities associated with demand forecasts

As stated previously, ElectraNet engaged ROAM to conduct market modelling to identify plausible generation/demand/interconnector scenarios over a ten year period. As part of this modelling exercise ROAM assessed the NEMMCO 2001 SOO load growth forecasts for a 10 per cent probability of exceedance. It considered the probability of the low, medium (or base) and high load growth forecasts occurring to be 25 per cent, 60 per cent and 15 per cent respectively. ElectraNet states that it took a more conservative approach in its revenue cap application using only the low and medium demand forecasts with 20 per cent and 80 per cent forecasts respectively.

In order to be more consistent with ROAM's analysis Meritec recommended that the probabilities applied to the load forecasts should be adjusted to a 25 per cent probability of a low forecast and a 75 per cent probability of a medium forecast. The Commission agrees with Meritec that such an adjustment would make the analysis more consistent with ROAM's analysis. Meritec calculates that such an adjustment would result in a reduction of approximately $12m over the regulatory period in the capital expenditure proposed by ElectraNet.

The Commission notes, however, that ElectraNet's capex program is based on the 2001 SOO load forecast and that NEMMCO's recently released 2002 SOO predicts an increase in load growth for South Australia above that predicted in its 2001 forecast. The Commission understands that, on average, load growth is 109 MW higher for the base growth forecast across the regulatory period. As a result of this change the Commission considers that the load forecasts used by ElectraNet are reasonable and

hence it does not require the probabilities applied by ElectraNet to the low and medium demand forecasts to be adjusted.

4.7.5 Analysis of ElectraNet's proposed capex program

The Commission notes that ElectraNet is proposing a large capex program and one that represents a significant increase on previous capex programs undertaken on the South Australian transmission network.

The size and cost impact of the proposed program

In many of the submissions received by the Commission interested parties raised their concerns over the size of the capex program being put forward by ElectraNet. They noted that once rolled into the asset base the program would add approximately 40 per cent to the initial regulatory asset base that ElectraNet is seeking, and over 50 per cent to the rolled forward jurisdictional asset base over the regulatory period. Interested parties were particularly concerned with the cost impact that the program would have on end users, particularly large end users. For example, the EUAA believed that if the ElectraNet application were accepted it would result in extraordinarily high transmission prices in South Australia.

Ability to deliver the proposed capex program

In its capex report Meritec identified, as one its main conclusions, that there was a potential risk that ElectraNet would not be able to deliver the proposed capex program. Meritec noted that the annual capex amounts proposed by ElectraNet in its application represent a significant increase on historical levels. ElectraNet has proposed a capex allowance of approximately $80m per annum over the regulatory period, while historically ElectraNet's capex program has averaged less than $40m per annum. Primary to Meritec's concerns is that a number of TNSPs and DNSPs have underway or a planning significant increases to their capex programs (and in some cases opex programs). Meritec noted that this is likely to lead to increased competition for limited resources, particularly in the areas of experienced service providers, major plant items and project management personnel.

Problems associated with potential clawback

The Commission shares Meritec's concerns regarding the size of the capex program and ElectraNet's ability to deliver it within the regulatory period. It notes that the approach proposed by the Commission in its DRP for making adjustments of over estimates in capex is the clawback mechanism. Meritec noted that while such a mechanism is effective for relatively small variations between approved and actual expenditure, if large variations occur it may be less easy to recover the variation by clawback. Meritec considered that should a significant amount of funding need to be clawed back it could have serious implications for a TNSP's cash flows.

ESIPC high level review of ElectraNet's capex program

The Commission approached ESIPC, as the South Australian Government's independent expert on the electricity supply industry, to obtain its view on ElectraNet's

Capex program. ESIPC provided the Commission with a report[25] containing the results of its high level analysis of the adequacy of the State's network for the next five years. Commission staff met with ESIPC on a number of occasions as part of its revenue cap consultations.

ESIPC found that the augmentations highlighted in its report reflected closely the typical augmentations anticipated for South Australia's transmission network in order to keep pace with customer demand growth. It notes however that given the high level nature of its analysis and the limited project information available at the time of its review (July 2002) the technical appropriateness and cost-effectiveness of the proposed solutions have not been tested or compared against reasonable alternatives.

ESIPC considers that, within the protective framework of the regulatory test process and given the potential for project optimisation following detailed design a forward capital investment plan in the South Australian transmission network of the order of $400m (inclusive of some of the refurbishment projects) to maintain South Australia's required network performance standards is reasonable. ESIPC advised that it high level review used ElectraNet's proposed project costs, relying on the cost conclusions from section 4.0 of Meritec's capex report. A copy of ESIPC's report can be found on the Commission's website.

The cost of meeting load growth

In its application ElectraNet notes that the majority of the capex program is driven by load growth. The Commission has undertaken a rough analysis of the cost of this additional load growth. It has determined its cost to be approximately $1000/MWh. That is, the majority of the capex program could be avoided if 500MW of load would accept $1000/MWh to switch off for up to 1.7% of the time or if peaking generation in or near Adelaide could be attracted into the market at that price.

Overall, given the concerns raised by interested parties regarding the impact of the program on transmission prices, its size relative to historical capex programs, concerns about ElectraNet's ability to deliver such a large program in the regulatory period and the risk that the Commission would need to claw back a substantial amount of funding in the next regulatory period the Commission considers that a total capex allowance of approximately $347m for the regulatory period is appropriate. The Commission believes that within this allowance ElectraNet should be able to prioritise its expenditures in order to ensure that its service standards are met.

4.7.6 Conclusion

On the basis of its own analysis, and that of its consultant Meritec, the Commission has concerns about size of the capex program proposed by ElectraNet. For the reasons set out in the previous section the Commission considers that a more prudent level of capex would be $347m over the regulatory period (inclusive of $62m of refurbishment projects). Consequently for the purposes of determining ElectraNet's revenue cap for the period 1 January 2003 to 30 June 2008, the Commission has included a capex

[25] ESIPC, *Planning Council Review of ElectraNet SA's Capital Expenditure*, 30 August 2002.

allowance of $347m as set out in table 4.7. This decision is made on the basis of ElectraNet's proposed project commissioning dates and includes an allowance for interest during construction of 8.59 per cent, which represents the nominal vanilla WACC as set out in chapter 2 of this draft decision.

Table 4.7 ElectraNet capex allowance

	Jan-Jun 03 ($m)	2003-04 ($m)	2004-05 ($m)	2005-06 ($m)	2006-07 ($m)	2007-08 ($m)	Total ($m)
Construction capex	4.9	57.7	48.3	65.3	65.9	43.3	285.4
Refurbishment	5.4	11.4	11.6	11.5	11.6	10.5	62.0
Total capex	**10.3**	**69.1**	**59.9**	**76.8**	**77.5**	**53.8**	**347.4**

In making this decision the Commission notes that ElectraNet must apply the regulatory test to each project in order to justify its inclusion within the capex program. The Commission will consider these matters further when it comes to including the projects into ElectraNet's asset base at the next regulatory review. The Commission also flags its intention to test the validity of ElectraNet's forecasts throughout the regulatory period through its *Information Requirements.* These guidelines contain provisions requiring the annual reporting of actual capex figures.

Appendix 4.1 Summary of ElectraNet's Proposed Capital Projects > $10 million

Project Number	Project Name	Project Est. Total Cost ($m)	Probability. Prior to June 2008	Proposed Roll-in ($m)	Stated Reason	Proposed to commence
Section 1 – Network Augmentation						
1.1	Bungama/Brinkworth 275/132 kV (No SAMAG)	24.7	0.50	12.2	Required as alternative to rebuild of Playford- Bungama 132kV lines which are in very poor condition	
1.2	Playford relocation to Davenport	14.0	1.00	14.0	Required due to age and condition of existing Playford switchyard	July – Dec 2002
1.3	South East to Snuggery 132 kV Line	10.2	1.00	10.2	Required to maintain adequate voltage levels during first level contingency	2004-05
1.4	Uprate all ElectraNet lines designed for 49^{o}C operation	18.4	1.00	18.4	Required to release additional capacity in various lines in order to supply load growth.	2004-05
1.6	Eastern Hills Project	12.1	1.00	11.9	Required to prevent overloading of lines during first level contingency	2004-05
1.13	East Terrace – Magill 2nd 275 kV cable, plus East Terrace 2nd 275/66 kV transformer	45.3	0.80	34.8	Required to supply load increases on the east terrace supply point to Adelaide CBD	2004-05
1.21b	Southern reinforcement, Wilunga – Network part	17.7	0.67	11.8	Required to supply load increases in the area	2005-06
1.24	Establish Tungkillo 275 kV substation – Stage 1	11.0	0.40	4.4	Required to maintain network reliability to southern suburbs	2005-06
1.33	Eyre Peninsula 132 kV Reinforcement	67.5	0.33	22.1	Required to facilitate connection of wind generation. ElectraNet expect it to pass part (b) of ACCC's regulatory test	2004-05
1.36	Monash 275/132kV substation and Robertstown – Monash 275 kV transmission line	44.7	0.80	35.8	Required to maintain adequate voltage levels during first level contingency	July – Dec 2002
1.38	Heywood Augmentation	32.9	0.64	21.1	To facilitate connection of wind generation and to increase the capacity of the Victorian interconnection at Heywood to 650MW	2004-05
1.44	South East to Tungkillo 275 kV circuit	101.4	0.13	13.0	To facilitate the connection of wind powered generation	2006-07

Project Number	Project Name	Project Est. Total Cost ($m)	Probability. Prior to June 2008	Proposed Roll-in ($m)	Stated Reason	Proposed to commence
1.52	Victorian Border – Monash component of SNI	30.9	0.45	13.8	To provide additional interconnection capacity between SA and NSW	2003-04
1.55	Bungama/Brinkworth 275/132 kV (with SAMAG)	28.5	0.50	14.0	Required as alternative to rebuild of Playford – Bungama 132 kV lines which are in very poor condition (Note that this is a mutually exclusive alternative to project 1.1	July – Dec 2002
Section 7 – ETSA Utilities – post EPO						
7.8	Northfield third 225 MVA 275/66kV transformer	11.6	0.80	8.6	To increase capacity at the Northfield ETSA Utilities supply point in response to load growth in the area.	2006-07

Notes: Commencement dates shown in italics are estimated by Meritec based on roll in date due to this data not being contained in ElectraNet's submission.
A number of projects are included in ElectraNet's capex forecast with multiple roll-in dates with varying probabilities. In these cases, commencement dates are indicative only.

5 Operating and maintenance expenditure

5.1 Introduction

In setting ElectraNet's allowed revenue, the Commission must assess ElectraNet's capacity to achieve realistic efficiency gains in its proposed opex. Because opex represents a large proportion of a network's variable costs, it is an important source of savings and productive efficiencies.

An important focus of the Commission's assessment is benchmarking.

The remainder of this chapter:

- sets out the requirements of the code
- summarises:
  - ElectraNet's opex proposal for the regulatory period (section 5.3)
  - the major findings of the consultant's review
  - submissions by interested parties
  - the Commission's considerations
- sets out the Commission's decision concerning the appropriate opex allowance.

5.2 Code requirement

The Commission's task in assessing ElectraNet's opex is specified in the code. In particular, Part B of chapter 6 of the code requires *inter alia* that:

- in setting the revenue cap, the Commission must have regard to the potential for efficiency gains in expected operating, maintenance and capital costs, taking into account expected demand growth and service standards
- the regulatory regime must seek to achieve efficiency in the use of existing infrastructure, efficient operating and maintenance practices, and an efficient level of investment.

The Commission engaged Meritec to review ElectraNet's opex program. The results of Meritec's review are summarised in section 5.4.

5.3 ElectraNet's proposal

5.3.1 Key factors in determining ElectraNet's proposed opex plan

ElectraNet states that it has taken into account the following factors in arriving at its proposed opex allowance.

Operational expenditure efficiency

ElectraNet states that it has put in place a number of work practices, processes and systems that are best practice. These include:

- outsourcing of non-core business activities through competitive tendering and performance based contracts
- deployment of best practice maintenance techniques
- introduction of a continuous remote asset monitoring system for key assets
- leveraging 'off-the-shelf' operational asset information systems
- a comprehensive computerised asset management system that is remotely accessible by service providers
- consistent use of risk management tools in decision making.

ElectraNet considers that the cost savings of these initiatives are implicit in its present cost structure. It believes that having introduced these initiatives there are minimal further efficiency and productivity gains to be achieved. ElectraNet claims that this is confirmed by its leading position in international benchmarking.

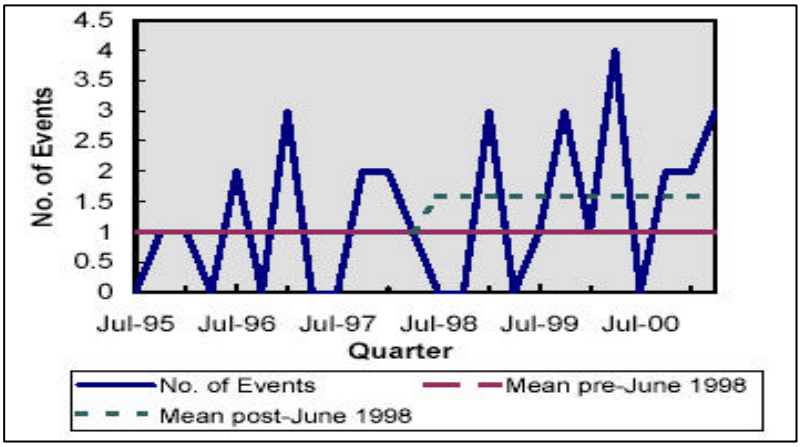
Ageing asset profile

ElectraNet claims that 24 per cent of its assets are currently over 40 years old, resulting in increased risk of unreliability. It argues that if this situation is ignored then reliability of the assets and the associated parts of the interconnected transmission network will deteriorate. ElectraNet argues that failure to increase expenditure now by reinvesting in the transmission network will have a detrimental impact on transmission network reliability in the future. It refers to a number of charts (see figure 5.1) to illustrate that the number and duration of system failures has increased in recent times.

ElectraNet considers that expenses incurred on asset refurbishment and renewals can not be aligned with historical figures as it is a new issue for TNSPs.

A study commissioned by ElectraNet, which analysed trends over the last five years, revealed an increase in the frequency of equipment failure that caused supply interruptions for greater than 0.2 minutes. ElectraNet believes that the results of this study confirm that the age related decline in reliability of these assets has already begun. It considers that some five per cent of substation assets will reach the end of their useful life during each of the next eight years. ElectraNet believes that this situation needs to be addressed through asset refurbishment or replacement of aged assets in order to avoid risk to reliability, costs and safety.

Figure 5.1 Extreme Value chart for events >0.2 system minutes (1995-2000)

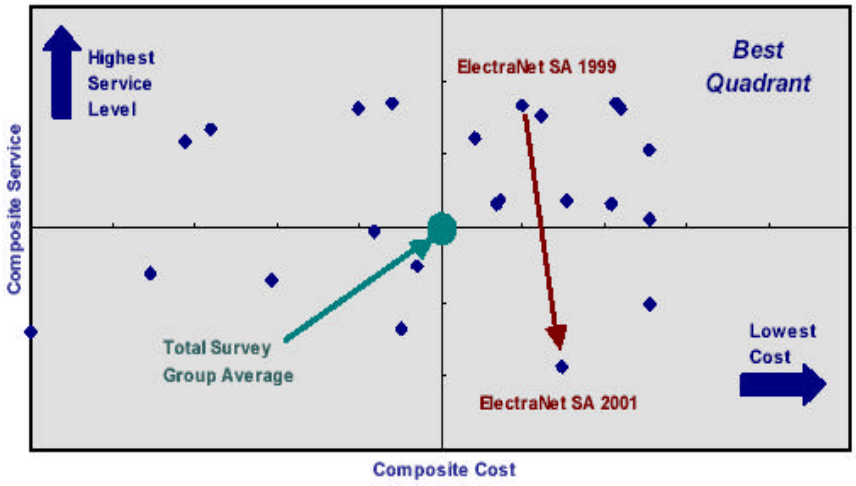


Benchmarking

Network benchmarking

ElectraNet has taken part in the International Transmission Operations and Maintenance Study (ITOMS) involving all Australian and New Zealand TNSPs and about 15 international TNSPs. The 1999 study showed ElectraNet as a leading performer with low costs and high service levels. The 2001 study showed that whilst the cost efficiency of ElectraNet was still high, the service level indicator had dropped dramatically (see figure 5.2).

Figure 5.2 2001 ITOMS Combined line and Substation Maintenance Performance compared with 1999 Performance.



ElectraNet notes that the driver for the fall in service levels is in the area of substations. It argues that this indicates that there is a requirement for additional expenditure over and above current regulatory allowances, particularly in the area of substations. It also believes that this explains its provisions for replacement and refurbishment of ageing assets. Furthermore ElectraNet argues that the EPO made insufficient allowance for

asset replacement and refurbishment and has resulted in a deterioration of the transmission network and has brought about the need for significant reinvestment.

Non-network benchmarking

ElectraNet notes that there is little comparative data available because of differing company specific characteristics. They further note that the best comparative benchmarking study available was undertaken by the ESC for Victorian distributors, which benchmarks at the sub-function level. ElectraNet considers this to be directly comparable with its operations. It states that the study found its non-network costs to be 25 per cent below the benchmark cost.

ElectraNet states that a number of factors need to be considered when comparing ElectraNet's network with other networks. It considers that it has:

- an extremely peaky load profile, which drives investment but has a very limited cost recovery
- the lowest load profile duration profile in Australia (ie. the top 25 per cent of demand occurs for less than four per cent of the time; a system maximum demand of 2850 MW for an energy throughput of only 12.4GWh)
- low load density (5,600 km lines and 68 substations to service the state, state population of 1.5 million with only 0.4 million living outside Adelaide)
- a large geographical area with which increases maintenance costs (with a service delivery area of approximately 200,000 square km)
- an ageing network (with an average asset age of 28 years)
- a high dependency on the South Australian-Victorian interconnector during peak periods which requires maintenance to be undertaken out of hours at much higher costs
- the most prescriptive customer reliability standards with the need to comply with both the code and the South Australian Transmission Code.

5.3.2 Operational expenditure categories

ElectraNet's application includes the following opex categories: network maintenance; network refurbishment; network monitoring and control; corporate costs; risk management and imposed costs. ElectraNet has also identified a number of cost components that it wants on a pass through basis.

Network maintenance

Network maintenance expenditure has been determined taking into account the growth in assets and changes in work practices to maintain customer service levels. ElectraNet considers that all of the material cost saving opportunities have been harnessed over the past five years.

Network refurbishment

ElectraNet considers that it has ageing assets due to concentration in the past on improving cost efficiencies and network development with little investment directed at replacing of ageing assets. ElectraNet believes that it has applied a pragmatic and rigorous approach using risk management techniques to prioritise the assets to be replaced. This has lead to targeting plant units rather than replacing the 'full unit' of property in the regulated asset base. It argues that accounting standards and the Commission's approach to asset valuation requires plant units to be expensed rather than capitalised.

ElectraNet is proposing a total average replacement and refurbishment expenditure of 1.5 per cent of asset replacement value over the regulatory period. It considers that this amount is below the 2-2.5 per cent long-term average expenditure required or the four per cent that would be required to replace all assets currently over 40 years.

Network monitoring and control

ElectraNet notes that the key cost driver in this category is the requirement to defer expenditure on aged assets and to improve reliability and reduce associated risk. The proposed expenditure includes the installation of equipment and systems that provide an early warning of changes in the condition of assets, with particular emphasis on indicators linked to catastrophic failure modes.

Corporate support

ElectraNet considers that benchmarking studies (see section 5.3.1) show that its corporate costs are efficient. It states that it will continue to build on efficiencies and economies of scale and absorb higher costs driven by an increase in the size of the business.

Risk management

ElectraNet states that a business risk review is carried out annually to identify and quantify risk and apply appropriate risk control measures. This includes the use of independent consultants to review ElectraNet's treatment of business risk. ElectraNet argues that it faces a number of risks, some of which are common to TNSPs and others that are perceived by insurers to be much greater (for example, bushfire risk).

ElectraNet states that over recent years, insurance premiums have been steadily increasing. It provided for a 64 per cent increase in insurance premiums in the first year of the regulatory period. ElectraNet states that insurance premiums have been conservatively based on a continuing no claims assumption.

ElectraNet also proposes that a self-insurance provision be made for credible risk and that a pass through will only be sought in the event of a catastrophic incident that exceeds ElectraNet's insurance cover or where insufficient insurance cover is built up.

Imposed costs

ElectraNet notes that this component includes costs, which are imposed by regulators, government and by law.

ElectraNet notes that grid support is an alternative to network augmentation that allows it to meet its reliability requirements. Grid support contracts have been established where they are more economic or practical compared to a transmission solution.

Proposed pass through costs

ElectraNet's application also proposes that a number of costs be treated as a pass through if and when they eventuate. ElectraNet considers that it is potentially exposed to the following additional costs:

- additional contracted grid support services
- material increases in ElectraNet's operating costs or risk exposures resulting from future NEM changes including firm access
- a change in the way or rate at which tax is imposed on ElectraNet
- catastrophic events that either exceed ElectraNet's insurance cover and deductible limit or for which insurance is unavailable and for which insufficient provision is made in the revenue cap
- changes to service obligations, ODRC Guidelines or other requirements imposed on ElectraNet through changes in the regulatory requirements.

5.3.3 Opex allowance proposed by ElectraNet

ElectraNet proposes the following opex requirements over the regulatory period. It considers that the cost increases are moderate over the regulatory period and are mainly due to the increase in the asset base.

Table 5.1 ElectraNet's proposed opex forecast

	Jan-Jun 03 ($m)	2003-04 ($m)	2004-05 ($m)	2005-06 ($m)	2006-07 ($m)	2007-08 ($m)
Network maintenance	9.3	18.9	19.4	19.8	20.3	20.6
Monitoring and control	4.7	6.8	6.9	6.8	7.0	7.0
Refurbishment	6.8	14.8	14.3	14.1	14.3	13.2
Corporate costs	4.1	8.3	8.3	8.3	8.3	8.3
Risk management	4.3	8.9	9.3	9.6	9.9	10.1
Imposed costs	6.8	13.3	13.1	12.8	12.9	12.3
Total opex	**36.0**	**70.8**	**71.2**	**71.5**	**72.6**	**71.5**

5.4 Consultant's report

The Commission engaged Meritec to undertake a review of ElectraNet's proposed opex requirements. The following section outlines Meritec's main findings and recommended opex allowance.

5.4.1 Summary of main findings

The main findings of Meritec's report are:

- ElectraNet has an established, robust asset management planning process, which is sound and consistent with transmission network asset management practices elsewhere
- ElectraNet's ability to show significant efficiency gains between years within a given regulatory period is limited due to the nature of the business and the type of assets involved. However, ElectraNet should be able to show efficiency gains between regulatory periods particularly after a number of years have passed
- the allowance sought for grid support should be accepted on a 'pass through' basis
- compliance costs associated with the NEM appear to be reasonable and should be allowed on a pass through basis
- based on the information provided to Meritec, it appears that imposed costs such as license fees and levies are already included in existing operating expenditure and have thus been removed
- in line with the *Queensland* revenue cap decision, hedging costs as an imposed cost should not be allowed
- when compared to previous reported opex, a number of items of operational expenditure proposed by ElectraNet appear to have been accounted for in more than one location and therefore have been removed
- all refurbishment expenditure originally included by ElectraNet in its opex application has been considered in the capital expenditure review by Meritec and removed from the operational expenditure provisions, resulting in an immediate reduction of the proposed opex of $77m over the regulatory period
- the majority of opex is associated with the maintenance and operation of existing assets. However a small portion of the proposed opex is related to the operation and maintenance of new assets (Meritec estimates that for every five per cent change in the capex budget a 0.024 per cent change in the same direction should occur in the opex budget).

5.4.2 ElectraNet's capitalisation policy

ElectraNet's capitalisation policy, which comes into effect from 1 January 2003, establishes ElectraNet's expenditure/capital definition. The definition of a unit of plant forms ElectraNet's basis for determining whether expenditure should be classed as opex or capex. A test commonly applied is whether the unit under consideration is physically or commercially separable, and to what level is it integrated into the system as a whole.

ElectraNet in their application expensed all costs incurred on parts of the unit while the entire unit is capitalised. Should a new unit be required or a unit of greater capacity is

needed then it is treated as capital. Costs incurred in restoring the unit to full service or to prevent deterioration are expensed as per ElectraNet's capitalisation policy.

Meritec disagrees with this definition. It notes that the effect of this policy if implemented could be that any refurbishment less than the unit of property would be able to be expensed.

5.4.3 Meritec's assessment of benchmarks

Meritec believes that ElectraNet's asset age profile is not older than other network companies in Australia and New Zealand. They note that in both countries a significant expansion of the electricity infrastructure occurred in the 1960s and 1970s. Meritec considers that over the next 10 to 15 years a significant portion of assets will require replacement as they fail or become difficult to maintain. However, it notes that, for some assets, ElectraNet may be able to extend their productive lives (beyond their nominal life).

Meritec states that TNSPs need to be compared on a number of indicators for benchmarking purposes and that no one measure is adequate. It considers that even then only general comparisons can be made and a range of factors need to be considered. In general Meritec notes that opex costs will be lower for companies with higher GWh, lower line length, lower number of transformers and substations and reduced peak demand.

Meritec notes that the ITOMS benchmarking studies referred to in ElectraNet's application indicate that after a period of satisfactory results ElectraNet's service levels have started to decline while its expenditure levels have remained similar to other TNSPs. Meritec considers that this could be due to ageing assets or external factors. It believes that results over a number of periods would need to be considered to determine the exact cause of the decline in ElectraNet's service levels.

Meritec does not consider that a comparison of ElectraNet to other non-TNSPs is particularly relevant when reviewing the appropriateness of ElectraNet's opex levels.

As part of its own benchmarking exercise, Meritec compared ElectraNet and other TNSPs using several opex ratios (opex divided by asset value, peak demand, annual power transmitted and line length). Meritec used its own recommendations, ElectraNet's historical data and ElectraNet's application for this exercise. The results of the exercise are shown below - see figures 5.6 – 5.8. (The Commission notes that the historical opex figures for TransGrid include financing costs of $75m, whereas financing costs are not included for Transpower or ElectraNet. The Commission considers that this has distorted Meritec's analysis.)

Overall Meritec considers that its recommended opex levels are reasonable and notes that they reduce as a percentage of the asset base over the regulatory period.

Figure 5.6 Opex in the year 2000

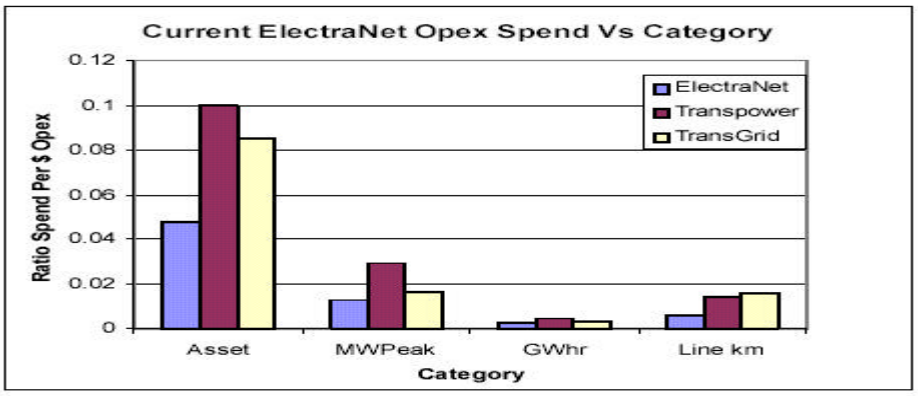


Figure 5.7 ElectraNet's proposed opex

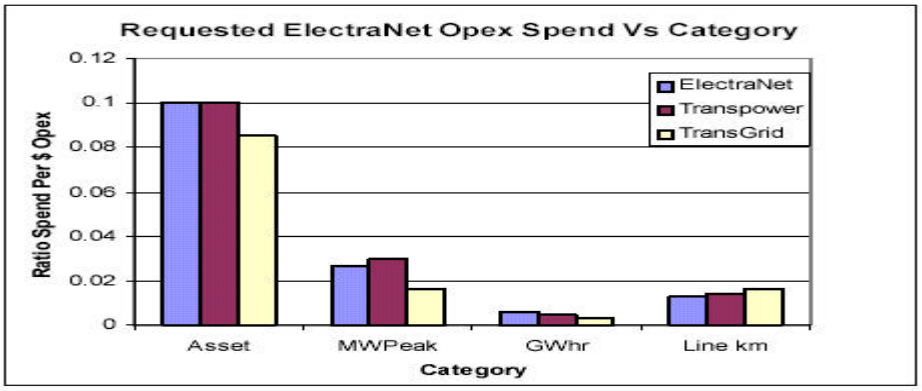


Figure 5.8 Meritec recommended opex

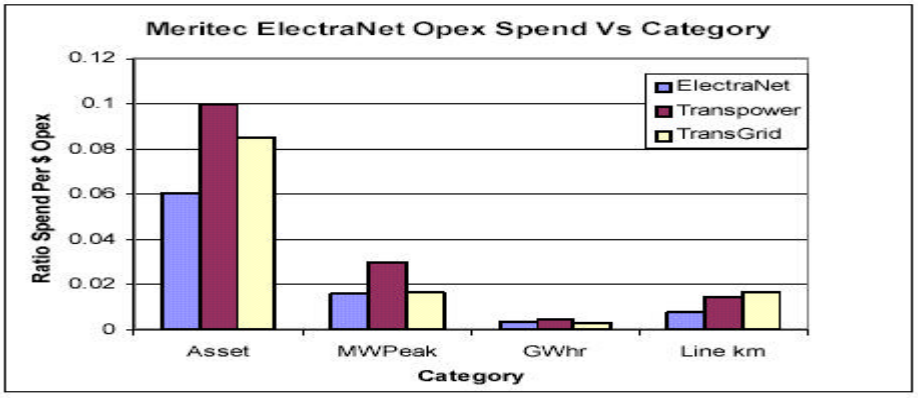
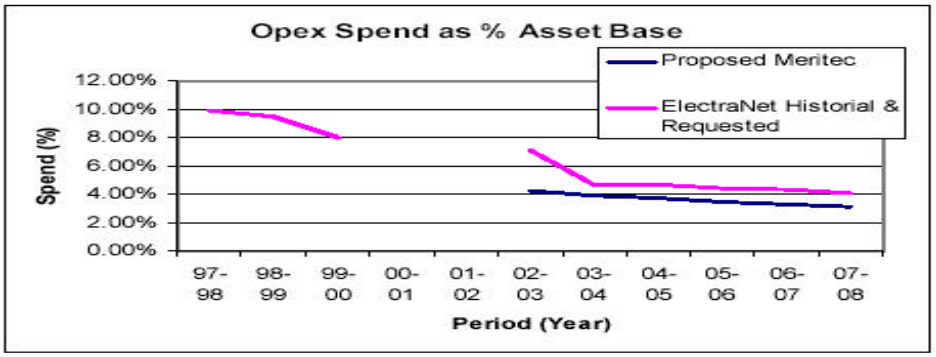


Figure 5.9 Opex vs asset value over period



5.4.4 Meritec's assessment of opex categories

Meritec stated that it was unable to compare individual cost items in ElectraNet's opex forecast with its historical figures, due to a lack of detailed breakdown of costs.

Meritec also stated that a line-by-line comparison of individual cost items among TNSPs was not useful because of the differences among networks.

Therefore Meritec took a holistic approach and analysed ElectraNet's total opex and trend.

Details of Meritec's assessment of individual opex categories form part of the its opex report. This report is available from the Commission's web-site.

5.4.5 Meritec's recommended opex allowance

Table 5.2 contains Meritec's recommended opex allowance

Table 5.2: Meritec recommended opex allowance

	Jan-Jun 03 ($m)	2003-04 ($m)	2003-04 ($m)	2003-04 ($m)	2003-04 ($m)	2007-08 ($m)
ElectraNet's proposal	36.0	70.8	71.2	71.5	72.6	71.5
Refurbishment[1]	5.4	11.5	11.6	11.5	11.6	10.5
Net opex[2]	30.6	59.3	59.6	60.0	61.0	61.0
Meritec's proposal	22.2	44.4	44.3	44.7	45.2	45.5

1. Ongoing asset specific projects
2. Excludes capex refurbishment

5.5 Submissions by interested parties

The Commission received a number of submissions from interested parties commenting on ElectraNet's opex allowance. The submissions raise a number of issues, which are outlined in the following sections.

5.5.1 Lack of detail

A number of submissions comment on the lack of information provided in ElectraNet's application to support its proposed opex. ECCSA notes that the application lacks specific detail and there is inadequate assessment to substantiate the doubling of opex over historical levels.

ECCSA and the EAG state that there needs to be greater breakdown of the 'regulated opex forecast'. It states that the proposed figures are not benchmarked against current expenditure level or against similar enterprises. ECCSA points out that regardless of the relative value of costs to be added every cost must be substantiated, efficient and reasonable. It considers that the information provided does not substantiate the increase in opex.

5.5.2 Historical operational expenditure

A number of submissions note that ElectraNet has requested a much higher opex allowance, compared to its historical expenditure. EUAA and ECCSA note that in the 1998, 1999 and 2000 annual reports of the South Australian transmission business its opex was $41m, $41m and $34m respectively. However they note that ElectraNet is asking for $71m per annum with little information or data to substantiate its claims, other than claiming that this opex is required to sustain a reliable network. However ECCSA notes that the issue of maintaining a reliable network is not unique to ElectraNet and is also an issue for other TNSPs.

WMC notes that the opex level requested by ElectraNet over the regulatory period is an extraordinary increase over current levels, as shown by the fact the that the South Australian Transmission Code, issued by the SAIIR in October 1999, establishes a target level of operations and maintenance expenditure equivalent to $12.47/MW of maximum demand. When GST is taken into account, this leaves an annual figure of $38.4m. WMC notes that ElectraNet is seeking an 82 per cent increase in the level of operations and maintenance expenditure felt to be justified by SAIIR and used as their target in the South Australian Transmission Code.

AGL states that while ElectraNet argues that the level of opex under the EPO was unsustainably low, SAIIR reported that ElectraNet spent less in this area than the base amount in the EPO and that this underspent amount contributed to an award of $1m under the performance incentive scheme. AGL considers that the actions of ElectraNet in 2000-01 appear to be inconsistent with their current claims.

5.5.3 Benchmarking

WMC and EUAA assess the reasonableness of ElectraNet's opex based on their own benchmarking analysis. They consider that, irrespective of the ratios used, they indicate that ElectraNet's proposed opex is excessive.

ECCSA notes that ElectraNet has provided one benchmark to demonstrate its need for an increase in opex (the ITOMS benchmarking study). It considers that care is needed in using just one benchmark, when other benchmarks indicate that ElectraNet's performance may be inadequate. ECCSA understands that the ITOMS assessment measures actual downtime for each plant item. If there is significant redundancy built

into the design of the elements of the network, than allowance for greater downtime can be tolerated due to greater capital investment.

ECCSA states that ElectraNet refers to a benchmarking study of Victorian distribution networks and rail systems and from this concludes that it compares well to these businesses. ECCSA considers that ElectraNet should be compared to similar or equivalent Australian and overseas transmission companies. It also notes that no benchmark figures are provided in support of their claim that ElectraNet is among the leading transmission companies worldwide.

NRG notes that benchmarking indicates that ElectraNet has performed well in terms of their recent cost performance. It considers that it would be disappointing to see this performance eroded as a result of the increase in opex. Consequently, continuous improvements dictate that ongoing efficiency and productivity gains are essential and should be reflected in the level of allowable opex.

5.5.4 Network features

ECCSA states that while a peaky load profile has an impact on the sizing of the equipment it has little impact on the extent of the opex required. It also considers that:

- South Australia has low load density but so do Queensland and Western Australia
- the geographic area of ElectraNet's coverage is similar to that of Queensland and Western Australia
- SPI, in Victoria, appears to have assets of a similar age to ElectraNet
- ElectraNet is a similar in size to Western Power and Transend.

Because of these network similarities with other Australian TNSPs, ECCSA considers that ElectraNet is still able to compare its opex levels with other TNSPs depending on what network factor is taken into account.

5.5.5 Relationship between opex and capex

In response to ElectraNet's claims that the need for capex is due to a need for opex, ECCSA states that the prime reason for capex is to reduce opex.

ElectraNet states that 24 per cent of its asset base is over 40 years old. ECCSA notes that the type and size of assets falling into this category needs to be identified as certain assets have a life considerably greater than 40 years.

NRG notes that the proposed opex amounting to $429.3m over the regulatory period should correspond to the proposed asset base and therefore will depend on the final asset base approved. It also considers that the additions of new assets to the asset base will not create a need for additional maintenance expenditure to the same level that would be required in the case of older existing assets.

5.5.6 Pass through costs

ECCSA considers that ElectraNet needs to indicate how it managed risks noted in the pass through section in previous times and the costs involved. NRG comments on a number of ElectraNet's proposed pass through costs. These are noted below.

- NRG supports the inclusion of anticipated grid support costs as an allowance in the opex budget.
- With regard to NEM imposed costs, it might be expected that firmer access arrangements would be accompanied by market based income sources, possibly off-setting the level of regulated revenue required.
- Catastrophic events are presumably limited to those completely outside the control of TNSPs and would not include risks against which appropriate insurance and other mitigation strategies should be available.
- Pass through in relation to regulatory risk would presumably apply only in the most limited circumstance where demonstrable costs impact results. To allow a blanket pass-through of such events would represent double dipping in any event, noting that the application elsewhere proposes an asymmetric risk premium in the rate of return to compensate the TNSP for such risks.

5.5.7 Reliability of the network

NRG notes that there needs to be a balance between improved reliability and cost, recognising the inherent trade-off. However, it considers that ElectraNet's application focuses exclusively on reliability, at the expense of cost efficiency and value for money considerations. ECCSA acknowledges that ElectraNet must meet certain reliability standards. However it argues that ElectraNet has not demonstrated that the efficiency of its operating performance has exceeded those of other TNSPs.

5.6 ElectraNet's response to submissions by interested parties

5.6.1 Increase in refurbishment expenditure

A number of submissions commented that other TNSPs also have (similar) network ageing issues and thus questioned why ElectraNet needed a step increase in refurbishment expenditure. In response, ElectraNet states that other TNSPs have already been spending at a reasonable level on asset re-investment. ElectraNet notes that it has changed its treatment of this expenditure from capex to opex, which increased the opex.

ElectraNet notes that they are proposing an average asset program of one per cent of the asset replacement costs. Given ElectraNet's asset age profile, this is at the lower end compared with other TNSPs that are spending in the range of 1-1.7 per cent of asset replacement costs. ElectraNet notes that the 1.3 per cent proposed is about half of the level of expenditure expected in the longer term. Given an average asset life of 40 years, this represents a smoothed re-investment cost of $^{1}/_{40}$ (2.5 per cent) of the asset base per year. Based on these figures, ElectraNet is of the view that their forecast refurbishment plans are too low, not too high.

ElectraNet argues that the service standards set out in the South Australian Transmission Code are higher than those in other states. It notes that these are lagging indicators. During the course of developing its asset management plan, ElectraNet undertook a study of leading performance indicators to assess service levels. It states that these findings in conjunction with international maintenance benchmarking results show a declining trend, which ElectraNet argues, must be addressed by responsible refurbishment plans.

5.6.2 Impact of low load profile

ElectraNet argues that its low load profile impacts on opex. This is because the network is built to accommodate peak demand in accordance with the South Australia Transmission Code. Therefore compared to the networks with a higher load profile, more assets are required in South Australia per unit of energy throughput (MWh), which leads to comparatively higher maintenance costs.

ElectraNet argues that comparisons of cost ratios between different TNSPs must reflect cost drivers such as load profile, load density, jurisdictional regulatory requirements, asset age profile, level of outsourcing and different accounting treatments.

5.6.3 Impact of EPO on opex

A number of submissions have noted that historical expenditures should factor heavily in determining future allowances. ElectraNet states that it inherited the previous owner's asset management plan via the EPO and associated Performance Incentive (PI) scheme. ElectraNet considers that the EPO drove transmission prices artificially low by omitting allowances for critical capital and operating expenses. It also states that the effect of underspending in maintenance and refurbishment are becoming apparent in the leading indicators of network performance, and thus increased expenditure is required.

ElectraNet notes that it has been responsible for the transmission network since 2000. It considers that it has developed a comprehensive asset management plan, which identifies the type and level of expenditure necessary to maintain customer service levels. Further ElectraNet argues that it has been constrained by the level of revenue allowance provided in prior regulatory and government decisions and that customers should not expect that recovery and re-investment expenditures should be made by ElectraNet without compensation.

ElectraNet argues that it has formulated its opex forecast in a manner that will provide a sustainable level of supply reliability for its customers.

5.6.4 Changes to ElectraNet's operating environment

There are many other changes to the environment that ElectraNet is operating within that have an impact on operating costs. These include a change in the economic regulator and the changing rules that come with it, changes in TNSPs responsibilities and risks in the NEM and higher insurance costs.

5.6.5 Relationship between opex and capex

ECCSA notes that one of the prime reasons for capex is to reduce opex. ElectraNet states that the vast majority of capex is required to meet load growth and to remove network constraints. Further, capex will increase the size of the network and the number of assets to be maintained, operated and managed. As a result opex requirements will increase rather than decrease.

5.6.6 Benchmarking of non-network costs

A number of submissions made to the Commission criticised the validity of conducting a benchmarking study of non-network costs using the Victorian ESC Distribution Pricing Review benchmarks. ElectraNet argues that this is the most applicable and independent benchmarking study that has been carried out for regulated network businesses in Australia.

5.7 Submissions by interested parties in response to Meritec's opex report

5.7.1 Treatment of refurbishments

ECCSA states that, from Meritec's comments, it appears that much of the massive opex increase from previous years is due to ElectraNet including significant amounts of capex under the opex allowance. ECCSA believes that Meritec is correct in excluding capex from the approved opex budget.

Powerlink notes that Meritec supports the refurbishment program proposed by ElectraNet. It notes however, that the Commission has directed that the refurbishment expenditure be removed from the opex budget and included in the capex budget instead. Powerlink considers this to be a fundamental change in a key regulatory principle and has the following undesirable consequences:

- it incentivises TNSPs to replace entire assets (at the unit of plant level) rather than refurbishing sub-component level
- it incentivises TNSPs to change the level at which a 'unit of plant' is defined to a much more micro level to reduce revaluation risk, increasing administrative costs
- it will make it necessary for TNSPs to keep a separate set of regulatory asset accounts as a broad policy of capitalising all refurbishment works is not compliant with accounting standards.

Powerlink considers that the Commission's approach seems to be a material deviation from the approach adopted for Powerlink and from accepted accounting practices. It believes that this will introduce a level of regulatory risk, which will lead to a loss of investment in transmission assets.

Powerlink states that an important factor in determining whether a refurbishment project is treated as opex or capex is whether the work effects the entire asset or just a part of it. It states that conventionally expenditure incurred on parts of units of plant are expensed while expenditure on entire units is capitalised.

Powerlink states that the level at which unit of plant is defined is crucial during an asset valuation. To avoid revaluation risk, it is important that the asset valuation definition of unit of plant is consistent with the level at which the capex versus opex decision is made. This is because expenditure that has been capitalised for a sub-component of a unit of plant is likely to be missed during an asset valuation on the modern equivalent value of the unit of plant. This would result in the TNSP not being fully compensated for the refurbishment investment.

Powerlink states that revaluation risk can only be managed by adopting a much smaller unit of plant. However, it states that the process of asset valuations becomes more complex and costly when assets are defined at a micro level. It believes that adding to the complexity introduced are the additional administrative inefficiencies in desegregating a project into much more detail for financial and maintenance registers and the subsequent management of those registers.

Powerlink does not consider the capitalising of all asset refurbishment to be supported by Australian accounting standards (namely SAC 4 and AASB 1021). It states that if the Commission changes its policy to impose an approach that does not conform with the accounting standards, then TNSPs would be forced to carry a separate 'set of books' for regulatory purposes. Powerlink cannot see that the benefits to the network outweigh the extra cost this would involve.

Transend notes that there are regulatory benefits in companies adopting consistent definitions of opex both across companies and over time. It notes that ElectraNet's change in capitalisation policy has made it difficult to analyse historic cost data. From a regulatory perspective Transend acknowledges that it is important that cost forecasts are shown on a consistent basis with historic data. It states that a change in capitalisation policy does not preclude comparisons with historic data. In Transend's view it is a matter for the regulated company and the regulator to ensure that historic and forecast data is presented on a comparable basis.

Transend's view is that ElectraNet has a legitimate case for revising its capitalisation policy, in order to avoid revaluation risk. It is concerned that the Commission's direction to Meritec regarding the placement of the refurbishment does not address ElectraNet's legitimate concerns regarding revaluation risk. Transend believes that it is important that the Commission adopts an approach, which provides transmission companies with appropriate incentives. Moreover it believes that the regulatory approach should be consistent between regulatory decisions.

Transend notes that the Commission accepted the advice of PB Associates that certain renewal and refurbishment expenditure should be treated as opex on. However in relation to ElectraNet it states that Meritec reaches a contrary conclusion to PB Associates. It notes that Meritec disagreed with ElectraNet's approach to using a unit of plant definition as the basis of determining whether something was opex or capex. Transend has reservations with Meritec's argument and believes that treating all refurbishment work as capital would discourage renewal of an asset's components because the expenditure would not be captured.

Transend put forward a number of possible solutions to address this issue, including less frequent valuations of the asset base and providing a guarantee that replacement and refurbishment expenditure will be separately recognised and included in the

regulated asset base. Transend believes that it is likely that the separate category of replacement and refurbishment expenditure would need to have its own asset life.

5.7.2 Benchmarking of opex

ECCSA considers that Meritec has undertaken benchmarking of ElectraNet's opex in a marginal fashion resulting in little meaningful comparison. It states that if the Commission accepts that such minimal benchmarking is sufficient for it to fulfil its obligations, then it has failed in its primary responsibility to implement the 'competition by comparison' aspect of regulatory control. ECCSA believes that the only way to either prove or disprove ElectraNet's claims is through wide and eclectic comparisons of performance and costs, which it believes ElectraNet and Meritec have both failed to do.

5.8 ElectraNet's response to Meritec's operational expenditure report

5.8.1 Findings of the Meritec Report

ElectraNet states that Meritec endorsed its proposed capex allowance for direct operational costs (ie. asset maintenance expenditure, monitoring and control) and asset renewals and refurbishment. ElectraNet believes that Meritec's recommendation for significant cuts in the area of indirect (or non-network) operational costs (ie. corporate costs, risk management and costs imposed by the regulatory environment) is unfounded. It states that there has been no double counting of items in the opex allowance proposed by it as claimed by Meritec. ElectraNet believes that Meritec reached this conclusion because of a number of incorrect assumptions made in the process of mapping the proposed opex allowance to outdated historical costs that were reported against different cost categories.

5.8.2 Meritec methodology

ElectraNet could not understand why Meritec had used the opex for 1999-00, rather than the costs for 2000-01.

ElectraNet considers that comparing the proposed opex allowance for the regulatory period with the reported historical opex contained in Transmission Lessor Corporation's 2000 Annual Report is problematic. It states that its proposed opex was developed using functional cost categories rather than the categories in the annual report. ElectraNet states that Meritec have attempted to reconcile these functional costs to 1999-00 historical costs, which were reported on a different basis and against different cost categories. It also states that the assumptions made concerning material and insurance costs are incorrect.

5.8.3 Cost difference between 1999-00 and 2001-02

ElectraNet considers that the process followed by Meritec did not take into account real cost increase of $5.8m between the years 1999-00 and 2001-02. It states that Meritec incorrectly used 1999-00 as the base year for its assessment. It claims that there was particularly low expenditure that year because the South Australian Government

enforced restrictions in the lead up to the sale of the business and diverted significant resources to support the sale process and year 2000 computer rectification activities. ElectraNet states that these factors limited the amount of maintenance work undertaken in 1999-00.

5.8.4 Increases in opex allowance over 2001-02 costs

ElectraNet provided a breakdown of the costs included in its proposed opex, which it claims to be increases over 2001-02 costs. It states that its analysis supports an opex allowance of $58m rather than the $46m recommended by Meritec. ElectraNet considers that its analysis shows that even if only those cost items recognised by Meritec are included Meritec's recommendation of $46m must be increased to $49m to correct for manifest errors in their assumptions. It believes that Meritec appear to have assumed the new cost items sought by ElectraNet were double counted because Meritec's reconciliation process failed to recognise the differences in underlying costs between 1999-00.

5.8.5 Cost items ElectraNet claims have been omitted

ElectraNet considers that Meritec has omitted a number of significant cost items to the value of $8.7m per annum. It states that these were removed with little or no justification other than they did not reconcile with Meritec's base cost model. ElectraNet considers that these items represent real costs that must be incurred by ElectraNet and that they should be included in their opex allowance. It identifies the following costs as being omitted by Meritec: hedging costs (($2.4m per annum); maintenance service contract costs ($0.7m per annum); site reparation and project management of additional refurbishment and operating projects ($1.9m per annum); and funding of employee superannuation ($2.5m per annum).

5.8.6 Pass- through costs

ElectraNet notes that Meritec recommended that additional costs such as NEM imposed costs ($1m per annum) and grid support ($2m per annum) be allowed but subject to pass through to ensure that ElectraNet only recovers actual costs incurred. In relation to NEM imposed costs ElectraNet considers these costs are known costs and that pass-through should only be applied to external costs beyond its control. ElectraNet believes that to do otherwise would mean that customers are less likely to receive the benefit of the most cost efficient outcome. Therefore ElectraNet considers that its NEM imposed costs should be included directly in its opex allowance and not as Meritec recommend as a pass-through item.

5.8.7 Treatment of refurbishment expenditure

ElectraNet notes that Meritec endorsed its proposed expenditure on asset refurbishment but that the Commission has directed Meritec to treat this expenditure as capex when most of it was included as opex in its application. ElectraNet states that the Commission's direction has been made without any justification or reference to the current accounting practices of other TNSPs, accounting standards or the appropriateness of capitalising this expenditure. It indicates that a detailed review of the refurbishment expenditure has subsequently identified $23.5m of the refurbishment works over the regulatory period must be expensed and not capitalised in order to

comply with accounting standards. ElectraNet believes that these costs must be added back to the opex allowance, even if the Commission persists with its direction to treat refurbishment expenditure as capital.

5.8.8 Concluding remarks

ElectraNet states that the Commission and interested parties must recognise that the cost items Meritec has inadvertently excluded from their recommended opex allowance and those that were specifically excluded represent real costs that must be incurred by the business. It believes that failure to include these will simply reduce the funds available to make the expenditures on asset maintenance, monitoring and control, asset renewals and refurbishment proposed in its Asset Management Plan and endorsed by Meritec. ElectraNet states that failure to carry out this work on the network will be to the detriment of customer service and reliability.

5.9 Commission's considerations

The Commission is required to assess whether the opex proposed by ElectraNet is reasonable, efficient and cost-effective in setting the revenue cap. The revenue cap provides an incentive mechanism whereby ElectraNet is allowed to retain any savings in opex. Likewise it would bear the cost of overruns or inefficiencies.

Therefore, the Commission has focused on assessing a reasonable level of opex for ElectraNet. It doing so the Commission is mindful of ElectraNet's claims that it has achieved substantial cost efficiencies as a result of pursuing best practices.

5.9.1 Historical opex levels

The Commission agrees with submissions by interested parties that the amount of opex requested by ElectraNet represents a significant increase over historical levels.

Table 5.3 shows that historically opex has been nearly $40m per annum. ElectraNet requested an average opex of $71.5m per annum over the regulatory period, including refurbishments. Excluding refurbishments, (which have now been capitalised) and grid support (which has been identified separately), the opex amount proposed by ElectraNet is about $56m per annum.

While the South Australian transmission business has had a number of different organisational structures and a change in ownership in 2000, its operations remain fundamentally the same. The Commission notes that opex has been relatively stable at $40m per annum, both before and after the change in ownership.

Table 5.3 compares the proposed opex with past figures. Though the amounts are in nominal dollars they are comparable as expected efficiencies over time could be expected to offset the low inflation rates during these years.

At a late stage of the assessment, the Commission found that there were significant differences between opex amounts in ElectraNet's annual reports and the amounts reported to SAIIR by ElectraNet.

Opex reported to SAIIR should be normal recurring expenses incurred in providing prescribed services, whereas the annual reports contained all expenses incurred by the company. For example:

- non-recurring expenses such as voluntary severance payments, acquisition costs were excluded from SAIIR reports
- non-prescribed services which accounted for appropriately about 1.5 per cent of the opex (about $1m in 2001-02) were also excluded from the reports to SAIIR
- the reporting period for SAIIR's performance incentive (PI) scheme was the year ending 31 March whereas the annual reports covered the year ending 30 June - SAIIR usually has both PI reports and regulatory accounts.

Table 5.3 South Australia transmission business, historical opex

Year		Annual Report[2] ($m)	SAIIR[3] ($m)
1997-98		41	
1998-99		40	
1999-00		34	30
2000-01		41	35 [4]
2001-02			35
2003-08	Meritec[1]	43	
2003-08	Application[1]	57	

1. Average over the regulatory period
2. From annual reports and regulatory accounts
3. Amounts submitted to SAIIR
4. One-off expenses of about $4.3m identified by SAIIR has been excluded

Table 5.3 shows that, on average, historical opex for the transmission business is about $35m according to the amounts reported to SAIIR, whereas ElectraNet's annual reports show about $39m. For the purposes assessing ElectraNet's opex allowance to establish its MAR, $35m is more appropriate as it excludes non-prescribed services and other non-recurring expenses.

The Commission notes that the opex has been steady since 1997-98, despite inflation and capex.

However ElectraNet is now proposing to undertake a substantial capex program. Some of the capex will result in an increase in opex whereas others may result in a decrease. Overall the Commission considers that the capex program is likely to result in a small net increase in opex.

5.9.2 'Like with like' expenditure analysis provided by ElectraNet

During its review of ElectraNet's opex Meritec claimed that there was insufficient detail to allow it to undertake an indepth analysis. Only highly aggregated information was provided to Meritec.

Subsequently ElectraNet provided historical data and a more detailed breakdown of the opex categories. In this information ElectraNet notes that it includes a number of 'historical correction factors', which incorporate changes to its capitalisation policy and the inclusion of other provisions and abnormal items as a result of changes in its accounting treatment of these items.

ElectraNet considers that these factors must be taken into consideration when comparing historical levels of opex with its proposed opex levels.

ElectraNet also provided adjustments for 'new additional expenditure'. These represent opex expenditure over and above historical levels.

The Commission has reviewed the like for like comparison provided by ElectraNet. It found that most of the differences related to abnormals and provisions, which are one-off expenses (for example, Y2k costs, asset write-downs, restructuring costs and storm damage costs). These cost should be excluded when benchmarking.

5.9.3 Benchmarking

ElectraNet's benchmarking analysis

In their application ElectraNet refers to two benchmarking studies to support the efficiency of its proposed opex. One assesses their network cost/reliability performance against other domestic and international TNSPs and the other assesses its non-network cost performance against that of Victorian rail and electricity distributor businesses.

In relation to the first study, ElectraNet states that it shows that in 1999 it was recognised as a leading performer with low costs and high service levels. In 2001, the study shows that while costs are still low, reliability has fallen. ElectraNet considers that this explains its provision for replacement and refurbishment of ageing assets.

In relation to the second study, ElectraNet concluded that its non-network costs are 25 per cent below the benchmark. Meritec and a number of interested parties question ElectraNet's use of the Victorian distribution benchmarking study to assess the efficiency of its non-network costs. The Commission agrees and considers that such benchmarking is of limited use.

The Commission considers that there is a need to balance reliability and cost efficiency. It agrees with NRG that the ElectraNet application focuses primarily on reliability, at the expense of cost efficiency and value for money considerations.

Commission's benchmarking analysis

The Commission acknowledges that there are a number of factors which limit the usefulness of comparing transmission companies. Such factors include varying load profiles, load densities, asset age profiles, network designs, local regulatory requirements and accounting practices.

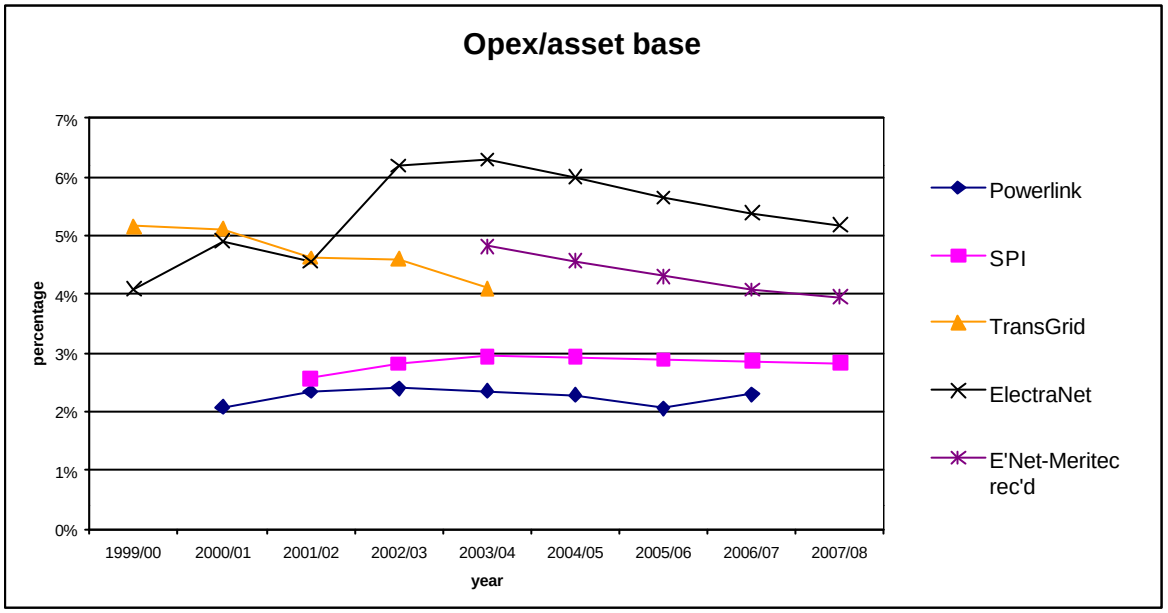
The Commission notes ElectraNet's argument concerning the specific characteristics of the South Australian electricity market and its effect on benchmarks. The Commission understands that comparisons based on a single benchmark are not very meaningful. However, a number of different ratios can provide an indication of the reasonableness

of ElectraNet's opex. As such the Commission has undertaken its own benchmarking that considers a number of different ratios in order to make a general assessment of ElectraNet's proposed opex.

As noted previously the Commission considers that components such as abnormal items, financing cost and depreciation should not be included in benchmarking assessments. These could inflate or deflate the ratios and may obscure the core operational expenditures of the business.

The Commission benchmarked ElectraNet against Powerlink, SPI and TransGrid. The results of the Commission's analysis are presented below.

Figure 5.10: Comparison of TNSP's opex per asset base



Note: Refurbishments and grid support have been excluded from ElectraNet's, Meritec's recommended and Powerlink's opex levels.

Figure 5.10 shows ElectraNet's opex as a percentage of the asset base has been reasonable compared to other TNSPs in previous years but increases significantly above that of other TNSPs in the future. The opex sought by ElectraNet is similar to that of SPI and Powerlink, which have considerably larger asset bases.

In considering other ratios, opex/electricity transported would show ElectraNet, which has low load density, in an adverse light compared to other TNSPs. Conversely opex/number of substation would show ElectraNet, which has a relatively high number of substations, in a favourable light.

Table 5.4: Ratio analysis of ElectraNet compared to other TNSPs.

		2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08
Opex/line length	ElectraNet	6.42	9.10	9.93	9.96	10.04	10.22	10.22
($'000/km)	ElectraNet-Meritec recommended			7.60	7.58	7.65	7.75	7.80
	Powerlink	5.04	5.45	5.63	5.81	5.49	6.17	
	SPI PowerNet	7.07	8.00	8.56	8.68	8.62	8.71	8.79
	TransGrid	8.71	8.85	8.99				
Opex per	ElectraNet	526	746	815	816	823	838	838
Substation ($'000)	ElectraNet -Meritec recommended			623	621	627	636	639
	Powerlink	657	711	735	758	716	805	
	SPI PowerNet	1052	1191	1275	1293	1284	1298	1309
	TransGrid	1394	1417	1439				
Opex/asset base	ElectraNet	4.56	6.19	6.29	6.00	5.65	5.39	5.19
(%)	ElectraNet -Meritec recommended			4.82	4.57	4.30	4.09	3.96
	Powerlink	2.34	2.40	2.36	2.29	2.06	2.30	
	SPI PowerNet	2.58	2.82	2.95	2.94	2.88	2.86	2.83
	TransGrid	4.63	4.60	4.10				
Opex/MW peak	ElectraNet	12.56	17.80	19.43	19.48	19.64	19.99	19.99
($'000/MW)	ElectraNet -Meritec recommended			14.87	14.83	14.96	15.16	15.25
	Powerlink	8.48	9.18	9.49	9.78	9.24	10.39	
	SPI PowerNet	5.64	6.39	6.84	6.93	6.89	6.96	7.02
	TransGrid	9.21	9.35	9.50				
Opex/GWh	ElectraNet	3.00	4.26	4.65	4.66	4.70	4.78	4.78
($'000/GWh)	ElectraNet -Meritec recommended			3.56	3.54	3.58	3.63	3.65
	Powerlink	1.38	1.50	1.55	1.60	1.51	1.70	
	SPI PowerNet	0.90	1.01	1.09	1.10	1.09	1.10	1.11
	TransGrid	1.62	1.65	1.68				

Note: Refurbishments and grid support have been excluded from ElectraNet's, Meritec's recommended and Powerlink's opex figures.

Source: Powerlink opex figures from financial modelling ($real) used to develop final decision.
SPI opex figures from PB associates' *Review of SPI PowerNet Operating Expenditure* ($real)
TransGrid opex figures from 25 January 2000 *NSW and ACT Transmission Network Revenue Caps 1999/00-2003/04* decision ($nominal).
ElectraNet opex figures from application ($real).
Meritec recommended opex figures from Meritec's *ElectraNet SA Operational Expenditures Review* ($real).

An examination of a single ratio is of limited use. However, examination of a number of ratios can provide useful insight. In this instance, the graphs below (figures 5.11 and 5.12) show that ElectraNet's opex is generally higher than that of other TNSP's. While the Commission recognises that each TNSP operates a different network in a different environment these graphs on the whole appear to suggest that ElectraNet's opex is on the high side.

Figure 5.11 Opex per GWh, per line length and per peak demand

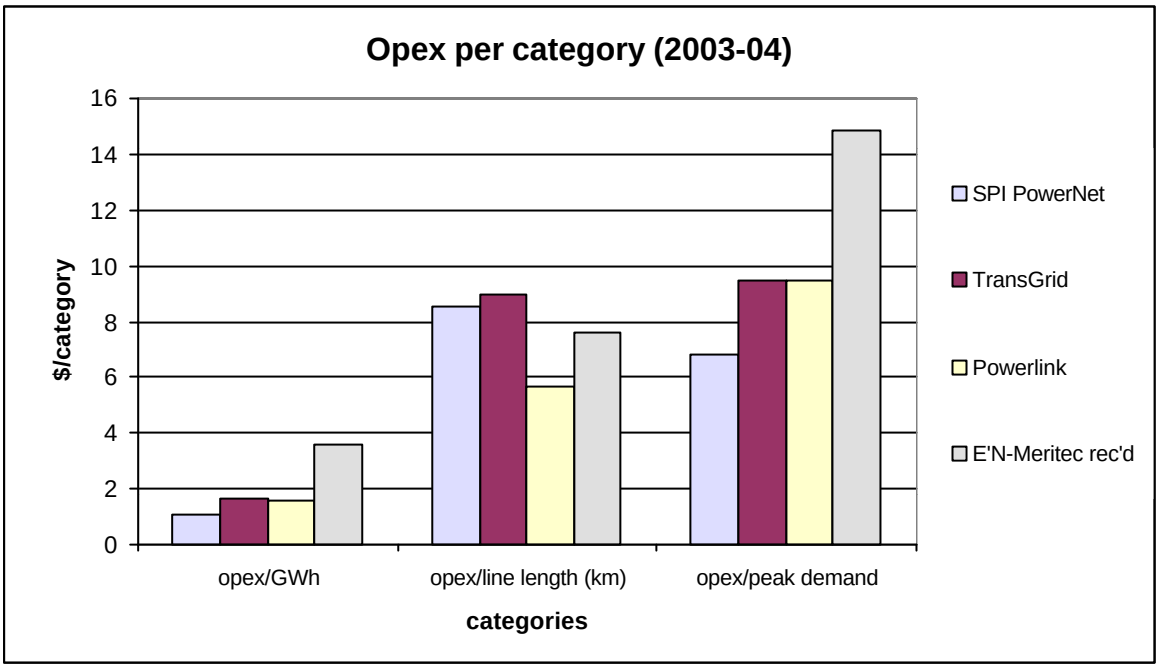
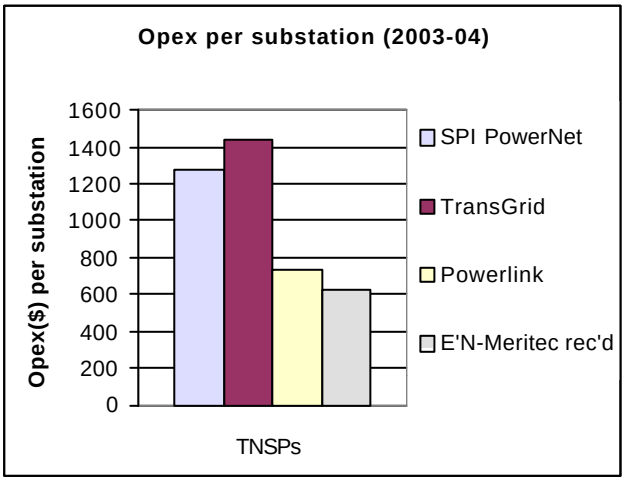


Figure 5.12 Opex per substation



ElectraNet provided a number of reasons why their network is different to other TNSPs operating in Australia. In particular it notes that it has a peaky load profile and that this has an impact on its opex requirement. The Commission understands that a peaky load profile may affect the asset base due to the need to increase the capacity of the network. However, it considers that the peakiness of ElectraNet's network has limited influence on the magnitude of opex it requires.

It is possible to argue that a peaky load profile should result in low opex/asset base ratio. This is because:

- The network is under utilised for most of the time making it easier to access, maintenance and repair, lessening the need for live line maintenance and out of hours maintenance
- The denominator will be large due the asset base sized for peak demand.

ElectraNet considers that line length per MW peak and substation per MW peak should be used to assess its network and its proposed opex levels. ElectraNet states that line length per MW peak and substation per MW peak shows that South Australia requires 25 per cent larger lines than Queensland and 100 per cent more substations than Queensland to provide the same level of service to customers. Table 5.5 shows these figures. The Commission considers that there is relatively little linkage between these ratios and required opex levels.

Table 5.5 Ratio Analysis of ElectraNet with TNSPs

	Powerlink	SPI PowerNet	ElectraNet	TransGrid
Line length/MW peak	1.68	0.80	1.96	1.06
Substation/MW peak	0.01	0.01	0.02	0.01

The Commission notes that although ElectraNet has ageing assets, so to do other TNSPs. While an ageing asset profile generally means greater maintenance, the replacement of old existing assets means that less high level maintenance would be required.

Furthermore, the type of construction present in the TNSPs network should also be considered. The Commission understands that in South Australia the majority of 132kV poles are made from steel and concrete, while in Queensland and Victoria the majority of poles are wooden. As such the Commission would expect that less maintenance would be required to maintain steel and concrete poles relative to wooden poles.

Generally, from the analysis provided above it can be seen that the amount of opex requested by ElectraNet is high especially compared to other TNSPs and ElectraNet's historical opex. Even the opex levels recommended by Meritec seem to be on the high side given the results of benchmarking and historical analysis.

5.9.4 Provision for self-insurance

Based on information provided by ElectraNet the Commission notes that the transmission business spent approximately $1.0m and $0.023m in 1999-00 and 2000-01 respectively on self-insurance.[26] In 2001-02 the business did not have any expenditures on self-insurance. This information indicates that historically the transmission business spent approximately $0.33m on self-insurance.

[26] The Commission notes that the 1999/00 Annual Report for the transmission business contains a figure of $148,000 for self-insurance costs.

In its application ElectraNet has claimed an allowance of $2.8m for self-insurance. This figure was later revised down to $2.175m, as it included provision for tax. This figure was determined by AON and Partners (AON) on behalf of ElectraNet. ElectraNet states that a self-insurance provision has been made for credible risks and that a pass through will only be sought in the event of a catastrophic event that exceeds its insurance cover or where insufficient insurance cover has been built up.

The Commission considers the amount of self-insurance requested by ElectraNet to be high. In a recent consultancy commissioned by the Commission it was found that a self-insurance allowance of a TNSP with approximately double the asset base of ElectraNet's should be in the order of $0.7m. The Commission considers that a self-insurance allowance of $0.7m per annum is more appropriate and more in line with the businesses' historical levels of self-insurance.

That said, the Commission has taken a total cost approach to assess opex. Therefore it has not analysed individual cost components of ElectraNet's opex.

5.9.5 Network refurbishments

During its review of ElectraNet's capex, the Commission directed Meritec to consider refurbishments as part of capex. In regard to 'other associated refurbishment projects', Meritec recommended a figure of $24.78m be included in opex instead of the $15.3m sought by ElectraNet. Meritec notes that due to the smaller one-off nature of these projects, it has recommended that this component be expensed. For a more detailed discussion of the Commission's treatment and assessment of refurbishment expenditure, refer to chapter 4.

5.9.6 Grid support

An amount of $4m per annum is allowed for grid support. This amount of grid support will be monitored by the Commission and will be clawed back at the end of the regulatory period if the amount is not spent by ElectraNet.

5.9.7 Pass through events

If ElectraNet can demonstrate that extraordinary contingencies have arisen, then the Commission will consider these on a case by case basis and will address them by way of a pass-through.

ElectraNet will be required to obtain the Commission's approval prior to incorporating any pass-through amounts. It will also be required to demonstrate to the Commission the materiality and reasonableness of such amounts.

5.10 Conclusion

The Commission uses the building-block approach to determine TNSPs' revenue cap. This is part of the light-handed incentive-based regulation preferred by the Commission. Under this approach the TNSPs are given a sum of money enabling them to earn a reasonable return when they are functioning efficiently. This approach enables

them to earn higher returns than those envisaged by the Commission, if they are functioning more efficiently than they were expected to. The converse is also true.

ElectraNet in its response to Meritec's opex review gave details of cost increases over previous years. The Commission disagrees with the claims due to the following reasons.

- As explained in the previous paragraph, the Commission prefers to use efficient costs rather than actual costs. (If the Commission were to adopt a cost-plus regulation, then details of costs would be important. A more heavy handed and interventionist approach to verification would be necessary.)

- The Commission considers that some amounts included in ElectraNet's submissions, such as the one for self-insurance, are high compared to previous years and other TNSPs' costs. However, the Commission prefers to focus on the total opex rather than individual cost components.

After considering all of the above, the Commission, for the purpose of this draft decision, considers a figure of $43m (excluding grid support) to be an appropriate opex allowance (see table 5.6). This figure is consistent with the recommendation of Meritec. The Commission however notes that $43m is significantly higher than the amount reported to SAIIR by ElectraNet and that by most measures appears to be higher than those of other TNSPs in Australia. Therefore, the Commission will re-examine the opex allowance before its final decision.

Table 5.6 ElectraNet's opex allowance

	Jan-Jun 03 ($m)	2003-04 ($m)	2004-05 ($m)	2005-06 ($m)	2006-07 ($m)	2007-08 ($m)
ElectraNet's proposal	36.0	70.8	71.2	71.5	72.6	71.5
Meritec's proposal[1]	20.2	42.4	42.3	42.6	43.2	43.5
Grid support	2.0	4.0	4.0	4.0	4.0	4.0
Total Opex	**23.5**	**47.1**	**47.0**	**47.4**	**47.9**	**48.2**

Note 1: Excludes grid support

6 Total revenue

Each of the major elements of the Commission's building block approach to setting ElectraNet's revenue cap were discussed in the previous chapters. This chapter brings this work together, along with a discussion of depreciation and other related matters, to set out the Commission's decision on ElectraNet's revenue cap for the period 1 January 2003 to 30 June 2008.

6.1 Code requirement

As explained in Chapter 1, the code requires the Commission to set a revenue cap with an incentive mechanism for non-contestable transmission network services. The Commission's role as regulator of transmission revenue is limited to determining the MAR while ElectraNet will calculate the resulting network prices in accordance with Chapter 6, part C of the code.

The code outlines the general principles and objectives for the transmission revenue regulatory regime to be applied by the Commission. The code grants the Commission flexibility to use alternative, but consistent, methodologies. In fulfilling its role as regulator, the Commission's aim is to adopt a process which eliminates monopoly pricing, provides a fair return to network owners and creates incentives for owners to pursue ongoing efficiency gains through cost reductions. The Commission will continue to develop the regulatory framework through its DRP.

6.2 The accrual building block approach

The building block formula is:

	AR	=	return on capital + return of capital + opex + tax
		=	(WACC * WDV) + D + opex + tax
where:	AR	=	Allowed Revenue
	WACC	=	post-tax nominal weighted average cost of capital
	WDV	=	written down (depreciated) value of the asset base
	D	=	depreciation
	opex	=	operating and maintenance expenditure
	tax	=	expected business income tax payable

However, in determining the MAR, the code requires the Commission to take into account the service standards that TNSPs are expected to maintain. Therefore, the Commission will adopt an annual service standard adjustment in the calculation of MAR; that is:

$$MAR_t = AR_t + (AR_{t-1} * S)$$

where: AR = Allowed revenue;

S = Service standards factor.

6.3 ElectraNet's proposal

ElectraNet's previous revenue cap was determined annually under the EPO. For the 2001-02 financial year, the actual revenue earned was $139m.

ElectraNet's application has been made on the basis that the Commission will commence its regulation of ElectraNet's network from 1 January 2003. However, to align ElectraNet's reporting requirements with the financial year, the Commission decision will apply for a five and a half year period, from 1 January 2003 to 30 June 2007.

ElectraNet proposed a revenue cap of $194.5m for 2002-03, which trends up over the regulatory period to $239.9m in 2007-08. This is largely as a result of:

- adjustments to the opening RAB
- the increase in capex and opex to address the emerging issues of the South Australian transmission network
- a post-tax nominal cost of capital of 8.66 per cent.

6.4 Commission's assessment of building block components

The Commission's assessment of the various components of the revenue cap, in the context of the building block framework, are discussed below.

6.4.1 Asset value

In order to establish the appropriate return on the funds invested in ElectraNet, the Commission has modelled ElectraNet's asset base over the life of the regulatory period and estimated a WACC based on the most recent financial information.

The basic methodology underlying the roll-forward of ElectraNet's asset base is that the closing value of the asset base from year to year is constructed by taking the opening value, adding in any capital expenditure, subtracting disposals and depreciation for the year and converting it to a nominal figure by adding in an inflation adjustment. The closing value for one year's asset base becomes the opening value for the following year's asset base.

Clause 6.2.3(d)(4)(iii) of the code states that the assets in existence and in service from 1 July 1999 are valued at the value determined by the jurisdictional regulator. In accordance with this provision, the Commission has rolled forward the jurisdictional valuation of 1 July 1999 to include asset additions, deletions and depreciation and setting an opening asset base as at 1 January 2003.

As discussed in chapter three, the Commission has set the opening value of ElectraNet's assets at $805m as at 1 January 2003.

6.4.2 Capital expenditure

In its application ElectraNet has proposed an extensive capital expenditure program over the regulatory period ($374m in real terms). Due to the uncertainties involved in forecasting future customer demand, generation and interconnection developments it has adopted a probabilistic approach to forecasting its capex requirement.

The Commission engaged Meritec to provide an independent assessment of ElectraNet's capex program. On the basis of its own analysis of the capex program and that of Meritec's the Commission has a number of concerns about the size of the program proposed by ElectraNet. Primary among these are:

- the impact of the program on transmission prices
- its size relative to historical capex and asset base
- concerns about ElectraNet's ability to deliver the program
- the risk that a substantial amount of funding may need to be clawed back at the end of the regulatory period.

Based on the above concerns the Commission considers that a more appropriate capex allowance to be $347.4m over the regulatory period. This is inclusive of $62.1m of refurbishment and replacement projects proposed as operational expenditures in ElectraNet's application.

6.4.3 Depreciation

Using a post-tax nominal framework, the Commission has made an allowance for "economic depreciation" which adds together the (negative) straight line depreciation with the (positive) annual inflation effect on the asset base. ElectraNet notes that the straight-line method of depreciation is considered to provide the best approximation of the pattern of asset exhaustion.

This economic depreciation has been used to model the movements of asset values over the life of the regulatory period (table 6.1) and for determining the return of capital (table 6.2). Calculation of the applicable straight-line depreciation component has been based on the remaining life per asset class of existing assets and the standard life for new assets.

On the basis of this approach the Commission has calculated a straight-line depreciation allowance of $17.17m in 2002-03 to $19.15m, $20.44, $20.55m, $22.30m and $21.41m in each of the following years.

6.4.4 Weighted average cost of capital

In determining ElectraNet's revenue cap, the Commission must have regard to ElectraNet's WACC. The WACC is a method commonly used for determining the return expected on an asset base.

While the WACC framework provides a well recognised theoretical model for establishing the cost of capital, there is less than full agreement on the precise magnitude of the various financial parameters that need to be applied. The Commission has given careful consideration to the value that should be assigned to ElectraNet given the nature of its business and current financial circumstances. Accordingly, the parameter values used are those considered most appropriate.

The Commission has chosen to apply a post-tax nominal return on equity of 11.40 per cent, which equates to a post-tax nominal WACC of 6.39 per cent. In arriving at those figures, the Commission has adopted:

- a nominal risk free interest rate of 5.41 per cent, reflecting the short term (40 day) average yield on five and a half year Commonwealth Government bonds;
- a real risk free rate of 3.04 per cent based on the short term average yield on the interpolated five and ten year capital indexed bonds;
- an expected inflation rate of 2.30 per cent derived from the difference between the two yields;
- a debt margin of 1.30 per cent above the nominal risk free interest rate leading to a nominal pre-tax cost of debt of 6.71 per cent.

The Commission has examined market evidence and accepted the advice of financial experts in determining a market risk premium of 6.00 per cent and a dividend imputation figure (gamma) of 0.5.

The Commission has examined the risks faced by ElectraNet and the equity betas of similar businesses, derived principally from the average equity beta for the infrastructure and utilities industry group listed on the ASX. Therefore, based on the analysis, the Commission has determined an equity beta for ElectraNet of 1.0.

The Commission's chosen post-tax nominal return on equity is 11.40 per cent. This number lies below ElectraNet proposal of a nominal post tax return on equity of 13.66 per cent.

6.4.5 Asset base roll-forward

Based on the above elements of the Commission's building block methodology, the Commission has modelled ElectraNet's asset base over the life of the regulatory period (see table 6.1). Note that, under the post-tax nominal framework adopted by the Commission, the return on capital building block has been calculated using the nominal vanilla WACC (8.59 per cent) consistent with the post-tax WACC determined from the cost of capital parameters. As discussed in chapter three, the Commission has set the opening value of ElectraNet's assets at $805m as at 1 January 2003.

Table 6.1: ElectraNet's return on capital, 2002-03 to 2007-08

	2002-03 ($m)	2003-04 ($m)	2004-05 ($m)	2005-06 ($m)	2006-07 ($m)	2007-08 ($m)
Opening asset base	784.64	813.40	868.00	912.91	978.03	1,044.18
Capital expenditure	45.93	73.76	65.35	85.67	88.45	62.83
Economic depreciation	17.17	19.15	20.44	20.55	22.30	21.41
Closing asset base	813.40	868.00	912.91	978.03	1,044.18	1,085.60
Return on capital	67.39	69.86	74.55	78.41	84.00	89.69

6.4.6 Operating and maintenance expenses

ElectraNet is seeking a substantial increase in opex levels over historical levels. Historically opex levels for the South Australian transmission business has averaged around $35-$40m per annum. ElectraNet is now seeking an average opex of about $53m per annum (excluding refurbishment and grid support). The Commission notes that although the South Australian transmission business has had a number of different organisational structures, the operations of the business remains fundamentally the same.

The Commission considers that ElectraNet's application and subsequent information provided to the Commission does not provide sufficient justification for the increase in opex levels being sought. It believes that the opex figures recommended by its consultant (Meritec) are more reasonable. Historical comparisons, benchmarking and submissions from interested parties suggest even this may be on the high side. However, for the purposes of this draft decision the Commission accepts the Meritec recommendations and proposes to grant ElectraNet an average opex allowance of about $43m per annum. (Grid support allowance of $4m has been provided for on the basis that any unspent amounts will be clawed back).

6.4.7 Estimated taxes payable

Based on the assumptions underlying the above building block components and taking into account the network's tax depreciation profile, the Commission assesses ElectraNet would be paying taxes during the regulatory period.

The Commission's assessment of taxes payable are based on the 60 per cent gearing level assumed in the WACC parameters, not ElectraNet's current gearing level. Further, the tax estimates relate only to the network's regulated activities. The Commission's estimated taxes payable trend from $14.63m in the first year of the regulatory period to $19.97m in 2007-08.

6.4.8 EPO revenue adjustments

On 19 June 2002, the Commission approved ElectraNet's tariffs for the period 1 July 2002 to 31 December 2002. The EPO's rebalancing controls prevented the Commission from allowing ElectraNet to fully recover its performance incentive bonus scheme bonus and the under recovery of revenue from the previous period.

ElectraNet have requested that $5.3765m be added to the AR over the transitional period from 1 January 2003 to 30 June 2003, resulting from:

- The performance incentive scheme bonus $0.870m
- Under recovery of revenue from 2001-02 resulting from a lower than forecast energy consumption due to an exceptionally cool summer $2.302m
- The under recovery of revenue for the period 1 July 2002 to 31 December 2002 resulting from the rebalancing control constraints $2.192m

The Commission will allow ElectraNet to recover the $5.365m within the transitional period from 1 January 2003 to 30 June 2003.

6.5 Efficiency

Most businesses in the competitive market are under pressure to achieve efficiency gains. The Commission considers that regulated businesses should not be an exception to this rule.

During the 1990s Australia's multi-factor productivity grew by nearly two per cent and the labour productivity grew by about three per cent. Both have shown an increasing trend recently.

The Commission considers that it is reasonable to expect ElectraNet to also achieve similar productivity gains. As the efficiency factor applies to overhead expenses, the labour productivity figures may be more appropriate. However for the purpose of this draft decision the Commission prefers to use the lower figure of two per cent.

The Commission applied an efficiency dividend of two per cent per annum to ElectraNet's overhead expenses.

6.6 Commission's considerations

Based on the various elements of the Commission's building block approach, the Commission proposes an unsmoothed revenue allowance that increases from $143.72m in 2002-03 to $178.44m 2007-08 as shown in table 6.2.

Table 6.2: Draft decision ElectraNet's AR 2002-03 to 2007-08 (nominal)

	2002-03 ($m)	2003-04 ($m)	2004-05 ($m)	2005-06 ($m)	2006-07 ($m)	2007-08 ($m)
Return on capital	67.39	69.86	74.55	78.41	84.00	89.69
Return of capital	17.17	19.15	20.44	20.55	22.30	21.41
Operating expenses	46.47	48.47	50.56	52.73	55.00	57.36
EPO under recovery	5.365					
Unadjusted revenue allowance	**143.72**	**145.36**	**154.08**	**160.55**	**170.96**	**178.44**

Table 6.3: ElectraNet's smoothed AR, 2002-03 to 2007-08 (nominal)

	2002-03 ($m)	2003-04 ($m)	2004-05 ($m)	2005-06 ($m)	2006-07 ($m)	2007-08 ($m)
Smoothed AR	**143.72**	**149.35**	**155.21**	**161.29**	**167.62**	**174.19**

6.7 Conclusion

On the basis of the Commission's draft decision, ElectraNet can roll forward the opening revenue figure of $143.72m, incorporating an annual adjustment based on the eight weighted capital city CPI using an smoothing factor of –1.62 per cent. On the basis of the Commission's forecast inflation, the Commission has determined a revenue allowance for ElectraNet that increases from $143.72m in 2002-03 to $174.19m in 2007-08 as shown in table 6.3.

The MAR will be determined according to the annual service standards adjustment factor.

The recent decrease in the five-year bond rate has resulted in a lower WACC and a consequent reduction in MAR. The Commission estimates that the effect on MAR is approximately $3m over the past year. In this context the Commission notes that most analysts predict that businesses will earn less returns in the future.

Establishment of revenue caps and CPI-X adjustment

Regulatory decision parameters	
Step 1.	
Decision parameters at start of period: - The regulatory asset base (A) - Post-tax WACC	Collect forecast variables for each year of the regulatory periods: - O&M (OM) - Capital expenditure (K) - Change in CPI (ΔCPI) *That is estimate:* *OM(i), K(i), ΔCPI(i), A(I) for i= 1,2,..5*
Step 2.	
Compute Target Revenues (TR) on the basis of forecasts	Sum forecast elements of cost for each year (taking into account any forecast efficiency improvements) to determine total revenue for each year: That is: $TR(i) = OM(I) + A(i)+K(i) - A(i+1)+ r \times A(i) + Tax$
Step 3.	
Choose the revenue cap for Year 1 Usually select AR(1)=TR(1)	The chosen revenue cap that will be used as the basis for the revenue cap in the following years via the CPI-X adjustment mechanism That is: $AR(i) = AR(i-1) \times (1+\Delta CPI(I))\times(1- X)$
Step 4.	
Calculate X	Determine the revenue caps to give same net present value as the target revenues (net of O&M) – using WACC as discount rate That is: *NPV(TR(1),..TR(5)) = NPV(R(1),…R(2))*
Step 5.	
Calculate Maximum Allowed Revenue (MAR)	Annual revenue is adjusted by a service standards factor (S) as outlined in chapter 7 That is: *MAR (i) = AR(i) + (AR(i-1)xS)*

Adjustments At End Year I

Establish Actual Revenue Cap for Year i+1 ie AR(i+1) Given: AR(1)=R(1)	Re-apply CPI-X adjustment using CPI outcome for year just past ΔACPI (i) That is: $AR(i+1) = AR(I) \times (1+\Delta ACPI(I)) \times (1- X)$

Adjust Regulatory asset base for next regulatory period

Adjust Regulatory Asset Base for changes in Actual Inflation and Actual Capex	Apply depreciation allowances for period as assessed to asset base based on actual capex

7 Service standards

7.1 Introduction

TNSPs provide a service and receive revenues not exceeding the MAR determined by the Commission. Such service differs from state-to-state, usually explained by differing asset structures, topography, etc.

Under existing arrangements TNSPs do not have any incentive to improve service quality. Such an incentive would exist if TNSPs could earn additional revenue for improving their service. Furthermore, under existing arrangements, TNSPs have an incentive to minimise costs, as it would result in increased profits. In doing so the TNSP may impose much larger costs on other market participants resulting from declining levels of service. Therefore TNSPs must have an incentive not to let service quality fall.

The Commission intends to design and implement an incentive scheme to provide appropriate incentives for a TNSP to maintain or improve service quality. This scheme will provide an incentive (or penalty) in addition to the MAR that a TNSP can earn.

The remainder of this chapter sets out:

- the code requirements for the inclusion of service standards in a revenue cap decision
- the Commission's current review of transmission service standards
- ElectraNet's application
- views of interested parties
- the Commission's draft decision concerning service standards.

7.2 Code Requirements

The code requires that the Commission establish a framework for the regulation of transmission revenues.

Clause 6.2.4(c)(2) of the code states that when the Commission sets a revenue cap it must have regard to:

- the service standards referred to in the code applicable to the regulated transmission network
- any other standards imposed on the network by agreement with the relevant network users.

Clause 5.2.3(b) and schedule 5.1 of the code specify the quality of supply to be achieved by the networks.

Clause 5.2.3(b) states that a network must comply with the service standards specified either in schedule 5.1 or in a connection agreement. However if a connection agreement adversely affects a third network user, then it would be superseded by schedule 5.1.

Schedule 5.1 outlines the planning, design and operating criteria that a network must achieve. The design of a network has a clear impact on its performance over time.

7.3 Review of transmission service standards

The code defines a minimum standard that TNSPs must provide. This is to ensure the entire NEM can operate in unison. These minimum (technical) standards do not give the TNSPs any incentive to provide better levels of service.

Currently the Commission is undertaking a review of transmission service standards. The purpose of the review is to develop a scheme that will provide incentives for TNSPs to consider the market impacts of their actions.

A perfect incentive scheme should match TNSPs revenue to the costs or benefits on the market resulting from its actions. However the Commission does not view that a perfect scheme is practicable at this time. The main reason is that currently there is insufficient information to establish a clear linkage between TNSP's actions and resulting market outcomes.

The Commission intends to design and implement a simple, practical and effective incentive scheme. Though the review has not yet been finalised, it has progressed enough to indicate the likely outcome. The incentive scheme will have the following characteristics:

- TNSPs will be held responsible for outcomes that they can control or are in the best position to manage
- Simple measures of constraints, outage times and restoration times will be used as proxy for TNSP performance
- A TNSP's benchmark will be developed using its own historical data. Where historical data is not available the Commission may:
    - use national and international TNSP data to set a benchmark
    - collect data and implement particular measures over time, which seems to be the preferred option.
- Improvements upon the benchmark will result in an increase in the MAR
- Reductions below the benchmark will result in a reduction in the MAR
- Slight improvements or reductions in service will not affect the MAR

- Maximum incentives or penalties will be small, yet sufficient to change behaviour. They are likely to be around one per cent of the total MAR.

As part of the review the Commission has engaged SKM to make a recommendation to the Commission regarding the design and implementation of this incentive scheme. SKM has consulted with market participants, NEMMCO, National Electricity Code Administrator (NECA), consumer representatives, state regulators and (extensively) with TNSPs.

SKM has provided the Commission with an update of its progress. It has determined a set of five simple indicators reflecting a TNSP's service quality.

1. Circuit availability
2. Number of loss of supply events
3. Average restoration time
4. Minutes constrained (inter-regional)
5. Minutes constrained (intra-regional)

7.4 ElectraNet's proposal

ElectraNet's did not propose specific performance targets. However its application outlined its view on transmission service standards.

ElectraNet noted the code requires the Commission to consider service standards in the code and in connection agreements when deciding its revenue cap. ElectraNet based its capex forecast and its total revenue requirement on its customer's maximum demand forecasts at each exit point. It believes that these forecasts are consistent with medium growth demand forecasts for South Australia.

ElectraNet considers any level of service higher than required by the regulatory compact deserves additional revenues.

7.4.1 Principles of performance standards

ElectraNet proposed principles for network performance standards, including:

- reasonable and appropriate for each regulated TNSP
- ElectraNet should only be held accountable for performance it controls
- must be consistent with network planning and development standards
- must be consistent with network operating standards and importance of recognising NEMMCO's role in power system security
- recognise that changing service standards require changing revenue

- recognise the chance of revenue changing increases the risk on the TNSP.

7.4.2 Principles of performance targets

ElectraNet's application does not include specific performance targets. However it does recognise:

- that TNSPs should be expected to deliver the performance targeted on average over the long term, given good asset management practices;
- setting performance targets requires available long-term historical performance data; and
- care must be taken in interpreting historical data.

ElectraNet supports the careful use of output measures as reliability indicators in establishing and monitoring performance trends. Unsatisfactory trends should be analysed to discover the cause.

7.4.3 Financial incentives for network performance

ElectraNet believes that linking TNSP performance to its revenues should be done on an annual basis, with a low risk-reward framework and targeting short-medium term performance measures.

Outside the code ElectraNet is required to meet standards imposed by the South Australian transmission code, including exit point reliability standards and global output measures. ElectraNet remains committed to set performance standards for interconnectors. It recognises how constrained interconnectors are causing market concerns. Performance indicators that ElectraNet believe are appropriate for monitoring performance trends include:

- connection point interruption frequency
- connection point interruption duration
- number of loss of supply events greater than 0.2 system minutes
- number of loss of supply events greater than 1.0 system minutes
- unplanned transmission circuit outage frequency and average duration broken down by meshed and radial network
- interconnector available capacity factor.

7.4.4 ElectraNet's proposal

ElectraNet propose that its revenue stream account for the standards it is required to meet. That is in the transmission system code and in connection agreements.

7.5 Submissions by interested parties

Five of the written submission addressed the issue of service standards. These include EAG, ECCSA, NRG, Origin and TransGrid.

TransGrid is supportive of the Commission's service standards review and believes the Commission is the best-placed regulator to administer the incentive scheme.

The EAG noted that ElectraNet's application did not included specific performance data. It concluded that the Commission could not develop an incentive scheme without such data.

Origin Energy considers that the CPI-X framework provides the TNSP with an incentive to minimise costs and not to take account of the energy market more generally. Origin believes it is important to link the TNSPs revenue, decided in the regulatory decision, to its performance.

NRG supports linking ElectraNet's regulated revenue to it performance. It notes that TNSPs should be held accountable for performance indicators in their control. Further, TNSP should be accountable where they are best placed to manage the risks. For example no-one can control lightening striking, however, the TNSP can ensure the network is protected (to the extent possible) to limit the impact of lightening.

NRG Flinders considered increasing the firmness of the settlement residues by linking the TNSPs income to the residues.

ECCSA supports the Commission's service standards review. It notes that ElectraNet should be required to meet the standards prescribed in the code and the South Australian transmission code. If these are not met ElectraNet must pay a penalty.

ECCSA further notes ElectraNet did not mention performance benchmarks in terms of its investing activities. ElectraNet must demonstrate that capex and opex allowances are spent wisely and sensibly.

7.6 Commission's considerations

The service standards review is aimed at giving incentives to TNSPs to operate the network in a fashion to provide optimum market outcomes. The Commission believes that it is appropriate that ElectraNet be given this incentive.

7.6.1 Consultation on the service standards incentive scheme

The Commission proposes in its draft decision that ElectraNet be provided with financial incentives to maintain transmission service levels. These service standards proposed by the Commission provide insight into SKM's final recommendation to the Commission. SKM is, at the time of writing this draft decision, finalising its recommendations in regard to the selection of performance indicators, setting of targets, and the design of the TNSP PI Scheme.

The Commission will seek written submissions on SKM's final report when it becomes available. However the timing of the finalisation of the transmission service standards review is uncertain. As such, the Commission has outlined the details of SKM's likely recommendation. This is will give ElectraNet and other interested parties the opportunity to provide a written submission on the incentive scheme in regard to the South Australian transmission network and this revenue cap.

7.6.1 Performance targets and incentives

The incentive scheme recommended is detailed and complex. However it can be explained by breaking it up into parts.

Indicators

SKM recommended to the Commission five basic indicators as described in chapter 7.3. Values for these indicators are set as performance targets for ElectraNet. It is important that these indicators are defined so that each TNSP can report on a consistent basis over time. SKM and the TNSPs contributed to the definitions of these indicators to ensure consistency over time. The performance indicators selected are:

- Circuit availability
- Loss of Supply Event Frequency Index
    - Frequency of events lasting more than 0.2 system minutes
    - Frequency of events lasting more than 1.0 system minute
- Average restoration time
- Minutes constrained (inter-regional)
- Minutes constrained (intra-regional)

See appendix 7.1 for definitions of these indicators.

Performance targets

SKM based performance targets, among other things, on the historical performance data provided by ElectraNet. The yearly historical average of these indicators and the performance targets are shown in appendix 7.2. The historical targets were used to assess what level of service ElectraNet has been providing. Further they provided a reasonableness check to ensure the performance targets were set according to what ElectraNet could actually deliver.

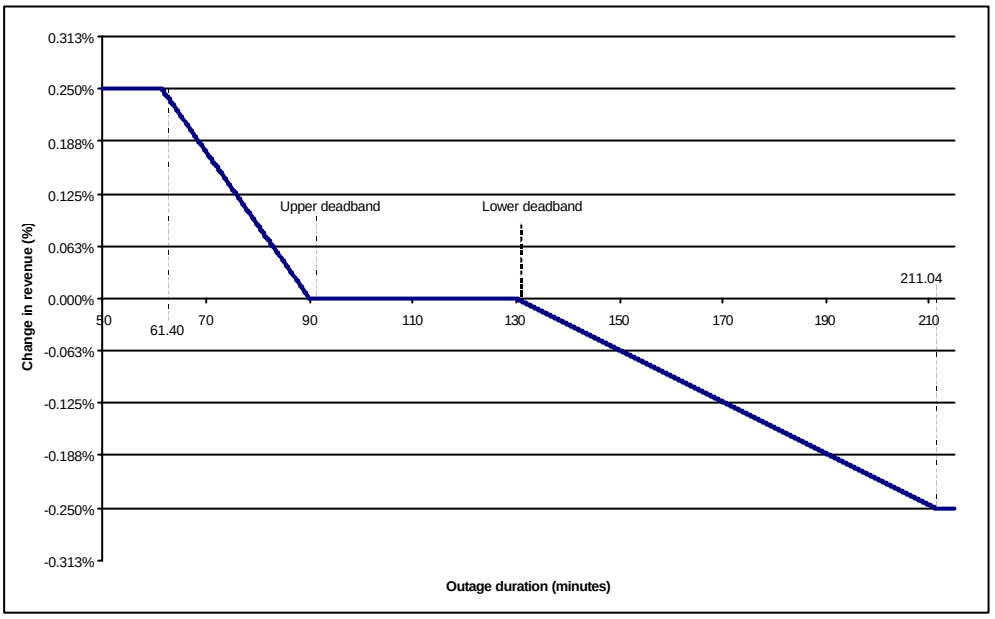
Historical information is not available for the constraints indicators (indicators 4-5). However the Commission intends to collect this data over the first 3-5 years of this revenue reset.

Performance targets will be set for these new measures when the Commission has the data to do so.

Financial incentives

Linking the level of service to financial incentives was done by selecting an appropriate percentage of the MAR that ElectraNet can gain or forfeit depending on the performance. The Commission considers that a one per cent increase in the MAR (per annum) would provide a large enough incentive for ElectraNet to maintain or improve their current level of service. Further that a one per cent decrease in the MAR would act as a deterrent to avoid deterioration of their current level of service.

Figure 7.1 Change in the MAR due to average outage duration



The Commission considers that the potential loss of one per cent of its MAR will not subject ElectraNet to extra material risk.

Performance between the "Lower headband" and the "Upper headband" will not change the MAR. Figure 7.1 is an example of this relationship.

Performance better than the "Performance for maximum penalty" and not as good as the "Lower headband" will result in a decrease in the MAR.

The inverse is true for rewards and performance that is better than the target and upper headband. Performance better than the "Upper headband" and not as good as the "Performance for maximum reward" will result in an increase in the MAR. The amount of the reward can be calculated using appendix 3. The maximum reward can be earned if performance is equal to or better than the "Performance for maximum reward".

7.6.2 Incorporating the penalty or reward into the MAR

The Commission requires, as part of its regulatory regime, each TNSP to report annually on its service standards according to the targets set. In the case of ElectraNet those are the actual performance according to the indicators defined in appendix 7.1.

The penalty/reward from this incentive scheme will lag by one year. That is the MAR in year two will include the penalty/reward for the performance achieved in year one.

The MAR is calculated as follows:

$$MAR_t = AR_t + AR_{t-1} \times S_{t-1}$$

Where:

MAR = Maximum allowed revenue

AR = Allowed revenue

S = Service standards factor

This calculation does not allow the effect of 'S' be compounded into future periods. That is each annual service standards reward or penalty will only affect revenues in one year.

Appendix 7.3 shows how to calculate 'S'.

Appendix 7.1 Performance indicator definitions

Measure 1 Transmission Circuit Availability

Measure	Transmission Circuit Availability
Unit of Measure	% of total possible hours available
Source of Data	TNSP outage reports and TNSP system for circuit availability
Definition/Formula	Formula: $\frac{\text{No hours pa circuits available x 100}}{\text{Total possible no of circuit hours}}$ Definition: The actual circuit hours available for transmission circuits divided by the total possible circuit hours available.
Exclusions	Exclude unregulated transmission assets (eg. Some connection assets). Possible number of circuit hours does not excludes any outages caused by a fault or other event on a "3rd party system" eg. Intertrip signal, generator outage, customer installation. Force majeure events.
Inclusions	Circuits includes overhead lines, underground cables, power transformers, phase shifting transformers, static var compensators, capacitor banks, and any other primary transmission equipment essential for the successful operation of the transmission system. Actual circuit unavailability includes outages from all causes including planned, forced and emergency events, including extreme events.

Measure 2 Loss of Supply Event Frequency Index

Measure	Loss of Supply Event Frequency Index
Unit of Measure	Number of loss of supply events per annum
Source of Data	TNSP outage reports and TNSP system for circuit availability
Definition/Formula	Number of events greater than "x" minutes per annum Number of events greater than "y" minutes per annum Where x and y are threshold values appropriate to each TNSP
Exclusions	Exclude unregulated transmission assets (eg. some connection assets). Exclude any outages shown to be caused by a fault or other event on a "3rd party system" eg intertrip signal, generator outage, customer installation. Force majeure events.
Inclusions	All unplanned outages exceeding the specified impact (ie. threshold values). Includes outages on all parts of the regulated transmission system. Includes extreme events.

Measure 3 Average Outage Duration

Measure	Average Outage Duration
Unit of Measure	Minutes
Source of Data	TNSP Outage Reporting System
Definition/Formula	Formula: $$\frac{\text{Aggregate minutes duration of all unplanned outages}}{\text{No of events}}$$ Definition: The cumulative summation of the outage duration time for the period, divided by the number of outage events during the period.
Exclusions	Planned outages. Excludes momentary interruptions (<1min). Force majeure events.
Inclusions	Includes faults on all parts of the transmission system (connection assets, interconnected system assets). Includes all forced and fault outages whether or not loss of supply occurs.

Measure 4 Transmission Constraints (Intra-regional)

Measure	**Hours of Binding Constraints (Intra-regional)**
Unit of Measure	Hours per annum
Source of Data	NEMMCO and TNSP
Definition/Formula	Formula: Aggregate number of hours per annum that binding constraints exist on any part of the interconnected transmission system within a region (excludes interconnectors)
Exclusions	Hours of binding constraints at or near (>95%) the capacity determined by the constraint equation describing all transmission elements in service. Excludes connection assets. Hours of binding constraints where non-credible generation contingencies coincide with previously notified planned outages. Force majeure events.
Inclusions	Includes binding constraints requiring "out-of-merit-order" scheduling of generation or rotational load shedding. Includes binding constraints from all causes including planned, forced and emergency events, including extreme events.

Measure 5 Transmission Constraints (Inter-regional)

Measure	**Hours of Binding Constraints (Inter-regional)**
Unit of Measure	Hours per annum
Source of Data	NEMMCO and TNSP
Definition/Formula	Formula: Aggregate number of hours per annum that binding constraints exist on an inter-regional interconnector. Hours of binding constraints to be accumulated against "importing" TNSP.
Exclusions	Hours of binding constraints at or near (>95%) the capacity determined by the constraint equation describing all transmission elements in service. Hours of binding constraints where non-credible generation contingencies coincide with previously notified planned outages. Any event which was clearly as a consequence of action or inaction of another TNSP. Force majeure events.
Inclusions	Events where binding constraints occur due to unavailability of interconnector support assets. Includes binding constraints from all causes including planned, forced and emergency events, including extreme events.

Definition of Force Majeure

For the purpose of applying the Service Standards Performance Incentive Scheme to ElectraNet, "Force majeure events" means any event, act or circumstance or combination of events, acts and circumstances which (notwithstanding the observance of good electricity industry practice) is beyond the reasonable control of the party affected by any such event, which may include, without limitation, the following:

- fire, lightning, explosion, flood, earthquake, storm, cyclone, action of the elements, riots, civil commotion, malicious damage, natural disaster, sabotage, act of a public enemy, act of God, war (declared or undeclared), blockage, revolution, radioactive contamination, toxic or dangerous chemical contamination or force of nature

- action or inaction by a court, Government Agency (including denial, refusal or failure to grant any Authorisation, despite timely best endeavour to obtain same)

- strikes, lockouts, industrial and/or labour disputes and/or difficulties, work bans, blockades or picketing

- acts or omissions (other than a failure to pay money) of a party other than the TNSP which party either is connected to or uses the high voltage grid or is directly connected to or uses a system for the supply of electricity which in turn is connected to the high voltage grid

- where those acts or omissions affect the ability of the TNSP to perform its obligations under the Service Standard by virtue of that direct or indirect connection to or use of the high voltage grid.

Force majeure, in this occurrence, excludes third party and natural events for which the TNSP can not reasonably be expected to cater for.

Appendix 7.2 Performance targets and incentives

Indicator	Historical performance[27]					Performance for maximum penalty	Lower Headband	Performance target	Upper Headband	Performance for maximum reward	Weighting Factor	Maximum decrease in MAR (%)	Maximum increase in MAR (%)
	1996-97	1997-98	1998-99	1999-00	2000-01								
Total circuit availability (%)	99.24	99.26	99.68	99.64	99.70	98.92	99.60	99.60	99.60	99.85	0.35	-0.35%	0.35%
Loss of Supply Event Frequency Index													
Number of events >0.2 system minutes	5	5	3	9	5	10	6	5	4	0	0.10	-0.10%	0.10%
Number of events >1.0 system minutes	3	2	0	2	1	5	2	2	2	0	0.30	-0.30%	0.30%
Average outage duration (mins)	239.1	205.7	82.7	70.9	141.3	211.04	130.00	100.00	90.00	61.40	0.25	-0.25%	0.25%
Minutes constrained (inter-regional)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	0.00%	0.00%
Minutes constrained (intra-regional)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	0.00%	0.00%

[27] ElectraNet advised that it intends to provide the Commission with an updated data set of its historical.

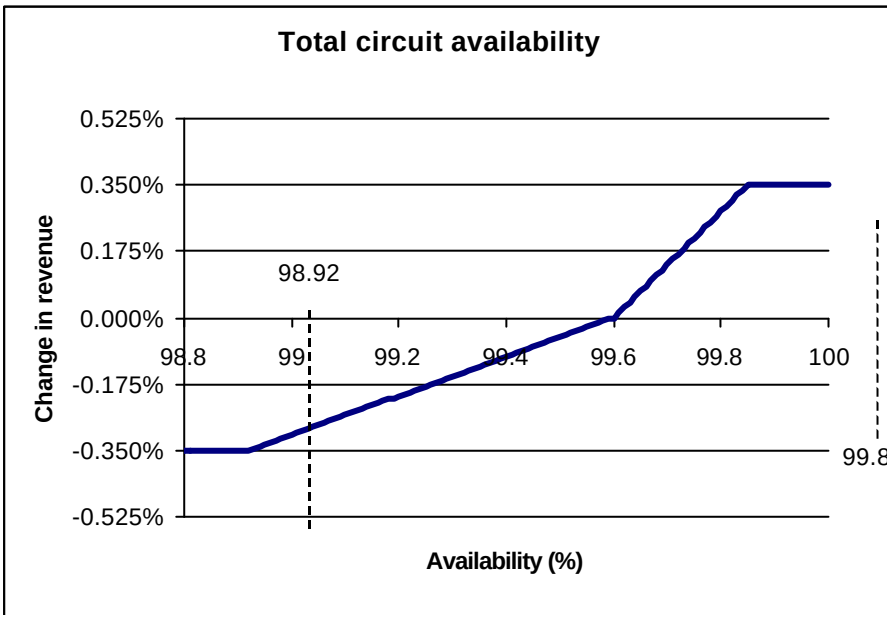
Appendix 7.3 Equations linking performance and penalty/reward

Calculation of 'S'

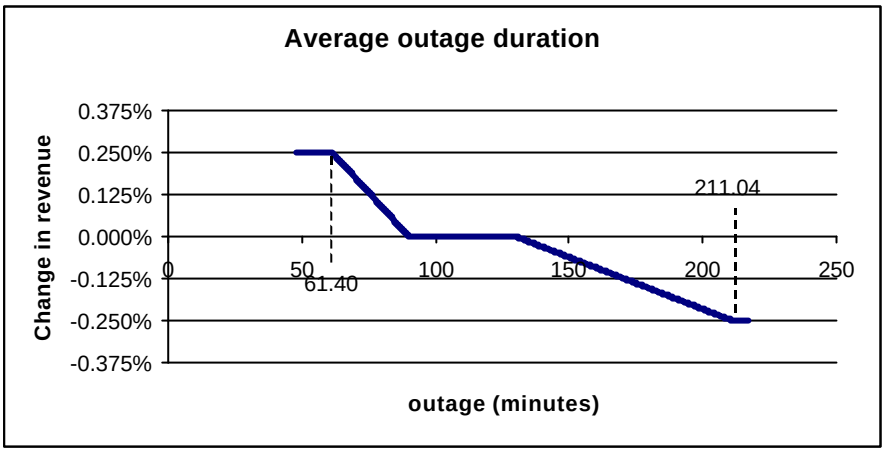
In its annual notification to the Commission of it MAR, ElectraNet will include its calculation of 'S'. ElectraNet will use the following tables to calculate 'S' at the end of each year. The Commission will audit ElectraNet's calculation and approve 'S', making adjustments if necessary. The total 'S' factor is equal to the sum of the individual 'S' factors for each performance target.

The MAR will be adjusted by S as indicated in chapter 7.6.2. The total 'S' will be the sum of the individual 'S' for each performance indicator.

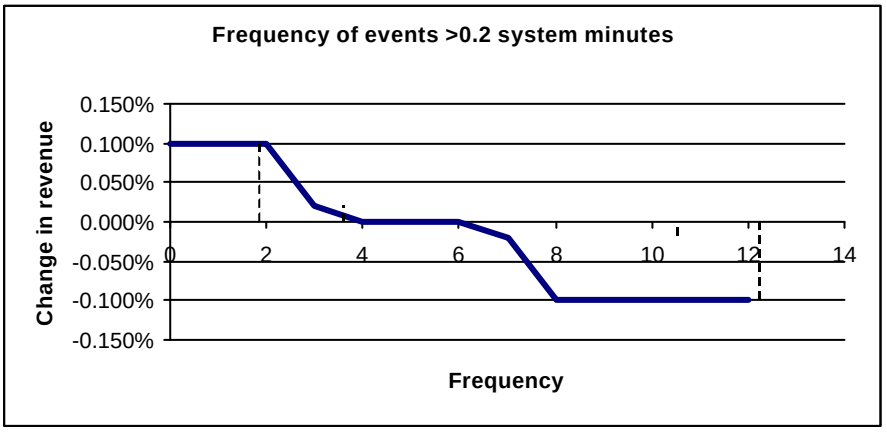
Total circuit availability (%)							
				Where:			
S =	0.00514706 x	Actual Availability -	0.512648	98.92 ≤	Actual Availability	≤	99.60
S =	0.01400000 x	Actual Availability -	1.394400	99.60 ≤	Actual Availability	≤	99.85
S =	0.0000			99.60 ≤	Actual Availability	≤	99.60
S =	-0.0035				Actual Availability	<	98.92
S =	0.0035				Actual Availability	>	99.85



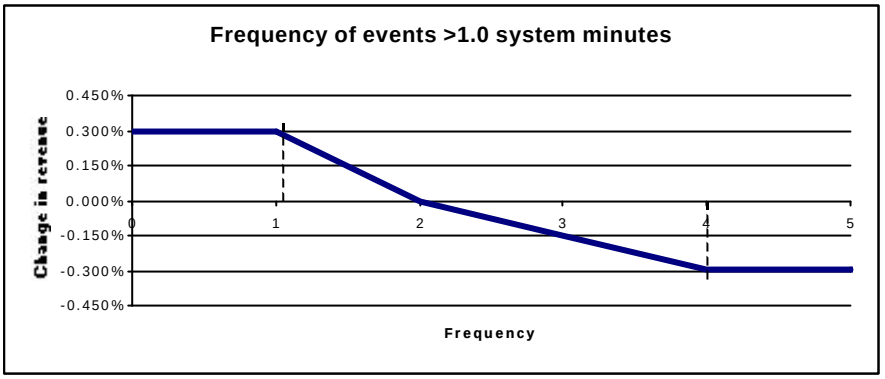
Average outage duration (mins)								
				Where:				
S =	-0.00003085	x Actual outage duration +	0.0040114	130.00	<	Actual outage duration	≤	211.04
S =	-0.00008741	x Actual outage duration -	0.0078671	61.40	≤	Actual outage duration	<	90.00
S =	0.0000			90.00	≤	Actual outage duration	≤	130.00
S =	-0.0025					Actual outage duration	>	211.04
S =	0.0025					Actual outage duration	<	61.4



Loss of Supply Event Frequency Index - >0.2 minutes per annum					
			Where:		
S	=	-0.0010	Actual frequency	=	10
S	=	-0.0010	Actual frequency	=	9
S	=	-0.0010	Actual frequency	=	8
S	=	-0.0002	Actual frequency	=	7
S	=	0.0000	Actual frequency	=	6
S	=	0.0000	Actual frequency	=	5
S	=	0.0000	Actual frequency	=	4
S	=	0.0002	Actual frequency	=	3
S	=	0.0010	Actual frequency	=	2
S	=	0.0010	Actual frequency	=	1
S	=	0.0010	Actual frequency	=	0



Loss of Supply Event Frequency Index - >1.0 minutes per annum					
			Where:		
S	=	-0.0030	Actual frequency	=	5
S	=	-0.0030	Actual frequency	=	4
S	=	-0.0015	Actual frequency	=	3
S	=	0.0000	Actual frequency	=	2
S	=	0.0030	Actual frequency	=	1
S	=	0.0030	Actual frequency	=	0



8 Financial indicators

8.1 Introduction

Clause 6.2.4(c) of the code provides that in setting the revenue cap, the Commission must have regard to the relevant financial indicators. Accordingly, the Commission has sought to examine the impact of its decision on ElectraNet's ongoing ability to manage its financial position. That is, the Commission has used this financial indicator analysis to provide a reasonableness check against the AR determined under the building block methodology. This approach is consistent with that outlined in the Commission's DRP, the *NSW and ACT* and *Queensland* revenue cap decisions.

Financial indicator analysis is relevant in the context that investors, financiers and credit rating agencies examine financial performance indicators as part of their assessment of a firm's credit worthiness. Firms with lower ratings are less likely to gain access to funds in debt and equity markets. In this context, the Commission cautions on placing too much emphasis on financial indicators derived from the regulatory model. These elements are not strictly comparable with the way in which traditional financial statements are derived.

More importantly ElectraNet has a revenue stream that is inflation indexed and almost guaranteed for the next five and a half years. This is unlike firms in the competitive market whose revenue stream can vary. This important difference limits the usefulness of the financial indicator analysis for TNSPs.

8.2 Financial indicator analysis

To assess the implications of the total revenue assessed for ElectraNet, the Commission has used both qualitative and quantitative indicators. The former broadly described as the business profile and the latter as the financial profile. A firm with a strong business profile but a weak financial profile may achieve the same credit rating as a firm with a weak business profile but strong financial profile.

Business profile

A range of issues impact on the assessment of a firm's business profile, including:

- the nature of the markets in which the firm operates
- the competitiveness of the firm
- the cost management systems of the firm
- the quality of key personnel of the firm.

It is not the Commission's function to comment on these factors directly.

However, the Commission is in a position to comment on one important issue that impacts on the regulated entity's business profile, namely the nature of the regulatory framework itself. The Commission considers that under the current revenue cap regime TNSPs should be able to maintain a relatively strong business profile.

Financial profile

As noted above, the process of calculating these ratios is complicated by differences between principles underlying the Commission's regulatory financial model and those used as the basis for construction of standard financial statements. However, the Commission considers that, for the purposes of high-level assessment, a reasonable basis for estimation is possible.

The Commission has used a typical range of financial ratios. The indicators used include measures of ElectraNet's:

- ability to cover operating costs
- profitability
- ability to service and repay debt
- ability to finance new expenditure from operations;
- gearing.

Credit rating

To generate an indicative overall credit rating from the business profile and financial ratios, the Commission has applied the classifications normally used by S&P. Those ratings, and the way they are normally interpreted, are as shown in table 8.1.

Table 8.1 Standard and Poor's key indicators

Utility business profile	Funds flow interest Cover (times)				Funds flow net debt payback (years)				Internal financing ratio (per cent)			
	AAA	AA	A	BBB	AAA	AA	A	BBB	AAA	AA	A	BBB
Excellent	4.00	3.25	2.75	1.50	4.0	6.0	9.0	12.0	100	70	60	40
Above ave.	4.25	3.50	3.00	2.00	3.5	5.0	7.0	9.0	100	80	70	50
Average	5.00	4.00	3.25	2.50	3.0	4.0	5.5	7.0	100	100	90	55
Below ave.	X	4.25	3.50	3.00	X	4.0	5.5	7.0	X	100	100	75
Vulnerable	X	X	4.00	3.50	X	X	4.0	6.0	X	X	100+	90

AAA Extremely strong capacity to meet financial commitments.

AA Very strong capacity to meet financial commitments.

A Strong capacity to meet financial commitments but somewhat susceptible to adverse economic conditions and changes in circumstances.

BBB Adequate capacity to meet financial commitments but more susceptible to adverse economic conditions however is not considered vulnerable.

Ratings in the BB, B, CCC, CC and C categories are regarded as having significant speculative business, financial and economic conditions.

8.2.1 Submissions by interested parties

ElectraNet regards any rating lower than BBB+ would be inappropriate and unacceptable. ElectraNet notes that its financial indicator analyses shows that the revenue cap that has been determined in its application is necessary to fund the major proposed investment program. It argues that lower levels of revenue would impact on ElectraNet's ability to fund the required investments and would adversely affect the ongoing financial viability of the business.

8.3 Commission's assessment and conclusion

The Commission has calculated a set of financial indicators for ElectraNet for the regulatory period. It's methodology was to take the maximum allowable revenues determined in this draft decision and incorporating those values with their associated costs into the set of financial indicators shown in table 8.2. In interpreting the results of the calculations, the Commission considers that ElectraNet has a business profile lying between excellent and above average given the likely stability of its earnings and lack of competitors for the services provided.

The Commission notes ElectraNet's concerns regarding the financial indicators and its associated credit ratings. However the Commission's forecast shows greater optimism for ElectraNet's future viability under this draft revenue cap decision. On balance the analysis suggests that, under the Commission's proposed MAR, ElectraNet is likely to have an overall credit rating that trends predominantly from **A to BBB** over the duration of the regulatory period.

The Commission has calculated the financial indicators, in table 8.2, using a benchmark of 60 per cent gearing as referred to in the cost of capital parameters in Chapter 2 of this decision. The actual level of gearing is a matter for network's owners and the Commission notes that ElectraNet's actual gearing is more like 80 per cent.

Further, in calculating the financial indicators, the Commission normally estimates the dividend payout ratio based on historical figures. However, the Commission notes that since the change from government ownership of ElectraNet to private ownership in October 2000, historical dividend payout information may no longer be relevant or applicable. The Commission also notes that dividend policy is a matter for the business and for the 2001 financial year, ElectraNet distributed no dividends. Nevertheless, for

the purpose of calculating ElectraNet's financial indicators and in the absence of more recent information, the Commission considers it would be appropriate to assume a positive dividend payout ratio and therefore has adopted a ratio of 50.

Table 8.2 ElectraNet financial indicators

Financial Indicators	2003-04	2004-05	2005-06	2006-07	2007-08
EBIT to revenues (%)	57.06	59.16	59.43	61.91	62.35
EBITD to revenues (%)	69.88	72.33	72.17	75.22	74.64
EBIT to funds employed (%)	10.48	10.58	10.50	10.61	10.40
EBIT to regulated assets (%)	10.48	10.58	10.50	10.61	10.40
Pre-tax interest cover (times)	2.60	2.63	2.61	2.63	2.58
Funds flow net interest cover (times)	3.19	3.21	3.17	3.20	3.09
S&P rating (excellent business profile)	**A**	**A**	**A**	**A**	**A**
S&P rating (above average business profile)	**A**	**A**	**A**	**A**	**A**
Funds flow net debt pay back (years)	8.87	8.78	8.99	8.85	9.36
S&P rating (excellent business profile)	**A**	**A**	**A**	**A**	**BBB**
S&P rating (above average business profile)	**BBB**	**BBB**	**BBB**	**BBB**	**BB**
Internal financing ratio (%)	54.26	67.32	53.70	57.83	83.06
S&P rating (excellent business profile)	**BBB**	**A**	**BBB**	**BBB**	**AA**
S&P rating (above average business profile)	**BBB**	**BBB**	**BBB**	**BBB**	**AA**
Gearing	60	60	60	60	60
Payout ratio	50	50	50	50	50

Note: Financial indicators formulae:

EBIT/funds employed	EBIT/(debt + equity)
Dividend payout ratio	Dividends/NPAT
Funds flow interest cover	(NPAT + depreciation + interest + tax)/interest
Funds flow net debt pay back	(Debt – (investments + cash))/(NPAT + depreciation)
Internal financing ratio	(NPAT + depreciation - dividends)/capex
Pre-tax interest cover	EBIT/interest
Gearing	Debt/(debt + equity)

The Commission is satisfied that ElectraNet's likely credit rating will be above investment grade and will not adversely affect its ability to access capital markets. Based on its analysis, the Commission considers that the trend, when assessed against the background of ElectraNet's strong business profile, indicates that the final revenue stream set out above will not adversely affect the ongoing financial viability of the network.

Once again the Commission would like to emphasise the limitations of applying a model that was designed for competitive businesses to TNSPs that have an almost guaranteed revenue stream.

Attachment A – Submissions in response to application

In response to the Commission's call for submissions on ElectraNet's application and the consultants reports, submissions where received from:

- AGL
- Conservation Council of South Australia
- Electricity Consumers Coalition of South Australia
- Energy Action Group
- NRG Flinders
- Origin Energy
- Powerlink
- SA Water
- Transend
- TransGrid
- TXU
- WMC Copper Uranium