The Australian Energy Regulator

Review of Proposed Expenditure of ACT & NSW Electricity DNSPs

Volume 5 – ActewAGL Distribution

Final

October 2008

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Engineering and Management Consultants
Advisers and Valuers

Wilson Cook & Co

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21 November, 2008

Mr M Buckley,
General Manager,
Network Regulation North Branch
The Australian Energy Regulator
Marcus Clarke Street
CANBERRA ACT 2601

Dear Mr Buckley

REVIEW OF PROPOSED EXPENDITURE OF ACT & NSW ELECTRICITY DNSPS: VOLUME 5 – ACTEWAGL DISTRIBUTION

In response to your instructions, we have pleasure in presenting our assessment of the proposed expenditure of the ACT and NSW electricity distribution network service providers for your consideration as part of the revenue determination to be applied to their services from 1 July 2009 to 30 June 2014.

This volume covers the assessment of ActewAGL Distribution's expenditure and is to be read in conjunction with volume 1, which deals with general and methodological matters relating to the work and common to all DNSPs.

In summary, the key issues and conclusions from our review are:

(a) ActewAGL will over-spend against the ICRC's capex determination in all years of the current period and in total by 34%. The principal reason given by ActewAGL for this was the need for increased expenditure on pole replacements. Our review concluded that the capex made was prudent and should be included in the regulatory asset base.

(b) ActewAGL will spend approximately the level of opex allowed in the ICRC's determination. An increasing trend in expenditure is evident, with under-spending against the determination in the initial years of the current period and probable over-expenditure against the determination in the final years to be, on balance, more-or-less in line with the determination.

(c) ActewAGL's proposed capex and opex from 1 July 2009 to 30 June 2014 are both substantially above the levels projected for the current period. The reasons for the increases are a combination of real escalation in the cost of labour and materials and an increased scope of work to be performed.

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(d) In respect of capex, the increase in the scope of work is driven by two principal factors: the need to comply with the a Government mandate to connect a second point of bulk supply to the city for security and reliability reasons and the need to increase the rate of replacement of poles. Overhead reticulation in Canberra is generally along the back boundaries of residential properties, which makes access difficult and increases the cost of pole replacements. We concluded that the capex programme proposed is reasonable in both scope and cost.

(e) The increase in the scope of opex is driven by increases in maintenance costs resulting from an increase in the volume of assets and their continued aging and by some additional compliance work. ActewAGL has not escalated its expenditure to reflect the projected increase in size of its asset base and will target efficiencies to offset the extra workload. Therefore, although we found from our comparative analysis that ActewAGL's base-year opex was not at an efficient level, we accepted that improvements in efficiency will be made over the next period and concluded that the proposed opex should be accepted without adjustment.

Our opinion is summarised in section 11 of the report, along with other matters that we would like to bring to your attention.

In conclusion, we acknowledge with thanks the assistance and cooperation of the AER and ActewAGL in the preparation of this report.

Yours faithfully,

Wilson Cook & Co Limited

Encl.

Review of Proposed Expenditure of ACT & NSW Electricity DNSPs

Volume 5 – ActewAGL Distribution

Final

Prepared for the Australian Energy Regulator

By Wilson Cook & Co Limited

Enquiries to Mr J W Wilson

Our reference 0803

October 2008

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Disclosure

Wilson Cook & Co Limited has prepared this report in accordance with the instructions of its client on the basis that all data and information that may affect its conclusions have been made available to us. No responsibility is accepted if full disclosure has not been made. We do not accept responsibility for any consequential error or defect in our conclusions resulting from any error, omission or inaccuracy in the data or information supplied.

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1 Introduction

1.1 Scope of this Volume

In this volume of our report, volume 5, we review the proposed expenditure of ActewAGL Distribution (ActewAGL) for the AER's consideration as part of the revenue determination to be applied to the services provided by ACT and NSW electricity distribution network service providers from 1 July 2009 to 30 June 2014. The volume is presented in eleven main sections:

Section 1	Introduction (this section)
Section 2	Background
Section 3	Capex in Current Period
Section 4	Capex in Next Period
Section 5	Growth Capex
Section 6	Replacement Capex
Section 7	System Capex
Section 8	Non-System Capex
Section 9	Opex
Section 10	Other Matters
Section 11	Conclusion and Recommendations.

1.2 Basis of the Review

Unless noted otherwise, the review is based on the proposals and submissions presented by ActewAGL to the AER and on supplementary information prepared by ActewAGL and submitted to the AER and us.

1.3 Particular Issues Considered

Particular issues considered in the review included identification of the basis of the forecasts in each expenditure category, consideration of the main expenditure drivers, identification of the impact of external factors, review of the impact of cost escalation and the treatment of forecast future real increases in costs, review of the efficiency of the estimated costs (and of unit costs where relevant) and consideration of the adequacy, efficiency and application of the DNSP's policies and procedures.

The tests applied were the tests required by the transitional Rules, as explained in volume 1 of this report.

1.4 Report to be Read in Conjunction with Volume 1

This volume of the report is to be read in conjunction with volume 1 of our report, which deals with general and methodological matters relating to the work and with matters that are common to all DNSPs.

The abbreviations and terms used are those in volume 1.

Unless noted otherwise, all sums are stated in real 2009 dollars.

Tables adjusted to 2009 dollars have all been adjusted using the Australian Bureau of Statistics' annual consumer price index (CPI) data for all Australian capital cities for the years ending 30 June.

1.5 Terms, Conditions and Disclaimers

This volume of the report is subject to the terms, conditions and disclaimers set out in section 11.3 below.

1.6 Acknowledgement

We acknowledge with thanks the assistance and cooperation of ActewAGL and the AER in the preparation of this volume of the report.

2 Background

2.1 Business Profile

ActewAGL was formed in October 2000 as a joint venture between the ACTEW Corporation and the Australian Gas Light Company (AGL). ActewAGL is organised in two businesses, ActewAGL Distribution (referred to as "ActewAGL" in this report) and ActewAGL Retail.

ActewAGL owns and operates the electricity distribution network in the ACT and the gas distribution network in the ACT, Queanbeyan, Palerang and Shoalhaven and manages and operates Canberra's water and sewerage networks under a management agreement with Actew Corporation.

AGL sold its interest in the distribution partnership to Alinta in 2006. Singapore Power purchased Alinta in 2007 and ActewAGL is now effectively owned equally by Singapore Power and the ACTEW Corporation.

2.2 Network Features

Before proceeding to identify and review the proposed expenditure, we first considered the network characteristics most relevant to our work and noted the following points. [1]

(a) The network takes its supply from the transmission grid through two TransGrid bulk supply points, the 330 kV/132 kV Canberra supply point at Holt and the 132 kV/66 kV Queanbeyan supply point at Oaks Estate. ActewAGL owns the three 132 kV sub-transmission lines from the Canberra supply point and the two 66 kV lines from the Queanbeyan supply point.
(b) It is intended that the 66 kV supply from Queanbeyan will be phased out and replaced by a new 132 kV bulk supply point to the south of the city, as discussed later in this report.
(c) Distribution is at 11 kV and low voltage.
(d) Designs at each voltage level appear to be conventional.
(e) A positive feature is the strong sub-transmission system, using 132 kV and circuits with high current ratings.
(f) An unsatisfactory feature is the presence of a considerable amount of "back yard" overhead reticulation that requires pole replacements and difficult to access.
(g) Another relevant factor is that the network supplies an area where the government's urban planning programmes have a material impact on network development requirements.
(h) The physical condition of the network is understood to be commensurate with age.

The network is small, as evidenced by the statistics in Table 2.1.

Table 2.1: Key Network Statistics

Sub-transmission system length (km)	205
HV distribution system length (km)	2,282
LV distribution system length (km)	2,209

[1] A full description of the network can be fond in the company's documents.

Sub-transmission transformers	28
Distribution transformers	4,670
Zone and switching substations	13
Distribution substations	4,518
Poles	53,037
Customers	156,359
Maximum demand (MW)	617

Source: ActewAGL.

Age Profile

An indicative profile of the age of the assets is shown in the graph of asset replacement cost *vs*. year in Figure 2.1. [2] The figure shows that the majority of the assets were installed after 1960, with a sharp drop in network expenditure in the second half of the 1990s.

Figure 2.1: Indicative Age Profile of the Assets

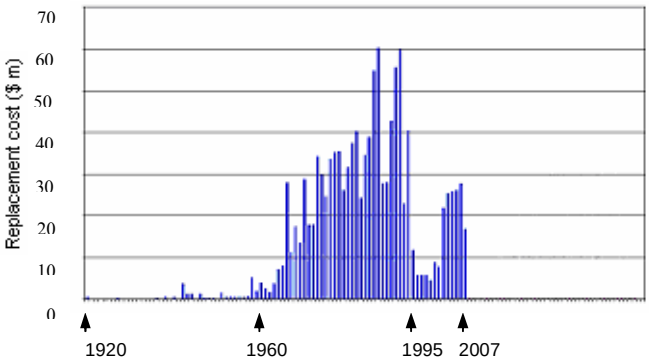


Table 2.2 shows the ages of assets in the main categories and Figure 2.2 illustrates the age profile of distribution poles, the replacement of many of which is an important driver of ActewAGL's proposed replacement capex in the next period.

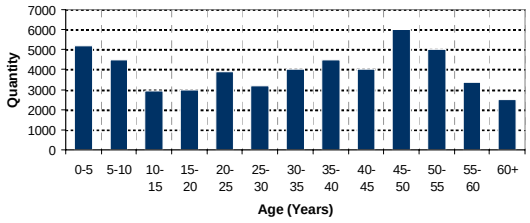
Table 2.2: Age of Main Asset Categories

Asset Category	Standard Life a/ (years)	Age as pct of Life
Sub-transmission lines	50	58%
Sub-transmission cables	50	10%
Zone substations	47	56%
Distribution substations	41	58%
Distribution underground	50	45%
Distribution overhead	50	45%

Source: ActewAGL.
a/ Standard life as used by ActewAGL.

[2] Source: ActewAGL. Figures exclude the value of pole replacements.

Figure 2.2: Age Profile of Distribution Poles



Network Performance

Network reliability in terms of SAIDI is shown in Table 2.3. The table shows that SAIDI has increased over the period FY 2003-07. The deteriorating trend is attributed to the planned outages that ActewAGL relates to the increased levels of pole replacement and reinforcement being undertaken. Overall, however, the SAIDI target has been met with the exception of FY 2006. [3]

Table 2.3: Network Reliability

YE 30 June	2003	2004	2005	2006	2007	Target
Overall SAIDI	67	77	88	94	84	91

Source: ActewAGL.

2.3 Summary of Expenditure Proposed

Table 2.4 summarises the expenditure proposed in the next period. ActewAGL has proposed capex and opex of $278 m and $306 m respectively in the next period. This represents an increase of approximately $114 m or 70% over the current period for capex and an increase of $65 m or 27% over the current period for opex.

Table 2.4: Expenditure Proposed ($m 2009)

Period (FYs)	2005-09 a/	2010-14
Capex a/	164	278
Opex b/	241	306

Source: ActewAGL.
a/ Excluding expenditure funded by customer capital contributions.
b/ FY 2010-14 opex includes $9 m of debt raising and self-insurance costs. Expenditure in both periods includes UNF tax costs ($10 m and $21 m in them respectively).

These proposed expenditures are analysed in the following sections of the report, after first briefly reviewing ActewAGL's capex in the current period against the determination.

[3] Our preference, when examining network performance in the context of replacement capex needs, is to consider equipment failure rates as they and any trends in them give a better indication of network condition than customer-oriented performance measures such as SAIDI. However, we have not done that in ActewAGL's case as the network is small and the analysis would thus not be particularly meaningful.

3 Capex in Current Period

3.1 Summary of Expenditure

Table 3.1 summarises ActewAGL's capex in the current period and compares it with the expenditure in the determination plus pass-through expenditure agreed to date.

Table 3.1: Capex in Current Period *vs.* Determination ($ m nominal) a/

	Actual		Estimated			Total
YE 30 June	2005	2006	2007	2008	2009	
Determination	22	22	25	22	24	114
Pass-through expenditure	0	0	0	0	0	0
Capex in current period	22	23	30	38	43	155
Over-run / (under-run)	**0**	**2**	**5**	**16**	**19**	**41**
Over-run / (under-run) (%)	0%	8%	18%	70%	78%	36%

Source: ActewAGL.
a/ Net of work funded by customer capital contributions.

The table shows that ActewAGL over-spent against the ICRC's determination in all years of the period except FY 2005 and in total by 36%. The principal reason given by ActewAGL for the over-spending was the need for increased expenditure on pole replacements. This was driven by significantly higher pole condemnation rates after 2003, resulting in expenditure in this area of $53 m in nominal dollars *vs.* the $17 m allowed for in the determination. This increase accounts for approximately 87% of the over-expenditure. [4] ActewAGL said that the other items causing the overrun were:

- preliminary costs of $2 m arising from developments planned for the next period, including Eastlake zone substation and the Government's requirement for the introduction of a new southern bulk supply point; [5]
- increased network augmentation capex driven by higher than anticipated levels of boring, rather than open trenching, for HV cable installation to meet the requirements of the *Tree Protection Act, 2005*;
- real price increases in the cost of materials (copper and aluminium in particular) and the cost of labour due to labour shortages; and
- greater-than-anticipated customer-initiated expenditure due to stronger residential and commercial growth than forecast.

3.2 Review by Category

ActewAGL's capital expenditure in the current period is summarised in Table 3.2. The table shows that approximately 50% was attributable to growth, 40% to replacement and the remaining 10% to IT communications, non-system capex and reliability capex.

[4] The ICRC's consultant considered ActewAGL's pole condemnation forecast to be high but in reality, it proved to be low.

[5] Source: presentations made to us in July, and ActewAGL's proposal.

Table 3.2: Capex in Current Period ($ m nominal)

	Actual			Estimated		Total	Pct of
YE 30 June	2005	2006	2007	2008	2009		Total
Renewal / replacement:							
Zone substations	0	1	1	1	2	6	3%
Sub-transmission	0	0	0	0	0	0	0%
Distribution substations	1	1	1	2	2	8	4%
Distribution overhead	8	9	13	13	13	56	31%
Distribution underground	0	0	0	0	1	2	1%
Buildings	0	0	0	0	0	0	0%
	10	**11**	**16**	**16**	**19**	72	40%
Growth: a/							
Customer initiated:							
New urban development	4	1	3	4	6	18	10%
Urban infill development	1	1	2	2	2	8	4%
Rural development	0	0	0	1	1	3	1%
Commercial development	4	4	6	6	6	26	15%
Special customer requests	1	1	1	1	1	4	2%
Relocations	2	1	1	1	2	7	4%
Community and associated development	0	0	0	2	2	4	2%
Replacement	0	0	0	0	0	0	0%
Services	1	1	2	2	2	8	4%
	13	**10**	**15**	**17**	**22**	77	43%
Augmentation:							
Sub-transmission	0	1	0	0	1	2	1%
Distribution system	1	3	1	3	3	10	6%
Zone substations	0	0	0	0	1	2	1%
	1	**3**	**1**	**3**	**5**	13	7%
Reliability / quality improvement:							
Sub-transmission	0	0	0	0	0	0	0%
Distribution system	0	0	0	1	0	1	1%
Zone substations	0	0	0	0	0	0	0%
	0	**0**	**0**	**1**	**0**	1	1%
IT communications and non-system:							
Network IT systems	0	1	1	2	2	6	3%
Other non system	0	0	0	0	1	2	1%
Share of corporate	2	1	1	4	2	10	5%
	3	**2**	**2**	**6**	**5**	18	10%
	27	**27**	**34**	**43**	**51**	181	100%

Source: ActewAGL.
a/ Inclusive of work funded by customer capital contributions.

Table 3.3 shows the expenditure on major projects and programmes in the current period.

Table 3.3: Major Projects and Programmes in Current Period ($ m nominal)

	Actual			Estimated		Total	Pct of Total
YE 30 June	2005	2006	2007	2008	2009		
Distribution substation replacement	1	1	1	1	2	7	11%
Overhead service cable replacement	1	1	0	0	1	3	4%
Pole replacement and reinforcement	9	9	13	13	10	53	81%
Distribution pole substations	0	0	0	1	2	3	4%
	11	**11**	**15**	**15**	**14**	65	100%

Source: ActewAGL.

The expenditure listed in the table accounts for 63% of total capex in the period other than customer-driven growth expenditure.

The distribution and substation replacement programme was aimed at replacing ground-mounted substation equipment and the overhead service cable replacement programme was primarily to deal with deteriorated PVC insulation that had failed due to its exposure to ultra-violet light. The pole replacement and reinforcement programme dealt with condemned wooden poles. The distribution pole substation replacement programme was partly to do with condemned poles but also to deal with other problems including unsafe transformer platforms, cross-arm problems and other defective items.

We discussed these programmes with ActewAGL and were satisfied that the programmes were reasonable.

3.3 Assessment of Prudence

Our assessment of the prudence of ActewAGL's expenditure in the current period was to be undertaken in accordance with section 6.2.1(e)(1A) of the transitional Rules and the ICRC's determination and was to be consistent with the review envisaged by the ICRC – that is, a review based on the information available at the time the investment decisions were made. [6] [7]

We noted in that context that ActewAGL's decision-making processes appeared reasonable and that the expenditure was for conventional purposes. We noted that the two major expenditure categories, replacement and growth, were accounted for by the major projects just reported and by customer demand. We noted that no other major capital projects had been undertaken. We considered the expenditure under the other headings – reliability and quality improvement and non-system capex – reasonable, except that it was not within our competence to examine the corporate expenditure item. Having considered these factors, we concluded that the expenditure would have been invested by a prudent operator acting efficiently, at the time, with good industry practice and in ActewAGL's circumstances, and that it did not need adjustment for the purpose of this review. This conclusion applies also to metering capex in the current period. [8]

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[6] The AER noted for our guidance that the ICRC's discussion on this topic appeared to be limited to the following, from the March 2004 final decision: "the Commission notes that ActewAGL will be subjected to a prudence test on all capital expenditures at the end of the regulatory period. The prudence test applied by the Commission is one that assesses the information available at the time the decision was made to determine whether the decision was reasonable and efficient given that information".

[7] The ICRC's decision also says, "…the Commission notes that in assessing the prudence of capital expenditure at the end of the forthcoming regulatory period it will give due to consideration to all aspects of ActewAGL's capital expenditure planning and approval processes and is likely to include reference to the willingness-to-pay study and its results". We did not consider it appropriate to consider willingness-to-pay in our review.

[8] Metering capex is reviewed in section 10.1.

4 Capex in Next Period

4.1 Summary of Proposed Expenditure

Table 4.1 summarises the capex proposed in the next period in comparison with that in the current period.

Table 4.1: Current and Forecast Capex ($ m 2009)

	Actual			Estimated		Proposed					Total in	Pct of
YE 30 June	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	'10-14	Total
System assets:												
Renewal / replacement	12	12	17	17	19	20	21	19	19	19	99	36%
Growth a/	16	15	17	21	26	52	38	34	31	16	170	61%
Reliability and quality of service enhancement	0	0	0	1	0	0	0	0	0	0	02	1%
Less capital contributions	6	4	4	5	8	6	8	7	4	4	29	11%
	21	**23**	**30**	**33**	**38**	**66**	**52**	**46**	**45**	**31**	241	87%
IT communications and non-system	3	2	2	6	5	12	6	6	5	7	36	13%
	25	**26**	**32**	**39**	**43**	**78**	**58**	**52**	**51**	**39**	278	100%

Source: ActewAGL.
a/ Inclusive of work funded by customer capital contributions.

The total expenditure proposed is $278 m, compared with an estimated $164 m in the current period, an increase of 70%. The main expenditure categories are growth and replacement and are these are discussed in sections 5 and 6 of this report respectively. The other expenditure categories are minor in comparison but are discussed in section 7.1 before we conclude our review of system capex in the next period as a whole. Non-system capex is reviewed in section 8.

4.2 Basis of Expenditure Forecasts

ActewAGL has based its forecasts on identified projects and programmes that we discuss in the following sections of this report. It has stated that the main reasons for the increased level of expenditure are:

- confirmation of the high level of condemned poles needing replacement; [9]
- the need for replacement of the 11 kV switchboard at the Civic zone substation;
- the need for two new zone substations, one at Eastlake and one at Molonglo;
- the mandated requirement for a second point of bulk supply for the city of Canberra;
- a need to improve and replace core IT systems; and
- one-off expenditure incurred in the fit-out of a new corporate headquarters. [10]

The third and fourth of these expenditure drivers – the new zone substation at Molonglo and the connections required to implement the second point of bulk supply – are either required

[9] The company's requests in this respect were not agreed to by consultants advising the ICRC at the time of the previous determination.

[10] There will be an offsetting capital receipt from the sale of the old headquarters building.

by Governmental land releases (Molonglo) or the Government's requirement to improve the security of supply. Both create significant new obligations that we discuss in section 5.

The proposed expenditure is reviewed in the following sections of the report.

5 Growth Capex

5.1 Summary of Proposed Expenditure

Table 5.1 summarises the growth capex proposed in the next period in comparison with that in the current period. Expenditure under this heading constitutes 61% of the total capex proposed.

Table 5.1: Current and Forecast Growth Capex ($ m 2009) *a/*

	Actual			Estimated		Proposed					Total in	Pct of
YE 30 June	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	'10-14	Total
Customer initiated:												
New urban development	4	1	3	4	6	6	7	6	5	4	28	16%
Urban infill development	1	1	2	2	2	2	2	1	1	2	8	5%
Rural development	0	0	0	1	1	0	0	0	0	0	1	0%
Commercial development	4	5	7	6	6	7	6	4	5	3	25	15%
Special customer requests	1	1	1	1	1	1	1	1	1	1	4	2%
Relocations	2	1	1	1	2	1	1	1	1	1	5	3%
Community and associated development	0	0	0	2	2	2	5	5	1	1	14	8%
Customer initiated replacement	0	0	0	0	0	0	0	0	0	0	1	0%
Services	1	1	2	2	2	2	2	2	2	2	10	6%
	15	**11**	**16**	**18**	**22**	**22**	**24**	**20**	**15**	**13**	94	55%
Augmentation:												
Sub-transmission	0	1	0	0	1	14	0	4	4	0	22	13%
Distribution system	1	3	1	3	3	3	3	3	4	3	14	8%
Zone substations	0	0	0	0	1	13	12	7	7	0	40	23%
	1	**3**	**1**	**3**	**5**	**30**	**15**	**14**	**15**	**3**	77	45%
	16	**15**	**17**	**21**	**26**	**52**	**38**	**34**	**31**	**16**	170	100%

Source: ActewAGL.
a/ Inclusive of work funded by customer capital contributions.

The table shows that 45% of the proposed expenditure is on zone substation, sub-transmission and distribution system augmentation, particularly in the initial four years of the next period. The remaining 55% is attributable to customer requirements, with an emphasis on new urban and commercial development. Expenditure in the "community and associated development" category, which shows as increase over the period FY 2008 to 2012, includes investment in electricity infrastructure works associated with ongoing water supply projects, including a proposed water purification plant in the Belconnen district. The other expenditure categories show little change from the current period.

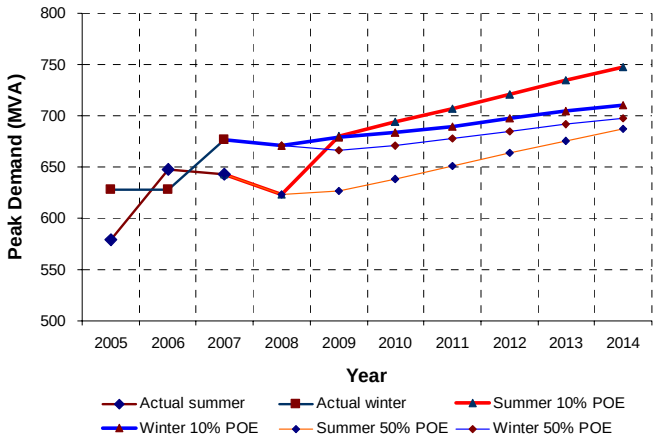
5.2 Expenditure Drivers

Demand Forecast

Increases in growth and augmentation capex are driven principally by demand. We noted that ActewAGL had engaged Sinclair Knight Merz (SKM) to produce its demand forecast for the next period. A review of the forecast was outside our terms of reference but we noted that it exhibited continued growth, as shown in Figure 5.1. We also noted that ActewAGL's capex programme is based on the "10% probability of exceedance" forecast and we consider

the implications of that on the timing of network augmentation projects at the sub-transmission level in conjunction with our discussion of plant ratings below. [11]

Figure 5.1: Forecast Growth in Maximum Demand



Security of Supply Criteria

Secondary determinants of demand-and-augmentation-driven capex are the security of supply criteria assumed. Table 5.2 shows a summary of ActewAGL's criteria. [12] The criteria in the ACT are not mandated as in Queensland or New South Wales but ActewAGL told us it had reviewed its criteria with the New South Wales conditions in mind and considered that they generally reflected a similar intent. On review, we agreed and concluded the criteria that had been applied were reasonable for use in ActewAGL's circumstances.

Table 5.2: Summary of Security of Supply Criteria

Network Element	Load Type	Standard	Interruption Time
Sub-transmission line		(n-1)	Nil
Zone substation		(n-1)	< 1 minute
Distribution feeders	Urban > 500 kVA	(n-1)	< 4 hours
	Urban ≤ 500 kVA	n	Best practice repair time
	Rural	n	Best practice repair time
Distribution substations e/	Commercial load	n	Best practice repair time
	Urban residential	n or (n-1)	Best practice repair time or restoration time
	Rural residential	n	Best practice repair time

Source: ActewAGL.

[11] Our expenditure review assumes that the AER's review of ActewAGL's demand forecast found in essence that the forecasting methodology was sound, the forecast had been developed from feeder load data assuming a normal weather year, adjustments had been made to remove the effects of inter-feeder load transfers, large load additions had been considered in parallel with the determination of growth trends, the effects of any newly-installed power factor correction equipment had been taken into account along with any other relevant factors and thus that the forecast was suitable for use for network planning purposes.

[12] Details are given in ActewAGL's Procedure No. EN SR016.

Plant Ratings

Plant ratings are a further determinant of demand-and-augmentation-driven capex. We were satisfied that ActewAGL calculates its plant ratings for transformers and cables in accordance with accepted international standards and that the underlying assumptions made were reasonable.

We noted that short-time emergency ratings were used in the planning work (whereas lower ratings would normally be chosen) but we considered that this was reasonable when taken in conjunction with the use of a 10% probability of exceedance demand forecast as opposed to a 50% probability demand forecast. A brief review of the impact of these combinations on the timing of the Eastlake zone substation project did not show any need for adjustment in the expenditure projections.

5.3 Review by Category

Major Projects and Programmes

Table 5.3 shows the main growth projects and programmes planned for the period. All four were reviewed.

Table 5.3: Main Growth Projects and Programmes ($ m 2009)

YE 30 June	2010	2011	2012	2013	2014	Total	Pct of Total
Southern supply point 132 kV lines	14	0	4	4	0	23	34%
Eastlake zone substation and associated feeders	9	10	1	1	1	22	33%
Molonglo zone substation and associated feeders	0	0	7	7	0	15	23%
Civic zone substation	4	3	0	0	0	7	10%
	27	**13**	**12**	**13**	**1**	66	100%

Source: ActewAGL.

Southern Bulk Supply Point

The connections required to implement the second point of bulk supply to Canberra are necessitated by the Government's requirement to improve the security of supply to the city. [13] It creates a significant new obligation for ActewAGL.

According to correspondence tabled by ActewAGL, the construction of 132 kV lines from the proposed new supply point (operated by TransGrid) to provide the ACT with a second 132 kV connection point to the NSW transmission network is required by a regulation introduced in 2006 by the Government. In addition, according to other correspondence, the lines were considered by the ICRC to meet the definition of a distribution network.

ActewAGL advised us that the project proposals had been developed jointly by it and TransGrid and that the two parties had applied the regulatory test to two main options, establishing the proposed scheme (the establishment of a 330/132 kV bulk supply point at Williamsdale) as the least-cost option.

[13] The Government's confirmation of this requirement was sought by the AER at the time of writing this report.

Eastlake Zone Substation

ActewAGL stated that the establishment of a new zone substation in Eastlake would provide initially 50 MVA of new capacity with provision to increase it to 100 MVA in the future. This will provide the required capacity for development in the surrounding areas and allow the progressive retirement of the "temporary" Fyshwick zone substation after 2014. [14] The substation will also take over part of the load on Telopea Park zone substation and enable it to supply new government and commercial developments on both sides of the lake.

ActewAGL state that there has been a sustained high level of land development and redevelopment in South Canberra and that based on known current and future development, demand in the area will exceed zone substation secure capacity by 2011. [15]

Molonglo Zone Substation

The requirement for a new zone substation at Molonglo is driven by a Governmental land release to be known as the Molonglo district. [16] It will be between Weston Creek and Belconnen. The intended population is 50,000 to 75,000. The new substation will take over some load in Weston Creek from Woden zone substation and therefore defer the need for capacity augmentation at Woden. There are four existing zone substations within 10km of the proposed Molonglo zone substation location but supply from them is not feasible, other than in the short term, requiring the construction of this substation by 2013.

Civic Zone Substation

Civic zone substation is located to the north-west of Canberra city centre and supplies predominantly commercial and residential buildings in the city. The substation was built in 1967 and has two 55 MVA transformers with associated switchgear. Based on forecast demand, ActewAGL state that the cyclic rating at Civic zone substation will be exceeded in the summer of 2008 in a one-in-ten-year weather condition, and the emergency rating will be exceeded by summer 2012. The preferred solution to meet the demand was determined to be the installation of a third transformer. The existing switchboard is to be replaced at the same time because of its poor condition.

Assessment of Major Projects and Programmes

These planned augmentation projects are the first significant augmentation investment since the Gold Creek zone substation was built in 1994. They account for 87% of the proposed augmentation programme.

We were satisfied that the indicative timing of the expenditure was reasonable.

We did not consider that demand management alternatives would allow a material deferral of the work.

In summary, we considered that all four plans were consistent with ActewAGL's overall network development strategy as explained to us, *viz.* continued with use of the voltages presently in service except that the 66 kV supply is to be phased out in parallel with TransGrid's long-term plans.

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[14] The capacity of Fyshwick zone substation is to be replaced progressively, following the commissioning of the proposed Eastlake zone substation.

[15] According to ActewAGL, the South Canberra area has a large number of government offices and major commercial facilities including the Parliament, federal government departmental offices, national institutions, the Canberra international airport, major hospitals and the Defence communication centre. About one quarter of ACT residents live in the area.

[16] See footnote 13.

Other Augmentation Capex

The remaining augmentation capex is related to distribution systems such as feeders and cable upgrades due to increased demand. The methods of its estimation have been stated by ActewAGL and, on review, we considered them reasonable.

Customer-Driven Capex

Customer-initiated capex reflects the projected level of new residential and commercial development. ActewAGL stated that the level takes account of direct customer or developer enquiries and the other usual information, particularly future development activity identified through the Government's plans and land release programmes. It recognises that these are subject to considerable uncertainty, particularly in the latter part of the period, and so it has not included any provision for unknown developments. According to ActewAGL, about 31% of the total customer-initiated programme will be recovered through capital contributions in accordance with the ACT *Capital Contributions Code*. [17]

On review, we considered the methods of estimation reasonable.

5.4 Other Considerations

Other factors considered when determining the reasonableness of the scope of work included the following.

Policies and Procedures

We were satisfied that ActewAGL had followed reasonable policies and procedures that included the identification of need and the determination of least-cost solutions when making its investment decisions.

Innovativeness of Planning Practices and Designs

We considered the level of innovation being applied to ActewAGL's investment decisions. Innovation in this context was taken to mean mainly the adoption of sound methods and ideas or the like rather than the introduction of new technologies in terms of network equipment, although we considered both possibilities.

Engineering and Operational Methods

In terms of engineering methods and ideas, ActewAGL's planning team appeared to be following current international planning practice in its work in most if not all respects and importantly, for growth-related expenditure, had adopted sound network planning concepts and criteria.

ActewAGL already considers zone substation load diversity and load transfers through the distribution system when planning its substation capacity augmentation.

Non-network options and demand-side management are recognised as potential alternatives to network augmentation solutions and are provided for in ActewAGL's procedures although the ICRC found in its 2004 final decision that price was the main tool for ActewAGL to manage demand and promote a demand-side response. [18] [19]

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[17] The cost of work funded by customer capital contributions is omitted from our tables and analysis unless noted otherwise and has not been examined by us for reasonableness, as we understand that mandatory policies for the calculation of contributions are in place in the ACT and are being followed consistently by ActewAGL.

[18] The small industrial base in the ACT provides only limited scope for application of embedded generation as an alternative to network augmentation.

[19] See section 6.2.3 of ActewAGL's proposal for further details if required.

Construction and Installation Methods

ActewAGL appeared from our review to be using appropriate methods for the construction and installation of its assets.

Types of Equipment

It appeared from our review that the particular types of asset entailed in the capex programme in the next period are appropriate for the purpose.

Conclusion

We did not find any evidence that suggested that material adjustment was needed in ActewAGL's proposed growth-related capex on the ground of these factors. In summary, therefore, we were satisfied that the scope of work proposed was reasonable and efficient for the purpose of this review.

5.5 Efficient Costs

We then considered whether the proposed expenditure was reasonable for the scope of work envisaged – in other words, whether it reflected efficient costs. We considered this under the following headings: the basis of the cost estimates, the method used to escalate historical costs to year 2009 dollars, the extent of any real cost increases that have been included in the estimates stated in the RIN templates in year 2009 dollars and, finally, the discussion of any issues arising.

Basis of Cost Estimates

ActewAGL has described its method of cost estimation for capex as a "zero-base" approach.[20] It said that costs associated with the identified capital works had been developed using bottom-up estimates of expenditure in FY 2008 dollars, escalated by relevant factors. It said that the unit rates used were given in the project justifications in the asset management plans and that the ten most important unit rates had been reviewed by Sinclair Knight Merz (SKM). [21] Of significance, the unit rates used for zone substations were based on industry knowledge from SKM, since ActewAGL had not built a zone substation since 1994. Actual capex is based mainly on competitive bids.

We reviewed SKM's report, noting the cost elements considered and the conclusions reached. We noted that SKM's estimates and ActewAGL's rates were in close alignment with the exception of the pole replacement costs (where ActewAGL's estimate was higher) and service lines where the reverse was the case. Given the degree of difficulty associated with the "back yard" pole replacement programme, we considered that ActewAGL's rates for that item should be accepted. [22]

The estimates generally did not appear to include separate allowances for price contingencies (*viz.* possible escalation), although we noted that that the cost estimate for the Civic zone substation work did include a 10% contingency allowance. [23]

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[20] See the proposal, p. 130 onwards.

[21] See attachment 17 (confidential) to the proposal. The rates examined were those for reticulation in new residential estates, underground feeders, new zone substations, new zone substation transformers, 132 kV lines, distribution pole replacements, domestic meter replacements, distribution transformer replacements and service wire replacements. SKM did not provide a rate for pole "nailing" as the work is contracted out and a market rate is thus established.

[22] SKM noted that the majority of ActewAGL's underground distribution lines are laid using "directional boring" techniques, a more expensive method than the normal trenching-and-reinstatement method, but that this was "to a large extent imposed on ActewAGL by local government regulations". SKM said it had allowed for that in its comparison.

[23] See *"Network ten year augmentation plan - 2008/2009 to 2017/2018"*. We expect contingencies to be included where necessary but not in a manner that leads to their being applied more than once.

These matters considered, we accepted the basis of the cost estimates as reasonable.

Escalation to 2009 Dollars

Recognising that there has been a period of significant cost increases in the electricity supply industry from around 2003, ActewAGL engaged SKM to develop escalation factors for its main asset categories. [24] SKM's review confirmed that the costs of materials used in the electricity supply industry have been rising at rates substantially in excess of the CPI and gave a table of escalation factors to be applied to the major asset categories. The findings are consistent with our own knowledge of price movements in this field in the electricity supply industry in New Zealand, many of the manufactured items of which are imported from Australia or elsewhere.

SKM also concluded (as others have) that wages growth in the electricity industry in Australia – they consider the ACT but the situation is widespread – have outpaced the CPI as well. [25]

Without going into detail, the analysis was based on contract price information, Econtech's escalators for labour rates, Consensus Economics' escalation rates for metal and oil prices (based in turn on futures market prices), Econtech's exchange rate forecasts (to convert US-denominated commodity prices to Australian dollar equivalents) and SKM's weightings for application of the various factors to each asset category. No real escalation rates were applied to steel prices (*viz.* steel is expected to remain unchanged in price in nominal terms). Details are given in SKM's report.

A one-year time lag between commodity price movements and the corresponding movements in the price of finished goods has been assumed.

We reviewed SKM's report and discussed it with ActewAGL and considered that the methodology used was reasonable.

We are not able to express a view on the reasonableness of the input assumptions regarding future cost movements. Nor were we able to verify ourselves that the methodology (and the escalators stated on p. 5 of SKM's report) had been applied in the stated manner as an audit would be required for the purpose. We have therefore relied upon ActewAGL's assurance that that is the case.

In conclusion, we accepted the basis of the cost estimates as reasonable for the scope of work concerned.

Real Price Increases Included in the Estimates

In essence, the effect of applying these escalation factors is that the forecast real price increases during the periods FY 2009 to 2014 have been included in the estimates stated in the RIN expenditure templates in 2009 dollars to the extent shown on p.5 of SKM's report in attachment 18 to the proposal.

Conclusion

We concluded that there was no ground on which to deem the costs applied to ActewAGL's growth capex programme inefficient.

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[24] SKM's report is given in attachment 18 to the proposal.

[25] ActewAGL and SKM report that since 2002, average weekly income and the Australian Bureau of Statistics (ABS) Energy, Gas and Water Index have both exceeded CPI, by 6.5% and 10.8% respectively (as at December 2007). Market price surveys conducted by SKM show that power transformer costs increased by more than 20% in two years (2004 to 2006), whilst aluminium cable and overhead conductor costs rose by 27% and copper cable by 46% cent over the same period.

5.6 Recommended Level of Growth Capex

Having considered the factors reported in this section, we conclude for the purpose of this review that no adjustment of the growth-and-reinforcement-related capex proposed by ActewAGL is needed.

6 Replacement Capex

6.1 Summary of Proposed Expenditure

Table 6.1summarises the replacement capex proposed in the next period in comparison with that in the current period. Expenditure under this heading constitutes 36% of the total capex proposed.

Table 6.1: Current and Forecast Replacement Capex ($ m 2009)

	Actual			Estimated		Proposed					Total in	Pct of
YE 30 June	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	'10-14	Total
Zone substations	0	1	1	1	2	4	5	2	2	2	15	16%
Sub-transmission	0	0	0	0	0	0	0	0	0	0	0	0%
Distribution substations	1	1	2	2	2	2	2	2	2	2	9	10%
Distribution overhead	10	10	14	13	13	13	13	14	14	15	69	70%
Distribution underground	0	0	0	0	1	1	1	1	1	1	5	5%
Buildings	0	0	0	0	0	0	0	0	0	0	0	0%
	12	**12**	**17**	**17**	**19**	**20**	**21**	**19**	**19**	**19**	99	100%

Source: ActewAGL.

The table shows that 70% of the proposed expenditure is on the replacement of overhead distribution assets and the remaining 30% is on zone and distribution substations and underground distribution assets. The increase in expenditure in FY 2009 and FY 2010 is mainly due to the Civic zone substation switchboard replacement ($0.8 m), after which the expenditure decreases. Distribution overhead expenditure (due to pole replacement) is expected to remain high, increasing over the period due to a predicted increase in the condemnation of poles.

6.2 Review by Category

Table 6.2 shows the main replacement projects and programmes planned for the period.

Table 6.2: Main Replacement Projects and Programmes ($ m 2009)

YE 30 June	2010	2011	2012	2013	2014	Total	Pct of Total
Pole replacement and reinforcement programmes	10	10	10	10	10	51	67%
Ground substation replacement	2	2	1	2	2	08	11%
Underground network replacement	1	1	1	1	1	05	6%
Civic switchboard replacement	1	2	0	0	0	04	5%
Zone fence upgrades	1	1	1	1	0	03	4%
Over-current & distance protection relay replacements	1	1	1	1	0	03	4%
Reactive and planned zone substation equipment replacement	1	1	0	0	1	03	4%
	16	**17**	**14**	**15**	**15**	76	100%

Source: ActewAGL.

Pole Replacement and Reinforcement Programmes

Observation

The forecast expenditure on pole replacement and reinforcement reflects the continuation of an established programme for ActewAGL, the costs of which are exacerbated by the lines being mainly at the back of residential lots, not on the streets in front. This design is not peculiar to Canberra but thankfully is rare. It is regrettable that the design was used in the first place and more regrettable that a considerable amount of money is now to be applied to remedy the deficiencies of its aged components. It may be a better long-term solution to replace the back yard reticulation with new reticulation in the street but we understand that ActewAGL's preliminary analysis has indicated that broad-scale undergrounding would not be financially viable. [26] Therefore, unless a customer levy or subsidy can be made available, the legacy of this unfortunate design will be perpetuated. If the AER is able to address this situation, it might consider doing so. Otherwise, the expenditure proposed by ActewAGL under this category should be assessed as follows.

Assessment

ActewAGL advised us that it had increased its pole inspection programme in 2003, following several pole failures with resulting damage and injury. This had led to an increase in the rates of condemnation of poles and thus to the pole replacement programme. [27] The network includes a high percentage of natural round poles compared to other Australian distribution businesses and the majority of pole condemnations relate to those poles. [28]

ActewAGL estimates that 5,492 poles will be replaced in the next period. Pole reinforcement is also a significant expenditure and is a prudent method of extending pole life, thereby deferring replacement. For example, 69% of the poles condemned to date were reinforced and presently remain in the network, although this ratio is expected to decline in the next period.

Most of the condemnation arises from rot at the base of the pole but other reasons include splitting due to corrosion of bolts at the tops of some poles (at least half of the natural round wood poles have cross-arms attached with a non-galvanised bolt that corrodes, causing the pole heads to split, leading to rot).

A pole replacement and reinforcement model has been developed by ActewAGL with the assistance of SKM to forecast the requirements over the next two periods. It shows that the quantities projected for the next period are as in Table 6.3.

Table 6.3: Pole Replacement and Reinforcement Quantities

YE 30 June	2010	2011	2012	2013	2014	Total
Pole replacements	1,095	1,095	1,095	1,105	1,102	5,492
Pole reinforcements	700	700	700	360	360	2,820
	1,795	**1,795**	**1,795**	**1,465**	**1,462**	**8,312**

Source: ActewAGL.

[26] ActewAGL said that an examination of its economic benefit has not yet been completed.

[27] During the period from May 2003 to November 2007, 13,050 condemned poles were rectified, 4,297 by replacement and 8,753 by reinforcement.

[28] The network incorporates approximately 53,000 poles, of which about 39,000 are wooden. Almost half of the poles in the network are untreated natural round wood poles, which are susceptible to deterioration over time.

Ground-Mounted Substation Replacement

The programme of replacement of components in ground-mounted substations and switching stations or the complete replacement of substations considered necessary to ensure compliance with ActewAGL's technical regulatory obligations and to maintain the reliability, safety and security of the distribution system.

Underground Network Replacement

The underground network replacement expenditure is also related to the need to meet technical regulatory obligations and to maintain the safety and reliability of the network, as recently identified by the technical regulator or actual failures. The replacement relates to various high voltage and low voltage mains, pilot cables and associated joints and terminations, service cables and distribution pillars or "tee-joints".

Where the requirement under the *Utilities Act* to manage vegetation to protect overhead assets conflicts with obligations under the *Tree Protection Act*, ActewAGL develops programmes to underground the overhead conductors or install "aerial bundled low-voltage overhead cable". It expects that the need to underground assets to protect registered trees will increase in the next period, as trees are placed on the "tree register" and more trees reach the size at which the regulations apply.

Zone Substation Work

The main component of the zone substation work shown in Table 6.2 is the proposed replacement of the switchboard at Civic zone substation. This is necessitated by the deteriorated state of its insulation. Other work includes the upgrading of perimeter fencing, the replacement of protection relays, cable sealing ends, instrument transformers, isolators and battery chargers and other important components due to deterioration and increased risk of failure.

Assessment of Major Projects and Programmes

The programmes listed in the table account for around 77% of the total replacement capex.

We were satisfied that they are reasonable, as is the indicative timing of the expenditure.

In summary, we considered that all the plans were consistent with ActewAGL's overall network development strategy as explained to us and as set out in its network ten year augmentation plan and asset management plan.

6.3 Other Factors Considered

We were satisfied that the factors discussed in section 5.4 of this report were equally relevant to the replacement capex reported in this section and we did not find any evidence that suggested that material adjustment was needed in ActewAGL's proposed replacement capex on the ground of those factors. In summary, therefore, we were satisfied that the scope of work proposed was reasonable and efficient for the purpose of this review.

6.4 Efficient Costs

We were satisfied that the factors discussed in section 5.5 of this report in relation to the efficiency of ActewAGL's costs for its nominated scope of work were equally relevant to the replacement capex reported in this section. Thus, we concluded that there was no ground on which to argue that the costs applied to ActewAGL's replacement capex programme were inefficient.

6.5 Recommended Level of Replacement Capex

Having considered the factors reported in this section, we conclude that no adjustment of the replacement-related capex proposed by ActewAGL for the purpose of this review is needed.

7 System Capex in Total

7.1 Other Categories of Capex

Reliability and Quality Improvement

Table 7.1 summarises the reliability capex proposed in the next period in comparison with that in the current period. Expenditure under this heading constitutes less than 1% of the total capex proposed.

Table 7.1: Current and Proposed Reliability Capex

	Actual			Estimated		Proposed					Total in	Pct of
YE 30 June	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	'10-14	Total
Sub-transmission	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0%
Distribution system	0.0	0.0	0.1	0.6	0.3	0.1	0.3	0.3	0.3	0.3	1.2	77%
Zone substations	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.3	23%
	0.0	**0.0**	**0.1**	**0.6**	**0.4**	**0.2**	**0.4**	**0.4**	**0.3**	**0.3**	1.5	100%

Source: ActewAGL.

This expenditure category was not considered separately in ActewAGL's 2004 submission to the ICRC but some expenditure was made in the current period, mainly in relation to feeder ties and under-frequency relays. ActewAGL stated that expenditure in the next period will be focussed on the rectification of localised reliability problems, rather than on the improvement of system-wide performance, as analysis shows that the cost of reliability improvement (e.g. through the installation of reclosers on 11 kV lines) outweighs its current understanding of customer willingness-to-pay.

In examining this capex, we had regard to the current reliability of the network as reported in section 2.2 of this report, its proposed augmentation projects and programmes and the fact that its reliability targets are to remain unchanged from their present levels. We consider the reliability improvement capex reasonable.

7.2 Other Factors Considered

Coordination of Work and Overlap of Expenditure Estimates

We noted evidence that capex programmes and projects under the various expenditure headings were sufficiently well coordinated to avoid inefficiencies. [29]

We did not find any evidence that suggested overlapping and thus double counting of expenditure requirements.

Deliverability

ActewAGL has recognised that it will be competing with other Australian distribution businesses, as well as in the broader international market, for resources and expertise to implement its proposed investment programme and has taken measures to ensure that it is able to do so. These include restructuring its electricity network business, establishing a new

[29] For example, the replacement of the switchboard at the Civic zone substation has been coordinated with the upgrading of the substation capacity.

major projects branch, carrying out a resource matching exercise for the initial years of the period, increasing its apprenticeship programme and entering into supply arrangements and alliances. It plans to use a combination of in-house and contract-based resources and is confident that it will be able to deliver its programme.

Smoothing

We were not advised of any "smoothing" of expenditure between years in the period or more widely, although some is normal and may be implicit in the various projects and programmes.

7.3 Recommended Level of Total System Capex

Having considered the factors reported in this section, we conclude that no adjustment is needed in the system capex proposed by ActewAGL for the purpose of this review.

8 Non-System Capex

8.1 Summary of Proposed Expenditure

ActewAGL's proposed non-system capex comprises network IT systems, a share of corporate capex and expenditure on other non-system assets. The network IT component includes some elements that we would normally consider to be part system capex, namely SCADA and communications equipment. ActewAGL leases rather than owns much of its non-system asset base, including computers, motor vehicles and some property.

Expenditure in the current and next period is shown in Table 8.1. Expenditure under this heading constitutes the remaining 13% of the total capex proposed.

Table 8.1: Current and Forecast Non-System Capex ($ m 2009)

	Actual			Estimated		Proposed					Total in	Pct over
YE 30 June	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	'10-14	05-09
Network IT systems	1	1	1	2	2	4	4	4	4	5	21	234%
Other non system	0	0	0	1	1	1	1	1	1	1	3	11%
Share of corporate	2	1	1	4	2	7	1	2	1	1	13	29%
	3	**2**	**2**	**6**	**5**	**12**	**6**	**6**	**5**	**7**	36	94%

Source: ActewAGL.

The total expenditure proposed in the next period is $36 m, compared with $19 m in the current period, an increase of 94%. ActewAGL has stated that the reasons for increased level of expenditure are:

- one-off costs of $5.3 m in FY 2010 for the relocation of its corporate head office,
- increased investment in IT systems to integrate existing systems and
- replacement of SCADA and communications equipment.

Basis of Forecast

ActewAGL advised us that a zero-based method of forecasting had been used and that its requirements had been built up using the following process:

- review of business requirements,
- assessment of data requirements for operational, regulatory and financial purposes,
- assessment of requirements arising from the expansion of the network,
- review of assessed condition of existing buildings and IT systems,
- integration needs for IT, and
- consideration of efficiency improvements.

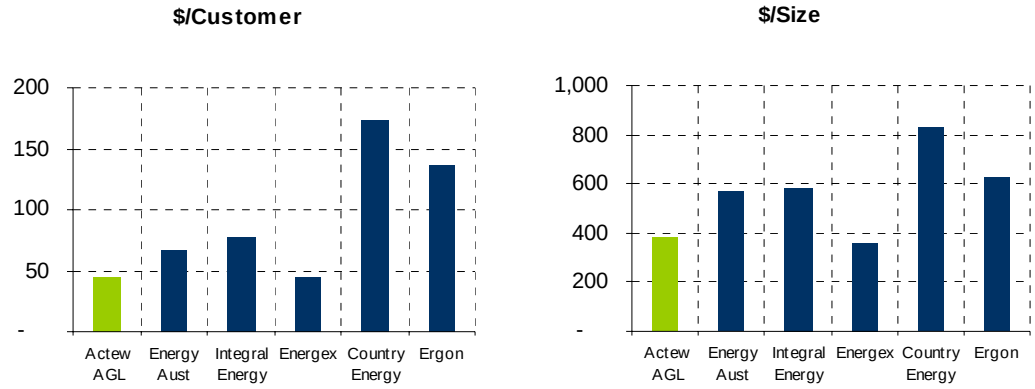
Application of Cost Escalation Factors

No real cost escalators have been applied to non-system capex (it was escalated only by CPI).

Efficiency of Overall Expenditure

ActewAGL's average non-system capex for the next period has been compared on a cost-per-customer and a cost-per-size basis with the other ACT and NSW DNSPs' forecasts and the regulatory allowances for Energex and Ergon Energy in the 2005 Queensland determination. [30] The comparisons are shown in Figure 8.1. [31]

Figure 8.1: Comparisons of Non-System Capex



We consider that "cost per size" is the best benchmark to use as a comparison because it takes account of the main parameters that drive non-system capex. The comparisons show that ActewAGL's proposed non-system capex is lower than the three NSW DNSPs on these two measures. This was expected, as ActewAGL leases its computers and motor vehicles. After also allowing for the significant one-off cost of the planned relocation of ActewAGL's corporate head office in FY 2010 and for the fact that the IT component contains some system-related IT capex, we considered that the benchmarking indicates, from a "top-down" perspective, that the planned overall level of non-system capex is reasonable.

The following sections consider a "bottom-up" assessment of specific categories and projects.

8.2 Review by Category

Network IT Expenditure

ActewAGL is forecasting a step increase of approximately $2 m p.a. in network IT expenditure from FY 2008 continuing to the end of the next period. The proposed expenditure is based on the company's technology and information management strategy. [32]

The strategy document identifies a need to improve business processes to achieve a more effective selection and implementation of IT projects and utilisation of systems once implemented. Several recommendations have been made and priorities set for future improvement that appear to have been accepted and included in the expenditure plan for the next period.

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[30] EnergyAustralia's expenditure excludes transmission-related costs.

[31] Size is taken as a composite variable $C^{0.5}L^{0.3}D^{0.2}$ where C equals the number of consumers, L equals the km of line and D equals the maximum demand, representing the networks by their key characteristics. This measure of size was developed by Ofgem but we have substituted demand for energy throughout in the formula on the ground that demand is a stronger driver of expenditure in a distribution lines business than is energy. Further details of the composite size variable are given in section 3 of volume 1 of this report.

[32] Confidential attachment to the proposal, prepared with the assistance of consultants, Strada Associates.

An additional document, the SCADA and information systems strategy, covers issues related to network control systems and complements the strategy. This plan, together with the IT strategy has been used to establish a ten-year technology and information management investment programme that identifies the specific projects to be undertaken.

Our review of the documents shows that they are comprehensive and detailed. The documents illustrate that projects are based on clear needs, options are considered and that projects are prioritised on need and risk.

The list of projects is large and contains many relatively small discreet items. There are, however, several larger projects to be carried out in the next period. These include:

- replacement of zone substation remote terminal units that interface to the SCADA system, $2.4 m;
- replacement of the SCADA system and protection pilot cables, $1.9 m;
- increased automation on the distribution network, $1.3 m;
- replacement of power system analysis software, $1.3 m
- replacement of the GIS system, $2.6 m; and
- replacement of the asset and works management system, $3.1 m.

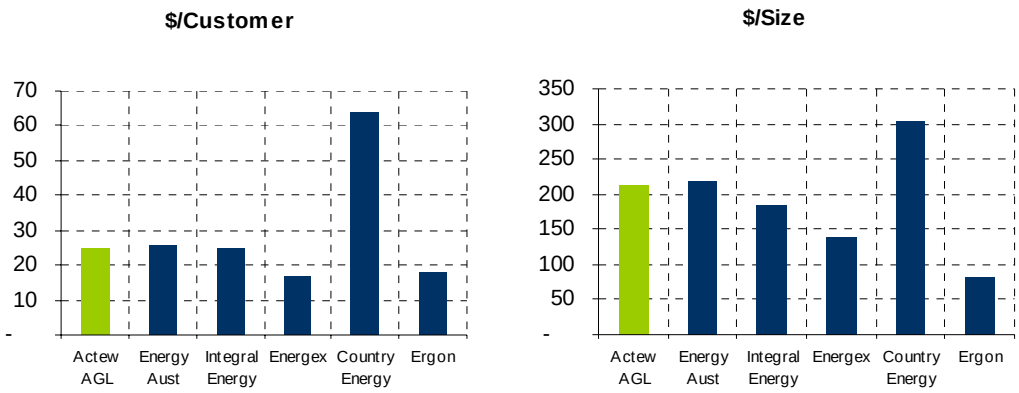
The cost estimates have generally been prepared at a budget level, based on market knowledge, particularly for the projects that will not commence until later in the period. Where costs are known in detail, such as in the case of the substation RTU units, these have been used.

We asked for and received additional information on the justification of the larger projects. The information had not been completed to a "business case" level but indicated that business needs had been considered, together with different options to meet them. We were satisfied that the need for the expenditure had been established to a level that justified its inclusion in the forecasts.

The investment proposed is on systems that are needed in network businesses. We found nothing unusual or excessive in the proposed programme.

As an additional test, we benchmarked IT expenditure on a cost-per-customer and cost-per-size basis, as shown in Figure 8.2.

Figure 8.2: Comparison of IT Capex



The figure shows that ActewAGL's proposed IT capex is not out of line with that of the other distributors in the comparison. After taking into consideration that the forecast expenditure includes some system assets and excludes hardware, which is leased, we considered the expenditure reasonable.

Share of Corporate Capex

Corporate capex arises from the allocation to the distribution business of capex undertaken by the wider ActewAGL corporate group. Corporate capex is allocated directly to a business where the expenditure can be linked to that business (electricity distribution, water division, retail, etc). For example, refurbishment and security upgrading at the Greenway depot is directly allocated to the electricity distribution business. Where expenditure cannot be directly allocated, the expenditure is allocated proportionally using the same method as in the last determination in accordance with clause 6.15.8(b)(1) of the transitional Rules.

The forecast incorporates capex for the relocation of the corporate headquarters in FY 2010 and the cost thus allocated to the electricity distribution business is $4.8 m. [33]

ActewAGL has justified its expenditure on the relocation of the corporate headquarters as being NPV-positive due to various reasons including the following:

- fit-out and operating expenses for the current building will increase as the building is more than forty years old;
- significant capex would be required to install new air-conditioning;
- improved communications and synergies will arise from centralisation of administrative staff;
- the new building will have lower operating costs;
- the initial fit-out of the new premises will defer significant further expenditure for at least seven years; and
- the central location will allow for greater staff and public access due to close proximity to bus interchange and retail precinct.

We briefly reviewed a summary of the business case for the shift and considered it reasonable.

Other expenditure included in this category consists of the allocation of ongoing refurbishment, replacement and addition of corporate assets including the maintenance and refurbishments of buildings, security enhancements and IT development and telecommunications enhancement. The level of expenditure for these other works is at a similar level to prior years and because of the relatively low level was not reviewed further.

Other Non-System Capex

The level of expenditure for other non-system capex is at a similar level to prior years and because of the relatively low level was not reviewed further.

8.3 Recommended Level of Non-System Capex

Having considered the factors reported in this section, we conclude that no adjustment is needed in the non-system capex proposed by ActewAGL for the purpose of this review.

[33] The regulatory asset base will be decreases in FY 2009 to reflect disposal of the asset.

9 Opex

9.1 Expenditure in Current Period

Table 9.1 summarises ActewAGL's opex in the current period and compares it with the expenditure in the determination plus the pass-through expenditure agreed to date.

Table 9.1: Opex in Current Period Compared to Determination ($ m nominal)

	Actual		Estimated			Total
YE 30 June	2005	2006	2007	2008	2009	
Determination	41	42	42	44	47	215
Pass through events	1	1	0	0	0	2
Opex in current period	38	40	42	46	51	217
Over-run / (under-run)	**(4)**	**(3)**	**0**	**2**	**4**	**(0)**
Over-run / (under-run) (%)	(9%)	(7%)	0%	5%	9%	(0%)

Source: ActewAGL

The table shows an increasing trend in expenditure with ActewAGL under-spending against the determination in the initial years of the current period and estimating that it will over-spend against the determination in the final years to be, on balance, consistent with the determination. ActewAGL said that the outcome primarily reflected the costs of meeting its safety and reliability obligations in an environment of generally rising costs. It said there the general growth in opex over the current period was driven by:

- real wages growth that out-stripped the CPI due to skill shortages;
- growth in the costs of materials used in operations and maintenance that significantly exceeded the CPI;
- growth in the number of the assets in response to development demands in the ACT;
- an ageing asset base , resulting in increased corrective and emergency maintenance;
- planned maintenance increases to contain and reduce reactive maintenance;
- the requirement for an enhanced pole inspection programme to deal with increased risks to safety from the aging asset base;
- additional vegetation and bushfire mitigation inspection and management programmes to address and mange the risks to electricity supply and the environment;
- additional overhead line maintenance – for example on pole tops, low conductors, and cross-arms – to address backlogs; and
- additional distribution substation and mini-pillar maintenance to address safety and access requirements raised by the technical regulator.

In addition, it said that there were emerging operational priorities during the period, including:

- a significant increase in required pole inspection and tree clearing expenditure (the forecast for the current period was $11.8 m but actual and expected expenditure has risen to $23.3 m;
- an increase in the apprenticeship, trainee, cadet and graduate programme from 33 staff in FY 2004 to 85 staff in FY 2009 (at the time of the last determination, ActewAGL's forecast for the current period was $6.7 m. The actual and estimated expenditure is $18.1 m);
- inclusion in the 2005 Enterprise Bargaining Agreement of a retention allowance for all electrical workers (this resulted in a total increase of $2.4 m in direct operating costs, albeit saving costs that would have otherwise been incurred in recruitment and training); and
- Increased scope of the "life guard" health, safety and environment management system (the cost of this measure increased in total by approximately $0.5 m.

ActewAGL said that despite the cost pressures and the emerging operational pressures arising during the period, ActewAGL has been able to re-prioritise and manage the costs, resulting in financial outcomes close to the regulatory allowance

9.2 Proposed Expenditure in Next Period

ActewAGL's proposed opex in the next period compared with that in the current period is shown in Table 9.2. [34]

Table 9.2: Current and Forecast Opex ($ m 2009)

	Actual			Estimated		Proposed				
YE 30 June	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Network operating	12	12	12	13	13	13	14	14	15	16
Network maintenance	10	12	12	13	16	17	17	17	17	16
Other expenditure	21	20	21	21	22	23	23	24	24	25
Total (excl UNFT)	**43**	**44**	**45**	**48**	**51**	**53**	**54**	**55**	**57**	**57**
UNFT	0	0	3	4	4	4	4	4	4	4
Total Opex	**43**	**44**	**47**	**52**	**54**	**57**	**58**	**59**	**61**	**61**

Source: ActewAGL.

The total expenditure proposed in the next period is $296 m, compared with an estimated $241 m in the current period, an increase of 23%. ActewAGL has stated that the reasons for increased level of expenditure are labour cost pressures, aging of the asset base, new obligations and a higher corporate management fee, resulting from the move from an owned to a leased property.

The UNFT (*Utility Networks Facilities Tax)* is a significant new tax that ActewAGL became liable for in FY 2007. The increase in total opex in the next period, excluding the impact of this tax is 20%.

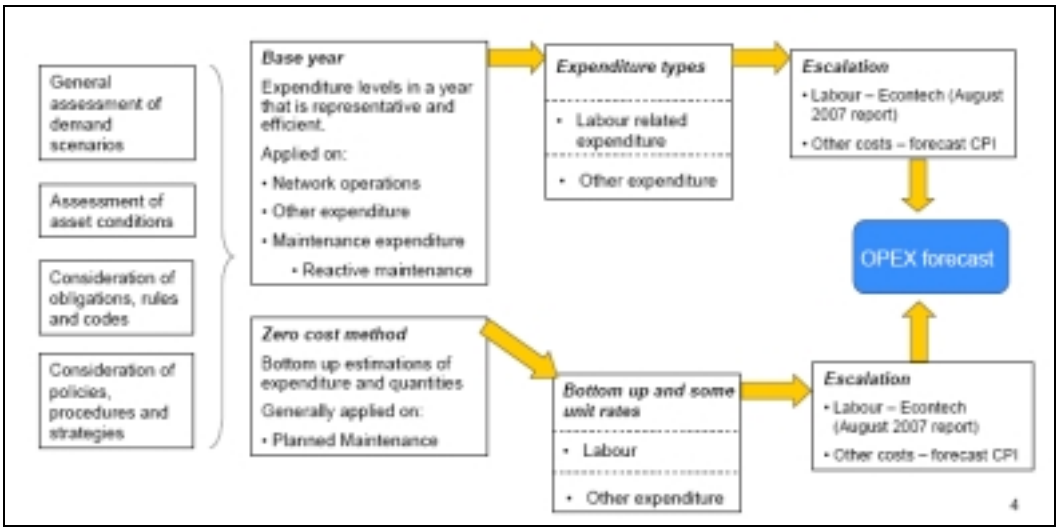
Basis of the Forecast

ActewAGL has used a combination of methods – escalation from the base year and a zero-based approach – to forecast its opex in the next period and the methodology is summarised in Figure 9.1. [35]

[34] The table excludes self-insurance, and debt and equity raising costs.

[35] Source: ActewAGL.

Figure 9.1: Forecasting Methodology for Opex



The "base-year" approach assumes a business-as-usual scenario and forecasts future opex requirements by escalating known and efficient historical expenditure levels. ActewAGL has selected FY 2007, the most recent year for which audited financial statements are available, as the base year. The expenditure categories that have been forecast using the base-year method are network operations, reactive maintenance and other expenditure.

Base-year expenditure is adjusted by removing any costs that will not be incurred in future years and adding any costs occurring from known step changes that will incur additional expenditure. On this basis, ActewAGL has adjusted the base-year costs for the increase in the apprentice training programme and the costs of the regulatory price review process (previously capitalised). No costs have been removed, since each of the other activities of the base year is expected to continue throughout the next period.

ActewAGL has used the zero-based method for expenditure categories in which it has identified step changes that are not reflected in historical expenditure levels. The zero base method involves making bottom-up estimates of the costs associated with these categories. ActewAGL has applied the zero-based method to planned maintenance expenditure.

ActewAGL has not adjusted its projected opex due to increases in network size, as it has assumed that it will capture economies of scale, despite it saying that the increase in the size of the asset base will cause cost increases.

Impact of External Factors

A significant new obligation is the Utility Networks Facilities Tax for which ActewAGL became liable in FY 2007.

Two other relatively minor step changes have been added to the base-year expenditure due to new obligations: $0.2 m to provide additional staff and vehicles for the on-site assessment of risks under the *Occupational Health and Safety (General) Regulations 2007* and $0.1 m from FY 2010 for an additional person and a database to meet a new obligation under the *Planning and Development Act 2007 (ACT)* to provide developers with information on the location of electricity assets. An allowance of $0.8 m has been made in each of the last two years of the next period for the costs of the price review for the following period.

Cost Escalation

ActewAGL has escalated its labour costs in accordance with Econtech's escalators described in section 5.5 and has used the CPI to escalate non-labour costs. [36] The proportion of labour cost in opex is approximately 70%.

Capex-Opex "Trade-Off"

The impact of replacement capex (or the lack of it) on opex was discussed by ActewAGL in its proposal. As ActewAGL observes, it is well understood that, other things being equal, the level of maintenance expenditure needed on a network will increase as the network ages. [37]

ActewAGL was not alone amongst the DNSPs in reporting a possible relationship between maintenance expenditure and asset age that had been developed by SKM for various DNSPs to provide an insight into the potential trade-off between replacement capex and maintenance expenditure. The relationship suggested by SKM is based in turn on the assumption of an exponential relationship between opex and age and was developed using two "known" points – the actual current level of opex (expressed as a percentage of the replacement cost of the assets) and the current average age of the assets, and an estimate of the level of opex applicable to new assets (that is, planned inspection and maintenance only, with no allowance for corrective or emergency maintenance). Whilst the modelling could theoretically be disaggregated to an asset class level, SKM found that very few utilities, including ActewAGL, had the data available for that to be done.

The modelling concludes with a graphical relationship between expenditure and age, from which marginal additional maintenance costs can be read for given movements in the average age of the assets.

In ActewAGL's words, the modelling suggested in its case that additional "operating and maintenance" expenditure amounts to approximately $1.4 m in FY 2008 dollars on average per annum over the next period although obviously as older assets are replaced, the required operating and maintenance declines.

Our view of the analysis is as follows.

- The relationship derived from the analysis is or ought to be restricted principally to maintenance costs and should not to be applied more widely, e.g. to opex as a whole or to opex categories unrelated to network condition.
- Quantitatively, the analysis begs the questions:
  - whether the present maintenance costs are efficient (this affects the second point on the graph that SKM produced),
  - whether the costs of maintaining new assets are comparable with those of maintaining old ones (this affects the first point on the graph and the relationship between the points), and
  - why the curve should be exponential. [38]
- The answers to the preceding questions are not clear.
- Although intuitively a relationship would appear to exist, evidence available to us from the New Zealand electricity supply industry suggests that direct costs may not

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[36] Corporate services labour is escalated at a different rate (5.5%), based on a weighted average of the escalation factors provided in a report provided to ActewAGL by Mercer.

[37] This is a consequence of deterioration of asset condition, the need for more frequent inspection and maintenance and an increase in the failure rate of assets in service.

[38] Exponential growth in expenditure of any type seldom occurs in reality.

increase *exponentially* with the average age of the network components, although they may be related to age in another way. [39]

ActewAGL confirmed that it had not incorporated the $1.4 m mentioned above into its opex projections, its commentary on the modelling intended solely to support its projected level of replacement capex and the increase proposed in planned maintenance derived from its bottom-up estimates.

9.3 Efficiency of Overall Expenditure ("Top-Down" Analysis)

Base-Year Opex

Before proceeding to a review of the proposed opex by category, we first considered the efficiency of the proposed base-year opex, using a "top-down" approach and the benchmarking methodology described in volume 1 of this report. Our objective was to help determine whether ActewAGL's opex in FY 2007 represented an efficient starting-point for the projection of opex in the following years. [40]

Adjustments were made to the FY 2007 reported figures of all companies to remove abnormal and one-off items. The only adjustment made for ActewAGL was the removal of the utilities network facilities tax.

The results of the benchmarking analysis are shown in section 3 of volume 1 of this report.

The comparisons suggest that ActewAGL's FY 2007 opex is around 20% above the industry norm.

As part of its submission, ActewAGL outlined a list of cost drivers that it considered unique to its business. [41] They included:

- back yard reticulation, resulting in significant access problems and higher costs of maintenance;
- access issues exacerbated by screen vegetation, planted by lessees around the boundaries of properties, that significantly increased the susceptibility of the network to outages and increased the complexity and cost of maintenance due to the need to provide notification in accordance with the *Utilities Act* (said to be further exacerbated by no-cooperative lessees causing additional cost through the need to get gates unlocked and animals restrained);
- planning decisions by governmental authorities in the ACT, aimed at minimising street "furniture" and keeping the network out of sight on the fringe of urban development areas, thereby increasing both capex and maintenance costs; and

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[39] We tested the assumption that there is an exponential relationship between direct maintenance cost and the average age of the network components by looking at New Zealand company data. New Zealand data was used due to its availability for all companies. Data for both 2005 and 2006 were tested with comparable results. We used total installed transformer capacity to normalise different network sizes. More complex regression formulae for network size were not considered warranted, based on the observed relationships between direct costs and up-to-date ODV fixed asset valuation data, all of which were available for all companies in the data set. The average network age was derived from the valuation data. From the dispersion of the points by type of network, we found that network type was a much stronger driver of cost. However, even within networks of the same general type, we found no obvious regression and, if anything, a direct linear relationship between direct costs and age seemed to have stronger trends.

[40] ActewAGL had provided some benchmarking information with its proposal but it was based on FY 2004 data escalated to FY 2007. We considered the FY 2004 data to be too old for our purpose.

[41] Section 8.4.1, p 184 of ActewAGL's regulatory submission

- the position of Canberra as the capital city with an accompanying expectation of a high level of security of supply, resulting in additional capacity being built into the network.

With the exception of the last of these, the cost drivers listed are maintenance-related and so we would expect them to be reflected in higher direct maintenance costs for ActewAGL. However, our analysis showed that it was not high *direct* maintenance costs that were driving ActewAGL's cost structure but high *indirect* costs, such as network operations and other opex. On a cost *vs.* size measure, ActewAGL's indirect costs in FY 2007 appeared to be more than double the average of the three NSW distributors. This appeared to be due at least in part to a relatively low level of allocation of overhead to direct maintenance and capital costs compared to the other DNSPs, which means less overhead may be capitalised in comparison to the other DNSPs. Additionally, ActewAGL leases its motor vehicles and computer equipment and that contributes to a higher level of opex compared to the other DNSPs, all of which own their vehicles and equipment.

ActewAGL noted that it is a small distributor in terms of customer numbers and network size but still has to bear fixed costs such as compliance and billing and thus is not able to achieve the same economies of scale as bigger distributors. However, our benchmarking did not suggest that there are significant economies of scale to be gained in the electricity distribution business. [42]

Movement in Opex from FY 2007

We then analysed the movements in opex that have taken place or are forecast by the ACT and NSW DNSPs to occur in the period from FY 2007 to FY 2014. The results are presented in section 3 of volume 1 of this report and are based on opex by size (which accounts for increases in the size of the businesses over the period). [43] The analysis is based on the reported expenditure and expenditure proposals of the DNSPs. [44] On the measure of opex by size, ActewAGL's expenditure in FY 2010 (the first year of the next period) is 15% above that in FY 2007 and by 2014 is 19% higher than the FY 2007 level.

If the effects of real labour cost escalation are removed as shown in Figure 9.2 (which is reproduced from volume 1), ActewAGL's FY 2010 "opex per size" is 6% above the FY 2007 level, the average over the next period is 1% higher than the FY 2007 level and by FY 2014, it is 4% below the FY 2007 level. This suggests that over the next period, ActewAGL's relative opex level improves from its FY 2007 starting position and thus moves closer to other DNSPs in the comparative group by the end of the period.

Summary of "Top-Down" Analysis

In summary, whilst we acknowledge that ActewAGL does experience some factors that could be considered to increase its opex in comparison to other DNSPs, [45] we have not been provided with evidence that they account for a cost structure that is around 20% above the industry norm. We therefore do not consider that ActewAGL has demonstrated that its base year is an efficient starting-point.

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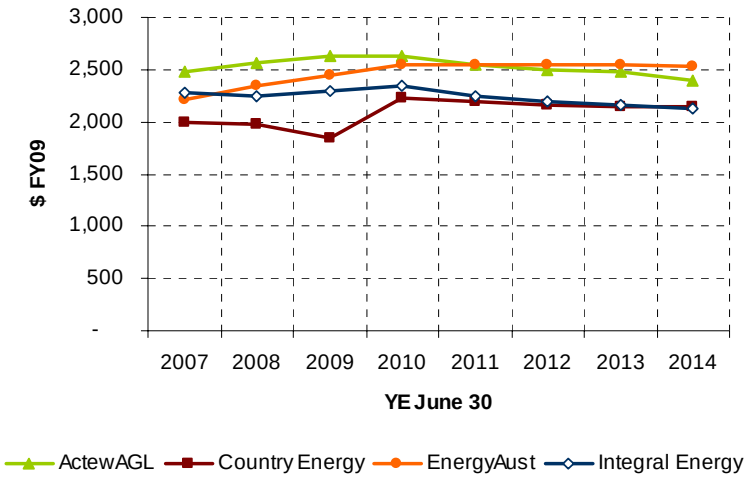
[42] There is nothing in the benchmarking work undertaken for this study or our experience in the New Zealand electricity distribution industry (where distribution is separated from retail and generation and there is there is a wide range in the size of distribution entities from under 10,000 customers to over 600,000 customers) to suggest the availability of economies of scale.

[43] It is appropriate to recognise that business costs will increase as the size of the business increases. We have used a composite size variable derived in volume 1.

[44] As in the case of the preceding analysis, abnormal and one-off expenditure was removed from the base year and the cost of debt- and equity-raising and self-insurance was excluded.

[45] E.g. leasing rather than ownership of some non-system assets and backyard reticulation

Figure 9.2: "Opex per Size" without Real Labour Cost Escalation



However, improvement in its relative position during the next period leaves ActewAGL in a better relative position at the end of the period to that in FY 2007.

9.4 Review by Category ("Bottom-Up" Analysis)

We then reviewed ActewAGL's proposed opex in the next period by category, as follows.

Network Operational Expenditure

Network operational expenditure consists of the costs associated with network management, operation, control, support services and planning. A summary of the actual and estimated expenditure for the current and next period is given in Table 9.3.

Table 9.3: Network Operational Expenditure ($ m 2009)

	Actual			Estimated		Proposed				
YE 30 June	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Network control	4	4	4	4	4	4	4	4	4	4
IT planning and operations	1	1	1	1	1	1	1	1	1	1
Network systems operations	2	3	3	3	3	3	3	3	3	3
Quality, environmental, safety	1	1	1	1	1	1	1	1	1	1
Executive & financial mngt	2	2	1	2	2	2	2	2	2	2
Other network operating	2	2	3	3	3	3	3	3	4	4
	12	**12**	**12**	**13**	**13**	**13**	**14**	**14**	**15**	**16**

Expenditure increases in this category in the current period has been driven by an increase in network systems operations costs and other network operating costs of $0.7 m and $0.9 m respectively. The cost increase in network systems operations is explained by the requirement for additional staff to deal with a significant increase in enquires for customer-initiated works – mainly network connection and modification advice for commercial and residential developments. There has also been an increase in expenditure on system switching due to the increase in customer-initiated works and asset replacement programmes.

Other network operating costs have increased due to the implementation of full retail contestability with additional operating costs arising, such as those associated with the management of customer transfers. There has also been a significant increase in the annual licence fee from the ICRC and the introduction of an energy industry levy in FY 2008 by the Government.

Expenditure in FY 2010 is forecast to be 9% above the base year, FY 2007, and total expenditure for the next period is forecast to be 13% above that in the current period.

ActewAGL used its "base-year" methodology to forecast network operating expenditure for the next period. The same split between labour and miscellaneous costs was maintained with labour cost escalators applied to the labour content and other costs held constant in real terms.

The only step increases identified in this category by ActewAGL are those related to new regulatory obligations and an allowance for costs in FY 2013 and FY 2014 associated with the next regulatory price review.

We have reviewed the basis of the estimates and found them to be consistent with the methodology outlined by ActewAGL, except for the category of executive and financial management. The increase in cost between the base year and the start of the next period in that sub-category is greater than the labour cost escalation rate but ActewAGL noted that this results from the creation of a team to oversee the capex programme. [46]

Maintenance Expenditure

ActewAGL's asset maintenance programmes are determined in accordance with the maintenance section of its asset management plan. Maintenance planning involves an analysis of maintenance needs against corporate objectives and service outcomes, identification of significant risks to the network, the development of maintenance strategies and control measures and the instigation of procedures to ensure adequate control of the implementation of the maintenance programme. Maintenance strategies are based on conventional procedures such as routine inspections and condition assessment, routine servicing when condition-based monitoring is not practical or possible, the evaluation of inspection and condition monitoring results and the analysis of faults. Exception-based maintenance is applied where maintenance is carried out only if an asset is reported as having the potential to affect the quality of supply to a customer or where a potential safety or environmental hazard is identified. [47]

The objective is to achieve an optimal balance between preventative and corrective maintenance.

Subordinate plans include a vegetation management strategy and plan and a bushfire mitigation strategy and management plan.

We reviewed the asset management plan and found the strategies and detailed inspection, condition monitoring and risk assessment processes to be typical of those that a prudent distribution operator would adopt.

Planned Maintenance

Planned maintenance expenditure consists of the costs associated with the inspection, scheduled preventative maintenance and scheduled repair of identified defects on the network. Scheduled preventative maintenance includes vegetation management. A summary of the actual and estimated expenditure for the current and next period is given in Table 9.4.

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[46] See Section 6.6.1 on p. 112 of ActewAGL's proposal.

[47] This approach is adopted only in a few asset categories such as distribution transformers where other maintenance would not be economic.

Table 9.4: Planned Maintenance Expenditure ($ m 2009)

	Actual			Estimated		Proposed				
YE 30 June	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Zone substations	2	1	2	2	2	2	2	2	2	2
Subtransmission	0	0	0	0	1	1	0	0	0	0
Underground distribution	0	0	0	0	0	0	0	0	0	0
Overhead distribution	5	6	6	7	7	8	8	8	8	7
Distribution station	1	1	1	1	2	2	2	2	2	2
	8	**8**	**9**	**9**	**12**	**13**	**13**	**13**	**13**	**12**

Source: ActewAGL.

The table shows that planned maintenance expenditure has increased over the current period and will increase further in the first years of the next period. Expenditure in FY 2010 is forecast to be 51% above the base year, FY 2007, and total expenditure in the next period is forecast to be 39% above that in the current period. The reasons for the increase in costs are as follows.

Ground-Mounted Distribution Assets: ActewAGL said that the technical regulator's audit of various ground-mounted distribution assets (substations and distribution pillars) in July 2007 had convinced it that a reactive approach to maintenance was no longer acceptable. It has instead sought to develop a condition monitoring approach, based around a five-yearly inspection and maintenance cycle. As a result, it has taken on additional contract resources and is building up in-house expertise through apprenticeships. It considers this necessary to meet its obligation sunder the *Management of electricity network assets code.* There is a resulting step increase in planned maintenance costs in FY 2009 and FY 2010.

Overhead Planned Maintenance: Overhead planned maintenance expenditure has increased throughout the current period due to costs associated with pole inspections and a programme for restoring access tracks to a usable condition after damage in major bushfires in December 2001 and January 2003.

Planned Maintenance for Substations: Planned maintenance for zone and distribution substations is forecast to increase in FY 2009 to bring the installations into compliance with current employee safety obligations. Developments in occupational safety and health standards mean that previously acceptable work methods or installation practices, e.g. in respect of pole substation platforms and in substations without protective personnel barriers, are no longer considered safe. Changes that are specific to particular activities or locations have resulted in modified access procedures, work methods and engineering controls. Examples are indoor substation safety rails and barriers, earthing tests at substations and the need for earth mat repairs and extensions.

Planned Overhead Maintenance: An increase in FY 2010 of $0.9 m in planned overhead maintenance expenditure is attributable to the increased effort associated with pole inspections. Examples include pole-top and cross-arm maintenance and the installation of vibration dampers and low voltage network line spreaders.

Planned maintenance expenditure on sub-transmission assets is expected to decrease after the completion of the track maintenance work and planned maintenance costs for zone substations, distribution substations and underground assets is forecast to be stable throughout the period.

The expenditure on planned maintenance has been forecast using a zero-based approach due to the number of step changes in the programme. Labour cost escalators have been applied but other costs have been held constant in real terms.

We reviewed the maintenance plans included in the asset management plan, including their budgeted cost, and found that the proposed work programmes were consistent with ActewAGL's policies and that the expenditure proposed was consistent with the schedule of works in the asset management plan. The time allowances for the various tasks were reviewed and considered reasonable. We consider that the increases in planned maintenance are justified and based on prudent network management practice.

Reactive Maintenance

Reactive maintenance expenditure consists of the costs associated with responding to and effecting repairs to faults or damage on the network. A summary of the actual and estimated expenditure for the current and next period is given in Table 9.5.

Table 9.5: Reactive Maintenance Expenditure ($ m 2009)

	Actual			Estimated		Proposed				
YE 30 June	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Zone substations	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2
Subtransmission	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Underground distribution	1.1	1.6	1.2	1.3	1.3	1.3	1.3	1.3	1.4	1.4
Overhead distribution	1.4	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.3	2.3
Distribution station	0.1	0.1	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2
	2.7	**3.8**	**3.6**	**3.6**	**3.7**	**3.8**	**3.9**	**4.0**	**4.1**	**4.1**

Source: ActewAGL.

ActewAGL has used a "base-year" methodology to forecast its reactive maintenance expenditure for the next period. The split between labour and miscellaneous costs has been maintained at the level in the current period. Labour cost escalators have been applied but other costs have been held constant in real terms.

We reviewed the basis of the estimates and found that they were consistent with ActewAGL's methodology and historical expenditure levels. We considered them reasonable.

Other Operating Costs

Other operating expenditure consists of those costs from the allocation of corporate overheads, costs of services provided by ActewAGL retail which include customer service and billing functions, and some direct network related business costs. The cost of non-recoverable apprentice training labour is included under this heading. A summary of the actual and estimated expenditure for the current and next period is given in Table 9.4.

Table 9.6: Actual and Forecast Forecast Other Operating Costs ($ m 2009)

	Actual			Estimated		Proposed				
YE 30 June	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Advertising & marketing	1	1	1	1	1	1	1	1	1	1
Corporate management fee	12	10	10	9	9	11	11	12	12	12
Services: ActewAGL Retail	2	2	2	2	2	2	2	2	2	2
Apprentice training programme	1	3	4	5	5	5	5	5	5	6
Business overheads	4	3	2	2	3	2	2	2	2	2
Regulated misc charges	1	1	1	1	1	1	1	1	1	1
External business expenditure	(0)	0	(0)	0	0	(0)	(0)	(0)	0	0
	21	**20**	**21**	**21**	**22**	**23**	**23**	**24**	**24**	**25**

Source: ActewAGL.

Expenditure has remained almost constant over the current period. An increase in the size of the apprenticeship programme has resulted in rising costs, which have been offset by a

reduction in the corporate management fee. Expenditure in FY 2010 is proposed to be 9% above the base year, FY 2007, and total expenditure for the next period is forecast to be 13% above the current period.

The "base-year" methodology has been used for establishing the next period forecasts with only labour escalators applied. There are two step-changes between the base year and the first year of the next period. The corporate management fee increases due to the lease costs of the new corporate headquarters and there is a further increase in apprenticeships.

We have reviewed the basis of the estimates and found that they were consistent with the methodology outlined by ActewAGL. However, other operating costs account for 43% of total opex, which we consider high in comparison to the industry norm. We thus cannot consider the expenditure reasonable. We do not have sufficient information to recommend a specific adjustment but take account of this consideration when recommending the overall level of opex.

9.5 Recommended Level of Opex

In summary, ActewAGL's proposed opex has been reviewed in this section from a "top-down" and "bottom-up" standpoint. The analyses show the following.

- ActewAGL has not demonstrated that its base-year opex is efficient.
- The bottom-up analysis found that the number of step changes applied to base-year opex is small and each is considered reasonable.
- The major change in expenditure is due to an increase in planned maintenance but this has been budgeted using a zero-based approach related to changes in the scope of planned work. It is not based on the base-year level of opex and its reasonableness is thus not contingent on acceptance of the base-year opex.
- Other operating costs comprise an unusually high proportion of total opex.
- ActewAGL's relative position in relation to other DNSPs improves over the next period, indicating relative efficiency gains.

After considering both the "bottom-up" and "top-down" analyses, we accepted that improvements in efficiency will be made over the next period and concluded that the proposed opex should be accepted without adjustment.

10 Other Matters

10.1 Metering Expenditure

We understand that the only alternative control service provided by ActewAGL is metering. ActewAGL's proposed capex and opex for this service in the next period compared with that in the current period is shown in Table 10.1.

Table 10.1: Metering Expenditure ($ m 2009)

	Actual			Estimated		Proposed					Total in	Pct over
YE 30 June	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	'10-14	05-09
Capex	1	1	2	3	3	6	3	3	3	3	19	76%
Opex a/	1	1	2	2	2	2	2	2	1	2	8	12%

Source: ActewAGL.

The table shows that capex is forecast to increase in the next period by 76% in real terms and that opex is forecast to increase in the next period by 12% in real terms. The increase in capex from FY 2010 onwards is attributable to meter replacement expenditure and to a multi-utility smart metering trial project called "MIMI". Additional opex of around $0.4 m is associated with the project in the first year. Other than in this respect, ActewAGL said that the projections based primarily on historical expenditure levels with small adjustments for domestic meter installations reflecting the anticipated level of activity in new urban development, urban infill development and commercial and industrial development.

The total cost of project MIMI is understood to be $7 m, with the majority of it being incurred in FY 2009 and FY 2010. The costs included for MIMI are consistent with the ICRC's implicit view that the AER should allow the recovery of $2.8 m in expenditure for the electrical part of the project. [48]

Meter reading costs have been increased in line with the CPI. Other costs have been increased using the same methods as in the main capital expenditure projections.

The cost of smart metering is excluded, other than in respect of the MIMI trial.

In summary, the level of capex was explained to our satisfaction and the level of opex was found to be similar to prior years, and so, given their relatively low levels, they were not reviewed further. [49]

10.2 Scope of Self-Insurance

It is common for electricity network businesses to carry their own insurance in certain respects, particularly where the risk of widespread loss is considered minimal, the premium for insurance is high or the deductibles or conditions attached to insurance cover make it worthless. We noted that ActewAGL had engaged Saha International to advise on its main self-insured risks and that the risks identified were:

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[48] Recognising the Government's announcement in October 2007, the ICRC in its April 2008 final decision for ACTEW Corporation suggested cost recovery for project MIMI on a 40:40:20 basis – that is, 40% electricity, 40% water and 20% gas. On this basis, the ICRC made an expenditure provision for ACTEW Corporation of $2.8 m in expenditure for the project in FY 2009.

[49] The prudence of metering capex in the current period has already been reported in section 3.3.

(a) the theft of assets,
(b) earthquakes of less than a certain magnitude,
(c) counter-party credit risk,
(d) general public liability,
(e) bushfires and
(f) the failure of poles, lines, transformers and circuit breakers.

The assessment of these risks appears to be outside our field and so they have not been reviewed. We note only that it is the prerogative of owners to determine their own risk appetite. [50]

We did not review the financial provisions associated with self-insurance but noted ActewAGL's confirmation that self-insurance costs had not been included in the base year (FY 2007) opex expenditure reported by the company. [51]

10.3 Opex Deemed Uncontrollable in Benefit-Sharing Scheme

We understand that the AER has developed an efficiency benefit-sharing scheme to apply to the ACT and NSW DNSPs and that the purpose of the scheme is to allow incremental opex efficiency gains or losses made during the next period to be carried over for five years after the year in which they were made, providing an incentive for DNSPs to improve the efficiency of their opex.[52] Four cost categories are excluded from the scheme: changes in capitalisation policy, differences between forecast and actual demand growth over the period, recognised pass-through events and non-network alternatives.

The AER has allowed the DNSPs to propose additional cost categories for exclusion from the scheme and ActewAGL has proposed the following:

(a) self-insurance costs,
(b) debt raising costs,
(c) the cost of additional pass-through events and
(d) UNF tax payments.

We considered the proposals solely from the standpoint of whether the costs are uncontrollable. We considered that they should meet a high threshold in that sense, as the pressure on DNSPs to minimise costs efficiently in any reasonable changing circumstance ought not to be diluted.

On that basis, we consider that the UNF tax payments would qualify for exclusion as the costs are completely outside the control of ActewAGL but in principle we do not see why self-insurance or debt-raising costs would qualify unless there is something in the rules that indicates this or the method of calculation of the allowance for these is determined externally by, say, the regulator. The additional pass-through events proposed by ActewAGL for exclusion from the scheme are those assumed to be identified in section 10.4 below. Of them, only those accepted by the AER for pass-through should be exempt from the scheme.

Expenditure to Address Backlogs

For the AER's guidance, we also suggest that care is taken when defining the scheme to exclude expenditure relating to backlogs of work from the base year as any such expenditure should not form part of the opening balance in the calculation of future benefits.

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[50] Wilson Cook & Co does not advise clients on insurance matters.

[51] Correspondence, dated 7 August 2008.

[52] The scheme does not apply to capex or distribution losses.

10.4 Additional Cost Pass-Through Events

Four general types of cost pass-through event are provided for in the Rules: regulatory change, service standard events, tax changes and instances of terrorism. [53] However, a DNSP may nominate additional cost pass-through events to apply in the next period and ActewAGL has proposed the following five:

- major natural disasters,
- transitional period events (*viz.* events occurring prior to the commencement of the next period but after ActewAGL's proposal was lodged),
- a "smart" meter event (essentially, a mandatory requirement to introduce "smart" meters), input price events (essentially, a proposal to index future expenditure for movements in the cost of materials, but not labour), and
- supply curtailment events (essentially, events relating to the recovery of distribution network revenue lost during periods of bulk power supply interruption).

As a general principle, we suggest that additional pass-through proposals are not to be recommended unless they are of a type that a prudent DNSP would not normally provide for in its expenditure estimates. We suggest that such proposals should meet a high threshold in that respect. In essence, we suggest that the potential events ought to be exceptional in nature. Normal or foreseeable business risks, including risks that an owner of the business ought to bear, should be excluded.

In that context, and dealing with the only proposal that appears to fall within our field –smart metering – we make the following observations.

ActewAGL defines a "smart" meter event as the imposition of a requirement to replace existing meters used to measure the consumption of electricity by distribution customers with meters that measure the consumption of electricity at specific time intervals and which are capable of being remotely read (commonly referred to as 'smart meters'), either on a pilot basis or as part of a wider roll out, which has a material impact on the cost of providing direct control services by ActewAGL which would not have occurred in the absence of the mandatory roll out.

The definition appears reasonable, although it ought to exclude the MIMI project, for which expenditure has been allowed in ActewAGL's estimates.

However, with some exceptions, the case for compulsory installation of these meters has not yet been made in Australia or elsewhere. It would be regrettable, therefore, if acceptance of this item as a pass-through removed the incentive for DNSPs to argue against it, if they do not consider the expenditure beneficial. Of course, there would be no choice if it were legislated – but there may be provision for pass-through under that heading already.

We suggest that the matter is one for resolution by discussion between the AER and ActewAGL.

Other Possible Pass-Through Events

Finally, we were also asked to say whether any other expenditure categories or items in the main capex projections would be more appropriately treated as pass-through events but no such cases were evident to us.

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[53] We understand that the Rules provide for an insurance pass-through event in the case of transmission determinations.

11 Conclusion and Recommendations

11.1 Opinion

Having considered the information received from ActewAGL and the factors required to be considered as summarised in this report, and based on that information, the representations made to us by ActewAGL and our own experience, our opinion in respect of ActewAGL's expenditure is as stated below.

(a) ActewAGL's capex from 1 July 2004 to 30 June 2009 including in respect of metering is considered to have been prudent – see sections 3.3 (system and non-system capex) and 10.1 (metering expenditure) of this volume.

(b) ActewAGL's proposed capex from 1 July 2009 to 30 June 2014 including in respect of metering is considered to be prudent and efficient – see sections 7.3 (system capex), 8.3 (non-system capex) and 10.1 (metering expenditure) of this volume.

(c) ActewAGL's proposed opex from 1 July 2009 to 30 June 2014 including in respect of metering is considered to be prudent and efficient – see sections 9.5 (opex) and 10.1 (metering expenditure) of this volume.

(d) We have no reason to suppose that ActewAGL will be unable to carry out its proposed programmes through a lack of resources – see section 7.2.

11.2 Matter for the AER's Consideration

In concluding this volume of the report in respect of ActewAGL, we would like to note the following matter for the AER's consideration.

Cost of Unsatisfactory "Back Yard" Overhead Reticulation

An unsatisfactory feature of ActewAGL's network is the presence of a considerable amount of "back yard" overhead reticulation that requires pole replacements and is difficult to access. This is a driver of a considerable amount of costly pole replacement capex. This design is not peculiar to Canberra but thankfully is rare. It is regrettable that the design was used in the first place and more regrettable that a considerable amount of money is now to be applied to remedy the deficiencies of its aged components.

It may be a better long-term solution to replace the back yard reticulation with new reticulation in the street but we understand that ActewAGL's preliminary analysis had indicated that broad-scale undergrounding would not be financially viable. Therefore, unless a customer levy or subsidy can be made available, the legacy of this unfortunate design will be perpetuated. If the AER is able to address this situation, it might consider doing so.

11.3 Conditions Accompanying Our Opinion

Assessment Not an Assessment of Condition, Safety or Risk

Notwithstanding any other statements in this report, this review is not intended to be and does not purport to be an assessment of the condition, safety or risk of or associated with the assets and nothing in this report shall be taken to convey any such undertaking on our part to any party whatsoever.

All Earlier Advice Superseded

For the avoidance of doubt, we confirm that this report supersedes all previous advice from us on this matter, whether written or oral, and constitutes our sole statement on the matter.

Disclosure

Wilson Cook & Co Limited has prepared this report in accordance with the instructions of its client on the basis that all data and information that may affect its conclusions have been made available to it. No responsibility is accepted if full disclosure has not been made. No responsibility is accepted for any consequential error or defect in our conclusions resulting from any error, omission or inaccuracy in the data or information supplied directly or indirectly.

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Non-Publication

With the exception of its publication by the AER, in relation to its review of ActewAGL's expenditure proposals, neither the whole nor any part of this report may be included in any published document, circular or statement or published in any way without our prior written approval of the form and context in which it may appear.