The Australian Energy Regulator

Review of Proposed Expenditure of ACT & NSW Electricity DNSPs

Volume 4 – Country Energy

Final

October 2008

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Advisers and Valuers

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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 4 – COUNTRY ENERGY

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 Country Energy'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 as follows.

(a) Country Energy will over-spend against IPART's determination for capex (inclusive of the pass-through allowance) in the current period. The principal reasons given for the overrun in capex were real cost increases in both labour and materials and the need to carry out more work than allowed for in the determination.

(b) Country Energy has deferred opex to keep within the determination inclusive of the pass- though allowance. It advised us that the need to defer work has meant that much of the additional work allowed for in the current period as part the cost pass-through will not be completed by the end of the current period. Expenditure for those programmes and to address a backlog is included in the next period.

(c) We note that at the time of the last determination, Country Energy was a relatively new organisation and may not have had the systems and knowledge to justify an appropriate level of expenditure. Country Energy's position in the comparative analysis and its over-expenditure in the current period

relative to the determination suggest that the level of opex allowed for in the current period may not have been sufficient for it to undertake a prudent level of work.

(d) Country Energy's proposed capex and opex from 1 July 2009 to 30 June 2014 are both substantially above the levels in 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.

(e) In respect of system capex, the increase in the scope of work is driven by three principal factors: growth, the need to comply with the NSW licence conditions for supply security and reliability and the need to increase the rate of replacement of aged network assets. For example, there is a seven-fold increase in expenditure on sub-transmission growth-related capex, most of which is to meet the security standards of the licence conditions, and there is a large increase in reliability-related capex to meet the reliability targets in the licence conditions. Also, forecast replacement-related expenditure on sub-transmission lines shows, on average, around a five-fold increase from the level in years FY 2007 to 2009, reflecting the work required to replace aged but important assets. On top of this, a considerable volume of work that has been categorised as reliability-related appears to amount, in effect, to an acceleration of Country Energy's replacement programme and would have been better categorised as such.

(f) We have concluded that the system capex programme proposed is reasonable in both scope and cost except that a correction is needed to remove a small non-capex item. However, from both a "top-down" and "bottom-up" perspective, the proposed level of non-system capex appears too high. We have therefore proposed adjustments in that expenditure category.

(g) The increase in the scope of opex is driven partly by increases in maintenance to meet the reliability targets in the licence conditions, particularly the individual feeder standards. We have concluded that the opex proposed is reasonable in both scope and cost, except for the growth of vegetation management volume over the period. We have proposed an adjustment in that item.

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 Country Energy in the preparation of this report.

Yours faithfully,

Wilson Cook & Co Limited

Encl.

Review of Proposed Expenditure of ACT & NSW Electricity DNSPs

Volume 4 – Country Energy

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 4, we review the proposed expenditure of Country Energy 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 Country Energy to the AER and on supplementary information prepared by Country Energy 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 Country Energy and the AER in the preparation of this volume of the report.

2 Background

2.1 Business Profile

Country Energy was formed in 2001 by the merger of Advance Energy, Great Southern Energy and NorthPower. This was followed by the amalgamation of Country Energy and Australian Inland Energy in 2005. There has been no change to the company's composition since 2005. Country Energy operates a large, extensively rural, electricity distribution network that extends across NSW and into parts of Queensland, Victoria and the ACT. It also has a retail business that includes natural and bottled gas, internet services, and energy and water management solutions.

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 sub-transmission network operates at 132 kV, 110 kV, 66 kV and 33 kV and is characterised by long circuits serving regional centres and isolated towns across the State.
(b) It takes its supply from TransGrid bulk supply points, power stations within the State and adjacent DNSPs.
(c) The network includes over 330 zone and sub-transmission substations with transformer capacities ranging from 1 to 180 MVA.
(d) The distribution network operates at 33 kV, 22 kV, 11 kV, 6.6 kV and low voltage with single wire earth return (SWER) at 19.1 kV and 12.7 kV in remote rural areas.
(a) The network is mostly overhead with over 99% of distribution substations pole-mounted.
(b) Designs at each voltage level are mixed, reflecting the origins of the business. Most appear to be conventional with the exception of the sub-transmission system in Wagga Wagga. [2]
(c) The physical condition of the network is understood to be commensurate with age.

The key network statistics are shown in Table 2.1.

Table 2.1: Key Network Statistics (Approximate)

Service area (sq km)	737,000
Total system length (km)	200,000
Pct of network underground	3%
Zone substations	330
Distribution substations	130,000
Pct pole mounted distribution substations	99%
Number of poles	1,400,000

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

[2] The sub-transmission system at Wagga Wagga is to be modified in the next period to meet the licence conditions.

Number of street lights	142,000
Total customers	771,000
Pct residential customers	84%
Energy distributed (GWh)	12,000
Maximum peak demand (MW)	2,250
Customers / line km	3.9
Load density (kW / line km)	11.3

Source: Country Energy.

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. [3] The figure shows that significant growth in the network took place in the 1950s and 1960s and that a reasonably uniform rate of investment has been maintained since. The weighted average age of the assets is around 27 years but an estimated 18% of the network by replacement value is 45 years of age or older and thus near the end of its life. This supports Country Energy's view that it should be accelerating its rate of asset replacement.

Figure 2.1: Indicative Age Profile of the Assets

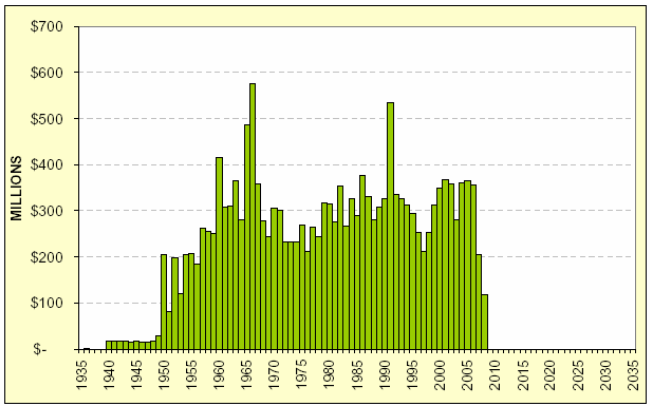


Table 2.2 shows the ages of assets in the main categories and Figure 2.2 illustrates the age profile of key assets – sub-transmission and distribution lines, substations and transformers. Expenditure in these categories accounts for around 87% of the total forecast replacement capex in the next period.

Table 2.2: Age of Main Asset Categories

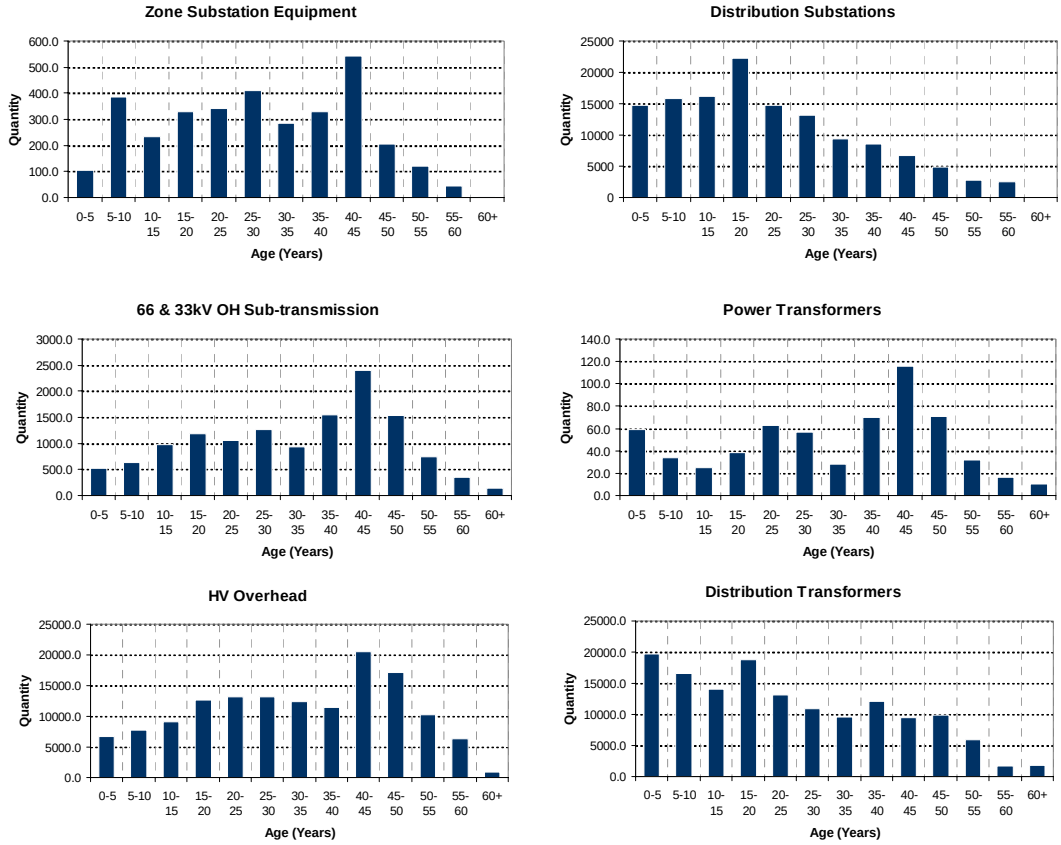
Asset Category	Standard Life a/ (years)	Age as pct of Life
132 kV OH sub-transmission	60	46%
66kV and 33 kV OH sub-transmission	53	61%
Zone substation equipment	47	57%
Power transformers	50	53%
Distribution substations	44	59%

[3] Source: Country Energy.

Distribution transformers	41	56%
HV overhead	52	60%
LV overhead	51	61%
HV underground	60	40%
LV underground	60	40%
Equipment	32	61%

Source: Country Energy.
a/ Standard life as used by Country Energy.

Figure 2.2: Age Profile of Main Asset Categories



Network Performance

Reliability

Network reliability in terms of SAIDI is shown in Table 2.3. The average SAIDI for urban and short rural feeders displays a slight improvement and downward trend over the period FY 2003-07 but the SAIDI for long rural feeders shows large yearly variation and no consistent trend. [4]

[4] This may be attributable to the wide spread of Country Energy's network, which results in storms not being eliminated from the statistics as, individually, they do not affect a sufficiently large proportion of the network as a whole.

Table 2.3: Network Reliability – SAIDI a/

YE 30 June	2003	2004	2005	2006	2007	Target
Urban feeders	163	124	158	109	114	125
Short rural feeders	338	293	276	317	239	300
Long rural feeders	418	373	625	578	497	700
Overall SAIDI	306	262	299	304	242	

Source: Country Energy.
a/ Adjusted for excluded interruptions and data corrections.

Details of the network's performance are given in Appendix E to Country Energy's proposal, its network asset management plan, from which we noted that in FY 2006 and 2007, urban, short rural and long rural feeder SAIDI levels were all within the standard set by the licence conditions and lower than the targets set for FY 2011 onwards. [5] However, Country Energy advised us that it has a large number of feeders that do not meet the individual feeder standards in the licence conditions and addressing that matter is a major driver of the increased expenditure evident in its reliability capex and opex proposals, particularly in relation to vegetation management in opex.

It plans to maintain its service levels compliance with the licence conditions and improve its reliability and quality of supply in under-performing areas of the network and on average over the entire network.

Fault Rates (HV Distribution Mains)

Network performance in terms of fault rates per circuit-km p.a. for Country Energy's high voltage distribution mains is shown in Figure 2.3. [6] [7] [8] [9] The figure shows (within the limits of such analysis) that Country Energy's susceptibility to faults on its overhead network is comparable with New Zealand and UK experience and generally less than other NSW DNSPs.

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5 The NSW licence conditions for reliability and security of supply, as amended in December 2007.

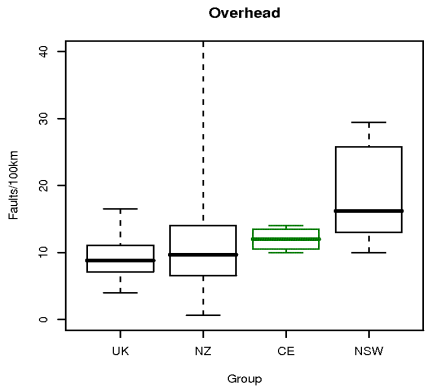
6 Sources: published data from the Office of Electricity and Gas Markets in the UK for the period 2002 to 2006; published data in respect of New Zealand lines businesses for 11 kV distribution circuits for the period 1998 to 2007 (may include 22 kV and 6.6 kV distribution circuits); and data from the NSW DNSPs supplied for the purpose of this review. The boxes show the upper and lower quartiles about the marked median value. The wide range of the data in the New Zealand case reflects the large number of companies involved (around 30) compared with the small number of companies in the UK.

7 The statistics are for faults from all causes.

8 We prefer the analysis of fault rates when considering the robustness of replacement expenditure projections, as they are more indicative of condition than customer performance indices such as SAIDI, which are affected by other factors and disguised to a degree by the removal of adverse weather events, the withstanding of which are a normal requirement of networks. (It is admitted that fault rates are also influenced by factors other than condition, e.g. by vegetation management and motor vehicle accidents, but in respect of storm damage they do reflect the robustness of the circuits and implicitly their general condition.)

9 The Country Energy fault data does not distinguish overhead and underground faults but only 2% of its network is underground. Country Energy also notes that the breakdown between HV and LV is not accurate in earlier years and, prior to FY 2007, many single customer outages were not captured.

Figure 2.3: HV Distribution Mains Faults in Comparison with Other DNSPs



If fault classifications other than "condition" are removed, Country Energy's position is as shown in Table 2.4.

Table 2.4: HV and LV Distribution Mains Fault Rates Attributable to Condition

YE 30 June	2005	2006	2007	2008
HV overhead mains	8,165	7,947	7,945	7,943
LV overhead mains	8,161	7,555	7,293	6,235

Source: Country Energy.

Within the limitations of the data accuracy, the table shows a flat trend for high voltage faults and a gradually decreasing trend in low voltage faults.[9]

2.3 Summary of Expenditure Proposed

Table 2.5 summarises the expenditure proposed in the next period. Country Energy has proposed capex and opex of $4,008 m and $2,116 m respectively. This represents an increase of $1,786 m or about 80% over the current period for capex and an increase of $625 m or about 42% over the current period for opex.

Table 2.5: Expenditure Proposed ($m 2009)

Period (FYs)	**2005-09**	**2010-14**
Capex a/	2,222	4,008
Opex b/	1,491	2,116

Source: Country Energy.
a/ Excluding expenditure funded by customer capital contributions but including revised figure for non-system capex for FY 2010-14.
b/ FY 2010-14 opex excludes $44 m of debt raising and self-insurance costs.

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

3 Capex in Current Period

3.1 Summary of Expenditure

Table 3.1 summarises Country Energy'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	244	249	251	258	265	1,267
Pass-through expenditure	0	0	126	131	134	391
Capex in current period	271	347	437	474	576	2,105
Over-run / (under-run)	**27**	**99**	**59**	**85**	**176**	**446**
Over-run / (under-run) (%)	11%	40%	16%	22%	44%	27%

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

The table shows that Country Energy's capex is projected to be 27% over the level allowed by IPART in its determination. The main reasons given by Country Energy for the over-spending were:

- the low level of the approved regulatory allowance; [10]
- higher-than-expected renewal capex due to the deteriorating condition of assets and the increasingly ageing asset base;
- real price increases in the cost of materials and labour and increased market rates for external contractors;
- insufficient capex allowed in the determination for the former Australian Inland Energy (which was merged with Country Energy in 2005);
- implementation of further security measures led by Governmental initiatives and the Energy Supply Association of Australia's guidelines;
- increased costs of land and easement acquisition particularly in populated areas;
- increased non-system expenditure, primarily to support the additional employees needed for the expanded capital works and maintenance programmes; [11] and
- a higher-than-anticipated rate of customer connections and peak demand growth, including an accelerated shift to summer peaking in parts of the network.

We did not review Country Energy's capex in the current period further, given a review of its prudence was not required, although we do consider past levels under each expenditure heading for comparative purposes.

[10] A late request from Country Energy for an additional $75 m of capex for "further new expenditure identified" was not agreed to by IPART or us, because of the lack of supporting evidence available.

[11] This support includes new accommodation, field service centres, IT systems and facilities, ancillary equipment, etc and expansion of the vehicle fleet.

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:												
Asset renewal/replacement	59	77	101	112	112	137	153	164	172	181	806	20%
Growth a/	72	94	187	199	198	247	272	288	299	311	1,417	35%
Reliability and quality of service enhancement	58	94	66	66	127	164	177	183	186	189	899	22%
Environmental, safety, statutory obligations	18	24	12	12	13	35	39	41	43	45	203	5%
Other	0	0	0	0	0	0	0	0	0	0	0	0%
	207	**288**	**366**	**389**	**451**	**584**	**642**	**675**	**699**	**725**	3,325	83%
Non-system assets b/	102	92	103	98	124	168	137	130	123	125	683	17%
	309	**381**	**469**	**487**	**576**	**752**	**779**	**806**	**822**	**849**	4,008	100%

Source: Country Energy.
a/ Net of work funded by customer capital contributions.
b/ Includes updated figures provided by Country Energy for non-system capex in FY 2012-14.

The total expenditure proposed, including on non-system assets, is $4,008 m, compared with an estimated $2,222 m in the current period, an increase of 80%. The increases are mainly in growth, replacement and reliability-related capex, the largest categories. These are discussed in sections 5, 6 and 7 of this report respectively. Growth capex is forecast to increase by 89% over the current period whilst replacement capex increases by 75% and reliability capex by 119%. Expenditure related to environmental, safety and statutory matters increases by 154% but is only 5% of the total. It is discussed in section 7.

Table 4.2 shows the same expenditure by asset type for system assets, where around a third is allocated to sub-transmission work and two-thirds to distribution. Non-system capex, which accounts for 17% of total capex, is discussed in section 8.

Table 4.2: Current and Forecast System Capex by Asset Type ($ 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
Substations	106	63	112	119	119	97	108	114	119	124	561	17%
Sub-transmission lines and cables	23	4	18	19	19	89	98	103	107	112	509	15%
HV distribution lines and cables	98	142	155	165	222	295	323	338	348	359	1,662	50%
LV distribution lines and cables	14	(0)	13	14	14	13	14	15	15	16	72	2%
Distribution transformers	7	2	35	38	38	40	45	48	50	52	235	7%
Customer metering and load control	12	1	17	18	18	23	25	27	28	29	132	4%
Communications	4	1	4	5	9	4	4	4	4	4	20	1%
Land	0	0	12	12	12	23	26	27	28	29	133	4%
Other system assets	(56)	75	0	0	0	0	0	0	0	0	0	0%
	207	**288**	**366**	**389**	**451**	**584**	**642**	**675**	**699**	**725**	3,325	100%

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

4.2 Basis of Expenditure Forecasts

The basis of Country Energy's expenditure forecasts is set out in its proposal, network asset management plan and metering asset management plan. [12] The key drivers of expenditure in the next period are identified as:

- augmentation of the network in high growth areas, such as the north eastern region and the south eastern coastal region,
- the need to comply with the licence conditions for reliability and security of supply, and
- the replacement and renewal of aging assets (including new renewal programmes for zone substations and transformers, aged customer services, air-break switches, dropout fuses and other items).

Country Energy states that it is "seeking an increased level of sustainable expenditure in order to deliver the intended capital work programmes" and that the proposed capex "will result in our customers continuing to receive a highly reliable, safe, secure, value-for-money and quality service".

It considers that it has applied "robust engineering models that predict aggregate asset replacement and distribution network growth-related capex requirements, based on an analysis of asset condition, risk and age, and forecasts of growth. It said it has adopted a "pragmatic and rigorous 'bottom-up' approach to the analysis of major projects, typically at the sub-transmission and zone substation level, and for some areas, at a high voltage distribution feeder level, using the best available information, detailed planning and the application of risk management techniques". It said that expenditure at the distribution network level had generally been assessed using a 'top-down' approach that aggregated the various investment requirements at that level. It said that the individual projections were then coordinated. It noted that the forecasts have been prepared on the basis that current technical standards and accepted industry practice will continue to apply during the next period.

We noted that Country Energy has applied productivity savings to its cost estimates, based on a review of its future resource requirements, and we discuss these in the following sections of this report in conjunction with our review of the planned expenditure. The savings amount to $48 m in total, of which $32 m is applied to capex and $16 m to opex. [13]

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[12] See also p. 16 of this volume and the appendices to the proposal.

[13] The capex estimates stated in Country Energy's RIN templates differ from those in its proposal and those in its network asset management plan. On investigation, we found that the network asset management plan estimates do not incorporate the foreseen productivity savings (or the effects of work programme phasing, new corporate allocations or real escalation and are in FY 2007 dollars); the proposal estimates do incorporate the productivity savings but as a line item not as an allocation to separate expenditure categories; and the RIN reflects the expenditure after allocation of the productivity savings.

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 35% 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	2007	2008	2009	2010	2011	2012	2013	2014	'10-14	Total
Sub-transmission lines and cables	9	10	11	69	76	81	84	87	397	28%
Distribution lines and cables	71	78	80	72	79	84	87	91	413	29%
Substations	60	67	69	54	59	63	65	68	309	22%
Transformers	17	19	20	18	20	21	22	23	106	7%
Low voltage lines and cables	6	7	7	6	7	7	7	8	35	2%
Customer metering and load control	4	4	5	4	4	5	5	5	23	2%
Communications	0	0	0	0	0	0	0	0	0	0%
Land	3	4	4	4	5	5	5	5	24	2%
Easements	3	3	3	19	21	22	23	24	110	8%
	174	**193**	**198**	**247**	**272**	**288**	**299**	**311**	1,417	100%

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

The total expenditure proposed is $1,417 m, compared with an estimated $750 m in the current period, an increase of 89%.

The table shows that 67% of the proposed expenditure is on sub-transmission circuits, zone substations, transformers, land and easements and the remaining 33% is on distribution circuits and customer connections.

Forecast expenditure on sub-transmission circuits shows on average around a seven-fold increase from the level in years FY 2007 to 2009, reflecting the work required to bring the network into compliance with the licence conditions and to cater for growth in demand. Movement in the other asset categories is minimal. [14] [15]

5.2 Expenditure Drivers

Demand Forecast

Increasing demand is the primary determinant of capex under the heading of growth. We noted that Country Energy had engaged the National Institute of Economic and Industry Research (NIEIR) to research and provide advice on forecasts of the key economic parameters that influence demand and to prepare growth forecasts for the next period. A review of the forecast was outside our terms of reference but we noted that it exhibited

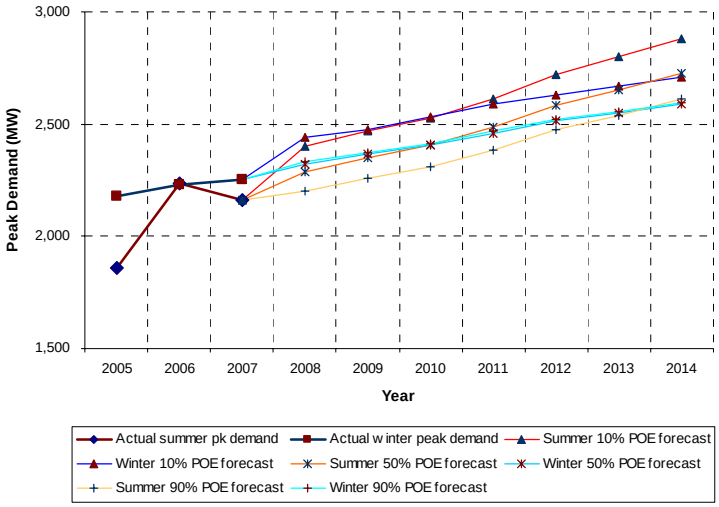
[14] The increase in land and easements matches that in the sub-transmission system category.

[15] Years FY 2007 to 2009 were used in the comparisons in this section and in sections 6 and 7 because of concern about allocations in the first two years of the current period and the merger with Australian Inland Energy in FY 2005.

continued growth, as shown in Figure 5.1. We noted that the maximum summer demand is forecast to grow at an annual rate of 3% over the next period and that the shift to summer peaking is set to continue.

We also noted that Country Energy's capex programme is based on a "50% probability-of-exceedance" forecast. [16]

Figure 5.1: Forecast Growth in Maximum Demand



Security of Supply Criteria

Secondary determinants of demand-driven capex are the security of supply criteria assumed. In NSW, these are mandated by the licence conditions. In essence, the licence conditions require an (n-1) security level to be attained at all zone substations serving demands over certain thresholds that are set out in the conditions and feeder loads not to exceed a certain percentage of their rated capacity. [17]

Plant Ratings

Plant ratings are a further determinant of demand-driven capex. We were satisfied that Country Energy calculates its plant ratings for transformers and cables in accordance with accepted international standards and that the underlying assumptions made were reasonable.[18]

We noted that cyclic plant ratings are used in parallel with the 50% probability-of-exceedance demand forecast and considered that combination reasonable for planning purposes.

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[16] Our expenditure review assumes 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.

[17] The planning design criteria stipulate an (n-1) design for urban 11 kV networks, which is extrapolated in the notes to the criteria as an average feeder utilisation target of 80% by FY 2014, reducing to 75% by FY 2019. Reference should be made to the conditions themselves for the full wording of all requirements.

[18] These were reviewed by Meritec at the time of the last determination and we understand they have not been changed materially since then, at least in respect of the previous Country Energy standards excluding Australian Inland Energy.

5.3 Review by Category

Sub-Transmission, Substations and Transformers

Country Energy states that its sub-transmission network augmentation and reinforcement capex is related to compliance with the licence conditions and demand. It states that the work required includes the construction of around 600 km of new lines to supply substation loads greater than 15 MVA that currently do not enjoy an (n-1) level of security and around 400 km of new lines to connect new assets, remove capacity limitations or address voltage problems. The programme includes the construction of new substations, installation of additional transformers, upgrading of switchgear and protection equipment, installation of bus section tie circuit breakers and associated protection systems, upgrading of overhead and underground cable substation connections, installation of capacitor banks and the purchase of land or other property rights for future substation sites. As part of this work, rural zone substations will generally be upgraded to urban designs to improve their security of supply.

We noted that plans for zone and sub-transmission substations are developed and updated annually to ensure they are capable of meeting a 50% probability-of-exceedance demand forecast. We noted that around 26 new zone substations or zone substation augmentations are planned, as described in the network asset management plan.

We noted Country Energy's statement that the expenditure reported under this heading does not include expenditure in the reliability and quality of supply programmes required to meet the reliability criteria in the licence conditions.

We noted that unlike the other DNSPs, Country Energy has a very large territory served by numerous small networks and a commensurately large number of smaller capex projects. This is illustrated by the table of major growth-and-reliability-related projects in Country Energy's RIN template. The sheet lists 106 projects under this category with an average size of around $5 m. Of these, 33 projects ranging in size from $7 m to $36 m (at an average size of $13 m) account for 75% of the expenditure on the list. We therefore adopted a sampling approach, focussed on the projects with the greatest investment and for implementation in the next period.

Sub-transmission projects were selected from Country Energy's list of projects by bulk supply point and descriptions of each area were found in the electricity system development review. We located each project on the sub-transmission line diagram and reviewed the underlying reasons for the work with Country Energy's senior staff familiar with the work. Projects discussed included Russell Street substation (replacement), the network in Wagga Wagga (network reconfiguration and replacement), the Tamworth area (strengthening of rural feeders), Narrabri (but outside the period), Inverell, the Lismore area, South Coff's Harbour (substation replacement and network strengthening), the Port Macquarie area (network development), Stroud - Hawks Nest (a bulk supply point to be added), Wellington – Narromine (132 kV circuit to be added and other work to be undertaken in the Narromine-Nyngan area), Cooma-Bega (line conversion from 66 kV to 132 kV) and Hay-Hillston (but outside the period).

We noted that the electricity system development review contained a standard format for each substation or network that encompassed such items as a statement of present capacity, forecast load, constraints and possible options.

We asked for and received reports for Coffs Harbour sub-transmission planning, Lismore-Mullumbimby network development, the Port Macquarie area, Queanbeyan sub-transmission planning, Tamworth sub-transmission planning, Tea Gardens planning and Wagga Wagga sub-transmission planning and did not notice anything exceptional about them.

We considered that the work was unexceptional and supported adequately by Country Energy's documentation and explanations. We did not consider that any adjustment was needed for the purpose of this review.

Distribution

Planned distribution capex includes the construction of new urban feeders, interconnections between feeders, up-rating of urban feeders by replacing conductors, extension of existing rural feeders, up-rating of rural feeders (by replacing conductors, re-tensioning them, installing regulators or changing the operating voltage to a higher level), provision of new and upgraded distribution substations and new transformers. The programme is aimed at removing network constraints and overloads. Where the peak load of a feeder exceeds 80% or feeders would be loaded above their emergency rating, augmentation work will be carried out.

Country Energy states that significant work is required in the high-growth areas of the northern and southern coastal corridors and larger regional centres. It said that to date, growth had not necessitated significant augmentation and reinforcement of the existing network but that the utilisation of existing assets is approaching accepted maximum levels.

Distribution expenditure of the type covered by these programmes is routine work and we did not discuss it with Country Energy, other than in general terms. However, we noted that the programme includes the installation of meters and load control receivers for new connections, new frequency injection plant, SCADA equipment at new zone and sub-transmission substations and the introduction of SCADA at sites presently without these facilities, particularly those that are inaccessible or remote. Automation is to be extended and optic fibre introduced. The communications expenditure is immaterial in the programme but will be mainly in the southern region, where the communications infrastructure is considered inadequate.

We also noted from its proposal that Country Energy has forecast its distribution network growth capex based on an assessment of expenditure and growth that considers customer connections and historical expenditure.

Table 5.1 shows that expenditure under the categories of distribution lines, low voltage lines and customer metering and load control is in line with levels in the current period and we therefore accepted the projections as reasonable.

The cost of work under these programmes 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 NSW and are being followed consistently by Country Energy.

Impact of Demand Management

In relation to demand management, we noted that Country Energy already has its own load control systems throughout the network and that to date, few outside demand management proposals have resulted in technically and commercially feasible solutions to network development requirements.

5.4 Other Considerations

Other considerations when determining the reasonableness of the scope of work included the following.

Policies and Procedures

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

Adequacy of Documentation

In respect of growth-related capex, we considered that the documentation made available for our review was adequate for the purpose.

Innovativeness of Planning Practices and Designs

We considered the level of innovation being applied to Country Energy'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, country Energy'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.

Country Energy 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 Country Energy's procedures in accordance with the prevailing requirements in NSW.

Construction and Installation Methods

Country Energy 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 Country Energy'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

Country Energy built up its forecast of capex (and opex) in the next period from its demand forecast, asset data (particularly in relation to condition or, where that information was not available, from age), unit rates (which it derived from recent historical expenditure), cost escalators and the application of overheads. [19] It said that costs associated with the identified capital works, including external contracting work, had been developed in FY 2007 dollars using its cost estimating system and then escalated by relevant factors.

Country Energy uses the same system for estimating the cost of contracted and internal work. The system was demonstrated to us. It incorporates cost estimating functions linked to the network database and updated periodically by its cost estimating staff to reflect current costs.

(We noted that Country Energy had engaged SKM to undertake a review of unit costs – appendix M to Country Energy's proposal. However, the scope of SKM's work was to update the unit costs in its asset valuation of 2002 to 2007 levels. We expressed the view to Country Energy that that would not be a suitable method of determining its actual construction costs for the purpose of its expenditure estimates and would not necessarily give comparable costs. Accordingly, we did not place any weight on SKM's work in this respect.)

We noted that Country Energy had applied its estimated productivity savings to its cost estimates, based on a review of its future resource requirements. We noted that this had resulted in a reduction of $32 m across the whole capex programme, of which $14 m applied to growth capex. [20]

After review, we accepted Country Energy's cost estimating methodology as reasonable and thus accepted its cost estimates as reasonable for the scope of work concerned.

Escalation to Year 2009 Dollars

Recognising that there has been a period of significant cost increases in the electricity supply industry from around 2003, Country Energy engaged the Competition Economists Group (CEG) to prepare forecasts for its input cost factors. [21] Its forecasts were applied to a weighted breakdown of Country Energy's capital costs to develop annual real escalators that, in turn, were used to develop the capex forecasts. We considered this methodology reasonable.

A summary of the real cost escalators so derived for application to the system capex projections (which were prepared in FY 2007 dollars) is given in Table 5.2.

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 in the table above) had been applied in the stated manner, as an audit would be required for the purpose. We have therefore relied upon Country Energy's assurance that that is the case.

In conclusion, we accepted the basis of the cost estimates as reasonable.

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[19] See p. 86 of its proposal with regard to capital costs.

[20] See also p. 10 of this volume.

[21] CEG's report is given in appendix C to the proposal.

Table 5.2: System Capex Real Cost Escalators (%)

YE 30 June	Weight	2009	2010	2011	2012	2013	2014
Labour	28.9	2.9	3.4	1.9	2.5	3.0	3.1
Fleet / plant	3.5	5.2	(1.6)	(0.5)	(0.2)	(0.8)	(0.4)
Cu and Al cable / conductors	6.2	0.9	(0.7)	(0.0)	(0.2)	(0.3)	(0.3)
Power transformers	6.2	1.1	0.5	0.8	0.2	0.2	0.2
Kiosks a/	14.7	1.4	1.1	1.3	0.7	0.7	0.7
Switchgear	8.4	1.1	0.5	0.8	0.2	0.2	0.2
Poles-Timber	1.1	1.0	1.2	1.2	0.5	0.5	0.5
Concrete poles	0.8	0.9	1.1	1.2	0.4	0.5	0.5
Steel poles	0.4	1.0	1.4	1.4	0.6	0.7	0.7
Underground copper cable	7.2	(0.5)	(2.4)	(1.1)	(1.1)	(1.3)	(1.2)
Land and easements	4.0	4.1	4.1	4.1	4.1	4.1	4.1
Materials - other	9.0	0.8	1.1	1.1	0.4	0.5	0.5
Meters	9.7	0.8	1.1	1.1	0.4	0.5	0.5
Weighted average	**100.0**	**1.7**	**1.3**	**1.1**	**1.0**	**1.1**	**1.2**
Annual escalator			1.013	1.011	1.010	1.011	1.012
Cummulative over FY 2009			1.013	1.025	1.035	1.047	1.059

Source: Country Energy.
a/ Distribution transformers and switchgear in a prefabricated box.

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 period FY 2009 to 2014 have been included in the estimates stated in the RIN expenditure templates in 2009 dollars to the extent shown above in Table 5.2.

Conclusion on Costs

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

5.6 Recommended Level of Growth Capex

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

6 Replacement Capex

6.1 Summary of Proposed Expenditure

Table 6.1 summarises the replacement capex proposed in the next period in comparison with that in the current period. Expenditure under this heading constitutes 20% of the total capex proposed.

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

	Actual	Estimated		Proposed					Total in	Pct of of
YE 30 June	2007	2008	2009	2010	2011	2012	2013	2014	'10-14	Total
Sub-transmission lines and cables	3	3	3	15	17	18	19	20	89	11%
Distribution lines and cables	47	52	54	62	70	75	79	83	369	46%
Substations	16	17	18	23	26	28	29	31	138	17%
Transformers	14	16	16	18	20	21	22	24	104	13%
Low voltage lines and cables	4	4	5	4	5	5	5	5	24	3%
Customer metering and load control	11	12	12	11	12	13	13	14	62	8%
Communications	4	4	4	4	4	4	4	4	20	3%
Land	0	0	0	0	0	0	0	0	0	0%
Easements	0	0	0	0	0	0	0	0	0	0%
	98	**109**	**112**	**137**	**153**	**164**	**172**	**181**	806	100%

Source: Country Energy.

The total expenditure proposed is $806 m compared with an estimated $462 m in the current period, an increase of 75%. The main area of proposed expenditure is the replacement of distribution lines (46%), followed by substations (17%), transformers (13%) and sub-transmission lines (11%), the remaining 13% or so being spread over low voltage lines and cables, customer metering and load control and communications assets.

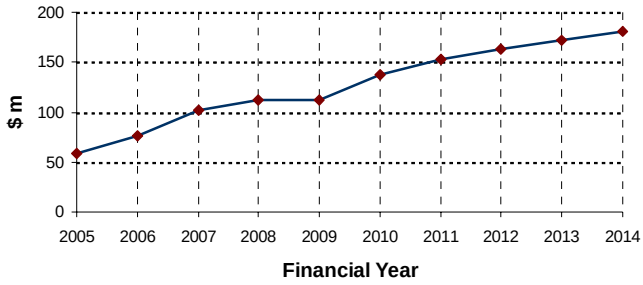
Forecast expenditure on sub-transmission lines shows, on average, around a five-fold increase p.a. from the level in years FY 2007 to 2009, reflecting the work required to replace aged but important assets. There are also increases of 35-62% in the other main expenditure categories – substations, transformers and distribution lines. [22] Movement in the other items is minimal.

The rising trend evident in replacement capex, as illustrated in Figure 6.1, is to be expected from the age profile of the assets discussed in section 2.2. Annual replacement expenditure at the end of the next period of $181 m represents around 1.2% of the replacement value of the network against a norm of 2% for assets of this type, so the rising trend in replacement is expected to continue into the following period. [23]

[22] Years FY 2007 to 2009 were used in the comparisons for the reasons given in footnote 15.

[23] Section 3.2.1 of the Country Energy submission gives the replacement cost of the network at $14.7 billion.

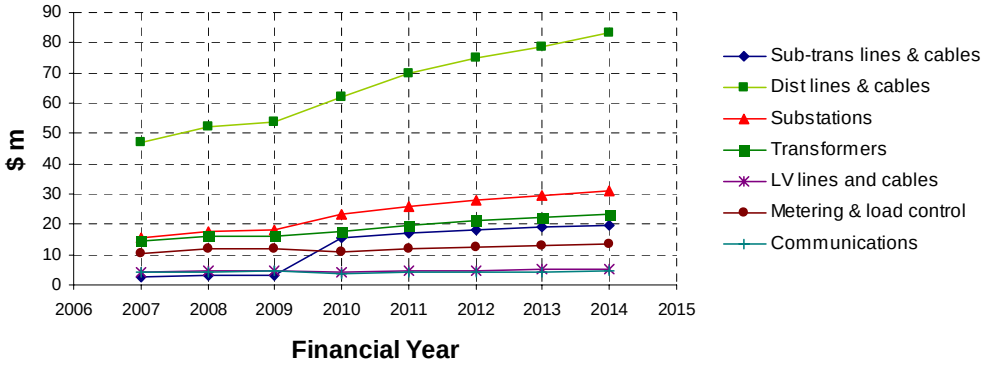
Figure 6.1: Trend in Replacement Capex ($ m 2009)



The main replacement programmes are directed at distribution mains and involve the replacement of poles, conductor, switchgear and fittings. The substation replacements are directed at aged circuit breakers in identified poor condition, as are the transformer replacements. The sub-transmission lines programme consists largely of the replacement of aged steel and copper conductor due to corrosion or work hardening. The proposed scope of work is based on Country Energy's analyses of condition (which we found to be thorough in the case of power transformers and substation equipment in particular) and the implementation of specific asset renewal programmes. It also reflects conclusions drawn from the age profiles, particularly in the longer term, based on Country Energy's statistical assessment of future failure behaviour. The assessment of risk is also considered.

Figure 6.2 shows the expenditure trends by asset category and reveals a more-or-less consistent trend in all categories other than sub-transmission lines (and to a lesser extent in substations), where a significant jump in expenditure is planned. This is attributed to work required to replace conductor in poor condition and is planned in conjunction with growth-classified expenditure on the sub-transmission networks to bring them into compliance with the licence conditions at the same time.

Figure 6.2: Trend in Replacement Programmes by Asset Category ($ m 2009)



6.2 Review by Category

Table 6.2 lists the proposed replacement capex by is major components.

Table 6.2: Replacement Capex by Major Items ($ m 2009)

YE 30 June	Total over '10-14	Pct of total
Distribution HV overhead	242	30%
Sub-trans & zone substations	121	15%
Sub-trans overhead lines	99	12%
Sub-trans & zone transformers	89	11%
Distribution switchgear	56	7%
Service connections	58	7%
Metering & load control	60	7%
Distribution substations	27	3%
Distribution transformers	22	3%
Distribution LV underground	18	2%
Distribution LV overhead	5	1%
SCADA & comms	9	1%
	806	100%

Source: Country Energy NAMP Table 8.7 adjusted to RIN total.

Distribution HV Overhead

Country Energy's network has around 1.4 m poles of which approximately 90% are treated and untreated hardwoods. Pole replacement follows conventional practice, being driven by routine inspections. Forecast replacement quantities consider the current level of replacement and the results of statistical modelling against the age profile.

Conductor replacements are based on corrosion and material strength assessments, with voltage regulation on the longer rural feeders being an additional driver. [24]

Cross-arms and other pole-top hardware are replaced based on inspection.

The projected expenditure is consistent with the current period expenditure and trends and is in concert with the age profile. The forecast scope of work in the next period appears prudent for the sustainability of the network.

Sub-transmission and Zone Substations

Replacement programmes at substations are largely directed at identified types of circuit breakers with known maintenance, risk or reliability issues or a lack of spare parts. Replacement is based on a priority assessment over a five-to-ten-year period. High voltage switchboards incorporating oil-filled switchgear are also addressed based on prudent risk avoidance. The retrofitting of switchboards with vacuum breakers is planned where this is feasible and represents the economic solution. The programme considers network development issues of growth and fault rating in the timing and priority of renewal works.

Associated replacement programmes are coordinated with the switchgear replacements and include the replacement of current and voltage transformers, older silicon carbide surge diverters and protection relays. Conventional programmes of building and fence renewal or upgrading and substation ancillary services replacement are included.

The forecast scope of work in the next period appears prudent for the sustainability of the network and the management of risk.

[24] Long rural feeders often use steel conductor of small cross-section to maximise span lengths and reduce cost but the higher conductor impedance leads to greater voltage drop as rural loads increase. The historical use of 11 kV, rather than a higher voltage for these feeders, is a contributing factor.

Sub-transmission Overhead Lines

Country Energy plans to replace approximately 170 km p.a. of 66 kV and 33 kV sub-transmission conductors for reasons of condition. The programme proposed for the next period is based on the findings of asset inspections and is considered prudent for the sustainability of the network.

Transformers

Country Energy uses a detailed condition assessment methodology to assess its power transformers through diagnostic testing and ranking by condition and risk. Replacement decisions also consider maintenance, spares and known defects in tap changers. The quantity of replacement forecast is consistent with its recent history of replacements and the transformer age profile. The replacement programme appears well considered and prudent for the sustainability of the network.

Distribution Switchgear

This category includes line isolators, automatic sectionalisers and reclosers and high voltage fuses. Country Energy has commenced a 20-year replacement programme to replace air break switches with gas-insulated switches based on known maintenance and safety issues. [25] Country Energy is also undertaking a programme to replace porcelain fuses and links with polymer types to mitigate safety risks. [26] Programmes such as this are common in the electricity distribution industry. Refurbishment of sectionalisers and reclosers is based on as-found condition under planned maintenance programmes.

Service Connections

Country Energy undertakes the replacement of service connections based on reported failures and defects, identified high-risk installations and through programmed replacement cycles as recommended by the technical regulator. [27] The programme is conventional and appears prudent for the management of risk.

Metering and Load Control

Country Energy undertakes a conventional meter replacement programme to replace identified meter types in bulk to maintain population accuracy over its approximately 1.4 m installed meters. Identified replacements in this programme, as described in the metering asset management plan, include the replacement of ball-and-jewel-type meters. [28] This type of meter is known to be problematic. The programme is considered prudent.

Distribution Substations

The distribution substation programme includes conventional condition-assessed replacement together with the replacement of particular pole-top substations with design faults and the reconstruction of unsafe chamber substations. The programme is conventional and prudent.

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[25] The major risk is falling porcelain from the breakage of deteriorated air break switches when they are operated.

[26] Breakage of deteriorated drop-out fuses and links when manually operated can result in live tails endangering the operator or contacting pole top transformers if situated below them.

[27] An electrical safety bulletin issued by the Department of Energy in 1996 highlights problems related to deteriorated LV overhead services and recommends certain replacement practices.

[28] Further details are given in the metering asset management plan, section 5.2.

Distribution Transformers

Distribution transformers are replaced when found to be corroded or leaking oil. A significant failure mode in the Country Energy network is through lightning strikes. The programme is conventional and is considered prudent from the perspective of identified need.

Other Programmes

Other minor programmes making up approximately 4% of the replacement programme in aggregate include distribution cable, low voltage mains (where the forecast assumes the current level of expenditure will continue) and communications and system control equipment. The scope of works in each case is considered reasonable for the circumstances of Country Energy.

6.3 Other Considerations

Other considerations when determining the reasonableness of the scope of work included the following.

Policies and Procedures

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

Adequacy of Documentation

In respect of replacement-related capex, we considered that the documentation made available for our review was adequate for the purpose.

Trend in Fault Rates

The comparison of fault rates between companies and our observations on Country Energy's rate of faults due to equipment condition have already been outlined in section 2.2 of this report and were considered in our assessment.

Conclusion

We did not find any evidence that suggested that material adjustment was needed in Country Energy's proposed replacement-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.

6.4 Efficient Costs

We were satisfied that the factors discussed in section 5.5 of this report in relation to the efficiency of Country Energy'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 Country Energy'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 is needed in the replacement-related capex proposed by Country Energy.

7 System Capex in Total

7.1 Other Categories of Capex

Reliability and Quality Improvement Capex

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 22% of the total capex proposed with the majority (90%) of it being attributable to distribution lines.

Table 7.1: Current and Forecast Reliability and Quality Capex ($ m 2009)

	Actual	Estimated		Proposed					Total in	Pct of
YE 30 June	2007	2008	2009	2010	2011	2012	2013	2014	'10-14	Total
Sub-transmission lines and cables	4	5	5	4	4	4	5	5	22	2%
Distribution lines and cables	20	23	80	148	159	164	166	168	804	89%
Substations	25	28	29	6	6	7	7	7	33	4%
Transformers	0	0	0	4	5	5	5	5	24	3%
Low voltage lines and cables	2	2	2	2	2	2	2	2	10	1%
Customer metering and load control	1	1	1	1	1	1	1	1	5	1%
Communications	0	0	4	0	0	0	0	0	0	0%
Land	1	2	2	0	0	0	0	0	0	0%
Easements	3	4	4	0	0	0	0	0	0	0%
	58	**64**	**127**	**164**	**177**	**183**	**186**	**189**	899	100%

Source: Country Energy.

Country Energy advised us that it has a large number of feeders that do not meet the individual feeder standards in the licence conditions and addressing that matter is a major driver of the increased expenditure in this category. [29]

The four main work programmes are:

- the individual feeder reliability programme;
- the urban distribution network "n-1" reinforcement programme;
- the average reliability standards improvement programme; and
- the quality of supply improvement programme. [30]

According to the network asset management plan, these programmes are in addition to core asset renewal, maintenance and network development programmes and strategies to maintain reliability.

Individual Feeder Reliability Programme

Country Energy proposes to invest $486 m over the next period to improve individual feeder reliability performance. It says that due to the potentially large number of projects involved

[29] This matter is discussed in section 7 of Country Energy's network asset management plan, appendix E to its proposal.

[30] There is a discrepancy between the totals of the programme expenditure and the total reliability expenditure stated in the RIN template of $17 m. See also footnote 13.

and the inherent variability in reliability problems, a detailed work assessment on individual feeders has not been possible. Instead, is says that capex under this programme is based on the estimated average cost of rectifying poor-performing segments of the overhead network on a long-term average of 110 feeder segments each year.

Country Energy says it has based its figure of 110 segments p.a. on having a total of 148,000 km of high voltage distribution line in service, replacing it on a 40-year cycle implying the need for the replacement or refurbishment of 3,700 km p.a., giving 110 segment replacements p.a. of an average length of 33.5 km. It notes that it has 4,420 feeder segments in service. [31] We have not verified the average feeder segment length assumed but it appears reasonable. The assumption of a 40-year life for this purpose is also reasonable.

The proposed capital works are as follows.

- Replacement of bare overhead line conductors and pole-top hardware. Country Energy estimates a total of 1,650 km p.a. of line conductors and associated pole structures will need to be replaced. This is said to increase the total average overhead line replacement capex from around 1% of line length p.a. to around 2%. It says that the programme has been costed using unit rates for bare overhead open-wire construction.
- Installation and replacement of reclosers and sectionalisers. This is aimed at reducing the number of up-stream customers affected by a fault. Country Energy estimates there is a deficiency of around 4,000 such devices on its network.
- Construction or reinforcement of interconnections between feeders to allow faulted sections of a feeder to be bypassed. Country Energy expects that four interconnections will be built each year to address poor-performing feeders.
- Construction of new small zone substations to shorten the length of rural feeders and hence reduce the number of customers affected by a fault. Country Energy expects two such substations to be built each year for the purpose of this programme.

Details of the expenditure are shown in Table 7.2.

Table 7.2: Individual Feeder Reliability Capex ($ m 2009)

YE 30 June	2010	2011	2012	2013	2014	Total	Pct of Total
Bare line conductor replacement	86	83	80	78	75	401	83%
New reclosers and sectionalisers	8	8	8	7	7	38	8%
Interconnection to other feeders	4	4	4	4	4	20	4%
New rural zone substations	5	5	6	6	6	27	6%
	103	**100**	**97**	**94**	**91**	486	100%

Source: Country Energy.

We note that this matter was examined at length by us in our April 2006 report to IPART in connection with Country Energy's pass-through application. [32] At that time, Country Energy proposed the replacement or refurbishment of 100 feeders p.a. and a package of work of the same nature as that now proposed but to cover only the three remaining years of the current period. After lengthy debate, we accepted the expenditure except for a weather-related effect. Based on that earlier work, we have no objection to the figure of 110 feeder segments now proposed.

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[31] The situation is not entirely clear, however, as Country Energy says in section 7.4.3.4 of its network asset management plan that the expenditure calculation is based on completing 15 km in each of the 110 segments each year or 1,650 km p.a.

[32] *"Electricity distribution network cost pass-through review – final report"*, Wilson Cook & Co, April 2006.

However, we note that in accepting this expenditure in 2006, we did so only for three years and stated various considerations that we thought relevant to the programme.

Having again considered this matter including the points made in our April 2006 report; recognising that Country Energy's proposal is an estimate of the cost of an unknown scope of work; recognising that Country Energy still reports a large number of non-complying individual feeders; considering thus that remedial work of the general type stated is required; noting that the proposed programme is for five years of work and reflects (on the assumptions stated above) an average annual investment of around $26,000 per km of line remedied: these points considered, we accept that the expenditure now proposed is prudent as best we are able to judge in the absence of a defined scope of the work involved.

By way of observation, however, we suggest: (a) that the work amounts in essence to an acceleration of Country Energy's replacement programme and would have been better categorised as such; and (b) continuation of this expenditure after the next period should not necessarily be accepted, given the other work planned for the period and assessed in this report.

Urban Distribution Network "N-1" Reinforcement Programme

Country Energy proposes to invest $217 m over the next period to augment and reinforce high voltage distribution feeders that have utilisation levels in excess of or approaching the 80% utilisation criterion in the licence conditions. It says that a "bottom-up" approach was taken for determining capex under this programme and that individual projects were identified, scoped and costed. The proposed capital works are as follows.

- Construction of new urban distribution feeders from existing zone substations where thermal ratings or utilisation levels have or will exceed the licence conditions.
- Construction of new interconnections between adjacent urban feeders for additional redundancy.
- Capacity upgrading of existing urban distribution feeders e.g. by replacing conductors to improve constraints.
- Installation of tie-point reclosers at feeder extremities to allow loop automation between adjoining feeders.
- Installation of gas-insulated switches.

Details of the proposed expenditure are shown in Table 7.3.

Table 7.3: Urban Distribution Network Reinforcement Programme ($ m 2009)

YE 30 June	2010	2011	2012	2013	2014	Total	Pct of Total
New urban feeders	6	6	9	6	7	34	16%
New urban interconnections	8	7	8	6	9	36	17%
Uprating of existing feeders	25	21	20	19	19	105	48%
Reclosers (non loop scheme)	1	0	0	1	0	2	1%
Urban open tie-point reclosers	5	5	5	5	5	25	11%
Enclosed interconnection switches	3	2	2	2	2	11	5%
General feeder works	2	1	1	1	1	5	2%
	49	**42**	**45**	**38**	**43**	217	100%

Source: Country Energy.

Country Energy says that implementation of these strategies in its regional centres is expected to increase network security and the ability of feeders to accept load transfers in the

event of a fault on interconnected portions of the network and, as a second-order effect, increase capacity and resilience of the urban network to meet future demand growth. It notes that the programme is additional to its growth-related programmes.

We reviewed the methodology underpinning this expenditure and considered the expenditure prudent and reasonable.

Average Reliability Standards Improvement Programme

Country Energy proposes to invest $125 m over the next period to improve average reliability performance to meet the licence conditions. It says it carried out modelling to determine the likelihood of average SAIDI and SAIFI levels exceeding the reliability targets for each feeder category and that the results suggested that the average reliability standards for the urban and short-rural feeder categories will be exceeded once every two years. Its proposed capex is based on increasing the expenditure to a level at which urban and short-rural feeders will have only a 20% probability of exceeding their targets by the end of FY 2014. [33] To achieve this, it has proposed to target levels of average reliability that are more stringent (i.e.: lower) than those set in schedule 2 of the licence conditions. [34]

Details of the proposed expenditure are shown in Table 7.4.

Table 7.4: Average Reliability Standards Capex ($ m 2009)

YE 30 June	2010	2011	2012	2013	2014	Total	Pct of Total
Sectional reclosers - urban first segments	15	15	15	15	15	75	60%
Sectional reclosers - short-rural excl. first segments	10	10	10	10	10	50	40%
	24	**25**	**25**	**25**	**26**	125	100%

Source: Country Energy.

We do not express an opinion on the appropriateness of setting a target in this way, since it appears to be a matter of interpretation of the licence conditions. However, we note the matter for consideration by the AER as potentially it gives rise to different levels of expenditure by the DNSPs in circumstances that otherwise would be the same.

We considered the reliability improvement capex under this heading reasonable when based on the method of compliance chosen by Country Energy.

Quality of Supply Improvement Programme

Country Energy proposes to spend $55 m on improving quality of supply over the next period. The expenditure is in relation to voltage regulation matters. The proposed capital works are as follows:

- feeder capacity upgrading (Country Energy states that it intends to augment 1% of all rural feeders, including single wire earth return lines);
- replacement of undersized distribution transformers and customer connections (Country Energy estimates that over 6,500 or around 4.5% of its total distribution transformer population is undersized);
- review of voltage regulation relay settings and distribution transformer tap positions; and

[33] The long rural feeder category is said to comply with the relevant target.

[34] 108 minutes *vs.* 125 minutes for urban feeder SAIDI, 276 minutes *vs.* 300 minutes for short rural SAIDI and 1.62 *vs.* 1.8 interruptions for urban SAIFI.

- installation of a network monitoring equipment.

Details of the proposed expenditure are given in Table 7.5. We considered the expenditure reasonable. However, we note that work on relay settings and tap positions is normally expensed, so the capex proposed should be adjusted by removing this item – a total of $12 m over the next period. [35]

Table 7.5: Quality of Supply Capex ($ m 2009)

YE 30 June	2010	2011	2012	2013	2014	Total	Pct of Total
HV mains capacity	3	3	3	3	3	13	23%
Upgrading undersized transformers	4	4	4	4	4	20	37%
Upgrading dedicated customer connection mains	1	1	1	1	2	7	13%
Distribution transformer tap settings a/	2	2	2	2	3	12	22%
Network monitoring system	1	1	1	1	1	3	5%
	11	**11**	**11**	**11**	**11**	55	100%

Source: Country Energy.
a/ Not a capex item.

Environmental, Safety and Statutory Obligations Capex

Table 7.6 summarises the capex proposed in the next period for environmental, safety and statutory compliance in comparison with that in the current period. Expenditure under this heading constitutes 5% of the total capex proposed.

Table 7.6: Current and Forecast Compliance Capex ($ m 2009)

	Actual	Estimated		Proposed					Total in	Pct of
YE 30 June	2007	2008	2009	2010	2011	2012	2013	2014	'10-14	Total
Sub-transmission lines and cables	0	1	1	0	0	0	0	0	0	0%
Distribution lines and cables	6	7	7	13	15	15	16	17	76	37%
Substations	3	3	3	14	16	17	17	18	82	40%
Transformers	1	1	1	0	0	0	0	0	0	0%
Low voltage lines and cables	0	1	1	1	1	1	1	1	3	2%
Customer metering and load control	0	0	0	7	8	9	9	9	42	21%
Communications	0	0	0	0	0	0	0	0	0	0%
Land	0	0	0	0	0	0	0	0	0	0%
Easements	0	0	0	0	0	0	0	0	0	0%
	11	**12**	**13**	**35**	**39**	**41**	**43**	**45**	203	100%

Source: Country Energy.

Expenditure under this heading relates almost entirely to substations (40%), distribution lines (37%) and customer metering and load control (21%). All three show significant movement from the current period.

The main drivers of expenditure under the substation heading are continuation of the existing programme to improve security (20 substations to be addressed each year at an approximate

[35] Country Energy confirmed this when commenting on the draft report. For the avoidance of doubt, we do not consider that this item needs to be added to Country Energy's opex proposal as Country Energy has not asked for that, the opex programme has already been assessed by us and found reasonable, this amount is not of a type that would normally be assessed in isolation of the opex programme as a whole, and so it is not clear to us that this amount needs to be so added.

cost of $5.7 m p.a.), installation of under-frequency load-shedding relays ($1.5 m p.a.), power factor correction ($2.4 m p.a.) and metering ($2.4 m p.a.)

Expenditure on distribution lines includes approximately $8 m p.a. for the continuation of existing programmes relating to line clearances from ground, bare conductor, the installation of spreaders and other environmental and safety-related work. [36] New expenditure in the next period includes approximately $6 m p.a. to achieve compliance with the 2008 NSW code relating to crossings of navigable waters. [37] A further $1 m p.a. is proposed for works related to private pole defects.

Expenditure on metering and load control includes a $42 m programme to achieve compliance in respect of under-frequency load shedding and power factor correction, including the installation of capacitor banks.

After consideration, we accepted the proposed expenditure under this heading as reasonable.

7.2 Other Considerations

Coordination of Work and Overlap of Expenditure Estimates

We noted evidence that capex programmes and projects under the various expenditure headings were coordinated to avoid inefficiencies.

We did not find any evidence that suggested overlapping or double counting of expenditure.

Deliverability

Country Energy 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.

Country Energy engaged PB to review the deliverability of its programme and we noted that amongst other things, PB had concluded "…Country Energy can deliver all the proposed works within the required time frame …"

7.3 Recommended Level of Total System Capex

In summary, having considered the factors reported in sections 4 to 7 of this volume, we conclude that no adjustment of the system capex proposed by Country Energy for the purpose of this review is needed except that $12 m of expenditure on relay and tap-setting work incorrectly classified as capex should be removed from the proposed capex in accordance with footnote 35 on page 27.

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[36] Details are given in appendix C of the network asset management plan.

[37] This programme involves rectifying overhead line constructions to meet clearance requirements, the installation of signage and planned boring underneath eight rivers p.a.

8 Non-System Capex

8.1 Summary of Proposed Expenditure

Country Energy's non-system capex comprises expenditure on IT systems, plant, equipment, motor vehicles, land, buildings and other non-system assets. During our review, we were advised by Country Energy of a correction to motor vehicle expenditure for the last three years of the next period that resulted in reduction in the forecast expenditure of $32 m. The revised expenditure in the current and next period is shown in Table 8.1. Expenditure under this heading constitutes the remaining 17% of the total capex proposed.

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

	Actual			Estimated		Proposed					Total in	Pct of
YE 30 June	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	'10-14	Total
IT systems	39	20	29	29	36	64	49	49	50	51	263	38%
Furniture, fittings, plant and equipment	14	13	19	8	9	11	10	9	10	9	49	7%
Motor vehicles a/	34	34	39	42	54	60	52	47	38	40	237	35%
Buildings	0	0	0	0	0	0	0	0	0	0	0	0%
Land	13	26	14	13	21	28	21	20	19	20	107	16%
Other non-system assets	3	(1)	3	6	5	5	5	5	6	6	27	4%
	102	**92**	**103**	**98**	**124**	**168**	**137**	**130**	**123**	**125**	683	100%

Source: Country Energy.
a/ Updated figures provided by Country Energy for FY 2012-14.

The total expenditure proposed in the next period is now $683 m, compared with $520 m in the current period, an increase of 31%. In the next period, expenditure on all categories of non-system expenditure is projected to be higher than the current period. We noted from the additional information supplied to us that the expenditure listed under land included both land and buildings capex.

Basis of Forecast

Country Energy says that its non-system capex forecast has been based on historical expenditure trends, coupled with specific asset replacement programs and the increasing number of technical and field employee levels.

Application of Cost Escalation Factors

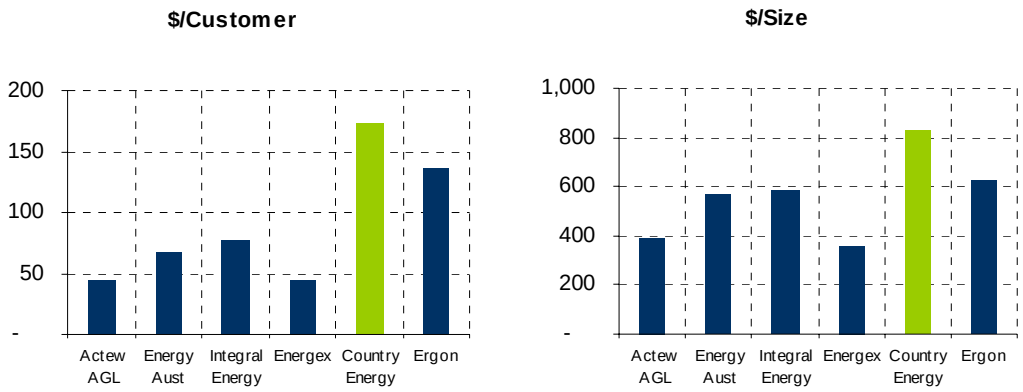
Country Energy advised us that it has applied a weighted average of CEG's cost escalators across all non-system capex. We were not provided with the basis of establishing the average and consider that, in general, there is no basis for applying real cost escalation to non-system capex. An adjustment has thus been made to remove it.

Efficiency of Overall Expenditure

Country Energy'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. [38] The comparisons are shown in Figure 8.1. [39]

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

Figure 8.1: Comparison 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 comparison shows that Country Energy's non-system forecast capex per size is at the top of the range of the group analysed and 20-25% above other DNSPs.

The benchmarking shows from a "top-down" perspective that Country Energy's overall level of non-system capex is high relative to that of the other companies.

The following sections of the report consider the proposed level of non-system capex from the standpoint of a "bottom-up" review of specific expenditure categories and projects.

8.2 Review by Category

IT Expenditure

Country Energy is proposing to spend $263 m on IT assets in the next period compared to $152 m in the current period, an increase of 72%. Country Energy say that the projected expenditure over the next control period is forecast to be generally consistent with historical spend but this statement is not consistent with the forecasts put forward.

Country Energy says that at the formation of the company in 2001, major systems of the merged entities were rationalised. In some cases, existing systems were inadequate for the needs of the new organisation and new systems were acquired. In other cases, systems have been built or extended. Some of these systems have been developed in relative isolation and to different vendor standards. A degree of integration of systems and data has taken place but data definition and quality vary between systems, leading to much exception handling and business rework. It says more work is required to consolidate and integrate systems.

Country Energy has prepared an "information and communications technology strategic plan" which it says is the basis of its forecasts. We were provided with a copy of the plan, which we noted covers only the period 2007-2010.

Major projects that are planned for the next period include the following.

Asset Management System: Country Energy plans to implement a new asset management system over the next period at an estimated cost of $55 m. It says it has several different

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[39] 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.

systems presently supporting this function and it requires a greater degree of integration than currently exists. LogicaCMG has been commissioned to lead a detailed functional review of key systems in terms of business support and technical robustness. We were provided a copy of the LogicaCMG report, which forms the basis of the justification and costing of the project. We noted that this report contains no detailed financial justification of the expenditure in terms of service or efficiency benefits that would be gained from the investment.

Network Billing and Customer Information System: Country Energy says the present system is relatively old and future vendor support may not be available in the future. Expenditure of $20 m over the next period has been allowed for the network share of this investment.

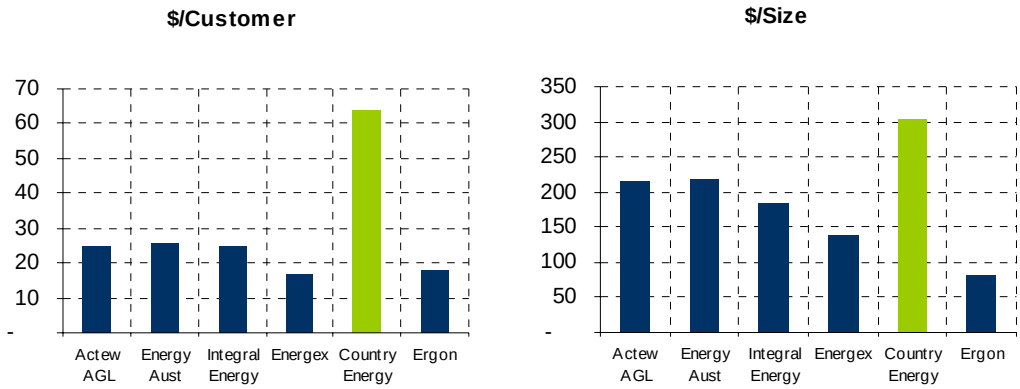
Network Quality Monitoring Systems: Expenditure of $5 m is planned to improve the monitoring and reporting of power quality throughout the network. This is aimed at improving the quality of supply to rural areas and assist Country Energy to meet its licence conditions.

Other expenditure planned includes ongoing replacement and upgrading of core infrastructure and software and providing resources for a larger workforce.

Overall, the proposed investment is for IT systems that are typical in network businesses but the scale and scope of the expenditure is large and well in excess of historical expenditure.

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 Country Energy's proposed IT capex is considerably higher than other DNSPs on these benchmarks.

Considering all the factors – the large increase on historical expenditure, the lack of financial justification for individual projects and the high level of expenditure relative by industry norms – we consider that an adjustment should be made to bring expenditure to an efficient level. We consider an appropriate adjustment would be a reduction of at least 25% of the proposed expenditure on IT systems, which would bring Country Energy's level on a cost per size basis to a level at the top end of the range of the other DNSPs.

Motor Vehicles

Country Energy is proposing to spend $237 m on motor vehicles in the next period compared to $203 m in the current period, an increase of 17%.

Country Energy's forecast fleet expenditure over the next period primarily comprises replacement expenditure for its existing fleet (97% of the projected expenditure) in accordance with Country Energy's documented vehicle replacement policies. The remainder covers increases in the size of the fleet to support the proposed increase in resources.

We were told that the increase over historical levels is primarily due to a policy change to replace elevated work platforms and crane borers after ten years. This policy change followed from a detailed heavy plant condition assessment that identified a need to address a range of issues including workplace health and safety, operational requirements, and the financial benefits of earlier replacement. The forecast expenditure for light vehicles is based on replacing the existing fleet in accordance with Country Energy's policy guidelines for operational vehicles. These vehicles are replaced at 100,000 km.

Country Energy has a high fleet expenditure due to the wide coverage of its network. We made a comparison with expenditure forecast by Ergon Energy (the only comparable distributor in terms of customer density) in its last regulatory proposal and found that, after adjusting for customer numbers, Country Energy's underlying motor vehicle expenditure was similar.

We reviewed the supporting information and were satisfied that the policies and processes for replacement and purchasing were appropriate but as noted above, an adjustment has been made to remove real cost escalation.

Land and Buildings

Country Energy is proposing to spend $107 m on land and buildings in the next period compared to $87 m in the current period, an increase of 23%. Although the expenditure is all shown under land in the RIN template, most of the expenditure relates to buildings.

Country Energy says that a number of regional offices and field service centres are at or nearing capacity and cannot accommodate the planned increases in the workforce. Capital investments will thus be required in the form of building modifications, rebuilding or extensions. There is also a requirement to continue the programme of depot refurbishments due to building condition to provide a safer, more efficient and secure working environment.

We were provided with a supporting estimate calculation spreadsheet outlining the proposed works. We noted that the estimates were the sum of both a detailed list of works and a calculated estimate of the extra building space required for an expanded workforce. We consider there is an element of double counting in this methodology as the detailed list contained additional buildings and some additions to create extra space. We therefore recommend that the allowance for extra resources be reduced by 50%, a total of $21 m over the period. Apart from this, we consider the proposed expenditure reasonable and found no reason to make any further adjustment, apart from the removal of real cost escalation as noted above.

Furniture, Fittings, Plant and Equipment and Other Non-System Capex

Country Energy is proposing to spend $76 m under this expenditure category in the next period compared to $77 m in the current period. We consider the proposed expenditure reasonable based on the historical trend, apart from the removal of real cost escalation as noted above.

8.3 Recommended Level of Non-System Capex

Having considered the factors reported in this section, we conclude for the purpose of this review, that adjustment of the non-system capex proposed by Country Energy is needed in respect of the following items:

- an overall reduction of 25% in IT expenditure;
- a reduction in expenditure on land and buildings to account for double counting of the cost of additional resource requirements; and
- removal of real cost escalation.

Details are given in Table 8.2.

Table 8.2: Adjustments to Non-System Capex ($ 2009)

YE 30 June	2010	2011	2012	2013	2014	Total
Capex proposed by DNSP	168	137	130	123	125	683
Proposed adjustments:						
IT systems	(16)	(12)	(12)	(13)	(13)	(66)
Land and buildings	(7)	(4)	(3)	(3)	(3)	(21)
	(23)	(16)	(16)	(16)	(16)	597
Escalation	(3)	(4)	(5)	(6)	(7)	(25)
	(26)	(21)	(21)	(22)	(23)	(112)
Pct of proposed capex	(15%)	(15%)	(16%)	(17%)	(18%)	(16%)
Recommended level of capex	**142**	**117**	**110**	**102**	**102**	**572**

The adjustments reduce Country Energy's non-system capex by 16%. This would bring it closer to, but still higher than, the other DNSPs in our benchmarking analysis in Figure 8.1.

9 Opex

9.1 Expenditure in Current Period

Table 9.1 shows that Country Energy's opex is projected to be $1,405 m over the current period, representing a total expenditure that is $21 m or 2% above the total allowed by IPART in its determination inclusive of agreed pass-through costs.

Table 9.1: Distribution Opex in Current Period *vs*. Determination ($ nominal)

	Actual		Estimated			Total
YE 30 June	2005	2006	2007	2008	2009	
Determination	232	241	250	259	269	1,253
Pass through events	0	0	42	44	45	131
Opex in current period	230	242	296	319	317	1,405
Over-run / (under-run)	**(3)**	**1**	**3**	**16**	**3**	**21**
Over-run / (under-run) (%)	(1%)	0%	1%	6%	1%	2%

Source: Country Energy.

The tables show that Country Energy is projecting expenditure very close to its allowance over the period. Country Energy says that it has experienced various cost increases above the rate of inflation over the period, including labour, material and external contract costs. It also says that whilst it has been successful in offsetting a proportion of these through productivity gains, elements of its inspection, maintenance and vegetation control programmes have had to be deferred in response to significant input cost increases and thus an increase in expenditure allowances is required in the next period. Much of the deferral relates to new activities proposed in its pass-through application in relation to the licence conditions.

If actual and forecast expenditure is compared to the original determination only, then total expenditure for the period is 12% above the determination and 18% above it in FY 2007.

Although Country Energy has not carried out the new activities proposed in its pass-through application, it has carried out additional vegetation management and maintenance work in excess of that envisaged in its original forecast for the current period. Country Energy has prioritised the work to achieve the greatest impact on customer reliability, the area in which it has the most improvement to make to comply with the licence conditions.

We note that at the time of the last determination, Country Energy was a relatively new organisation and may not have had the systems and knowledge to justify an appropriate level of expenditure.

9.2 Proposed Expenditure in Next Period

Overview

Country Energy's proposed opex in the next period compared with that in the current period is shown in Table 9.2. [40]

[40] Total opex excludes self insurance, debt and equity raising costs.

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	23	29	29	24	17	18	18	18	18	19
Network maintenance	195	202	246	261	264	345	352	364	376	390
Other expenditure	44	34	43	43	36	37	38	40	41	42
	262	**265**	**318**	**328**	**317**	**400**	**408**	**421**	**435**	**451**

Source: Country Energy.

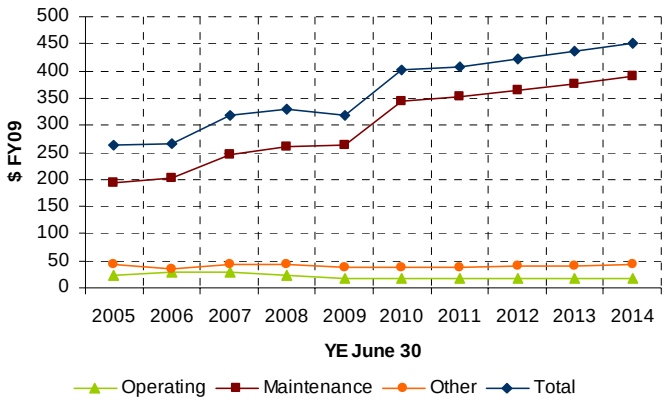
The total opex proposed in the next period is $2,116 m compared with an estimated $1,491 m in the current period, an increase of 42%. A high proportion (87%) of Country Energy's opex is attributed to maintenance. This is because Country Energy allocates most of its corporate, business and technical overheads to direct expenditure – maintenance and system capital works. We note that this is likely lead to a higher proportion of overheads being capitalised as compared to other DNSPs.

The reasons given for the increase in opex over the next period are:

- new, deferred and backlog asset inspection and maintenance works to mitigate risk and improve network performance;
- cost increases above inflation for labour and input materials; and
- increased workload due to additional assets.

Table 9.1 shows the trend of expenditure over the period 2004 to 2014.

Figure 9.1: Opex Trend 2004 – 2014 ($ m 2009)



The graph shows a rise in expenditure in FY 2010 after an almost constant level of expenditure from FY 2007 to FY 2009. Expenditure continues to rise from FY 2010 to FY 2014 but at a slower rate.

Basis of Forecast

A "bottom-up" methodology has been used by Country Energy to establish its opex forecasts over the next period. It incorporated "business as usual" costs as well as incremental items with all work prioritised based on risk assessments. It developed a model ("RISMO") to project the quantity of inspection, vegetation control and maintenance works needed. The work programme was then costed using unit rates in FY 2007 dollars. Escalation in relation to cost inputs and asset growth was then added and allowances were made for productivity improvements and a reduction in emergency response work resulting from the impact of the

proposed reliability-related capex programme. Other categories of expenditure were escalated from their base-year levels.

Impact of External Factors

Country Energy advised us that it had not incorporated any specific step increases for new or future obligations in its opex projections but we noted that the maintenance and vegetation control programmes were heavily influenced by expenditure to meet the reliability targets of the licence conditions.

Application of Cost Escalation Factors

Country Energy has escalated its costs in the next period in accordance with the escalation factors in CEG's report compiled for all three NSW DNSPs and described in section 5.5 of this report. Country Energy has calculated weighted real cost escalators based on expected changes in the cost of labour (53% weighting), plant (7% weighting) and materials (40% weighting) and added them to its maintenance (excluding vegetation management) forecasts. No real cost escalation has been applied to the materials component and the plant component shows small decreases in real terms. The average rate of real cost escalation over the period is 1.5% p.a.

Higher real cost escalators, averaging increases of 2.4% p.a. over the period, have been applied to vegetation management. This is due to a high weighting of contractors' costs (which are forecast to escalate at the EGW labour rate), creating a higher weighted escalation rate than used for other maintenance activities.

The effect of real cost escalation adds approximately 10% to the average annual opex in the next period compared to the base year.

Escalation for Growth in Size of Network

Country Energy has applied an escalation factor to reflect network growth, correlated with growth-related capex. It has increased its network-related opex by the proportion of average annual growth-related capex to the estimated total replacement cost of system assets. This ratio is then reduced by 25% to reflect the fact that new assets will not incur condition-based maintenance costs. The result of this is a growth escalation rate of 1.75% p.a. In comparison, the expected increase in the size of the business over the period is 1.6% p.a.

The effect of growth escalation adds approximately 7% to the average annual opex for the next period as compared to the base year.

Capex-Opex "Trade-Off"

Country Energy has included a reduction in emergency response expenditure to reflect expected benefits from the reliability-related capex programme. The reduction totals $15 m over period. No trade-off between replacement expenditure and opex has been included. We agree that this adjustment is appropriate, as the replacement expenditure is not sufficient to reduce the average weighted age of the network over the period.

Proposed Step Changes

Country Energy says that its FY 2010 forecast includes a step increase of $91 m to account for new, deferred and backlog asset inspection and maintenance programmes to mitigate risk, improve network performance and support general business functions. Many of these programmes were to be commenced in the current period in response to the licence conditions but were deferred to the next period so that Country Energy could keep its opex within its determination allowance.

Productivity Savings

The level of opex has been reduced by expected productivity gains due to the refinement of existing work practices. This saving has been calculated in accordance with Country Energy's resource plan and results in a reduction of $16 m in opex over the period.

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

Comparison with Other DNSPs

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 Country Energy's opex in FY 2007 represented an efficient starting-point for the projection of opex in the following years.

Adjustments were made to the FY 2007 reported figures of all companies to remove abnormal and one-off items. No abnormal or one-off items were identified by Country Energy and so no adjustments were made in respect of its expenditure.

The conclusion from the analysis in volume 1 indicates that within the limitations of the comparisons, [41] Country Energy can be considered to be operating close to or a little below the average level of expected cost.

Given the limitations of benchmarking, expressed in volume 1 of the report, we looked only for anomalous positions that might suggest higher-than-expected costs and thus implicitly inefficient expenditure levels. This did not apply for Country Energy.

Country Energy's FY 2007 expenditure is almost identical to its regulatory allowance but the allowance included funding for additional work to comply with the licence conditions that was not carried out. In comparison to the original allowance, Country Energy's FY 2007 opex is 18% higher than the allowance.

Country Energy's position in the comparative analysis and its over-expenditure in the current period relative to the determination suggest that the level of opex allowed for in the current period may not have been sufficient for it to undertake a prudent level of work.

Movement in Opex from FY 2007

In order to look at the reasonableness of the forecast levels of total opex in the next period, we then analysed the movements in opex that took place or are forecast to take place by the ACT and NSW DNSPs in the period FY 2007-14. The results are presented based on "opex per size", which accounts for increases in the size of the businesses over the period. [42] The analysis is based on the reported expenditure and expenditure proposals of the DNSPs. [43]

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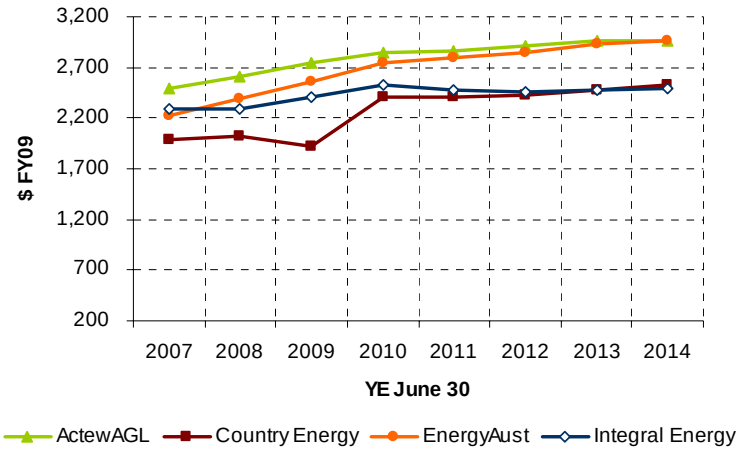
[41] There is only one entity, Ergon Energy, with similar characteristics to Country Energy – low customer density – thus limiting the size of the comparable group.

[42] It is appropriate to recognise that business costs will increase as the size of the business increases. We have used the composite size variable derived in Vol.1 as the measure used to account for size. Forecast customer numbers and maximum demands from the businesses regulatory information templates have been used over the period. No forecast of line km was available, so we have escalated this at the same growth rate as customer numbers.

[43] 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 of self-insurance was excluded.

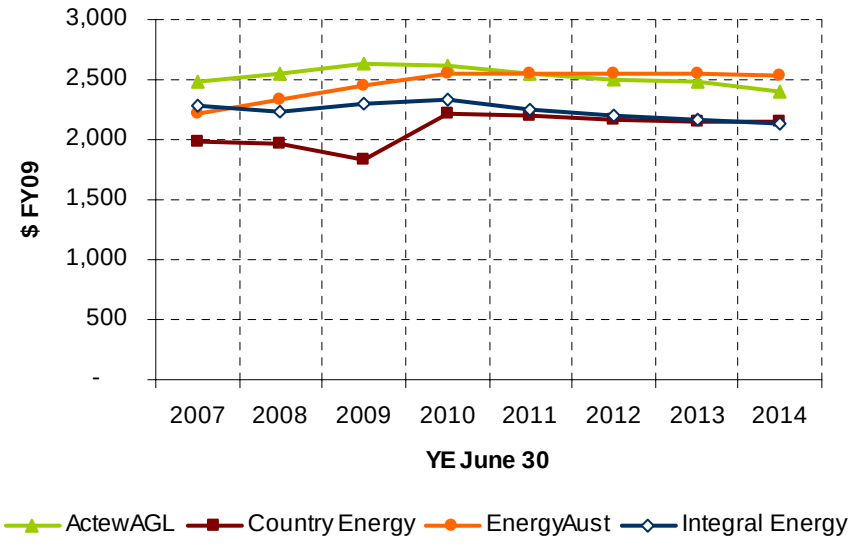
Figure 9.2: Comparison of "Opex per Size" for FY 2007-14



On the measure of "opex per size", Country Energy's expenditure in FY 2010 (the first year of the next period) is 20% above that in FY 2007 and by 2014 is 26% higher than its FY 2007 level.

If the effects of real labour cost escalation are removed, as shown in Figure 9.3, Country Energy's FY 2010 "opex per size" is 12% above its FY 2007 level, the average over the next period is 9% above and by FY 2014, it is 8% above.

Figure 9.3: "Opex per Size" without Real Labour Cost Escalation



The big step-up between the current period and the next is due to the workload that has been deferred: essentially, it is needed to meet the reliability requirements of the licence conditions.

The licence conditions relating to the reliability of individual feeders have created a significant opex impact on Country Energy for the future, notably so in comparison with urban DNSPs, where the major expenditure impact is on capex to meet security requirements.

Summary of "Top-Down" Analysis

The conclusion from the "top-down" analysis is that Country Energy's FY 2007 opex represents an efficient level, even though it deferred work associated with meeting the licence conditions. Although there is an increase in expenditure from the start of the next period (approximately 10%, once the effects of real labour cost escalation are removed), we consider from a "top-down" perspective, after taking account of the requirement to meet the licence conditions on individual feeder reliability, the increase is reasonable. [44]

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

Network Opex

This expenditure category is an overhead item. We were advised that business and technical overheads were allocated mainly to maintenance and capital activities and that the costs shown under this category comprised the balance not so allocated. We noted that the forecast costs under this item in the next period were $90 m, compared with $123 m in the current period, a decrease of 27%, and were advised that the reduction arose from a change in the method of allocation, with more overhead allocated to direct expenditure categories.

Network Maintenance Expenditure

Table 9.3 shows actual and estimated maintenance expenditure for the current and next periods.

Table 9.3: Current and Forecast Maintenance Expenditure ($ m 2009)

	Actual			Estimated		Proposed				
YE 30 June	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Inspection	11	13	21	25	24	38	39	40	42	43
Pole replacement	18	12	4	5	2	2	2	2	2	3
Maintenance and repair	37	32	43	49	43	68	69	71	74	76
Vegetation management	29	37	45	54	67	105	108	112	117	123
Emergency response	43	43	55	48	47	48	48	49	50	51
Other network maintenance	56	65	79	79	81	84	86	88	91	95
	195	**202**	**246**	**261**	**264**	**345**	**352**	**364**	**376**	**390**

Source: Country Energy.

Expenditure in the next period is $1,828 m compared with $1,167 m in the current period, an increase of 57%. Maintenance costs account for approximately 87% of Country Energy's total opex for the period. Average annual expenditure over the next period is $366 m, 49% above the base-year level.

Maintenance Policies and Processes

Country Energy's maintenance strategy is outlined in its network asset management plan and various other policy documents. Country Energy says that it has recently reviewed all its inspection, vegetation control, maintenance and renewal management policies, procedures and practices. At the same time, new strategic plans and work programmes have been developed, based on risk management techniques, to ensure that inspection, vegetation and maintenance issues relating to system assets are identified, assessed and mitigated to the extent possible.

[44] We note for the AER's consideration that Country Energy received an allowance in response to its pass-through application for work that it will not complete in the current period but in our review, we consider only the need and efficiency of proposed expenditure in the next period, not regulatory or cost recovery matters.

The risk assessment process was undertaken in various stages that included:

- identification of tasks for all asset classes of equipment based on current policies and procedures;
- an audit of each region to establish the degree to which the tasks were being implemented; and
- a risk assessment of each asset class against criteria of customer impact, safety, replacement cost, environmental and compliance requirements etc with individual asset class risks being modified further by applying probability, priority, age and activity stream factors.

Country Energy said that a work plan was then prepared based on the work tasks identified and prioritised from the risk assessment. Each work task was then costed using unit rates and quantities. This provided the basis of the zero-based budget for the next period and allowed the identification and quantification of deferred inspection, maintenance and vegetation control work for tasks not currently fully performed in accordance with existing plans, policies and procedures.

We reviewed the asset management plans and policies and the principles applied to the risk-based model used to derive the work programme. We found the maintenance strategies and processes used by Country Energy to be typical of electricity distribution businesses. Inspection cycles and routine maintenance activities were in line with industry standards. The process used to review and identify maintenance requirements appeared to be robust and appropriate. Based on our review, we are satisfied that Country Energy's maintenance policies and processes are appropriate and properly applied.

Inspection

Inspections in the next period account for 11% of Country Energy's total maintenance opex. Average annual expenditure over the next period is $41 m, 92% above the base-year level.

We were advised that the increases have been driven by step increases of $9.9 m p.a. for deferred programmes and $4.1 m p.a. for new programmes. Over 80% of the deferred programme relates to patrols and inspections of poorly performing feeders. This is due to the focus in the licence conditions on improving the reliability of each DNSP's worst performing feeders. The new programmes include new initiatives to widen the scope of the inspection programme, including programmed internal inspection of all underground pits and pillars, six-monthly condition monitoring of critical distribution substations and ring main units, programmed live-line pole-top inspection of all radial sub-transmission feeders, a 'thermo vision' programme covering all critical equipment and urban network components and six-monthly condition monitoring of all regulators and reclosers.

We consider the increased scope of the proposed programmes reasonable and should enable the company to identify risks earlier and improve system performance.

Maintenance and Repair

Expenditure on maintenance and repair in the next period accounts for 20% of Country Energy's total maintenance budget. Average annual expenditure over the period is projected to be $72 m, 69% above the base-year level.

We were advised that the there is a proposed step increases of $23 m p.a. of which 39% is for a reduction in the maintenance backlog, 29% for deferred programmes and 32% is or new programmes. The works consist of a wide range of preventative and corrective tasks. The annual expenditure on these activities is not excessive for the size of the network asset base and we consider the proposed level reasonable.

Vegetation Management

Expenditure on vegetation management in the next period accounts for 31% of Country Energy's total maintenance budget. Average annual expenditure over the next period is $113 m, 150 % above the base-year level.

Country Energy says that it underestimated the vegetation management required for the current period and although it has deferred programmes that it put forward in justification of its pass-through application, it has spent more than the total allowed for vegetation management during the period.

To predict the cost of vegetation management more accurately in future, it has added a vegetation density profile to its GIS. This enables it to prioritise risk, develop better practices, estimate vegetation growth rates and cycles and improve planning and costing of the vegetation programme. The information gives it the ability to analyse vegetation issues by feeder category, area and the like and has been used to forecast future expenditure for the continuation of the present programmes and for the reliability improvement programme.

Country Energy provided us with a comparison that had been undertaken with Ergon Energy's vegetation management expenditure. The comparison showed that Ergon Energy had a similar profile of vegetation density and that after allowing for differences in cycles and size, Country Energy's proposed expenditure was comparable to that incurred by Ergon Energy.

We have reviewed all the information provided on the vegetation management forecast. Much of the increased programme is new and targeted at different purposes to the historical programme. It will take some years before it can be established that the programme achieves the reliability improvements being targeted but use of the profiling data does provide a reasonable basis for estimating the required works.

We note that the cost escalation rates applied to vegetation management are higher than applied to other programmes due to the high labour content of this work. Country Energy has also applied an asset growth escalator to this work.

We do not consider that it is appropriate to apply the asset growth escalator to vegetation management, as it is unlikely that the quantity of work in this area will be driven principally by growth capex. We therefore propose an adjustment to remove this from the proposed expenditure, a total adjustment of $30 m over the period.

Emergency Response

Expenditure on inspections in the next period accounts for 13% of Country Energy's total maintenance opex. Average annual expenditure over the next period is $49 m, 10% below the base-year level. As noted earlier, the reduction is due to the expected reduction in emergency response because of the reliability improvement capital and maintenance programme. We consider the expenditure forecast to be reasonable.

Other Network Maintenance

Expenditure on other network maintenance in the next period accounts for 24% Country Energy's total maintenance opex. Average annual expenditure over the next period is $89 m, 13% above the base-year level. This expenditure covers system control and network technical support including asset strategy, policy, planning, design, and specialised engineering services. The increase in expenditure is explained by cost and growth escalation. We consider the expenditure forecast to be reasonable taking into account historical expenditure levels and projected work levels over the next period.

Other Opex

Table 9.4 shows actual and estimated "other" opex for the current and next period.

Table 9.4: Current and Forecast Other Opex ($ m 2009)

	Actual			Estimated		Proposed				
YE 30 June	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Meter reading	20	19	21	21	19	19	20	20	21	22
Customer service	10	11	17	18	13	13	14	14	15	15
Advertising, marketing and promotions	4	4	5	5	5	5	5	5	5	5
Other operating costs	10	0	0	0	0	0	0	0	0	0
	44	**34**	**43**	**43**	**36**	**37**	**38**	**40**	**41**	**42**

Source: Country Energy.

Expenditure in the next period is $199 m compared with $201 m in the current period, a decrease of 1%. Other operating costs account for approximately 9% of Country Energy's total opex for the period. Costs are at a similar level to the current period. Cost escalation has been offset by a reduction in the allocation of overheads to these categories. We consider that there is no need for an adjustment to the forecast expenditure.

9.5 Recommended Level of Opex

In summary, Country Energy's proposed opex has been reviewed in this section from a "top-down" and "bottom-up" standpoint. The top-down analysis suggests that Country Energy's base-year level of expenditure is low based on comparative benchmarking and may be below a prudent level to maintain targeted service levels.

We note that Country Energy was a relatively new organisation at the time of the last regulatory review, having been formed only in 2001. As such, it may not have had the processes and systems in place to prepare an adequate forecast and justification for its expenditure at that time.

Our conclusion from the "bottom-up" analysis is that the forecast scope of work has been prepared on a robust basis. There is a large increase for inspection, repair and vegetation management, much of which is for compliance with the reliability targets in the licence conditions. This is to be expected for a predominantly rural distributor with an extensive network.

Considering these factors, only one adjustment is proposed – that in relation to the growth escalation applied to vegetation management. Details are shown in Table 9.5.

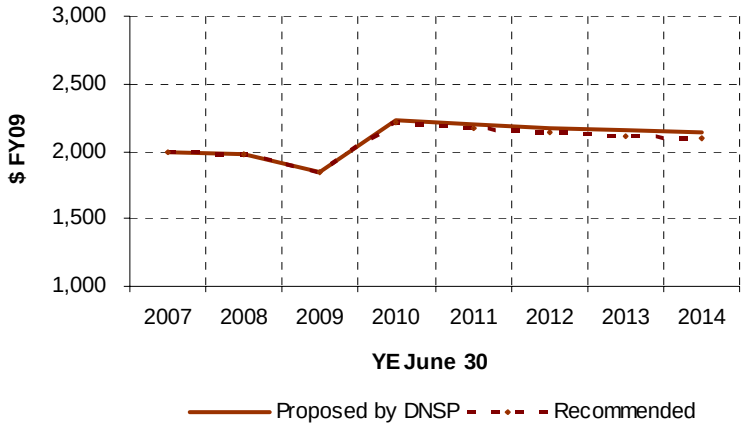
Table 9.5: Proposed and Recommend Level of Opex ($ m 2009)

YE 30 June	2010	2011	2012	2013	2014	Total
Opex proposed by DNSP a/	400	408	421	435	451	2,116
Proposed adjustments:						
Vegetation mgmt escalation	(2)	(4)	(6)	(8)	(10)	(30)
	398	405	415	427	441	2,086
Pct of proposed opex	(0%)	(1%)	(1%)	(2%)	(2%)	(1%)
Recommended opex	**398**	**405**	**415**	**427**	**441**	**2,086**

a/ Excludes self insurance, debt and equity raising costs.

The level of opex recommended for the next period is as shown in the bottom line of the table and the impact of the adjustment made is shown in Figure 9.4.

Figure 9.4: "Opex per Size" without Real Labour Cost Escalation



10 Other Matters

10.1 Public Lighting Expenditure

We understand that the only alternative control service provided by Country Energy is public lighting. Country Energy'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: Public Lighting 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	2	0	2	2	2	2	2	2	2	2	10	22%
Opex a/	9	1	8	9	13	13	13	13	13	14	65	65%

Source: Country Energy.
a/ Exclusive of debt and equity raising costs and self-insurance.

The proposed level of capex shows no change from that in the current period. The proposed increase in opex is due to the commencement of a bulk lamp replacement programme costing an additional $3 m p.a. Country Energy notes that FY 2009 is the first year of its bulk lamp replacement programme and that the full benefit will not be realised until later as an allocation for a high rate of spot lamp replacement and maintenance is still required.

We considered the proposed expenditure reasonable.

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 note from its proposal that Country Energy has resolved to self-insure against the following risks:

(a) fraud,
(b) sabotage (bomb threat / hoax),
(c) earthquakes of less than a certain magnitude,
(d) insurer's credit risk,
(e) counter-party credit risk,
(f) key person risk,
(g) risk of non-terrorist impact of planes and helicopters,
(h) general public liability,
(i) bushfires and
(j) the failure of poles, lines, transformers and circuit breakers.

These risks appear to be outside our field and so have not been reviewed. We note only that it is the prerogative of owners to determine their own risk appetite. [45]

We did not review the financial provisions associated with self-insurance but note that some of the costs of managing the risks listed above may be included or implicit in the base year (FY 2007) opex reported by the company or in its projections as normal business costs in the

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

electricity distribution industry. We did check where possible to see whether any such events were included in the base-year expenditure but generally, it was not possible to determine this from the high-level information supplied.

10.3 Opex Deemed Uncontrollable in Benefit-Sharing Scheme

Country Energy has not sought exclusions from the efficiency benefit-sharing scheme for any costs. (For the AER's guidance, we 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.)

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. [46] However, a DNSP may nominate additional cost pass-through events to apply in the next period and Country Energy has proposed the following six:

- new or additional market requirements (for example, the mandatory rollout of interval meters and the consequent significant data handling costs),
- "intelligent network" investments,
- self-insurance events,
- changes in risk assessment costs due to legal outcomes,
- changes to obligations,
- structure and costs due to outcomes of the retail reform project, and
- input cost variations (essentially, a proposal to index future expenditure for movements in the cost of materials, but not labour).

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.

We have not reviewed the pass-through events proposed by Country Energy, as their assessment appears to be outside our field.

Other Events Proposed

We have not been able to review the other cost pass-through events proposed by Country Energy as their assessment is outside our field.

Other Possible Pass-Through Events

Finally, we were 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.

[46] 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 Country Energy and the factors required to be considered as summarised in this report, and based on that information, the representations made to us by Country Energy and our own experience, our opinion in respect of Country Energy's expenditure proposals is as stated below.

(a) Country Energy's proposed capex from 1 July 2009 to 30 June 2014 including in respect of public lighting is considered to be prudent and efficient, subject to the adjustment proposed in section 8.3 (non-system capex) and the removal of a small non-capex item as proposed in section 7.3 (system capex) – see also section 10.1 (public lighting expenditure) of this volume.

(b) Country Energy's proposed opex from 1 July 2009 to 30 June 2014 including in respect of public lighting is considered to be prudent and efficient, subject to the adjustment proposed in section 9.5 (opex) – see also section 10.1 (public lighting expenditure) of this volume.

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

11.2 Matters for the AER's Consideration

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

Impact of Licence Conditions

The licence conditions relating to the reliability of individual feeders have created a significant opex impact on Country Energy for the future, notably so, in comparison with urban DNSPs, where the major expenditure impact is on capex to meet security requirements.

A related consideration that we have not examined but believe will be true is that there appears to be little likelihood of many of the weather-related incidents that impinge on Country Energy's reliability statistics (SAIDI, etc) being eliminated from its reported performance figures under the measurement rules as the percentage of the network affected in each event is guaranteed to be small in Country Energy's case, given the wide coverage and low customer density of its network.

Inadequate Opex Allowance under Last Determination

We note that at the time of the last determination, Country Energy was a relatively new organisation and may not have had the systems and knowledge to justify an appropriate level of expenditure.

Country Energy's position in the comparative analysis and its over-expenditure in the current period relative to the determination suggest that the level of opex allowed for in the current period may not have been sufficient for it to undertake a prudent level of work.

Other Matters

For completeness, we also note the productivity savings that Country Energy has factored in (see pages 10 and 16) and Country Energy's interpretation of the licence conditions relating to feeder reliability (see page 26).

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 Country Energy'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.