The Australian Energy Regulator

Review of Proposed Expenditure of ACT & NSW Electricity DNSPs

Volume 1 – Main Report

Final

October 2008

Wilson Cook & Co
Engineering and Management Consultants
Advisers and Valuers

Wilson Cook & Co

Engineering and Management Consultants
Advisers and Valuers

Reply to: Auckland Office
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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 1 – MAIN REPORT

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 includes an executive summary and covers general matters relating to our work and common to all DNSPs. The accompanying volumes, 2 to 5, deal with EnergyAustralia, Integral Energy, Country Energy and ActewAGL Distribution respectively. They should be read in conjunction with this introductory volume.

The main conclusions arising from the review are set out in the executive summary that follows the table of contents.

Our opinions are based on the work undertaken and in turn on the requirements of the terms of reference and the information and data provided to us by the DNSPs.

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

Yours faithfully,

Wilson Cook & Co Limited

Encl.

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Review of Proposed Expenditure of ACT & NSW Electricity DNSPs

Volume 1 – Main Report

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.

Disclaimer

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Executive Summary

Appointment and Terms of Reference

In December 2007, the Australian Energy Regulator appointed Wilson Cook & Co Limited, Engineering and Management Consultants, Advisers and Valuers, of Auckland to assist it with its assessment of the expenditure proposed by the ACT and NSW DNSPs as part of its forthcoming five-year price review and make recommendations on allowances for their prudent and efficient capital expenditure and operating and maintenance costs.

Work Programme, Consultation and Reporting

Work on the assessment commenced in December 2007 with the pre-lodgement tasks and continued in June 2008, following the submission of the DNSPs' proposals. Visits were made at the end of April 2008 to meet the DNSPs and discuss the review process. Further meetings were held with the DNSPs during the period 30 June to 11 July. The object of those meetings was to be briefed by the DNSPs on the matters that they wished to emphasise in their proposals, discuss in detail with the DNSPs' staff each of the main elements of the expenditure proposals and receive additional supporting information. Meetings were also held with the AER to brief us on the background to the work and the outputs required.

Additional information was requested by us after these meetings and the responses to our requests, and to outstanding matters arising during our visits, were received from the DNSPs over the period ending 4 September 2008.

Following receipt and analysis of the information, and after seeking clarification of certain points, we prepared our report and submitted it to the AER on 8 September as a draft for review and confirmation that it addressed our terms of reference. The report was sent at the same time by the AER to the DNSPs for their confirmation that it did not contain factual errors, misinterpretations of the material received from the DNSPs or information that is confidential to the DNSPs. We then met with the AER and the DNSPs to discuss their responses. Final drafts were sent subsequently to the AER for review and again to the DNSPs for checking for errors and confidential information. The points identified have been corrected but broadly our conclusions were not affected and the final report was tabled on 21 November 2008 for use by the AER.

This Report

This report summarises the work carried out, our general observations and conclusions. It is presented in five volumes:

Volume 1	Main Report (this volume)
Volume 2	EnergyAustralia
Volume 3	Integral Energy
Volume 4	Country Energy
Volume 5	ActewAGL Distribution.

Background and Approach to the Review

The background and approach to the review are described in section 2 of this volume, noting that our approach generally followed the framework proposed by the AER, as set out in the terms of reference. Related matters are discussed, including the definition of prudence and efficiency, assessment of external obligations, consistency with the DNSPs' demand forecasts, unit costs, escalation rates for materials, cost escalation methods, expenditure drivers, appropriateness and application of policies and procedures, level of preparation of projects, optimality of their timing, optimality of designs and reasonableness of construction costs, capex-opex "trade-offs", and the reasonableness of aggregated projections. We also note the matters not considered in our review.

Comparison with Other DNSPs

For reasons outlined in the main text in section 3 of this volume, we considered it necessary to carry out a comparison of the DNSPs' opex and non-system capex with that of a selected comparative group.

We did not consider it appropriate to benchmark the DNSPs' system capex with other DNSPs as system capex is driven by business-specific factors and comparisons of it – particularly those based on denominators such as customer numbers or line kilometres – are generally inappropriate.

Efficiency of Base-Year Opex

In relation to the efficiency of the DNSPs' base-year opex, our analysis suggested that EnergyAustralia's and Integral Energy's opex in FY 2007 is at or a little above the industry norm. However, given the limitations of benchmarking, we are not able to say that their levels of opex are sufficiently at variance from the industry norm to conclude that they are inefficient, although the analysis tends to suggest that there may be potential for efficiency improvements within both businesses. A more detailed assessment of the businesses, beyond the scope of this review, would be required to quantify the degree of any efficiency gains possible.

In respect of ActewAGL, the analysis suggests that its opex in FY 2007 is around 20% above the industry norm. Unless it is considered that mitigating factors account fully for the difference, ActewAGL would appear to be operating below the average level of industry efficiency.

The analysis in respect of Country Energy is less conclusive due to there being only one closely comparable DNSP whose performance we have not assessed. However, the comparisons suggest that Country Energy is operating close to or a little below the industry norm.

Test for Economies of Scale

Of interest, we also tested the data to discern economies of scale by plotting "opex per size" against the size of the organisation. The results showed that there is a weak correlation between the two, suggesting that few economies of scale are achievable – a conclusion supported by a separate analysis of New Zealand data – and that there may be weak diseconomies of scale.

Effect of Increases in Opex in Next Period

Our analysis of the movements in each DNSP's opex in the next period, taking out the effects or real labour cost escalation to reveal the movement in "opex per size" in real terms, shows

the following. If the comparative group of DNSPs held its "opex per size" ratio constant (and if all DNSPs in the group faced the same level of real labour cost escalation), then by FY 2014, Integral Energy and ActewAGL would have improved their position in relation to the other DNSPs in the comparative group. EnergyAustralia and Country Energy would have a poorer relative position.

These findings, and the benchmarking of non-system capex, are examined further in volumes 2 to 5 of this report.

Levels of Expenditure Recommended for Individual DNSPs

Our findings and opinions on the levels of expenditure for individual DNSPs is set out in the letters of transmittal and section 11 in each of volumes 2 to 5 of this report. In summary:

EnergyAustralia

- EnergyAustralia will over-spend against the IPART distribution and ACCC transmission determinations in both opex and capex in the current period. The principal reasons given by EnergyAustralia were real cost increases in both labour and materials and the need to carry out more work than allowed for in the determinations.
- EnergyAustralia'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.
- In respect of capex, the increase in the scope of work is driven by four principal factors: growth in demand, the need to comply with the NSW licence conditions for supply security and reliability, the need to address deferred 11 kV work and the need to increase the rate of replacement of aged network assets, many of which are now at the end of or beyond their prudent engineering lives and are presenting in many cases an unacceptable safety and supply risk. We have concluded that the capex programme proposed is reasonable in both scope and cost.
- The increase in the scope of opex is driven partly by increases in maintenance costs resulting from an increase in the volume of assets in service and their continued aging but to a much larger degree by increases in business and network support costs. We have not been convinced of the need for such large increases in these support costs and consider that EnergyAustralia should be able to achieve efficiencies within the business from its investments in IT systems and property, and from other improvement initiatives to offset many of the incremental costs it claims it will face. We have therefore concluded that some adjustment is required to bring its opex to a more reasonable level.

Integral Energy

- Integral Energy expects to spend a little more than its capex allowance in the current period and a little less than its opex allowance. It under-spent on opex against the determination in the first three years (by a considerable margin in the first two) and expects to over-spend in the last two. The expenditure profile is said to be due primarily to the longer-than-expected period required to ramp up its maintenance programme.
- Integral Energy's proposed capex and opex from 1 July 2009 to 30 June 2014 are both substantially above the levels projected for the current period. The reasons for

the increases are real escalation in the cost of labour and materials and an increased scope of work to be performed.

- In respect of capex, the increase in the scope of work is driven by three principal factors: growth, the need to comply with the licence conditions for supply security and reliability and the need to increase the rate of replacement of ageing network assets. We have concluded that the capex programme proposed is reasonable in both scope and cost, apart from some relatively minor issues for which adjustments are recommended.
- The increase in the scope of opex is driven partly by increases in maintenance costs resulting from an increase in the volume of assets in service and their continued aging and some additional compliance work. Integral Energy has allowed for compounding productivity improvements of 2% p.a. that largely offset the real labour cost increases. We found some minor adjustments that could be made and would reduce the proposed opex but concluded that the proposed opex should be accepted without adjustment on the ground that the identified adjustments are minor, the business has adopted aggressive productivity improvement assumptions of its own volition and its reductions in maintenance expenditure from replacement capex may have been over-estimated.

Country Energy

- 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.
- Country Energy has deferred opex to keep within the determination inclusive of a 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.
- 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.
- 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.
- 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.

- 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.
- 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.

ActewAGL

- ActewAGL will over-spend against the ICRC's capex determination in all years of the current period and in total by 34%. The principal reason given by ActewAGL for this was the need for increased expenditure on pole replacements. Our review concluded that the capex made was prudent and should be included in the regulatory asset base.
- ActewAGL will spend approximately the level of opex allowed in the ICRC's determination. An increasing trend in expenditure is evident, with under-spending against the determination in the initial years of the current period and probable over-expenditure against the determination in the final years to be, on balance, more-or-less in line with the determination.
- ActewAGL's proposed capex and opex from 1 July 2009 to 30 June 2014 are both substantially above the levels projected for the current period. The reasons for the increases are a combination of real escalation in the cost of labour and materials and an increased scope of work to be performed.
- In respect of capex, the increase in the scope of work is driven by two principal factors: the need to comply with the a Government mandate to connect a second point of bulk supply to the city for security and reliability reasons and the need to increase the rate of replacement of poles. Overhead reticulation in Canberra is generally along the back boundaries of residential properties, which makes access difficult and increases the cost of pole replacements. We concluded that the capex programme proposed is reasonable in both scope and cost.
- The increase in the scope of opex is driven by increases in maintenance costs resulting from an increase in the volume of assets and their continued aging and by some additional compliance work. ActewAGL has not escalated its expenditure to reflect the projected increase in size of its asset base and will target efficiencies to offset the extra workload. Therefore, although we found from our comparative analysis that ActewAGL's base-year opex was not at an efficient level, we accepted that improvements in efficiency will be made over the next period and concluded that the proposed opex should be accepted without adjustment.

General Matters for the AER's Consideration

In concluding this report, we would like to note the following general matters for the AER's consideration. Matters in relation to individual DNSPs are set out in volumes 2 to 5 of this report.

Issues Common to the DNSPs

Certain issues common to the DNSPs were evident in this review. They included:

- considerable increases in cost over the current period, especially in relation to materials,
- different responses from the DNSPs to these increases, some curtailing work to keep within their regulatory allowance, creating a backlog to be addressed in the next period, some over-spending their regulatory allowance and some doing both.
- continuing labour cost increases above inflation in the next period but a reduced rate of increase in the cost of materials;
- real cost increases in the projections with different methodologies used for their calculation and some related issues;
- a big impact from the newly mandated licence conditions for security of supply (including asset utilisation) and feeder reliability in NSW;
- the need to replace ageing assets at a faster rate, in respect of which the expenditure in the next period is only the first phase of what will be a major and extended period of capital investment in Sydney CBD and elsewhere;
- increased expenditure in IT; and
- better-prepared cases in support of the expenditure proposals this time, compared with the cases put forward for assessment in NSW for the previous review.

Defining Feature of Distribution Network Capex Assessments

This review will have highlighted the differences between distribution and transmission network expenditure, the former being characterised by a large number of small projects making project assessment possible only on major sub-transmission work. Likewise, distribution work at 11 kV and low voltage is mainly programme-based, entailing an enormous number of routine items carried out in a wide range of circumstances. These factors make it important for a reviewer to take an overview of the networks and the expenditure projections and to gain a full understanding of what is happening – e.g. in relation to trends in fault rates and asset utilisation, age and reported condition, changes in approach from one period to the next – and the expenditure required. The initial sections in each of the subsequent volumes of this report have been included to provide background for that purpose and support our acceptance in most cases of the DNSPs' system-related capex proposals overall, notwithstanding that some minor expenditure components may not have been perfectly prepared by the DNSPs.

Efficiency of DNSPs' Own Capital Costs

We are not able to say definitively that the DNSPs' own capital costs (as opposed to those related to goods and services that are procured competitively) are efficient in all respects, although we have accepted them as sufficiently so for the purpose of our review. Private enterprise is generally considered to be strongly incentivised to operate efficiently but the same may not be true of state-owned enterprises, although no doubt they also have performance objectives set by their shareholding ministers. A review of this matter would

require a major study of the work practices in each DNSP. Not only would that be well beyond the scope of our review but also it would appear to us to be a management responsibility, not a regulatory one. If the AER wishes to flush out latent efficiency improvements in the DNSPs' own work force, it might consider the introduction of a suitable incentive to apply in the next period for the purpose. [1]

Allocation of Overheads between Capex and Opex

In future assessments, the AER might consider requesting details of the basis of allocation of overheads to capex and opex. The cost allocation methodologies approved by the AER cover the allocation of costs between regulated and non-regulated activities but different methods of allocation of overheads and support costs within the regulated businesses lead to different outcomes, particularly in respect of allocations to capex and opex.

Impact of International Financial Crisis

For the avoidance of doubt, we note that our work is based on the DNSPs' proposals and that they were prepared before the present international financial crisis became fully evident. Its potential effects have therefore not been considered.

Acknowledgement

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

[1] Reference in main text: section 2.4 under the sub-heading "Unit Costs and the Efficiency of Capital Costs Generally".

1 Introduction

1.1 Appointment and Terms of Reference

In December 2007, the Australian Energy Regulator (the AER) [2] appointed Wilson Cook & Co Limited, Engineering and Management Consultants, Advisers and Valuers, of Auckland to assist it with its assessment of the expenditure proposed by the ACT and NSW distribution network service providers (DNSPs) as part of its forthcoming five-year price review and make recommendations on allowances for prudent and efficient capital expenditure and operating and maintenance costs for the DNSPs. [3] [4]

The principal objective of the Services was to provide the AER with advice on, and assistance with, the review of the capital, operating and maintenance expenditure proposals submitted by the DNSPs. In doing so, we were to have regard to the National Electricity Law and the National Electricity Rules, particularly the new Chapter 6 and associated transitional provisions, primarily clause 6.5.6 and clause 6.5.7.

The terms of reference for the Services are given in appendix A.

1.2 Objectives

The objective of the review was to assess the DNSPs' expenditure proposals and report to the AER on whether in our opinion the forecast expenditure reasonably reflected the efficient costs of a prudent DNSP working in the circumstances of the DNSP concerned.

In the case of ActewAGL Distribution, a second objective was to report to the AER on whether ActewAGL Distribution's capex during the current period was prudent. This review was to be undertaken in manner consistent with that envisaged by the previous regulator, as set out in its determination. [5]

1.3 Scope of Work

We were to assist the AER with a variety of pre-lodgement tasks, which included assistance in finalising the regulatory information notices (RINs) and accompanying templates. [6] We were then to:

- form a preliminary view of unit costs for capital expenditure estimation,
- review the external factors and obligations identified by the DNSPs,
- develop appropriate escalators for the cost of materials and inform ourselves of the assumptions made by the DNSPs in determining their own forecasts of demand and material cost escalators,

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[2] References to the AER are generally to the management unless the sense requires reference to the Board itself.

[3] The relevant DNSPs are ActewAGL Distribution, Country Energy, EnergyAustralia and Integral Energy.

[4] Throughout the report, references to periods are to regulatory periods unless the context requires otherwise.

[5] The previous regulator of ActewAGL's prices was the Independent Competition and Regulatory Commission (ICRC).

[6] This work was completed before the DNSPs lodged their proposals.

- undertake a detailed review of the policies and procedures by which the DNSPs make their operational and investment decisions,
- assess the prudence of capex undertaken by ActewAGL Distribution during the current period,
- undertake a high-level review of opex and capex during current period, and
- test the magnitude of the capex and opex forecasts submitted by the DNSPs by examining the application of the submitted policies, procedures and unit costs to the DNSPs' networks for the next period.

We were required to review the expenditure projections for consistency with the demand forecasts accepted by the AER.

We were also to make such other recommendations to the AER as we considered necessary for the fixing of appropriate levels of expenditure, in the context of clauses 6.5.6 and 6.5.7 of the transitional Rules.

Finally, we were to:

- examine and assess any additional pass-through events proposed by the DNSPs, and
- assess the reasonableness of any uncontrollable opex cost categories proposed by the DNSPs in the context of the efficiency benefit-sharing scheme (EBSS) developed by the AER.

1.4 Data Used

Unless noted otherwise, the report is based on the proposals submitted by the DNSPs, supplementary information prepared by the DNSPs and submitted to the AER and us and the representations made by the DNSPs.

1.5 Work Programme, Consultation and Reporting

Work on the assessment commenced in December 2007 with the pre-lodgement tasks and continued in June 2008, following the submission of the DNSPs' proposals. Visits were made at the end of April 2008 to meet the DNSPs and discuss the review process. Further meetings were held with the DNSPs during the period 30 June to 11 July. The object of those meetings was to be briefed by the DNSPs on the matters that they wished to emphasise in their proposals, discuss in detail with the DNSPs' staff each of the main elements of the expenditure proposals and receive additional supporting information. Meetings were also held with the AER to brief us on the background to the work and the outputs required.

Additional information was requested by us after these meetings and the responses to our requests, and to outstanding matters arising during our visits, were received from the DNSPs over the period ending 4 September 2008. [7]

Following receipt and analysis of the information, and after seeking clarification of certain points, we prepared our report and submitted it to the AER on 8 September as a draft for review and confirmation that it addressed our terms of reference. The report was sent at the same time by the AER to the DNSPs for their confirmation that it did not contain factual errors, misinterpretations of the material received from the DNSPs or information that is

[7] Information from Integral Energy in relation to the effects of adopting a different demand forecast was received on 3 September 2008, too late for us to consider in this report. However, its later review suggested that no alteration was needed in our findings.

confidential to the DNSPs. [8] We then met with the AER and the DNSPs to discuss their responses. Final drafts were sent subsequently to the AER for review and again to the DNSPs for checking for errors and confidential information. The points identified have been corrected but broadly our conclusions were not affected and the final report was tabled on 21 November 2008 for use by the AER.

The work was carried out for and on behalf of Wilson Cook & Co Limited by a team comprising Mr Jeffrey Wilson (team leader), Mr Derek Walker, Mr Steven Cooke, Mr Pat Hyland and Mr Chris Collie-Holmes, all of Wilson Cook & Co.

A list of personnel met during the assessment is given in appendix B.

1.6 This Report

This report summarises the work carried out, our general observations and conclusions. It is presented in five volumes:

Volume 1	Main Report (this volume)
Volume 2	EnergyAustralia
Volume 3	Integral Energy
Volume 4	Country Energy
Volume 5	ActewAGL Distribution.

This volume (volume 1) is presented in four sections:

Section 1	Introduction (this section)
Section 2	Background and Approach to the Review
Section 3	Comparison with Other DNSPs
Section 4	Conclusions and Recommendations.

1.7 Abbreviations, Tables and Currency Units

The following abbreviations and terms are used in the text and have the meanings stated:

ACCC	the Australian Competition and Consumer Commission
AER	the Australian Energy Regulator
DNSP	Distribution network service provider
EBSS	Efficiency benefit-sharing scheme
ICRC	Independent Competition and Regulatory Commission
IPART	Independent Pricing and Regulatory Tribunal of NSW
PB	Parsons Brinckerhoff
RIN	Regulatory information notice
Saha	Saha International
SKM	Sinclair Knight Merz
the Code	the National Electricity Code
the Law	the National Electricity Law
the Rules	the National Electricity Rules.

[8] Volume 1 was provided to all the DNSPs but with the executive summary removed: the remaining volumes were provided only to the DNSP concerned in each case.

Other abbreviations – capex, opex, GIS, GWh, HV, IT, LV, MVA, ODV, SCADA and the like – have their common meanings.

"NA" in the tables means 'not applicable' or 'not available' as the context requires; and "c." means *circa* or 'about'.

Sums have generally been rounded and tables may not add for that reason. FY 2008 means the financial year ending 30 June 2008, etc.

Unless noted otherwise, all sums are stated in real 2009 dollars except for the comparison of expenditure in the current period, where nominal dollars are used.

1.8 Probity

The AER's staff provided guidance in respect of our terms of reference and assisted us with our work. We considered their advice and requests but are satisfied that none influenced our report or its conclusions inappropriately.

1.9 All Earlier Advice Superseded

For the avoidance of doubt, we confirm that this report, including all five of its volumes, supersedes all earlier written or oral opinions or statements presented by us on the matters discussed and constitutes our sole statement on the matters discussed.

1.10 Acknowledgement

The cooperation and assistance of the AER and the four DNSPs in the preparation of this report is gratefully acknowledged.

2 Background and Approach to the Review

2.1 Background

ICRC's Role in the Australian Capital Territory

The Independent Competition and Regulatory Commission (ICRC) is presently the jurisdictional regulator of electricity distribution services under the National Electricity Code (the Code) in the Australian Capital Territory (ACT). Its objectives are defined in two principal Acts, the *Independent Competition & Regulatory Commission Act, 1997* and the *Utilities Act, 2000*.

The ICRC made a price determination for ActewAGL Distribution's electricity, water and sewerage charges in May 1999, to apply for the period beginning in FY 2000 and ending in FY 2004. [9] The Code was introduced during the time of the formulation of the 1999 price direction and so, whilst the price determination was not strictly covered by the Code, it was framed to ensure compliance with both the Commission's Act and the Code. The ICRC made a further determination 2004 covering the period FY 2005 to FY 2009. [10]

IPART's Role in New South Wales

The Independent Pricing and Regulatory Tribunal (IPART) is presently the jurisdictional regulator of the DNSPs in NSW under the Code. In 1999, its price determination took the form of a revenue cap but the methodology was changed to a weighted average price cap in the 2004 determination. In June 2004, the Tribunal released its final price determination for the period FY 2005 to FY 2009 for each of the DNSPs. Maximum price changes were set, based on an analysis of the revenues that the DNSPs will require to cover the efficient costs of service provision during the period.

Clauses 14 and 15 of the determination set out circumstances under which a DNSP might apply for a 'cost pass-through' to recover any increases in its efficient costs associated with the result of certain, specified, changes that were outside its control. These changes fell into two categories: (a) a general cost pass-through (changes in certain taxes, and changes in regulatory obligations); and (b) specific cost pass-through (changes associated with specific, pre-defined events that the Tribunal knew might occur during the period but for which insufficient information was available at the time of the determination to quantify the cost impacts).

On 1st August 2005, the then Minister for Energy, Utilities and Sustainability introduced new licence conditions for the DNSPs relating to security of supply and network reliability. The new conditions imposed the following obligations upon the DNSPs: (1) minimum and average reliability standards, specified by feeder type; (2) minimum network design planning criteria; and (3) customer service standards requiring the DNSPs to make payments to customers (on application) if they experience more than a certain number or duration of interruptions in a given year. In December 2005, all three DNSPs lodged cost pass-through

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[9] ActewAGL was founded following the formation of a utility joint venture partnership in 2000 between the ACTEW Corporation and the Australian Gas Light Company (AGL). Since 2007, ActewAGL has effectively been owned equally by Singapore Power and the ACTEW Corporation.

[10] The previous regulatory determinations for the DNSPs (July 2004 to June 2009) were made by the ICRC, IPART and the ACCC.

applications with IPART, seeking approval for expenditure totalling over $1.5 billion related to the imposition of the new licence conditions. These applications were reviewed by Wilson Cook & Co and a decision was taken on them by IPART in 2006. Subsequently, Wilson Cook & Co assisted IPART with the preparation of guidelines for auditing the pass-through expenditure. The licence conditions were amended in December 2007, mainly in relation to a change in the compliance date from 2009 to 2014. [11]

The ACCC and the AER

The Australian Competition and Consumer Commission (ACCC) was established in 1995 as part of the national competition policy reform programme. It is the national agency dealing with competition matters and its primary responsibility is to ensure that individuals and businesses comply with competition, "fair trading" and consumer protection laws, in particular the *Trade Practices Act, 1974*.

The AER was established as the body responsible for economic regulation and compliance with the rules of the electricity and natural gas industries at a national level. The AER, in accordance with its responsibilities under the National Electricity Rules (the Rules), is to assess the appropriate revenue determination to be applied to the services provided by the ACT and NSW DNSPs from 1 July 2009 to 30 June 2014 (the next period).

Whilst EnergyAustralia's transmission network was assessed separately to its distribution network at the last review, the transitional provisions of the Rules require a single assessment for EnergyAustralia's network as a whole when the current determination is made.

2.2 Documents and Data Received

The Rules oblige the DNSPs to provide information about their costs. In consultation with the DNSPs, the AER developed a regulatory information notice (RIN) and *pro forma* templates to collect information on the DNSPs' capital and operating expenditure and this information forms the basis of our review. Documents and data received from the AER included the DNSPs' proposals of June 2008 and accompanying supporting papers.

Documents and data requested and received directly from the DNSPs or through the AER included relevant published reports, responses to our questions, presentations made at our meetings with the DNSPs and copies of other relevant documentation, some or all of which was considered confidential. The following list indicates the type of material received.

(a) Statements of corporate intent and selected annual reports.
(b) Organisation charts showing staff complements and functional responsibilities.
(c) Asset management plans.
(d) Network planning reports and project and expenditure assessments.
(e) Relevant policies and procedures.
(f) Miscellaneous data including, for selected cases or years:
    (i) past and proposed expenditure broken down by function;
    (ii) supplementary descriptions of past and proposed expenditure items and the reasons for them;
    (iii) details of indirect costs (overheads) assigned to the network businesses units;
    (iv) details of the cost and nature of services or facilities (other than those covered by overheads) provided to the network businesses units;
    (v) information on the method of prioritisation of capital works;
    (vi) network planning criteria;

[11] Reference should be made to the conditions themselves for full details.

(vii) selected information on the cost of major projects or programmes included in the capex and opex estimates;
(viii) details of the methodologies used to establish the estimates and in some cases copies of the costing or estimation models used;
(ix) reconciliations of expenditure tables;
(x) descriptions of the cost escalation methodologies applied; and

(g) general data including customer numbers, network line diagrams, load and circuit reports, substation peak load reports, forecast demand, energy throughput, electrical losses, network performance statistics and asset age profiles.

We did not consider it necessary to request detailed asset condition information or power planning analyses for our review, although we did request and receive selected summaries of asset condition data and engineering assessments to evaluate the expenditure programmes.

2.3 Adequacy of Information Available

A noteworthy feature of the expenditure review this time was the improved availability of accurate information within the DNSPs in respect of their assets and expenditure requirements, at least as evidenced by the generally high quality and completeness of the information and arguments provided to us for review. The comprehensive RIN, developed and issued by the AER, assisted this process but the DNSPs themselves are to be commended for the preparatory work – an effort that has helped justify their projections in a way that was not so readily achieved in the previous regulatory reviews in NSW.

No DNSP refused us any information that we requested and that was considered by us to be material to our assessment.

2.4 Our Approach to the Review

Our approach to the review generally followed the framework proposed by the AER, as set out in the terms of reference, *viz.* to:

- review identified external factors and obligations of the DNSPs,
- develop appropriate escalators for the cost of materials and inform ourselves of the assumptions made by the DNSPs in determining their own forecasts of demand and material cost escalators,
- undertake a detailed review of the policies and procedures by which the DNSPs make their operational and investment decisions,
- assess the prudence of capex undertaken by ActewAGL Distribution during the current period,
- undertake a high-level review of opex and capex during current period, and
- test the magnitude of the capex and opex forecasts submitted by the DNSPs by examining the application of the submitted policies, procedures and unit costs to the DNSPs' networks for the next period.

We were also required to review the expenditure projections for consistency with the demand forecasts accepted by the AER.

Finally, we were to:

- examine and assess any additional pass-through events proposed by the DNSPs, and

- assess the reasonableness of any uncontrollable opex cost categories proposed by the DNSPs in the context of the efficiency benefit-sharing scheme (EBSS) developed by the AER.

Transitional Rules

Part 1 of the terms of reference made it clear that our review "is primarily concerned with clause 6.5.6 of the transitional Rules relating to opex and clause 6.5.7 of the transitional Rules relating to capex". In carrying out the review, we thus noted the transitional Rules and in particular clauses 6.5.6(c) and 6.5.7(c) in which the key expenditure objectives are summarised.

Clause 6.5.6(c) requires opex to reflect: (1) the efficient costs of achieving the operating expenditure objectives; and (2) the costs that a prudent operator in the circumstances of the relevant DNSP would require to achieve the operating expenditure objectives; and (3) a realistic expectation of the demand forecast and cost inputs required to achieve the operating expenditure objectives.

Clause 6.5.7(c) requires capex to reflect: (1) the efficient costs of achieving the capex objectives; (2) the costs that a prudent operator in the circumstances of the relevant DNSP would require to achieve the capex objectives; and (3) a realistic expectation of the demand forecast and cost inputs required to achieve the capex objectives.

The opex and capex objectives are set out in clauses 6.5.6(a) and 6.5.7(a) and are: (1) meet or manage the expected demand for standard control services over that period; (2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services; (3) maintain the quality, reliability and security of supply of standard control services; and (4) maintain the reliability, safety and security of the distribution system through the supply of the standard control services. [12]

Prudence and Efficiency

The terms of reference do not define prudence or efficiency for the purpose of the review. Therefore, without attempting to interpret the transitional Rules (and except in the case of our assessment of prudence of ActewAGL Distribution's capex in the current period – see below), we adopted the following approach.

We first noted that the objective of the review was in essence to assess the DNSPs' expenditure proposals and report to the AER on whether in our opinion the forecast expenditure reasonably reflected the efficient costs of a prudent DNSP working in the circumstances of the DNSP concerned.

We noted that to ensure adequacy or effectiveness, a prudent operator might undertake more work than otherwise considered necessary but to ensure efficiency it might undertake less and thus a balance between the two is required.

We noted that *prudence* has connotations of exercising sound judgement especially concerning one's own interests, being careful to avoid undesired consequences, being cautious or circumspect in one's conduct, managing carefully and with economy. Prudence is often best judged by the absence of evidence suggesting a lack of it. In the case of electricity networks, imprudence might be most discernible if there was evidence of failure to invest adequately, accompanied by identified adverse consequences, and is thus best assessed retrospectively.

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[12] Point 4 is interpreted by EnergyAustralia as a requirement to ensure the physical sustainability of the distribution system. This interpretation was confirmed with the AER to be reasonable and has been used in our review.

Where we considered that there was an appropriate balance between these factors, prudence and efficiency, we have said in the text that the expenditure is "reasonable".

Where we found identifiable instances of imprudent expenditure, an imprudent failure to make expenditure or of what appeared to be inadequate provision for future expenditure, we have identified them.

We considered *efficiency* in terms of the nature or timing of expenditure and looked for evidence that as far as practicable the expenditure reflected optimal planning and design and competitive costs taking account of local factors, 'good electricity industry practice' and the defined security of supply and service standards of the DNSP concerned.

We interpreted *good electricity industry practice* to be the exercise of that degree of skill, diligence, prudence and foresight reasonably to be expected of a distribution business working under the prevailing conditions consistent with applicable regulatory, service, safety and environmental objectives.

Prudence of Past Capex

The only requirement to review the prudence of past capex was in relation to ActewAGL Distribution, with the review to be undertaken in a manner consistent with that envisaged by the previous regulator, ICRC, as set out in its previous determination. Details are given in volume 5 of this report.

External Obligations

The terms of reference asked us to pay special attention to the impact of external obligations on the expenditure. [13] However, whilst each DNSP provided a list of external obligations affecting its expenditure projections, the lists did not serve the purpose of highlighting the obligations that were significant from our point of view, *viz.* obligations that are key drivers of expenditure. A further complicating factor was that a legal review would be required to establish completeness. [14]

In consultation with the AER, therefore, we have dealt with this requirement by considering only those obligations that are material to the expenditure and in particular those that have changed from the current period to the next. Prospective obligations have been identified where their impact is identified by the DNSPs.

Consistency with Demand Forecasts

We familiarised ourselves with the DNSPs' demand forecasts in terms of the projected rates of growth and the nature of any seasonal load shifts but did not review them. Nor were we able to verify that the demand forecasts assumed by the DNSPs for planning purposes were necessarily those reviewed by the AER or its other consultants. We were able to check in selected cases that the DNSPs' growth-related capex proposals were matched to levels of demand stated in their planning documents but an audit would be required to verify that the demand forecasts are consistent internally.

Unit Costs and the Efficiency of Capital Costs Generally

The terms of reference envisaged that we would develop independent forecasts of unit costs (rates) in advance of receiving the DNSPs' proposals and that it would be possible for them

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[13] The terms of reference also referred to external factors and they were identified and considered under each expenditure heading.

[14] The terms of reference proposed that we review the lists for completeness and to ensure a full understanding of the operational implications of the obligations on the DNSPs. We were also to identify any obligations that we considered material and that had been omitted.

to be compared with the costs that the DNSPs had applied when preparing their expenditure forecasts. This comparison did not prove possible, as the DNSPs use various methods for cost estimation, relying generally on the reported cost of completed work, internal costing programmes or independent review – processes that we consider normal practice – and not on unit costs of a type that could be compared.

In particular, we were not able (and thus did not attempt) to place any weight on comparisons of unit costs for the installation of lines and cables or for work on lines, cables or the equipment on them as our experience has shown repeatedly that they can vary in a range of around ten-to-one in unit cost per km of circuit length, depending on the circumstances. This is before the consideration of multipliers to allow for special laying conditions such as in CBDs, rocky ground, rugged terrain, remote areas or urban *vs.* rural locations and before the addition of traffic management allowances. Unit costs for other work such as distribution substation installations are prone to a lesser but significant degree of variation. Unit costs for major substation work may be able to be compared (but then only in respect of well-defined building blocks, and with other DNSPs using similar designs, and excluding site-specific costs). Unit costs for replacement work may bear little resemblance to costs for "green-field" or "brown-field" construction of new assets on a cost per kilometre basis because set-up costs are generally not able to be spread. [15]

Having said this, it should be noted that the majority (around 80% or more) of capex is related to the procurement of materials and contract services and that they are generally obtained competitively and so it is not unreasonable to rely on reported costs of recently completed work in place of questionable unit rate comparisons when considering the efficiency of costs. [16] We thus viewed the DNSPs' reported costs of recently completed work as efficient within the context of the industry as it presently operates, although there may still be scope for efficiency improvement. [17]

Escalation Rates for Materials

The terms of reference also asked us to develop appropriate escalators for the cost of materials. However, the DNSPs had retained expert advisers to project future material (and labour) price movements and on review of that material, we did not consider it appropriate to attempt a separate estimation (it may be appropriate for the AER to have the validity of the escalators reviewed by specialist economic advisers). We noted only that the escalation rates assumed for the main material or asset categories appeared modest and did not reflect a

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[15] These conclusions are based on comprehensive sampling and analysis by several New Zealand DNSPs in consultation with others and us. The underlying information is mostly confidential to the clients concerned and cannot be reported here. (For completeness, it may be appropriate to add that whilst unit rates are commonly used in asset valuations for practical reasons, that does not mean they are suitable for use as a foundation for capex estimates – a point that has also been examined in detail by us in New Zealand.)

[16] A comment made on our draft report was that without independent comparison, past practices would be factored into future cost estimates without challenge or any incentive for efficiency improvement. However, we considered that that view presupposed that the DNSPs never scrutinise their costs or designs themselves or seek their own improvements, or that they do no do so effectively, a view that we would dispute.

[17] As an observation, a more relevant question than that addressed in the preceding footnote might be that of the efficiency of the DNSPs' field operations. In that context, we are not able to say definitively that the DNSPs' own capital costs (as opposed to those related to goods and services that are procured competitively) are efficient in all respects, although we have accepted them as sufficiently so for the purpose of our review. Private enterprise is generally considered to be strongly incentivised to operate efficiently but the same may not be true of state-owned enterprises, although no doubt they also have performance objectives set by their shareholding ministers. A review of this matter would require a major study of the work practices in each DNSP. Not only would that be well beyond the scope of our review but also it would appear to us to be a management responsibility, not a regulatory one. If the AER wishes to flush out latent efficiency improvements in the DNSPs' own work force, it might consider the introduction of a suitable incentive to apply in the next period for the purpose.

continuation of the rapid escalation of costs evident in the electricity supply industry in Australasia over the past five years or so. [18]

Cost Escalation Methods

We noted the escalation methods that had been applied by the DNSPs to build projected real cost increases into their expenditure projections, and confined ourselves to reviewing whether the application of the escalation was reasonable. Our terms of reference did not require us to review labour escalation rates and we have not, accepting the rates used by the DNSPs. We considered the methodologies reasonable but were not able to verify ourselves that the methodologies had been applied in the stated manner as an audit would be required for the purpose. We have therefore relied upon the DNSPs' assurance that that is the case.

Expenditure Drivers

The expenditure drivers identified by the DNSPs included the usual ones such as the need to meet demand growth, replace ageing assets, address safety and environmental issues and maintain and operate a growing asset base. Other drivers cited were the impact in NSW of the new licence conditions [19] relating to security of supply and reliability and the impact of increased material and labour costs. Some DNSPs referred to constraints arising from previous determinations and identified a consequential backlog in the maintenance and replacement of their assets. Others cited a need for more vegetation management expenditure to meet their reliability targets. Each DNSP listed the main external obligations that it said impinged on its expenditure. Details of the drivers most relevant to each DNSP are given in the remaining volumes of this report.

Appropriateness and Application of Policies and Procedures

The terms of reference required us to be satisfied that the DNSPs have appropriate policies and procedures in place and that these had been applied consistently when forecasting the expenditure.

We reviewed the documents that the DNSPs said underpinned their operational and investment decisions and then checked that the proposed expenditure had been formulated in general accordance with them. In essence, to test appropriateness, we looked to see if the policies and project documents reflected:

- modern industry practice in electricity distribution including in respect of risk management,
- an appropriate basis of establishing need,
- a sound basis for the estimated cost (preferably based on market rates for prior work of a similar type),
- the consideration of credible alternatives,
- identification of the least-cost solution taking long-term costs into account,
- consideration of optimal timing [20] and
- consistency with relevant long-term development plans.

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[18] Several of the DNSPs presented evidence of cost escalation over recent years in addition to projections of future cost increases. Their evidence of recent increases in the cost of installed equipment generally reflected experience in New Zealand, where, for example, work carried out by us indicates a 30% increase in the cost of distribution network assets from June 2003 to June 2006.

[19] See section 2.1.

[20] This can be assessed only in an indicative sense.

We considered the adequacy of the documentation only from the viewpoint of substance, not form, and placed no weight on departures where they had little or no effect on the outcome reached. [21]

We did not expect minor or routine works to be supported by detailed analyses.

We considered that demonstrable necessity e.g. for safety or compliance would satisfy the "demonstration of need" test automatically, as would work required to replace defective plant or equipment or to meet load growth provided that demand management alternatives had been considered.

We found that much of the documentation was conventional and that the expenditure was driven not by the policies *per se* but by load growth, inadequacies in asset condition, the new licence conditions in NSW and other usual considerations such as identified safety issues and environmental risk. [22]

We did not find any policies or procedures to be unsuitable or unreasonable in ways that would have had a material effect on the expenditure reviewed.

Where we had reservations about the expenditure, they related mainly to instances where there was a lack of supporting facts, not to policy weaknesses.

In short, the review concluded that sound and systematic approaches to the work were being followed by the DNSPs. Details are given in the other volumes of this report.

Self-Insurance, EBSS Exclusions and Cost Pass-Through Events

Where we considered it within our field to do so, we have commented in the other volumes of this report on matters to do with the scope of self-insurance, opex deemed uncontrollable for the purpose of the efficiency benefit-sharing scheme and proposals for additional cost pass-through events. Mostly, these matters fell outside our field. However, we note the following points for consideration by the AER.

- 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 did not review the financial provisions associated with self-insurance but noted that some of the costs of managing risk are normal business costs in the electricity distribution industry.
- We did check where possible to see whether any such costs were included in the projections that we reviewed but generally, it was not possible to say from the high-level information supplied.
- We suggest that proposals for exclusions from the efficiency benefit-sharing scheme ought to meet a high threshold in the sense of being uncontrollable, as the pressure on the DNSPs to minimise costs efficiently in any reasonable changing circumstance ought not to be diluted.
- We suggest for the AER's guidance that care be taken when defining the scheme to exclude expenditure relating to backlogs of work from the base year as any such

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[21] Governance matters, such as the internal levels of approval of projects or confirmation that the DNSP's limits of delegated internal authority are complied with, were considered to be outside the scope of our review.

[22] The various documents are listed in the DNSPs' proposals and have been referred to in our report only where clarity so required.

expenditure should not form part of the opening balance in the calculation of future benefits.

- We suggest that additional pass-through proposals should not be accepted 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.
- 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.

These points are discussed further in volumes 2 to 5 of this report.

2.5 General Considerations in Reviews of this Type

We were satisfied that the approach adopted was consistent with the conventional methods adopted in reviews of this type and that it included, to the extent needed:

- the identification of key expenditure drivers;
- confirmation of the DNSPs' policies for the capitalisation of expenditure;
- a review of the adequacy of the information available to the DNSPs on their assets;
- a review of the adequacy of the DNSPs' planning processes in terms of the appropriateness of planning criteria, robustness of modelling and decision-making and adequacy of documentation (including asset management plans);
- commentary, if necessary, on the comparability of the DNSPs' activities with international practice in respect of asset provision, asset utilisation and network reliability; [23]
- the identification of the DNSPs' major projects and programmes, their expected outcomes, demonstrated necessity and reasonableness of timing;
- an assessment of the individual expenditure components including the installed cost of new assets, the optimality of design and construction practices, the reasonableness and efficiency of the expenditure proposed for: (demand-related) reinforcement, new connections, asset replacement, reliability and quality improvement , environmental, safety and statutory compliance, SCADA and IT facilities and support plant, equipment and facilities;
- comparison of the proposed levels of capex with past levels;
- consideration of the reasonableness and efficiency of the projected capex in total;
- consideration of the efficiency and reasonableness of the proposed opex under headings such as preventive maintenance, reactive maintenance, etc and in total;
- comparison of the proposed levels of opex with past levels;
- consideration of any new factors impinging on the DNSPs to the extent they have not already been assessed under the preceding points;

[23] In New South Wales, asset utilisation and reliability have been mandated in the licence conditions.

- a review, to the extent possible, of any resource constraints that might impinge on the DNSPs' ability to implement their expenditure proposals fully within the period; [24] and
- a review of comparative performance statistics publicly available in respect of other network businesses.

As is the case in other reviews of this type, we do not endorse or reject particular projects individually but seek only to satisfy ourselves of the reasonableness and efficiency of the aggregate level of expenditure required. [25]

In that context, we note that the normal objective of this type of assessment is that the reviewer should be able to:

- assess the efficiency of the network businesses' expenditure estimates and asset management policies in terms of their match with international practice,
- take into account a natural level of trade-off between capex and opex,
- be satisfied that the proposed expenditure, projects and programmes are consistent with maintaining, or where necessary varying, standards and service delivery capacity,
- form an overall strategic view of whether the businesses' proposed levels of expenditure are reasonable and efficient; that is, whether they represent efficient levels for the defined security of supply and service standards or,
- if required, be satisfied that they reflect a transitional path from the present level of expenditure to a more efficient level.

We thus took into account past levels of spending from the standpoint of whether it ought to influence future expenditure levels and other expert opinion on the projected expenditure or related matters that was made available to us.

Level of Preparation of Projects and Optimality of their Timing

Generally, we considered that the level of preparation of the projects and programmes we reviewed was appropriate for planning purposes, recognising that plans do not constitute, by themselves, a justification for proceeding with work until detailed studies have been prepared and the relevant criteria met. In that context, it is normal for some work to be advanced later on, for other work to be deferred, for some to be amended and for other items to be dropped altogether.

We noted that whilst particular items of expenditure might be justified, the optimality of their timing was more difficult to gauge.

Optimality of Designs and Reasonableness of Construction Costs

We did not receive as much information as we would have liked from all DNSPs in respect of the unit construction costs assumed for the estimation of expenditure on the proposed works although we noted that, in general: the procurement of materials and equipment is bid

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[24] The terms of reference did not require us to opine on the ability of the DNSPs to implement their plans or on whether we considered they might experience constraints in resources. However, in commenting on the draft report, the AER asked us for our view on this matter. Whilst the answer can only be conjectured, we see no reason why the DNSPs, along with others in the country and worldwide, cannot gear up for the additional workload foreseen, providing they take concerted action for the purpose. In that context, we noted that each DNSP had put forward its plan for the purpose and unless noted otherwise in volumes 2 to 5 of this report we considered that each had adopted a reasonable strategy. We expect that expenditure will ramp up over the period due to the need to increase the resource base and this is reflected in some of the DNSPs' proposals.

[25] The DNSPs should determine, themselves, whether to pursue individual projects.

competitively whilst design and installation is undertaken using the DNSPs' own resources or contracted resources; the designs used appeared reasonable; and various high-level reviews of the cost of construction of new assets, undertaken by engineering advisers to the DNSPs, had generally found that the construction costs assumed by the DNSPs in their proposals were reasonable.

Whilst it was not possible to gauge accurately how effective the DNSPs' internal resources and processes are at the implementation of this work, we considered, on balance, and in light of our experience, that the installed cost of new assets was reasonable for the purpose of this review.

Capex-Opex "Trade-Off"

We considered whether the DNSPs' proposed expenditure exhibited an appropriate trade-off between capital and operating expenditure. [26]

Reasonableness of Aggregated Projections

Where possible, we reviewed the DNSPs' expenditure proposals from a "top-down" perspective as well as a "bottom-up" perspective. The "bottom-up" approach was made by considering the build-up of both capex and opex from projects, programmes and past expenditure levels. The "top-down" approach looked at the level of expenditure as a whole in the context of the size and nature of each network and the circumstances of each DNSP. [27]

As a general principle, we retained the view that whilst each individual project or programme may be justified when considered in isolation, it is still necessary that the aggregated expenditure projection be reasonable. The aggregation of estimates for individual projects and programmes without adequate consideration of their impact in total, or of cost savings in other parts of the business, generally does not lead to an efficient level of expenditure. [28]

2.6 Matters Not Considered

The following matters were excluded from consideration in our work or were not undertaken:

- review of forecast demand, as that was not within our terms of reference;
- review of the DNSPs' policies for the capitalisation of expenditure other than to note that the cost of replacing run-to-failure assets of a minor nature is expensed;
- review or re-calculation of detailed power planning analyses;
- re-estimation of the cost-of-materials escalators applied by the DNSPs to their proposals;
- review of expenditure other than that associated with the DNSPs' network business units;
- review of capital contributions; [29]
- physical inspection of the assets;
- re-calculation of expenditure if we had reason to consider the projections inappropriate, other than in respect of proposing adjustments for the AER's consideration;

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[26] These are discussed in section 9 (opex) in each of volumes 2 to 5 of this report.

[27] "Top-down" assessments were restricted to opex and non-system capex, as described in section 3 of this volume.

[28] Amongst other reasons, this is because the individual components interact, or ought to do so.

[29] Our assessments relate to net capital expenditure, not gross.

- consideration of the possible effects of the following factors that can only be conjectured:
  - requirements for capex related to future safety issues, new statutory requirements, new Government policies or initiatives, or environmental requirements except to the extent that they have been identified by the DNSPs;
  - possible adjustments in capex stemming from the application of demand management policies other than those already reflected in the DNSPs' estimates;
  - any changes from current network planning or design practice;
- any matters outside our field of expertise; and
- any other matters identified elsewhere in the report as having been excluded from our work.

We did not carry out an audit of any DNSP's accounts, asset register, data, expenditure, processes or any item or activity or take any action that might be considered to have constituted an audit but relied instead solely on the submissions received from the DNSPs and the representations made in response to our enquiries.

3 Comparison with Other DNSPs

3.1 Scope of Benchmarking

It is acknowledged that benchmarking has limitations and thus, whilst broad comparisons of the expenditure of DNSPs may be made, various factors complicate the comparisons and require the exercise of considerable judgement when interpreting the results. [30]

It is also acknowledged that any comparison of a particular business with others implicitly assumes that the other businesses are efficient and the services provided are comparable in nature and quality. [31]

Nevertheless, for reasons outlined later in this report, we considered it necessary to carry out a comparison of the DNSPs' opex and non-system capex with that of a selected comparative group. The benchmarking of opex is reported in the remainder of this section and in volumes 2 to 5 of this report: the benchmarking of non-system capex is reported for each DNSP separately in volumes 2 to 5.

We did not consider it appropriate to benchmark the DNSPs' system capex with other DNSPs as system capex is driven by business-specific factors and comparisons of it – particularly those based on denominators such as customer numbers or line kilometres – are generally inappropriate. We considered that a business-specific assessment was the correct approach with capex although, normally, we would accompany it with a test of the total level of capex against the replacement cost of the network fixed asset base. However, no recent re-valuations of the network assets of the DNSPs were available on a comparable basis, in addition to which a complicating factor this year would be the impact of capex attributable to the licence conditions.

We also reviewed the comparative studies presented by the DNSPs in their proposals and comment further on them in the other volumes of this report.

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[30] These factors include differences in the type of network, the extent of transmission *vs.* sub-transmission systems, voltage levels, growth rates, customer and load densities, asset ages and condition, load mix, geographic coverage and other factors including service targets.

Additionally, some businesses may fully out-source their operational and maintenance activities whilst others carry out the work in-house or use a mix of both policies.

Some businesses own non-system assets such as computers and motor vehicles whilst other businesses lease these assets leading to an increase in opex and a reduction in capex. Different approaches lead to different cost structures.

Other adjustments that may need to be made before drawing conclusions include: a check that the period reviewed was typical of expenditure patterns in each business; whether the same asset or expenditure categories have been included in all cases – metering, public lighting and vested assets are sometimes excluded, whether any exchange rate or other adjustments are required before comparisons are made with off-shore businesses and whether there are any differences in accounting policies (some businesses may allocate a greater percentage of their corporate and network support costs to maintenance and capital activities whilst others report them separately, resulting in differing levels of allocation between capex and opex).

The mandatory licence conditions in NSW and Queensland also have cost impacts that may not apply in other states.

Finally, there may be differences in balance dates and regulatory periods that make data hard to compare.

[31] This is impossible to confirm, as we have not had the opportunity to examine the other businesses cited in our comparison in depth.

3.2 Efficiency of Opex in FY 2007

Composite "Size" Variable

Typically, a DNSP's opex is benchmarked on measures such as opex per MW or MVA, kilometre of line or customer. All vary in relation to customer density and it is usual to compare only networks with others of a similar customer density, albeit at the expense of reducing the number of relevant comparable DNSPs for use in the comparison.

Various attempts have been made by others to find a normalising variable that takes account of the network characteristics for comparative purposes. In 2004, Ofgem presented a composite variable by combining the common network variables (customer numbers, network length and kWh delivered), based on the equation:

$$\text{Size} = C^d L^e U^f$$

where C= customer numbers, L = network length, U = units of energy delivered and d, e and f are weights where d = 0.5, e = 0.3 and f = 0.2. We tested this variable on Australian and New Zealand data and found that, when using it, there was little or no correlation with customer density, thus making it an appropriate measure to use to represent the "size" of a network business – that is, "opex per unit of size" using this variable should be able to be used to compare networks with different customer densities. [32]

Intuitively, we considered that maximum demand in MW (or we could have used MVA) would be a more direct driver of opex in a DNSP than energy distributed, so we substituted demand for energy distributed. Thus, the modified variable that we have used is:

$$\text{Size} = C^d L^e D^f$$

where C= customer numbers, L = network length, D = maximum demand in MW and d, e and f are weights where d = 0.5, e = 0.3 and f = 0.2.

Method of Analysis

We compared the ACT and NSW DNSPs with those in Victoria, Queensland, South Australia and Tasmania. We chose data as close as possible to FY 2007 for the analysis, as it is the base year used by three of the four ACT and NSW DNSPs and is the most recent year for which data is publicly available. [33] Data for other DNSPs was sourced from publicly available information, including regulatory determinations and published performance reports. Abnormal items were removed from the ACT and NSW numbers. [34]

We compared all businesses based on the relationship of total opex *vs.* the composite size variable. We then used the size variable as a base and compared all businesses by plotting "opex per size" against both customer density and size to validate the neutrality of that measure against those variables and thus verify that the composite size variable is a valid measure on which to make a high-level comparison of businesses with different network characteristics.

We also compared two separate groups of businesses, those that are predominantly urban and those that are predominantly rural. This comparison was made on both the "opex per size" measure and traditional benchmarking measures. The results have been plotted against customer density and trend lines have been established where appropriate.

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[32] This can be seen from Graph A in Figure 3.2, which shows a lack of correlation, noting that the DNSPs are ranked in ascending order of customer density.

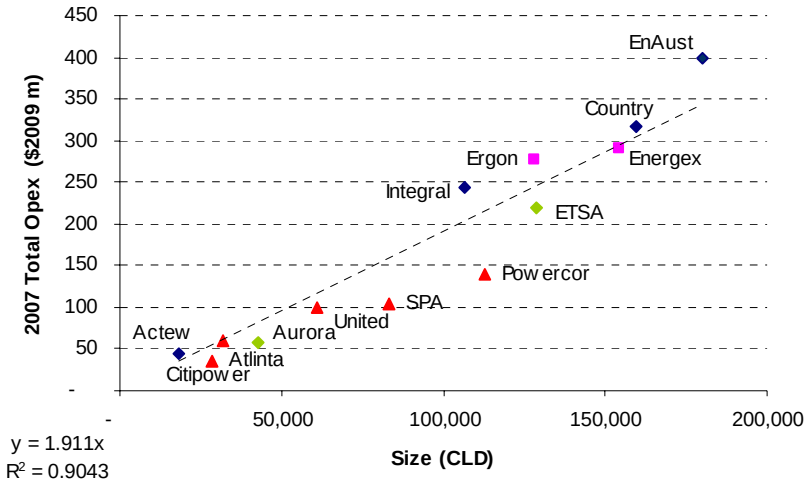
[33] Victorian data is for year ended 31 December 2006.

[34] EnergyAustralia's data excludes expenditure allocated to transmission. Data from DNSPs other than those in the ACT and NSW has not been reviewed by us or adjusted for any abnormal items that may be present.

Analysis of All DNSPs Based on Composite "Size" Variable

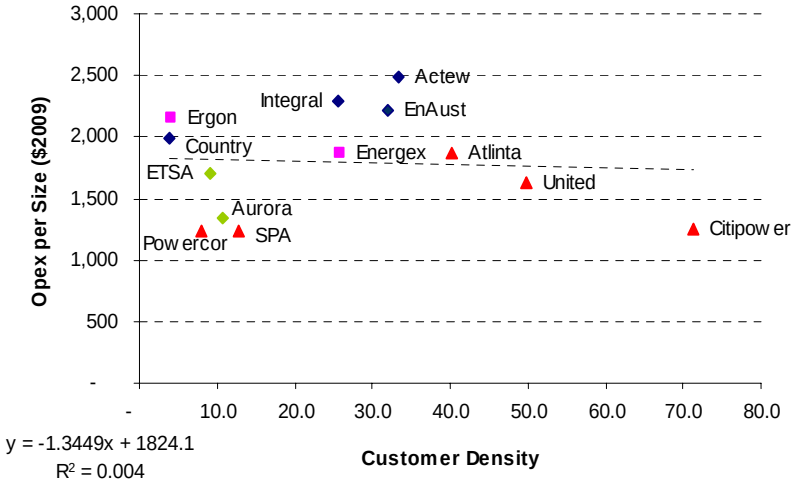
A comparison of total opex *vs.* size is shown in Figure 3.1. The comparison shows that the composite "size" variable exhibits a high degree of correlation with total opex over the DNSPs (a correlation coefficient of 0.90).

Figure 3.1: Comparative Analysis of Opex *vs.* Size



We then tested the neutrality of the composite "size" variable against customer density by plotting "opex per size" against customer density. The results are shown in Figure 3.2.

Figure 3.2: Comparative Analysis of "Opex per Size" *vs.* Customer Density



The figure confirms that there is little correlation between "opex per size" and customer density and thus the validity of using the composite "size" variable as the base when comparing DNSPs with different network characteristics.

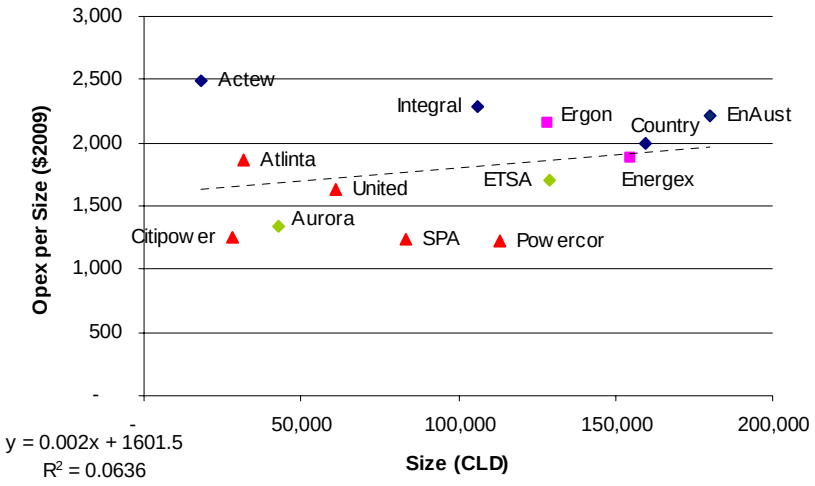
The preceding analysis shows that using the composite variable as measure of network size provides a reasonable basis for making a high-level comparison of distribution opex of DNSPs of different size and with different network characteristics.

Test for Economies of Scale

Of interest, we then tested the data to discern economies of scale by plotting "opex per size" against the size of the organisation as represented by the composite "size" variable. The

results are shown in Figure 3.3. The figure shows that there is a weak correlation between "opex per size" and size, suggesting that few economies of scale are achievable – a conclusion supported by a separate analysis of New Zealand data – and that there may be weak diseconomies of scale.

Figure 3.3: Comparative Analysis of "Opex per Size" *vs.* Size



Relative Position of ACT and NSW DNSPs

The next conclusion drawn is that on a size-adjusted basis – using the composite "size" variable as a measure of size – ActewAGL, Energy Australia and Integral Energy have costs above the other DNSPs in the comparative group and Country Energy has costs similar to the average. We have calculated the variance of the ACT and NSW DNSPs by comparing actual FY 2007 opex to the level predicted by the regression line in Figure 3.1. The results are shown in Table 3.1.

Table 3.1: Actual *vs.* Predicted Opex ($ m 2009)

	Actual	Predicted	Difference
EnergyAustralia	399	344	16%
Integral Energy	243	203	20%
Country Energy	318	305	4%
ActewAGL	45	35	30%

Analysis of Comparable Sub-Groups – Urban and Rural

To provide a check on the validity of the conclusions observed so far, we undertook comparisons of the ACT and NSW DNSPs using two sub-sets of the comparative group, selecting DNSPs with similar network characteristics – predominantly urban and predominantly rural. These two groups were compared on the same basis as above (*viz.* the composite "size" variable basis) and using the traditional benchmarks of opex per customer, opex per MW and opex per line km. Due to the small number of DNSPs in each of these sub-groups, the samples are relatively small and in the case of the predominantly urban group, three of the ACT and NSW DNSPs make up half the sample.

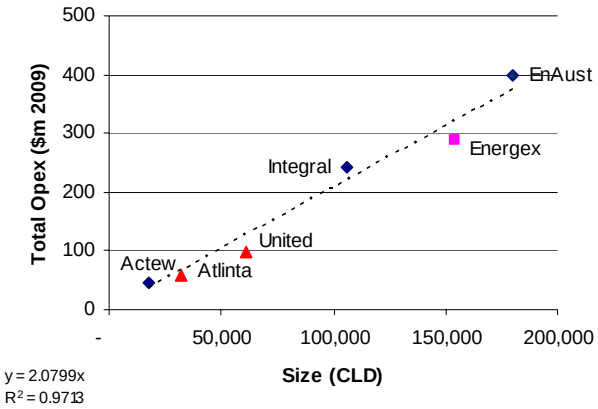
Predominantly Urban DNSPs

The analysis of the predominantly urban group was comprised of Energex (QLD), Integral Energy (NSW), EnergyAustralia (NSW), ActewAGL (ACT), Atlinta AE (VIC) and United Energy (VIC), comparing them on traditional benchmarks and total opex *vs.* size. Customer

densities in this group range from 26 to 50 customers per km of line. (Atlinta AE and United Energy are solely urban DNSPs but the others have some rural lines that reduce their customer densities.) Citipower (VIC) was not included as it is essentially only a CBD DNSP with customer and load densities much higher than those of any of the other DNSPs considered. The relationship of total opex *vs.* size was repeated to see if different results would be obtained in the groups compared with the total sample above. The comparisons are shown in Figure 3.4

Figure 3.4: Comparative Analysis of Predominantly Urban DNSPs

(Total Opex *vs.* Size)



The relationship between total opex and size shows a very high correlation (0.97) and a relationship that predicts costs 9% higher than the total sample. The difference could indicate that the urban group exhibits a higher cost structure than the total sample, or it may be that the smaller sample has a higher cost structure than the total sample. The difference is not significant enough or the sample large enough to establish which. As above, actual expenditure has been compared with that predicted by the formula with the results shown in Table 3.2.

Table 3.2: Actual *vs.* Predicted Opex – Urban DNSPs ($ m 2009)

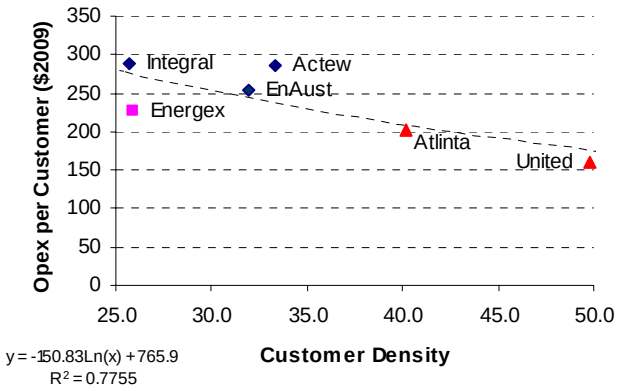
	Actual	Predicted	Difference
EnergyAustralia	399	374	6%
Integral Energy	243	221	10%
ActewAGL	45	38	20%

The differences are smaller than calculated from the analysis of the larger sample but all three DNSPs in this category show actual costs higher than similar DNSPs in other states.

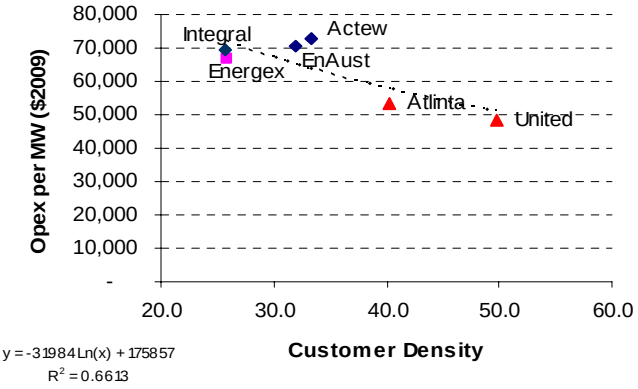
A similar comparison of actual and predicted levels of opex was made based on the traditional benchmarks shown in Figure 3.5.

Figure 3.5: Comparative Analysis of Predominantly Urban DNSPs

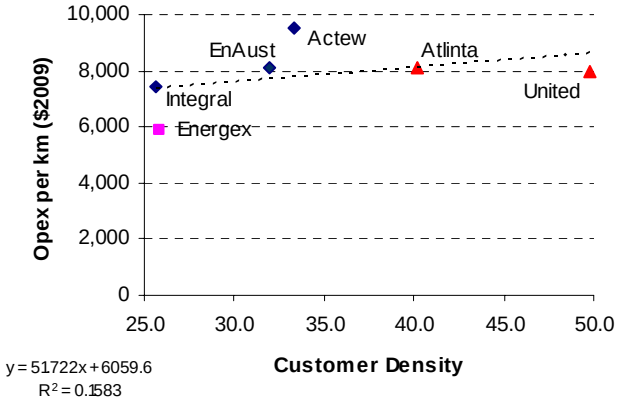
(Opex per Customer *vs.* Customer Density)



(Opex per MW *vs.* Customer Density)



(Opex per km *vs.* Customer Density)



The differences between actual and predicted levels for each benchmark and an average of all three benchmarks are shown in Table 3.3.

Table 3.3: Actual *vs.* Predicted Opex (Traditional Benchmarks) – Urban DNSPs

	Difference from Predicted Level			
Normaliser	Customer	MW	Line km	Average
EnergyAustralia	5%	9%	5%	6%
Integral Energy	5%	-4%	0%	0%
ActewAGL	21%	14%	23%	19%

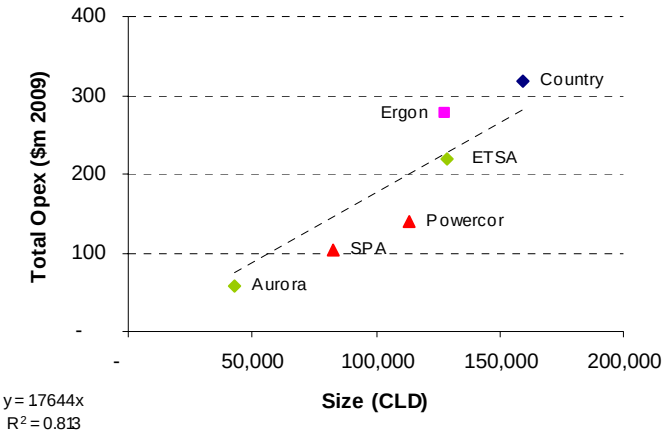
The table shows a close alignment with the results presented in Table 3.2 for Energy Australia and ActewAGL using the traditional benchmarks but a difference between the two for Integral Energy.

Analysis of Predominantly Rural DNSPs

The analysis of the predominantly rural group was comprised of Ergon Energy (QLD), Country Energy (NSW), Powercor (VIC), ETSA (SA), Aurora (TAS), Atlinta AE (VIC) and SP Ausnet (VIC). Customer densities in this group range from 4 to 13 customers per km of line. (Ergon Energy and Country Energy have a customer density of less than half the other DNSPs in this group and are the only DNSPs without a significant urban base.) The comparisons are shown in Figure 3.6.

Figure 3.6: Comparative Analysis of Predominantly Rural DNSPs

(Total Opex *vs.* Size)

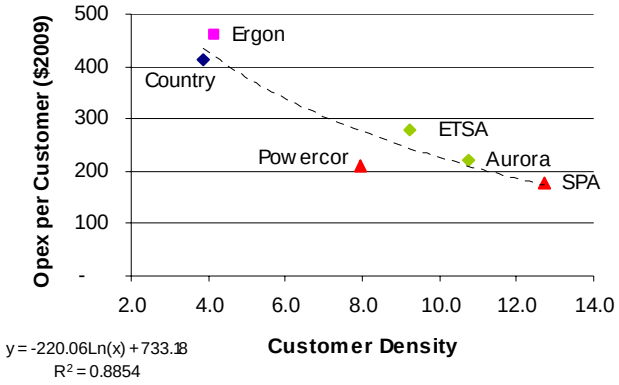


The relationship between total opex and size shows a lower correlation (0.81) than that of the full sample and a relationship that predicts costs 8% lower than the total sample. The difference could indicate that the rural group does exhibit a lower cost structure or it may be that the smaller sample has a higher cost structure than the total sample. The difference is not significant enough or the sample large enough to establish which. Country Energy's actual opex is 13% above the predicted level based on the rural group trend line compared to 4% in the total sample.

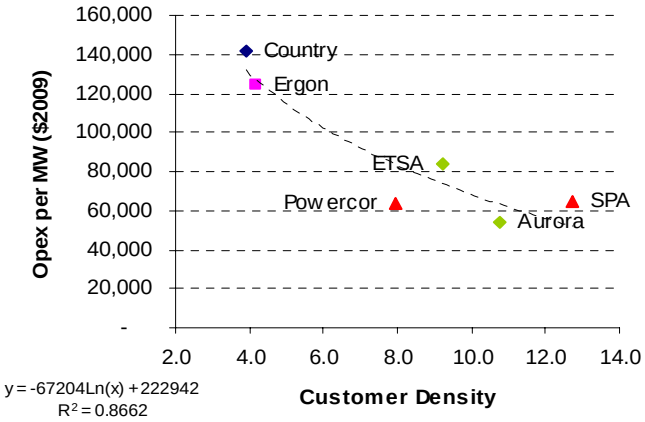
A similar comparison of actual and predicted levels of opex was made based on the traditional benchmarks shown in Figure 3.7.

Figure 3.7: Comparative Analysis of Predominantly Rural DNSPs

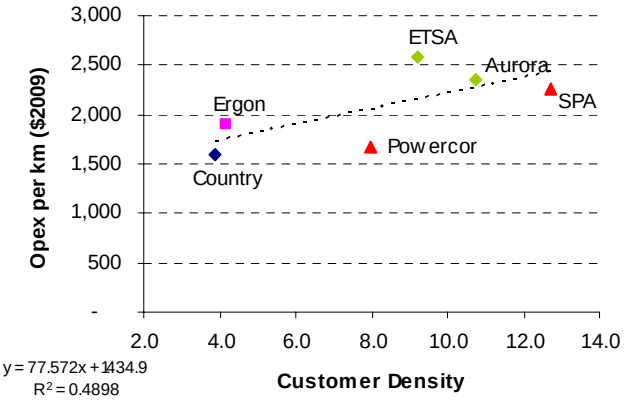
(Opex per Customer *vs.* Customer Density)



(Opex per MW *vs.* Customer Density)



(Opex per km *vs.* Customer Density)



The differences between actual and predicted levels for each benchmark and an average of all three benchmarks are shown in Table 3.4.

Table 3.4: Actual *vs.* Predicted Opex (Traditional Benchmarks) – Rural DNSPs

	Difference from Predicted Level			
Normaliser	Customer	MW	Line km	Average
Country Energy	-5%	0%	-8%	-4%

The table shows that Country Energy has lower levels of opex than predicted by the traditional benchmark analysis as compared to a higher level than that predicted by the composite size variable analysis. This may be because in the comparative group, only Ergon Energy has a similar very low customer density making the comparisons less reliable.

Overall, the analysis tends to indicate that Country Energy's costs are around the industry norm.

Summary of Efficiency of Opex in FY 2007

In summary, the preceding analysis (which includes a variety of comparisons) suggests that EnergyAustralia's and Integral Energy's opex in FY 2007 is at or a little above the industry norm. However, given the limitations of benchmarking, expressed at the beginning of this section of the report, we are not able to say that their levels of opex are sufficiently at variance from the industry norm to conclude that they are inefficient, although the analysis tends to suggest that there may be potential for efficiency improvements within both businesses. A more detailed assessment of the businesses, beyond the scope of this review, would be required to quantify the degree of any efficiency gains possible.

In respect of ActewAGL, the analysis suggests that its opex in FY 2007 is around 20% above the industry norm. Unless it is considered that mitigating factors account fully for the difference, ActewAGL would appear to be operating below the average level of industry efficiency.

The analysis in respect of Country Energy is less conclusive due to there being only one closely comparable DNSP whose performance we have not assessed. However, the comparisons suggest that Country Energy is operating close to or a little below the industry norm.

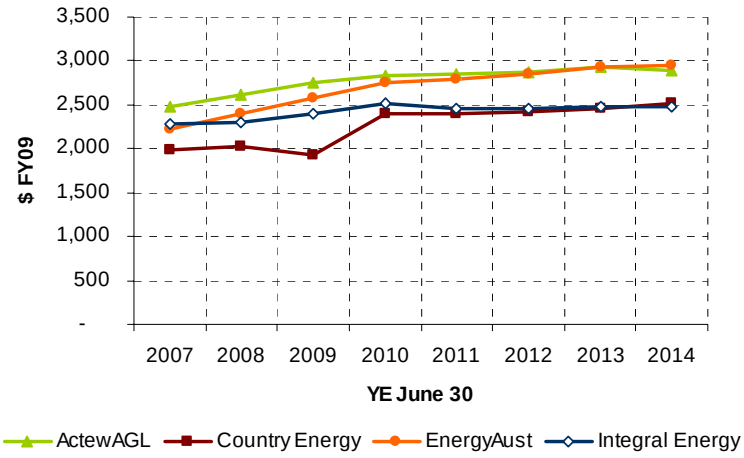
We consider each of the ACT and NSW DNSPs further in volumes 2 to 5 of this report.

3.3 Effect of Increases in Opex in Next Period

We then reviewed the ACT and NSW DNSPs' forecast increases in opex over the next period by analysing the movements in opex that are forecast to occur in the period from FY 2007 to FY 2014. The results are presented in Figure 3.8, based on opex by size (which accounts for increases in the size of the businesses over the period) for FY 2007 to FY 2014. [35]

[35] 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 3.8: "Opex per Size" – 2007- 2014



The figure shows significant forecast increases in opex for all four DNSPs between FY 2007 and the start of the next period, with lower rates of increase over the next period. The differences from the FY 2007 to the FY 2010, "average next period" and FY 2014 levels for each company are shown for each DNSP in Table 3.5.

Table 3.5: Difference from FY 2007 "Opex per Size"

	Difference from FY 2007		
	FY 2010	Avg Next	FY 2014
EnergyAustralia	24%	29%	34%
Integral Energy	10%	8%	9%
Country Energy	20%	22%	26%
ActewAGL	14%	16%	16%

This analysis suggests that all DNSPs are forecasting increases in real cost per size between FY 2007 and FY 2010, the start of the next period. EnergyAustralia, Country Energy and ActewAGL show further increases in the next period and Integral Energy shows a small decline on a size-adjusted basis.

Removal of Real Cost Escalation in Labour

Since a significant part of the increases in each case are due to real cost escalation, mainly in labour, we have calculated an approximate labour cost escalator [36] and used it to remove the effects of real labour cost escalation to identify the changes in the opex levels without it. The revised graph is shown in Figure 3.9 and the revised differences are shown in Table 3.6.

[36] For the NSW DNSPs, this was calculated by applying a 60% weight on the EGW labour rate and a 20% weight on the general wage rate as outlined in the CEG report to total opex. The remaining 20% of costs were assumed to apply to materials, which generally have not had real cost increases applied. Labour escalation was similarly removed from ActewAGL's figures but using the escalators prepared by SKM and Mercer and assumed by ActewAGL.

Figure 3.9: "Opex per Size" without Real Labour Cost Escalation

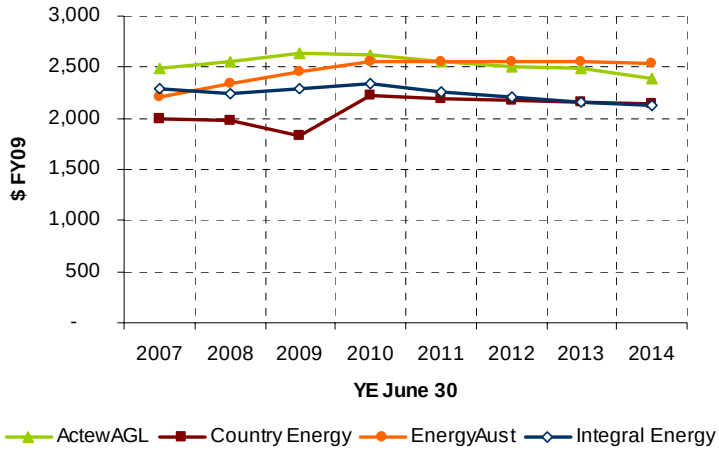


Table 3.6: Difference from FY 2007 "Opex per Size" without Real Labour Cost Escalation

	Difference from FY 2007		
	FY 2010	Avg Next	FY 2014
EnergyAustralia	15%	15%	14%
Integral Energy	2%	-3%	-7%
Country Energy	12%	9%	8%
ActewAGL	6%	1%	-4%

This analysis indicates that all DNSPs are forecasting increases in costs over and above real labour cost escalation between FY 2007 and FY 2010, the start of the next period. However, throughout the next period, all DNSPs are forecasting constant or declining costs on a size-adjusted basis, once real labour cost escalation is removed. [37]

Summary of Increases in Opex in Next Period

In summary, our analysis of the movements in each DNSP's opex in the next period, taking out the effects or real labour cost escalation to reveal the movement in "opex per size" in real terms, shows the following. If the comparative group of DNSPs held its "opex per size" ratio constant (and if all DNSPs in the group faced the same level of real labour cost escalation), then by FY 2014, Integral Energy and ActewAGL would have improved their position in relation to the other DNSPs in the comparative group. EnergyAustralia and Country Energy would have a poorer relative position.

In essence, Table 3.6 summarises the movement in "opex per size" proposed by the DNSPs in real terms over the period ending FY 2014. The reasons for the increases vary amongst the DNSPs and are examined in volumes 2 to 5 of this report.

[37] The incorporation of real cost increases in labour disguised this trend.

4 Conclusions and Recommendations

4.1 Levels of Expenditure for Individual DNSPs

Our opinion on the levels of expenditure for individual DNSPs is set out in volumes 2 to 5 of this report and in the executive summary presented at the commencement of this volume.

4.2 Matters for the AER's Consideration

In concluding this report, we would like to note the following general matters for the AER's consideration (additional matters in relation to individual DNSPs are set out in volumes 2 to 5).

Issues Common to the DNSPs

Certain issues common to the DNSPs were evident in this review. These included:

- considerable increases in cost over the current period, especially in relation to materials,
- different responses from the DNSPs to these increases, some curtailing work to keep within their regulatory allowance, creating a backlog to be addressed in the next period, some over-spending their regulatory allowance and some doing both.
- continuing labour cost increases above inflation in the next period but a reduced rate of increase in the cost of materials;
- real cost increases in the projections with different methodologies used for their calculation and some related issues;
- a big impact from the newly mandated licence conditions for security of supply (including asset utilisation) and feeder reliability in NSW; [38]
- the need to replace ageing assets at a faster rate, in respect of which the expenditure in the next period is only the first phase of what will be a major and extended period of capital investment in Sydney CBD and elsewhere;
- increased expenditure in IT; and
- better-prepared cases in support of the expenditure proposals this time, compared with the cases put forward for assessment in NSW for the previous review.

Defining Feature of Distribution Network Capex Assessments

This review will have highlighted the differences between distribution and transmission network expenditure, the former being characterised by a large number of small projects making project assessment possible only on major sub-transmission work. Likewise, distribution work at 11 kV and low voltage is mainly programme-based, entailing an enormous number of routine items carried out in a wide range of circumstances. These factors make it important for a reviewer to take an overview of the networks and the expenditure projections and to gain a full understanding of what is happening – e.g. in

[38] The impacts are discussed in volumes 2 to 5 of this report.

relation to trends in fault rates and asset utilisation, age and reported condition, changes in approach from one period to the next – and the expenditure required. The initial sections in each of the subsequent volumes of this report have been included to provide background for that purpose and support our acceptance in most cases of the DNSPs' system-related capex proposals overall, notwithstanding that some minor expenditure components may not have been perfectly prepared by the DNSPs.

Efficiency of DNSPs' Own Capital Costs

We are not able to say definitively that the DNSPs' own capital costs (as opposed to those related to goods and services that are procured competitively) are efficient in all respects, although we have accepted them as sufficiently so for the purpose of our review. Private enterprise is generally considered to be strongly incentivised to operate efficiently but the same may not be true of state-owned enterprises, although no doubt they also have performance objectives set by their shareholding ministers. A review of this matter would require a major study of the work practices in each DNSP. Not only would that be well beyond the scope of our review but also it would appear to us to be a management responsibility, not a regulatory one. If the AER wishes to flush out latent efficiency improvements in the DNSPs' own work force, it might consider the introduction of a suitable incentive to apply in the next period for the purpose. [39]

Allocation of Overheads between Capex and Opex

In future assessments, the AER might consider requesting details of the basis of allocation of overheads to capex and opex. The cost allocation methodologies approved by the AER cover the allocation of costs between regulated and non-regulated activities but different methods of allocation of overheads and support costs within the regulated businesses lead to different outcomes, particularly in respect of allocations to capex and opex.

Impact of International Financial Crisis

For the avoidance of doubt, we note that our work is based on the DNSPs' proposals and that they were prepared before the present international financial crisis became fully evident. Its potential effects have therefore not been considered.

4.3 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 DNSPs' 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

[39] Taken from section 2.4 under the sub-heading "Unit Costs and the Efficiency of Capital Costs Generally".

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.

Disclaimer

This report has been prepared solely for our client, the Australian Energy Regulator (the AER), for the stated purpose. Wilson Cook & Co Limited, its officers, agents, subcontractors and their staff owe no duty of care and accept no liability to any other party, make no representation or warranty as to the accuracy or completeness of the information or opinions set out in the letter to any person other than to its client including any errors or omissions howsoever caused, and do not accept any liability to any party if the letter is used for other than its stated purpose.

Non-Publication

With the exception of its publication by the AER, in relation to its review of the DNSPs' 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.

Appendix A: Terms of Reference

1. Introduction

The Australian Energy Regulator (AER), in accordance with its responsibilities under the National Electricity Rules (NER), is to conduct an assessment into the appropriate revenue determination to be applied to the services provided by ACT and NSW electricity distribution network service providers (DNSPs) from 1 July 2009 to 30 June 2014 (the next regulatory control period). The relevant DNSPs are ActewAGL, Country Energy, EnergyAustralia and Integral Energy (the DNSPs). The assessment is to include EnergyAustralia's transmission network services.

The current regulatory determinations for the DNSPs (July 2004 to June 2009) were determined by the Independent Competition and Regulatory Commission (ICRC), the Independent Pricing and Regulatory Tribunal (IPART) and the Australian Competition and Consumer Commission (ACCC). [40]

As part of the AER's assessment, an appropriately qualified consultant is required to review the DNSPs' past and forecast capital expenditure (capex), operational expenditure (opex) and associated policies and procedures. These reviews are to have regard to the National Electricity Law (NEL) and the NER, particularly the new Chapter 6 and associated transitional provisions, referred to in this document as 'the transitional Rules'. The consultant's review is primarily concerned with clause 6.5.6 of the transitional Rules relating to opex and clause 6.5.7 of the transitional Rules relating to capex. Clause 6.5.6(a) sets out the opex objectives, clause 6.5.6(c) sets out the opex criteria and clause 6.5.6(e) sets out the opex factors. This structure is mirrored in clause 6.5.7 with respect to capex.

The consultant's review will assist the AER to assess the DNSPs' regulatory proposals relative to the requirements of the transitional Rules. In accordance with the transitional Rules, the AER is effectively required to release its draft determination by late November 2008. The consultant's final report must therefore be provided to the AER no later than 30 September 2008.

The AER's determinations are subject to merits review by the Australian Competition Tribunal and judicial review in the Federal Court. The consultant's analysis and reports must be produced at a standard that is commensurate with this context.

2. Services Required

The services required for the primary engineering assessment and cost review covered by these terms of reference are described below. Within its report, the consultant must explicitly address each of the opex and capex objectives, criteria and factors set out in clauses 6.5.6 and 6.5.7 of the transitional Rules. This is to form a separate section of the consultant's report and be referenced to further discussion in the report as appropriate. For example, the opex and capex factors include items such as:

- benchmarking the level of expenditure that would be incurred by an efficient DNSP;
- substitution possibilities between opex and capex; and
- the provision for efficient non-network alternatives such as demand management.

[40] The ACCC made a determination with respect to EnergyAustralia's transmission assets.

2.1 General Pre-Lodgement Work

The consultant will be required to assist the AER with a variety of pre-lodgement tasks. Such tasks may include, for example, development of independent forecasts of unit costs in advance of regulatory proposals (see section 2.7 of this document), and preliminary meetings with each DNSP during April.

2.2 Review of Prudence of Past Capex

The consultant will be required to assess the prudence of capex undertaken by ActewAGL during the current regulatory period. The assessment should be undertaken in accordance with relevant provisions of the transitional Rules.

In accordance with clauses 6.2.1(e)(1) of the transitional Rules there will be no prudence review of the capex undertaken by NSW DNSPs. Conversely, as set out in clause 6.2.1(e)(1A) of the transitional Rules and the ICRC's determination, the prudence assessment of ActewAGL's capex may lead to adjustment of ActewAGL's actual capex and, subsequently, its opening regulatory asset base.

The assessment of ActewAGL's capex must be consistent with the review envisaged by the previous regulator, as set out in its relevant determination. It is to be undertaken on the basis of the information available at the time the investment decisions were made, not with hindsight. If the consultant determines that investment decisions by ActewAGL were imprudent given the information available, the consultant will be required to provide the AER with the quantified prudent level, and justification for this variance.

It is intended that the ex-post prudence assessment of ActewAGL's capex is based on a sample of projects to be agreed with the AER, having regard to the information and analysis available at the time the relevant business made the decisions to invest. In recommending the sample, the consultant shall consider each of the main areas in which expenditure was made and projects and programs that are material within each area.

2.3 High-level Review of Opex and Capex during Current Regulatory Period

Based on the information provided with the DNSPs' regulatory proposals, the consultant shall undertake a review of expenditure (capex and opex) over the current regulatory period in comparison with the expenditures forecast at the last determination. This review will form one of the capex factors and one of the opex factors as set out in clauses 6.5.7(e)(5) and 6.5.6(e)(5) respectively of the transitional Rules. Variances between expenditure during the current regulatory period and forecasts for the 2009-14 period should also be examined. The consultant should examine the drivers and reasons for any significant variances and provide relevant explanations.

The review should address capex and opex separately for each DNSP. When assessing EnergyAustralia's expenditure against the current determinations, it will be necessary to compare it with the separate transmission (ACCC) and distribution (IPART) determinations.

The review should provide a preliminary indication of any areas that require more detailed analysis over the forecast period and will establish the context in which the expenditure forecasts have been made.

2.4 Review of Identified External Factors and Obligations of the DNSPs

The DNSPs have been asked to submit a list of external factors as part of their regulatory proposals. These factors will include legislative and regulatory obligations such as licence conditions and any other requirements that are expected to affect the level of services to be provided by the DNSPs and to influence the level and types of expenditure required by each DNSP.

The consultant shall review the list of factors for completeness and to ensure a full understanding of the operational implications of the obligations on the DNSPs. The consultant shall also identify any obligations that it considers material and that have been omitted.

2.5 Forecast Demand and Cost Escalation Factors

External factors such as those affecting the future demand for electricity and the future cost of labour and the future cost of materials will have a significant bearing on the DNSPs' expenditure forecasts. The AER will engage another consultant to review the DNSPs' forecasts of demand and will have information available on the impact of increases in the cost of labour. Whilst the AER anticipates that the DNSPs will propose their own cost escalators for materials (as well as in respect of labour costs), the consultant is to develop, as part of its work under these terms of reference, appropriate escalators for the cost of materials. [41] This independent assessment is intended to ensure that the consultant is able to carry out a robust review of the DNSPs' cost escalation proposals in respect of materials consistent with clauses 6.5.6(c)(3) and 6.5.7(c)(3) of the transitional Rules, that state expenditure should reasonably reflect a realistic expectation of the demand forecast and cost inputs required to achieve the capex/opex objectives (which are set out in clauses 6.5.7(a) and 6.5.6(a) respectively).

The AER does not require the assumptions underpinning the DNSPs' materials cost escalators to be re-estimated by the consultant but the consultant shall inform itself of the assumptions made by the DNSPs when undertaking the other assessments and reviews required by these terms of reference.

2.6 Review of Policies and Procedures

The DNSPs have been asked to specify the policies and procedures by which their operational and investment decisions are made. Such policies are expected to relate to, for example, augmentation, replacement, opex, capitalisation and demand management. The consultant shall undertake a detailed review of these policies and procedures. This work is to include a review of network performance targets and associated forecasts, augmentation models and opex and replacement models.

The consultant shall report on its review of these policies and procedures, noting, where relevant, any policies and procedures that it considers unreasonable or inappropriate against clauses 6.5.6(c) and 6.5.7(c) of the transitional Rules. Should the consultant find any such policies or procedures, it is to specify alternative policies or procedures and substantiate why they are reasonable and appropriate with reference to clauses 6.5.6 and 6.5.7 of the transitional Rules.

2.7 Review of Unit Costs for Augmentation, Asset Replacement and Opex

The DNSPs have been asked to propose unit costs for all material areas of their expenditures for the next regulatory period. It is anticipated that a variety of unit costs will be identified relating to the various components of augmentation and replacement capex and for opex. The consultant shall develop its own independent forecasts of unit costs in advance of the regulatory proposals of the DNSPs being received. These independent unit costs are to be developed, based on historical expenditure by similar DNSPs and, where possible, by reference to such industry benchmarks as the consultant considers relevant. The independent costs should also be established in the context of clauses 6.5.6 and 6.5.7 of the transitional Rules. It is intended that the independent unit costs will be used to inform the further stages of the consultant's review and the analysis of the unit costs proposed by the DNSPs. If

[41] The independent assessment should have regard to the AER's Final Decision regarding Electranet's transmission network, to be released by the end of April 2008.

required and relevant, the independent unit costs may be used to develop alternative unit costs.

Following receipt of the DNSPs' regulatory proposals, the consultant shall review and analyse the unit costs presented by each of the DNSPs. Following this review, the consultant should identify the unit costs so reviewed and should indicate whether they reasonably reflect a realistic expectation in accordance with clauses 6.5.6(c)(3) and 6.5.7(c)(3) of the transitional Rules. Where the unit costs do not represent a realistic expectation, the consultant will be required to recommend substitute unit costs to the AER. The consultant's findings will also be used in the review of the application of policies and procedures set out below.

2.8 Application of Policies & Procedures & Impact of Demand Forecasts

The consultant is to test the magnitude of the capex and opex forecasts submitted by the DNSPs by examining the application of the submitted policies and procedures (see section 2.6 above) and unit costs (see section 2.7 above) to the DNSPs' networks for the next regulatory period.

The consultant is also to review the expenditure projections for consistency with the demand forecasts accepted by the AER, following the separate consultant's work.

For these purposes, the DNSPs have been asked to provide details of their forecast augmentation, replacement, opex and non-network expenditure programs as part of their regulatory proposals. This information is to include a list of all major projects and programs above a specified threshold. [42]

The consultant shall review the application of the DNSPs' policies and procedures (and, where relevant, shall check for consistency with the demand forecasts) in the following:

- the major projects and programs identified in the DNSPs' regulatory proposals;
- areas of expenditure where there is a substantial deviation, upwards or downwards, from expenditure in the current period and/or agreed to in the previous determination (the preliminary high-level review of expenditure during the current regulatory period may also highlight areas for testing the application of relevant policies and procedures); and
- a representative sample of other projects and programs to be agreed with the AER. In recommending the sample, the consultant shall include forecast expenditure on a range of assets, time, magnitude and location for each DNSP, sufficient to demonstrate consistency of application of the DNSPs' stated policies.

The focus of the assessment is identifying whether there are any systemic flaws in the DNSPs' practices. The consultant is to identify the projects and programs reviewed in its report and present well-reasoned and substantiated conclusions as to whether the relevant policies, procedures and unit costs have been applied appropriately against clauses 6.5.6 and 6.5.7 of the transitional Rules. If the consultant identifies relevant policies and procedures and unit costs that it considers have not been applied appropriately, it shall identify the problem and recommend appropriate adjustments where considered necessary to correct the situation. In such an instance, in consultation with the AER, the consultant may be required to investigate whether the application problems are systemic in nature. If found to be the case, this would likely involve the assessment of additional projects and programs of a

[42] The draft RIN specified that a project or program would be considered material if cumulative expenditure on it exceeded 2% of revenue for year 5 of the current regulatory control period.

similar nature. Again, well-reasoned and substantiated recommendations must be made, including the recommendation of appropriate adjustments where considered necessary.

The consultant shall also make such other recommendations to the AER as the consultant considers necessary for the fixing of appropriate levels of expenditure, in the context of clauses 6.5.6 and 6.5.7 of the transitional Rules.

2.9 Cost Pass-Through

Clause 6.6.1 of the transitional Rules concerns cost pass-through. Unlike the transmission regulatory framework, contingent projects are not included in the regulatory framework for electricity distribution. However, the AER is given discretion to nominate 'additional' pass-through events in the determination. [43] This discretion allows the AER to include large uncertain distribution capex projects as pass-through events. Under the transmission regulatory framework, these types of events may be included in a determination as contingent projects.

The consultant is required to examine any additional [44] pass-through events proposed by the DNSP and assess them against the revenue and pricing principles of the NEL [45] and the capex objectives and criteria set out at clause 6.5.7 of the transitional Rules. The assessment should also have regard to any guidance provided by the AER and relevant considerations within clause 6.6.1 of the transitional Rules.

The consultant is also required to assess:

- whether the costs attributable to the pass-through event should be included in forecast capex
- whether the costs attributable to the pass-through event have already been included in forecast capex
- whether the DNSP has provided an appropriate description of the pass-through event and, if not, if it is appropriate to include an amended description of the pass-through event
- whether there are investments within forecast capex that would be more appropriately linked to the occurrence of a pass-through event; and
- the likelihood of the pass-through event occurring in the next regulatory period.

If the consultant considers any element of the pass-through event proposed by the DNSP to be inappropriate or unreasonable the report must substantiate the findings in the report with reference to the material set out above.

2.10 Review of Opex to be Deemed Uncontrollable for Purposes of EBSS

Under clause 6.5.8 of the transitional Rules, the AER has developed an efficiency benefit-sharing scheme (EBSS) to be applied to the ACT and NSW DNSPs. The scheme allows incremental opex efficiency gains/losses made during the next regulatory control period to be carried over for five years after the year in which the gain/loss is made. The EBSS developed by the AER allows opex cost categories to be deemed uncontrollable and to be excluded from the operation of the scheme. DNSPs may propose for exclusion from the EBSS, cost

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[43] See the definition of pass-through event in chapter 10 of the NER. 'Additional' refers to items not within the four categories of pass-through events listed in the glossary.

[44] Additional to the four categories of pass-through event listed in the glossary of the NER (Chapter 10).

[45] See section 7A of the National Electricity Law.

categories which are considered to be uncontrollable.[46] In implementing the EBSS the AER must have regard to clauses 6.5.8(c)(1)–(5) of the transitional Rules.

The consultant is required to assess whether the DNSPs' [47] proposals regarding uncontrollable opex cost categories are reasonable in the context of the EBSS. In undertaking this assessment the consultant must have regard to section 5.2 (pp.11–13) of the final decision on the EBSS to be applied to ACT and NSW DNSPs during the next regulatory control period.

2.11 Potential Further In-Depth Review as Directed by AER

The AER may direct the consultant to undertake further assessments of specific aspects of the regulatory proposals of one or more DNSPs. The extent and scope of this work is unknown and, potentially, it may not be required. Accordingly, should the AER require further in-depth reviews to be undertaken by the consultant, the work will form a separate item under the contract. [48]

2.12 Review of Submissions from Interested Parties

The consultant may be required to review and provide advice on matters raised in submissions from interested parties prior to the AER's draft determination.

3. Liaison with DNSPs and the AER

Without affecting the independence of the review, the consultant is expected to liaise closely with the DNSPs during the course of the review. This liaison is expected to include meetings with each of the DNSPs at their respective offices with AER staff attendance as appropriate and, if required, preparation of written requests for additional information and documentation.

The consultant shall also liaise closely with AER staff and provide regular updates on:

- progress towards achieving deliverables;
- any impediments that have arisen to achieving those deliverables; and
- any significant issues that have been identified.

Pre-Determination Conferences

The consultant shall be available for pre-determination conferences (public forums) relating to the AER's draft determination, which will be held in Sydney and Canberra.

4. Project Deliverables

To comply with the transitional Rules, the AER is required to publish its final decision two months before the commencement of the DNSPs' next regulatory control period, *viz.* by 30 April 2009. The consultant is to note that the timeframe in the transitional Rules do not allow for flexibility in the dates and that there are no 'stop the clock' provisions. The AER and its consultant are thus required to meet the timeframe specified by the terms of reference to ensure compliance with the requirements of the transitional Rules.

The DNSPs are to submit their regulatory proposals by 2 June 2008. Given the timing requirements set out in the transitional Rules, the AER must release its draft determination by late November 2008 and thus the consultant will be required to meet the following deadlines:

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[46] See page 6 of efficiency benefit-sharing scheme for the ACT and NSW 2009 distribution determinations.

[47] As discussed in the final decision (pp. 22–23), uncontrollable cost categories may also be proposed by other interested parties.

[48] Additional to these terms of reference.

- preliminary meetings with the AER and the DNSPs during April 2008 and other pre-lodgement work as defined in clause 2.1; [49]
- meetings as required with the DNSPs following the submission of their proposals, including inspection of the material required to be held by the DNSPs on their premises;
- provision of draft written reports on its findings, accompanied by a presentation to the AER Board, by 31 August 2008. In addition to the draft reports, the consultant must provide supporting spreadsheets and analysis to ensure the AER can meet the requirements set out in clause 6.12.2 of the transitional Rules;
- attendance at the public forums held to discuss the draft determination; and
- provision of final written reports on its findings, accompanied by a presentation to the AER Board, by 30 September 2008. In addition to the final reports, the consultant must provide supporting spreadsheets and analysis to ensure the AER can meet the requirements set out in clause 6.12.2 of the transitional Rules

The consultant must be available for follow-up questions from the AER as well as responding to any issues raised in submissions on the draft determination. The extent and scope of the work is unknown and, potentially, it may not be required. Accordingly, should the AER require further advice from the consultant following the presentation of its draft determination, the work will form a separate item under the contract.

5. Merits and Judicial Review

The regulatory determinations made by the AER under the NEL are subject to merits review by the Australian Competition Tribunal and judicial review in the Federal Court. Accordingly, the consultant's final report must be written to a professional standard with well-reasoned analysis and recommendations. The consultant's report will be published alongside the AER's determinations as part of the public consultation process.

Any work required as a result of a merits review will be the subject of a separate contract.

6. Timeline

The timetable for the review is set out in the table below.

April 2008	Preliminary visit to the DNSPs
2 June 2008	Regulatory proposals due from the DNSPs
June 2008	The AER must notify the DNSPs if the regulatory proposals require further information or amendments – this will be informed by an inspection by the consultant of the proposals and the material held at the DNSPs' premises
July 2008	DNSPs must resubmit information to the AER if requested
July 2008	The AER is to publish, and request submissions on, the regulatory proposals
August 2008	Submissions due on regulatory proposal
31 August 2008	Consultant's draft report due to the AER
30 September 2008	Consultant's final report due to the AER

[49] This item excludes assistance on the preparation of the RIN and terms of reference, provided under the initial contract, dated 30 January 2008.

November 2008	The AER is effectively required to release, and request submissions on, its draft determination and consultant's reports. A DNSP may submit a revised regulatory proposal up to 30 business days after the release of the AER draft determination.
December 2008	Pre-determination conferences will be held in Sydney and Canberra
18 February 2009	Submissions close on the draft determination and consultant's report
30 April 2009	The AER to release its final determination.

Appendix B: List of Personnel Met

Meetings or discussions were held with the following personnel: [50]

The Australian Energy Regulator

- Mr Steve Edwell, Chairman
- Mr Ed Willett, ACCC Commissioner
- Mr Andrew Reeves, Board Member
- Ms Michelle Groves, Chief Executive Officer
- Mr Mike Buckley, General Manager, Regulation North Branch
- Mr Warwick Anderson, Director
- Ms Donella Greer, Director
- Mr Scott Haig, Director
- Ms Anita Bryant, Assistant Director
- Mr Luke Griffin, Assistant Director
- Mr Lawrence Irlam, Assistant Director
- Mr Brett McCarthy, Assistant Director
- Mr Kenny Yap, Assistant Director
- Mr Dan Barclay, Senior Analyst
- Mr Simon Bell, Senior Analyst
- Mr Toby Holder, Senior Analyst
- Ms Sonja Tasovac, Senior Analyst
- Ms Jessica Gordon, Analyst
- Ms Robyn Le, Analyst
- Mr Kurt Stevens, Analyst
- Mr Gary Davies, NAS Advisory Services (contractor to the AER)

ActewAGL Distribution

- Mr Michael Costello, Chief Executive Officer
- Mr Michael Charlton, General Manager, Networks
- Mr David Graham, Director, Regulatory Affairs and Pricing
- Ms Leanne Holmes, Manager, Network Regulation
- Mr Christopher Bell, Manager, Regulatory Affairs
- Ms Alexandra Curran, Senior Regulatory Adviser
- Mr Silvano Forlin, Manager, Asset Performance
- Mr Alex McPherson, Senior Regulatory Analyst
- Mr Darryl Ramm, Manager, Health Safety Environment & Quality
- Mr Paul Sanguineti, Metering Manager
- Mr Ajay Singhal, Manager Corporate Reporting

[50] The positions indicated are those held at the time.

Mr Bjorn Tibell, Senior Financial Adviser
Mr Stefan Vress, Manager, System Control
Mr Chris Walker, Commercial Manager
Mr Dale Weber, Manager Project Design
Mr Janusz Worony, Manager, Regulatory and Strategy

Country Energy

Mr Craig Murray, Chief Executive Officer
Mr Bill Frewen, Group General Manager, External Relations
Mr Gary Humphreys, Group General Manager, Service Delivery
Mr Justin De Lorenzo, Group General Manager, Finance and Risk
Mr Ken Stonestreet, Group General Manager, Networks & Infrastructure
Ms Natalie Lindsay (nee Banicevic), General Manager, Regulatory Affairs
Mr Patrick Cooper, General Manager, Information & Metering Services
Mr Wayne Lynch, General Manager, Operational Performance & Support
Mr Col Ussher, General Manager, Network Strategy
Ms Catherine Waddell, General Manager, Regulated Pricing
Mr Jason Cooke, Group Manager, Regulatory Strategy
Mr Terry Holmes, Group Manager, Planning & Investment
Mr Luke Jenner, Group Manager, Corporate Operations
Mr Col Lambert, Group Manager, Reliability Improvement Program
Mr David Mattson, Group Manager, Street Light Strategy
Mr Bill Nolland, Group Manager, Network Asset Systems
Mr Neil Chapman, Manager, Maintenance Strategy
Mr Lawrence Clark, Chief Risk Officer
Mr Michael Kendon, Project Coordinator Revenue Resets
Ms Cassie Pelley, Asset Management System Business Co-ordinator

EnergyAustralia

Mr George Maltabarow, Managing Director
Mr Geoff Lilliss, Executive General Manager, Network
Mr Trevor Armstrong, Executive Manager, Asset & Investment Management
Mr Harry Colebourn, Executive Manager, Network Regulation & Pricing
Ms Catherine O'Neill, Manager, Asset Management & Regulatory Planning
Mr Rob Baxter, Manager, Hunter Planning
Mr Steve Buncombe, Manager, Operational Investment
Mr Paul Colebourn, Reliability Engineer
Mr Matt Cooper, Manager, Investment Strategy
Mr Mervyn Davies, Consultant
Ms Alex Dean, Operations Investment Engineer
Mr Terry Fagan, Manager, Network Investment
Ms Kate Gunton, Group Manager, Property
Mr John Hardwick, Manager, Operations Investment
Mr John Hartman, Manager, Sub-transmission Planning - Sydney
Mr James Howard, Development Manager, Sydney City

Mr Paul Howarth, Manager, Distribution Planning - Sydney
Mr William Nixey, Network Business Consultant
Mr Ian Packman, Manager, Commercial Operations & Business Support
Mr Rodney Smith, Operations Investment Business Analyst
Ms Ping Tan, Senior Engineer
Mr Son Truong Vu, Senior Regulatory Analyst
Mr Gary Winsor, Operations Investment Manager
Mr Scott Young, Manager, Regulatory Policy - Network

Integral Energy

Mr Vince Graham, Chief Executive Officer
Mr Alan Flett, General Manager, Network Asset Operations
Mr Rod Howard, General Manager, Network Development & Control
Ms Karen Waldman, General Manager, Regulatory & Corporate Affairs
Mr Mike Martinson, Manager, Regulatory and Pricing
Mr Matt Webb, Technical Regulatory Manager
Mr Jim Battersby, Manager, Business Services and Compliance
Mr Ty Christopher, Manager, System Development
Mr Jonathan Cook, Major Renewal Projects Manager
Mr Ron Das, Fleet Manager
Mr Jim Hyndman, Network Policy and Regulations Manager
Mr Manoraj Jayasekara, Renewal Program Development Manager
Mr Frank Nevill, Regulated Operations Manager
Mr Brian O'Connell, Manager, Group Performance
Mr Ian Robinson, Manager, IT Planning and Infrastructure
Mr Michael Tamp, Manager, Asset Renewal Planning
Mr Rick Wallace, Strategic Network Planning Manager
Mr Adrian Woodford, Manager, Construction Program