Independent Pricing and Regulatory Tribunal
of New South Wales

Total Cost Review – Draft Report

June 2003

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Prepared for

Independent Pricing and Regulatory Tribunal
of New South Wales

By

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Table of Contents

1.0 Introduction

1.1 Appointment and Terms of Reference

In December 2002 the Independent Pricing and Regulatory Tribunal of New South Wales (IPART) commissioned Meritec Ltd (Meritec), Engineering and Management Consultants of Auckland New Zealand, to assess: the prudence of each DNSP's operating expenditure (opex) for the period from the financial year ending 30 June 1999 (FY 1999) to the end of FY 2003; the prudence of each DNSP's capital expenditure (capex) for the same period; the efficiency of each DNSP's estimates of opex for the period from FY 2004 to FY 2009; the efficiency of each DNSP's estimates of capex for the period from FY 2004 to FY 2014; the reasonableness of each DNSP's forecasts of growth in terms of customer numbers, energy sales and maximum demand for the period FY 2004 to 2009; and the reasonableness of each DNSP's low, medium and high growth scenarios and associated costs.

Meritec, previously known as Worley International Limited, undertook the 1998 capital expenditure review of DNSPs, including TransGrid, for IPART and reference is made to the final report of that review in this present report.

1.2 Work to Date

Work on the review began in December 2002 with a meeting with IPART to discuss the proposed approach and confirm the brief. A questionnaire and template were prepared in January, modelled on the 1998 documents but with revisions to suit current needs. Following review of the documents with IPART, the questionnaire and template were issued to DNSPs for completion. Their responses were received in two stages: general information on 28 March and detailed responses on 10 April. Meetings were held with the DNSPs during the period 23 April to 1 May and IPART was briefed on the meetings on 2 May. Supplementary information was requested from several DNSPs and was supplied. Further information may be requested as work on the review is concluded.

Work to date has been carried out by a team led by Jeffrey Wilson. Other team members involved include Michael Whaley, Power Economist; Conrad Holland, Distribution Engineer; Dave Almond, Power Engineer; John Cranston, IT Specialist; and other support staff.

1.3 Draft Report

The purpose of this Draft Report is to set out the current status of the work, summarise the approach adopted, and present preliminary conclusions based on the work carried out to date for consideration by interested parties, thus enabling us to take into account their views.

The report does not set out detailed or final findings in respect of individual DNSPs as, notwithstanding the comprehensive submissions made to us by the DNSPs, several matters remain under consideration, and further discussions have yet to be held with the DNSPs concerned.

The report does not, therefore, necessarily represent Meritec's final position on the matters discussed.

The report concentrates on the key issues affecting the assessment, their likely impact, and the approach we have adopted to conclude the work. Its findings will be superseded by our Final Report, when presented.

1.4 Programme for Remaining Work

This report will be made available by IPART to interested parties for review. A presentation will follow in Sydney on 11 July. Submissions on the report are then to be received by IPART. At the same time DNSPs will be asked to provide clarifications and further supporting material where required in consultation with us, after which we will conclude our recommendations to IPART, discuss them with IPART and the DNSPs concerned, and submit our Final Report to IPART in August, first in draft then final form.

1.5 Final Report

The Final Report, to be presented in August, will include the general material in this report and additional detailed sections covering our final conclusions in respect of each DNSP. As in the 1998 review, each detailed section will be discussed with the DNSP concerned prior to the conclusion of the report.

The detailed submissions made to us by the DNSPs, comprising completed questionnaires and templates, detailed capital expenditure projections and other material are considered confidential to IPART and the DNSPs concerned. The material has been forwarded to IPART for its information.

1.6 Acknowledgement

The co-operation and assistance of IPART and the DNSPs' management and staff during the course of the review to date is gratefully acknowledged.

1.7 Disclaimer

This report reflects the preliminary views of Meritec Limited and not necessarily the views of the Secretariat to IPART or the Tribunal.

The report has been prepared solely for IPART as an input into its 2004 determination. No liability is accepted by Meritec Limited, its management or staff, or any other person associated with the review to any other party or if the report is used for any other purpose.

1.8 Abbreviations

The following abbreviations are used in this report when referring to the DNSPs: AI for Australian Inland, CE for Country Energy, EA for Energy Australia and IE for Integral Energy.

2.0 Methodology

2.1 Background to the Review

IPART is the jurisdictional regulator for DNSPs in New South Wales under the National Electricity Code and regulates network tariffs. In 1999 its determination took the form of a revenue cap but this methodology has been changed, for the 2004 determination, to a weighted average price cap for distribution with a pass-through of transmission charges and prices for miscellaneous charges and monopoly fees.

The total cost review reported on here is an important input to IPART's determination. As already outlined in Section 1.1 it includes a review of opex as well as capex. Past expenditures – those since the previous determination – and projected future expenditures are both considered. These tasks required modification of the approach used in the 1998 review that Meritec (Worley International) undertook for IPART as it covered capex alone and did not include a review of a prior period. Specifically, the work includes the assessment of the prudence of actual expenditures in comparison with projected expenditures during the period FY 1999 to FY 2003, and a review of the efficiency of projected expenditures for the future.

Other changes from the 1998 review include the consideration of different load growth scenarios; the preparation of independent load growth projections by the consultant; changes in the scope of potentially excluded services; and the removal of transmission-related costs from IPART's ambit as IPART is no longer responsible for regulating transmission services.

Prudence v. Efficiency

A distinction is drawn in the Terms of Reference between the prudence of past expenditures and the efficiency of projected future expenditures. The significance of past capex is that, if accepted as prudent, it will be rolled into the asset base. The review of past opex is undertaken to assist in forming a view of the reasonableness of projected future opex.

For the purpose of this review, prudent means that the expenditure was reasonable, given the information available at the time of the expenditure; and efficient means that operating and maintenance expenditure and capital expenditure, considered together, are or were the least-cost way of providing the requisite network services over the life of the network. The efficiency test was applied by considering the expenditures in the conventional manner, taking account of power planning concepts and operational practice. Prudence was considered in respect of prior expenditures only, modifying the general approach based on our understanding of the information available at the time.

Benchmarking

Benchmarking was an input into our review and provided us with an additional level of comfort when finalising our conclusions. However, whilst broad comparisons may be made between the DNSPs in NSW and with DNSPs elsewhere, several factors such as those discussed in this report complicate the comparisons requiring judgment to be exercised. These factors include differences in types of network, customer and load densities, asset ages and condition, load mixes and other factors including service targets matched to the particular circumstances of each DNSP.

2.2 General Approach

The work was undertaken in the following stages in accordance with IPART's proposed timetable:

- Discussion of approach;
- Preparation of questionnaire;
- Issue of questionnaire and receipt of responses;
- Assessment including prudence, benchmarking and efficiency reviews;
- Reporting.

Data requested included but was not limited to:

- General information including annual reports, organization charts, corporate plans, asset management plans, long-term network development plans, procurement and construction specifications, network performance reports, network line diagrams and maps and other information.;
- Information on assets in service including quantities and ages;
- General statistics and performance data;
- Demand forecasts;
- Actual and projected capex and opex;
- Information on inter-company transactions.

Actual or projected expenditures and timings associated with major replacement and augmentation programmes and projects were reviewed for reasonableness and optimality.

For renewal-based capex, age profiles were not taken as the main criterion: instead, information on asset condition and information on replacement policies was reviewed to assess the reasonableness of replacement capex.

For opex, we considered historical trends and cost-based performance indicators and took account of changes in the working environment in the industry.

We also took account of the overall quality of each DNSP's asset management practices and reviewed the processes used to derive growth forecasts.

As in 1998 we considered the processes and systems used by each DNSP to plan and control its expenditures.

2.3 Network Planning Criteria

All DNSPs with the exception of AI have network planning criteria including documented security of supply criteria, permissible voltage limits, and permissible plant loading guidelines. The security of supply criteria generally included a mix of deterministic and probabilistic criteria in accordance with current international practice. The voltage limits generally included normal and emergency thresholds. These and the plant loading guides were found generally to be consistent with accepted international practice and published Australian or international standards. We considered that they were generally suitable for the networks concerned although they are applied in different ways, particularly in relation to the assessment of risk, that do not lead to consistency between DNSPs. A comparison of the criteria has been prepared and will be presented in our final report.

2.4 Capex Approval Processes

All DNSPs with the exception of AI documented their internal controls used to monitor capital expenditures.[1] These controls generally included: (a) establishing the need for action; (b) establishing consistency with the organisation's corporate objectives and long-term network development plans; (c) determining the least-cost solution; and (d) determining the rate of return on investment. The most important items as far as this review is concerned are the establishment of need and the determination of optimal timing of the resulting works. We did not consider the achievement of a rate of return on investment equal to or in excess of the weighted average cost of capital (WACC) as the ruling criterion where need was established under other criteria as, in low-growth and low-loss situations such as those prevailing in the State, a lower rate of return may say more about tariffs than about the merit of particular works.

A detailed review of all projects for compliance with the network planning criteria and capital approval processes was beyond the scope of this review. We thus limited ourselves to the question of how the stated criteria and processes had affected the capital expenditures made or projected. For the purpose of the review, we looked particularly at whether:

- Network modelling under normal and contingency conditions had been used to test the capacity of the system;

[1] AI's Asset Management Plan and Long-Term Network Development Plan included information on these procedures but in limited detail.

- Full account was taken of load transfer capability between substations and through lower voltage networks where available;
- The security of supply criteria used, if deterministic (e.g.: n-1) in the first instance, had been supplemented by a probabilistic analysis before capital expenditure commitments were made;
- Non-network solutions had been considered;
- The timing of new work.

We noted that DNSPs were required in this review to have their responses signed by their directors and we considered that this added an additional level of assurance to the process.

We also noted that some DNSPs had their projections reviewed independently but we did not consider ourselves bound by the findings of those assessments.

2.5 Installed Cost of New Assets

DNSPs were asked in the 1998 capex review to indicate whether their cost estimates assumed unit rates similar to or the same as those in the then reasonably current Treasury Guidelines on valuation. The same question was asked again this time. In both cases, more so this time, most DNSPs said that their expenditure projections were based on their own estimates of costs to complete new works rather than on the Guidelines. CE, however, said that it used the Guideline replacement costs for its projections. We are carrying out a high-level review of the costing of certain selected projects to check for reasonableness. We will report our findings in the final report.

To date we have not found any reason to believe that the installed costs of new assets assumed by DNSPs are unreasonable.

2.6 Optimality of Design and Construction Practices

All DNSPs claimed that their design and construction practices were more-or-less optimal (in AI's case the adoption of designs from another DNSP is under consideration). We found no material evidence to contradict their assertions.

2.7 Asset Renewal Expenditure

The DNSPs have conventional replacement policies that recognise the need for judgement when determining whether replacement is preferred to refurbishment. All recognise that age alone does not determine need although their replacement capex naturally reflects the age profiles of their assets. All have condition assessment programmes of some type to judge the serviceability of assets and, where appropriate, to drive their maintenance and replacement programmes. Some use computer models as high-level tools to predict future replacement capex requirements.

Most DNSPs confirmed that comprehensive condition assessment programmes were commenced in the mid-1990s (probably in response to growing commercial pressures in the industry at that time). They outlined the programmes. We did not ask for or receive comprehensive information on the results of the programmes but were assured by the DNSPs that the programmes supported their requested replacement capex projections and their representations to us.

It is a matter of opinion how 'old' the asset stock should be, on average, before replacement is considered appropriate. The assessment of 'standard' lives is important in this context as even a small increase in standard life could shift a considerable amount of expenditure out of a given period into the next. Since large expansions of electrical networks took place in the 1960s, and since many of these assets are considered to have a standard life of thirty to sixty years, their replacement falls into the current time frame or the ones following. Thus the impact on capex projections of assuming a different standard life can be great.

Guidance on standard lives can be obtained from published papers, including the NSW Treasury's draft Policy Guidelines on valuation, and from industry experience. Generally we consider that the lives given in the Guidelines are reasonable but evidence elsewhere suggests that actual lives may exceed the Guidelines' standard lives in some instances. Emphasis in the 1990s on the restructuring, valuation, sale and purchase of DNSPs worldwide has brought asset lives into sharper focus. In particular, the drive for cost efficiencies in the industry has resulted in considerable emphasis being placed on improved asset management and on the achievement of life extensions where economic.

The remaining lives chosen for projecting replacement capex should reflect the continued use of serviceable assets as long as their retention is economic. Historical service records provide the most compelling evidence for the determination of remaining service lives but, in many instances, populations are not sufficiently aged for this evidence to be available.

2.8 Renewals for Environmental and Other Reasons

The same environmental, safety and statutory obligations affecting future renewal capex were identified by the DNSPs as were identified in respect of past expenditures, namely: environmental protection, safety, under-frequency load-shedding to meet NEC requirements, and quality of supply (a programme, in Integral's case, to monitor quality of supply throughout the network). The only local government impact was the requirement to service new urban residential developments underground.

Expenditure under this category generally comprised only a small part of the total and may be accepted. We do, however, expect to see such expenses off-set to the extent possible by savings in other areas as DNSPs should not be exempt from the pressures that require companies to absorb certain costs in competitive markets.

2.9 Demand-Related Expenditure

The prediction of growth (demand related) capex requires knowledge of future demand and load patterns not on average across the service area as a whole but in each particular area separately. The analysis is complicated and, other than in small networks, the data is voluminous. Most DNSPs provided data on loadings at the zone substation level and we were able to refer to it when reviewing their planning methods and particular programmes or projects. We examined selected capital expenditure projects put forward by the DNSPs. At the time of writing this report, this work is continuing.

Increases in actual growth from forecast figures are normally accommodated at the distribution level by advancing the implementation of the capital works that form part of the long-term network development plan. Conversely, slower-than-expected load growth is accommodated by deferral. It is normally considered prudent to maintain a reserve against unexpected increases in demand in the short term. Where there is doubt about the necessity of projected programmes deferral of the associated expenditures could be considered by IPART. This may be appropriate in respect of investments later in the forecast period as, generally, they are not yet fully planned, designed, or tested against the investment criteria. Projected capex should however, be appropriate in total. The point is discussed later in the report.

2.10 Reliability and Quality Improvement

Past and projected capex for reliability and quality improvement was reviewed with the DNSPs concerned. In some instances no expenditures were recorded under this heading for system assets, the principal reason for the expenditures being cited as either replacement or growth.

For the purpose of the review, we considered that reliability targets similar to or the same as present levels of reliability are, prima facie, reasonable.

We also noted that there is only an indirect link between expenditure and outcomes because of the time lag in reliability performance indices.

2.11 Demand Management and Non-Network Solutions

The DNSPs already utilise demand management systems to manage their peak demand and all but one gave estimates of the load already controlled through these channels. Future loads may be reduced by additional demand management programmes and capex may be reduced by the introduction of non-network solutions.

All DNSPs recognise the need for investigation of non-network solutions but few reported material prospects for its implementation. DNSPs should demonstrate that they are giving non-network solutions full consideration. This should entail analysis in sufficient depth to test the possibilities closely. At this stage the majority if not all DNSPs give the appearance of complying with the requirements without confidence that material possibilities for demand management will be found. There may not be material possibilities for a number of reasons but we would pre-judge the situation if we accepted a negative view without receiving evidence to support it.

This area requires further work by all DNSPs. Likewise, DNSPs will be asked to outline the expected impact of any new tariffs being considered to modify load patterns.

2.12 Operating and Maintenance Expenditure

Past patterns of opex were reviewed for consistency and the link between the FY 2003 projections and those of the first year of the new regulatory period was examined. A series of cost-based performance indicators was defined and asked for in the questionnaire and are reported and discussed later in the report.

2.13 Expenditures for Possibly Excluded Services

Details of expenditures for possibly excluded services were requested. There were noticeable differences in approach between the DNSPs in reporting these expenditures and further analysis is needed before a conclusion can be reported.[2]

2.14 Other Expenditures

Expenditures on other items, specifically Y2K and costs associated with full retail contestability, were reported separately. Prior expenditures on FRC have already been assessed by IPART and agreed to in part or in whole. Prior expenditures on Y2K have been reviewed but not accepted by IPART. Future expenditures on FRC are reported and will be discussed with IPART. Obviously there are no future expenditures on Y2K.

[2] One DNSP expressed reservations about the accuracy with which it could segregate these expenses.

3.0 General Findings and Conclusions

In this and the following sections of the report we discuss specific findings in the context of the DNSPS' medium load growth scenarios. With some exceptions, we based the text on the information originally submitted by the DNSPs. Corrections were received from several DNSPs but they have not necessarily been incorporated yet. We discuss general conclusions in this section along with load growth. Capex is discussed in Section 4 and opex in Section 5.

"n.a." in the tables means 'not applicable'; "d.n.s." means the DNSP concerned did not submit the data; and "c." means circa or 'about'. All sums are rounded to the nearest million or, in some cases, to the nearest thousand. Where information was not submitted in response to specific questions we were able, in some cases, to deduce it from responses to other questions. As mentioned already, FY 2003 means the financial year ending 30 June 2003 etc.

3.1 Statistics

Table 1 below summarises the general statistics of the DNSPs' networks in FY 2003.

Table 1: Key Statistics of the DNSPs

	AI	CE	EA	IE
Total service area (sq km)	155,100	582,000	22,275	24,500
Total system length (km)	9,425	182,023	c.47,144	33,863
Percent of total system length underground (%)	< ½	2	26	27
Maximum demand (MW)	c.77	1,990	5,051	3,190
Energy sold (GWh)	414	10,134	25,738	16,641
Annual load factor (%)	c.61	57	61	64
Employee Numbers (full-time equivalent, year-end):				
Network	74	2008	c.2,737	1,547
Retail	17	199	c.395	235
Non-regulated business	112	551	c.395	264
Total	203	2,758	c.3527	2,046
Customers:				
Customers connected (No)	19,066	726,333	1,478,600	800,807
Customer density (customers per km of system length)	2	4	31	24
Customer density (customers per sq km of service area)	0.12	1.2	66	33
Customers per employee (network)	258	362	c.540	391

The table highlights the significant differences between the DNSPs in terms of scale of operation, service area, load density and customer density. The table itself is a generalisation as the DNSPs are not homogeneous.

Asset utilisation and investment in each DNSP in FY 2003 is summarised in Table 2 below:

Table 2: Asset Utilisation and Investment

	AI	CE	EA	IE
Network Utilisation:				
Overall power transformer capacity (Nameplate MVA)	155	7,718	c.10,035	10,347
Corresponding utilisation ratio (%)	58%	27	c.49.7	33.8
Substations transforming to an intermediate voltage level:				
Total load transferred through these substations (MVA)	d.n.s.	d.n.s.	c.4,047	2,801
(n-1) nameplate capacity of transformers (MVA)	25	297	c.4,420	2,787
Corresponding utilisation (%)	d.n.s.	d.n.s.	c.92	100
Substations transforming to distribution voltage:				
Total load transferred through these substations (MVA)	d.n.s.	2,095	c.5,598	3,071
(n-1) nameplate capacity of transformers (MVA)	70	3,265	c.6,260	3,300
Corresponding utilisation (%)	d.n.s.	64	c.90	93
Distribution substations:				
Total system MD less HV customer demand (MVA)	61	2,488	d.n.s.	5,334
Distribution transformer capacity (MVA)	208	6,769	d.n.s.	7,620
Utilisation ratio (%)	29	37	d.n.s.	70
Network Investment:				
Total network investment at replacement cost ($ m)	260	7,909	c.10,927	c.6,208
Corresponding investment per MVA of MD ($ 000 / MVA)	2,902	3,179	c.2,192	c.1,933
Total network investment at DRC	168	3,733	c.4,698	c.3,382
Corresponding investment per MVA of MD ($ 000 / MVA)	1,873	1,501	c.942	c.1,084
Energy Losses				
Energy losses as percentage of energy entering the system	c.10.5%	9.5%	4.7%	c.5.8%

The table demonstrates that DNSPs with large urban concentrations have the highest asset utilisation, lowest costs per unit of demand served, and lowest losses.

We would prefer the DNSPs who did not provide all the data to do so but we accept AI's statement that it does not have adequate metering or up-to-date network analyses available to provide all the information requested (it did provide a table of zone substation capacity utilisation). It accepts that it should have.

SAIDI minutes lost in FY 2002 are shown in Table 3 below and the number of faults per 100 km of overhead circuit in Table 4. The reliability data in Table 3 is not sufficiently comprehensive to comment on but the line fault data presented in Table 4 appears reasonable with the exception that EA's 66 kV line fault incidence is high. Recent trends in SAIDI minutes lost are unclear.

Table 3: SAIDI Minutes Lost in FY 2002

	AI	CE	EA	IE
Total Urban – all causes except planned	d.n.s.	d.n.s.	d.n.s.	45
Total Rural – all causes except planned	d.n.s.	d.n.s.	d.n.s.	55
Total – all causes	359	286	98	134
Total excluding loss of bulk supply	d.n.s.	d.n.s.	98	134

Table 4: Faults per 100 km of overhead circuit in FY 2002

	AI	CE	EA	IE
132 kV overhead lines	n.a.	n.a.	5.4	2.9
66 kV overhead lines	2.2	2.6	48.3	8.2
33 kV overhead lines	1.3	14.8	30.2	19.8
22/11 kV overhead lines	10.0	14.2	38.7	58.7
SWER overhead lines	1.3	2.3	6.8	n.a.
LV overhead lines	68.1	13.9	8.1	6.5

3.2 Forecast Demand

Table 5 shows average actual growth rates over the period FY 1999-2003 and forecast rates for the period FY 2004-2014. It also shows the magnitude of controlled load and the DNSPs' assessments of the impact of current non-network solutions on their networks.

Only EA proposed different growth rates in its alternative scenarios. (Alternative rates of growth were offered for FY 2003 as well: hence the range reported under 'actual growth in energy sales, FY 1999-2003').

Table 5: Growth in Demand

	AI	CE	EA	IE
Actual growth in energy sales, FY 1999-2003, p.a.	0 a/	1.7%	2.7 -3.2%	1.4%
Projected growth in energy sales, FY 2004 to 2014, p.a.	1.6%	1.7%	2.22.9%	2.1%
Projected movement in annual load factor	unknown	decreasing	Decreasing	decreasing
Estimated total controlled load, 2003 (MW)	d.n.s.	1,500	1,400	1,556
Impact of distributed generation and other non-network solutions currently in service	Not material	Not material	Not material	Not material
a/ 1.5% excluding their largest CRNP customer.				

Points noted were:

- All growth rates in energy sales were and are projected to remain modest;
- All DNSPs forecast aggregate (system-wide) energy first then derived their aggregate demand forecasts from their projected load factors;
- All DNSPs except AI prepared their aggregate forecasts using a combination of trend and econometric methods. AI reported a nil projected growth but 1.5% excluding its largest CRNP customer (it accounts for around 30% of total energy sales);
- Parts of some aggregate forecasts were prepared using an end-use approach (e.g. in the residential sector by estimating customer numbers and specific consumption, the latter based on projections of appliance penetration);
- CE, EA and IE reported that they had their forecasts reviewed independently and gave us copies of the reports;
- The impact of demand management measures already in service is taken into account in the projections;
- The prospective impact of future demand management measures was not considered by the DNSPs to be great although the possibility of localised effects were identified;
- The net present value (NPV) of distributed generation and non-network solutions presently in service is not material (in IE's case it was $2.3 million);
- Growth is not evenly spread;
- Forecasts for individual substations were generally based on local factors and in some cases as always vary significantly from the aggregate rates.

We expect to accept the forecasts as reasonable for the purpose of this review. In EA's case we expect to accept the medium scenario. These conclusions are subject to further work being undertaken on the economic conditions to be expected over the period ending 2009.

4.0 Capital Expenditure

4.1 Capex in FY 1999-2003

All DNSPs made capital expenditures over the period FY 1999 to 2003 in excess of the projections they made at the time of the 1998 capex review. Expenditures projected and actually expended are summarised in Table 6 below. The projections are in 1998 dollars and actual expenditures are in nominal terms. In some cases the expenditure projections approved by IPART in the 1999 Determination differed from the projections made by the DNSPs in 1998 but the comparison here is presented in terms of the DNSP's own wishes as expressed at the time.[3]

EA's figures exclude transmission expenditures.

Table 6: Projected v. Actual Capex FY 1999-2003

	AI	CE	EA	IE
Projected renewal capex – end of life($m)	<1	85	219	232
Actual renewal capex – end of life ($m)	**4**	**531**	**409**	**290**
Projected renewal capex – environmental etc ($m)	0	0	21	1
Actual renewal capex – environmental etc ($m)	**6**	**0**	**56**	**14**
Projected growth capex ($m)	5	232	270	133
Actual growth capex ($m)	**3**	**258**	**589**	**244**
Projected reliability improvement capex ($m)	2	134 a/	68	5
Actual reliability improvement capex ($m)	**3**	**0**	**48**	**12**
Projected capex – possibly excluded services ($m)	8	162 b/	54	66
Actual capex – possibly excluded services ($m)	**5**	**213**	**189**	**149**
Projected capex – Y2K and FRC ($m)	0	0	0	0
Actual capex – Y2K and FRC ($m)	**<1**	**22**	**70**	**28**
Actual as pct of projected	132%	162%	215%	168%

a/ Includes projected IT and non-network expenditures.

b/ Metering, public lighting and consumer-related works.

CE did not give us projections: we compiled them from our records of Great Southern Energy's Advance Energy's and NorthPower's submissions to our 1998 capex review and

[3] IE's view is that this presentation is incorrect because, they say, it does not take account of the difference between cost increases due to inflation (which they say would have been modelled in the revenue formula as corresponding increases in allowed expenditure) and cost increases above inflation(which may have contributed to over-expenditure). They consider that the comparison, as made, understates the allowed expenditure and [thus] exaggerates any [over-]expenditure. For our purposes, however, we have no problem with the analysis as presented as inflation was modest and accounts for only around 10-12% of the overruns reported. The balances of the overruns remain significant. This point is made again in the main text below. CE also queried the point for a similar reason.

made assumptions, where needed. We were not, however, able to reconcile our calculations with other data provided in CE's questionnaire and thus our figures need to be reviewed by CE.

There are clearly other measurement uncertainties. For example, we understand that CE did not treat pole replacements as capex in its projections (or those of its predecessors) in 1998 but changed its policy in this regard and capitalised the actual expenditures. This will be checked with CE.

EA said that non-system capex reported in replacement capex includes FRC-related expenditures in spite of a request that there be no duplication of entry in the templates. This needs correction but the effect will be small.

EA had the biggest overrun with actual expenditure as a percentage of total projected capex 0f 215%. CE and IE reported similar expenditures at 162% and 168% respectively. AI had the lowest at 132%.

In some instances expenditures have obviously been re-categorised in an attempt to fit historical or projected data into the categories requested. For example, AI projected zero expenditure under the 'environmental and other' heading but reported expenditures for that purpose; and EA projected expenditures under the 'reliability improvement' heading but reported nil expenditure.

Renewal and growth capex were the main drivers of actual capex followed by capex for possibly excluded services. The latter was comprised mainly of customer-funded connections, developer-funded works, metering and public lighting services.

In CE's case non-system investments such as fleet, IT, etc was a significant driver.[4]

We asked the DNSPs to explain their excess expenditure under the following headings:

(a) Changes in projected or actual load or in load patterns during the period;
(b) Changes in installed unit costs from those assumed in the 1998 projections;
(c) The need for compliance with new statutory obligations, if any;
(d) The advancement or deferral of expenditures during the period other than for the preceding reasons;
(e) Adoption of new policies, planning criteria or designs following amalgamation with other DNSPs;
(f) Planning or budgeting errors (e.g. cost under-estimation, failure to plan to avoid construction bottlenecks, etc);

[4] CE commented to us after reviewing the draft of this report that "it would appear that projected non-system capex has been included in reliability improvement capex and that actual non-system expenditure has been included in system related renewal capex. Meritec may not be comparing like with like … Further to the previous point, Country Energy provided reliability improvement capex in asset renewal category. This would tend to bias the 'over' expenditure on asset renewals. We would suggest that projected reliability capex be included in projected renewal capex to ensure like with like comparison. We will check these points in consultation with CE.

(g) The extent to which Y2K or full retail contestability costs added to expenditure;
(h) The extent to which changes in policy for overhead cost allocation increased the cost of capital works;
(i) The extent to which non-network solutions and demand-side management measures reduced capex;
(j) Other factors, for example: the net cost after insurance recoveries of remedying damage.

DNSPs offered qualitative and in some cases quantitative responses.

They generally did not mention possible off-setting savings where new factors were adding to costs although they should have done so, in our view, for the reason cited earlier.

The following particular responses were noted:

- Although higher-than-expected growth in demand was cited as a reason for capex in Sydney and some other areas, average annual growth rates remained modest;[5]
- Air conditioning load growth and a shift in peak demand from winter to summer in some locations were also cited as factors and there is evidence that this change took place. It would have affected plant ratings and would normally lead to a requirement for capex;
- Changes in installed costs were not cited as a significant factor in the overruns;
- Additional statutory obligations were cited as a reason for cost overruns and in some cases their impact was quantified. Three examples cited were security and safety improvements, environmental protection, and under-frequency load shedding. It was not clear in all instances that the obligations cited were new or that they were causes for the overruns;
- No off-setting measures for cost reduction were cited in the responses to this part of the questionnaire (they were not asked for);
- A perceived need for increased expenditure on refurbishment was cited in several cases but asset ages did not suggest urgency in all cases;
- Y2K and costs associated with FRC were identified. (Most businesses had to absorb Y2K costs and it appears that IPART also took this view. Expenditure on FRC was material and has been reviewed by IPART.);
- Expenditure on IT system improvements was material in some cases and all DNSPs report a need for further work in this area;
- Non-system capex was also material although not all DNSPs included projections for it in their 1998 submissions. Some did. CE cited this as a particular reason for its overrun;
- One DNSP claimed that expenditure on land and buildings was not able to be included in the 1998 review and cited it as a reason for its overrun. Further

[5] This is not to say that growth in certain areas did not drive capex but the general point made here, that the industry is operating in a low-growth environment, remains valid.

discussions with that DNSP are required to assess the nature of expenditure and the reasons why it was not included in the 1998 projections;
- Demand management measures were cited as a cost but the figures were not material.[6]

Overall, our conclusions regarding the prudence of the additional expenditures over those projected for the period FY 1999-2003 may be summarised as follows:

- We accept that there was higher growth than projected in certain locations including but not limited to Sydney and that this situation, in conjunction with the Olympics, did precipitate capex that could be considered to have been prudent at the time. Overruns under these headings may be accepted;
- DNSPs should presumably have ensured that appropriate allowances were made in their 1998 submissions for non-system capex. Overruns under these headings should therefore not necessarily be accepted;
- Where new impositions have been made on DNSPs their costs should be off-set to the extent possible by other savings to avoid a situation where the sector works solely on a cost-plus basis without feeling any pressure for economy of operation. Overruns in this area might therefore be accepted only in part or not at all;
- Although the DNSPs did not cite increases in installed costs as an important reason for their overruns an allowance for inflation could be made. It would not, however, explain an overrun of more than around 10-12%;
- The winter-to-summer load shift in certain areas had the propensity to drive capex in specific locations but is not a change that should be put forward repeatedly as a reason for additional capex. Overruns in this area may be accepted partially or in full but the argument should not be raised again for additional augmentation of the same assets.

We will prepare quantitative recommendations for IPART on prudent capex during this period for each DNSP after further consultation with the DNSPs concerned. Estimation will be required where full details have not been provided. We cannot indicate a figure at the moment but reductions in the amounts claimed may be necessary.

4.2 Capex Projections for FY 2004-2014

The DNSPs' projections of capex for the period FY 2004 to FY 2014 are shown in the Table 7 below based on primary purpose. Expenditures in each category as a percentage of the total are also shown, as are the total annual expenditure as a percentage of indicative network replacement cost and the implied weighted average age of the assets as a percentage of standard life.[7] All figures are in real (FY 2003) dollars (CE's figures

[6] This does not imply that the costs were not efficient or prudent, only that they were not material in explaining the overruns.
[7] This is a simplification but adequate for the point made.

were presented to us in nominal dollars and have been converted using the escalation rates they indicated in their template).

EA's figures exclude transmission expenditures.

Table 7: Capex Projections, FY 2004-2014

	AI	CE	EA	IE
Projected renewal capex – end of life ($m)	8	1,589	1,700	1133
Projected renewal capex – environmental etc ($m)	5	0	450	39
Projected growth capex ($m)	7	712	1,922	1,178
Projected reliability improvement capex ($m)	9	0	224	177
Projected capex for possibly excluded services ($m)	15	621	470	124
Other projected capex (Y2K and FRC) ($m)	0	0	14	0
Total annual average expenditure ($m)	**4**	**266**	**435**	**241**
Expenditure in each category as pct of total				
Renewal	18	55	36	43
Environmental, safety, statutory, etc	11	0	10	1
Growth	16	24	40	44
Reliability improvement	21	0	5	7
Sub-total	66	79	91	95
Possibly excluded services	34	21	9	5
Full retail contestability costs	0	0	<1	0
Total	100	100	100	100
Network investment at replacement cost ($m) (ex Table 2)	260	7,909	c.10,927	c.6,208
Network investment at depreciated replacement cost ($m)	168	3,733	c.4,698	c.3,382
Implied weighted average age of assets as pct of std life (see footnote on this page)	**35%**	**53%**	**57%**	**46%**
Annual expenditure as pct of network replacement cost	**1.5%**	**3.4%**	**4.2%**	**3.9%**

Renewal and Replacement Capex (End of Life)

The table shows that:

- AI has the youngest assets and the lowest projected renewal capex as a percentage of network replacement cost and as a percentage of total capex;
- EA has the oldest assets and the highest projected renewal capex as a percentage of network replacement cost but not as a percentage of its total capex;

- CE's assets are younger than EA's but it has the highest renewal capex as a percentage of total capex and a high (but not as high as EA) level of renewal capex as a percentage of network replacement cost;
- IE's assets are younger than CE's but its renewal capex as a percentage of network replacement cost is higher than CE's and its replacement expenditure as a percentage of total capex is higher than EA's..

IE's projections of replacement capex lead to a weighted average remaining life of its assets, in aggregate, of 50% of their standard life.

EA, however, reported that its target is that no more than 10% of its total asset base or 40% of a single category of assets are aged beyond their standard life unless known asset condition overrides the assessment in specific cases. These approaches have clearly led to different projections.

We did not ask for, nor were we presented with, evidence of condition, e.g. dissolved gas analysis (DGA) or insulation polymerisation test results, to help substantiate the projected renewal capex but the DNSPs did assure us that they had taken their condition assessments into account when preparing their projections.

Subject to further consultation with the DNSPs we expect to conclude with respect to renewal capex (assets reaching the end of their life) that IE's average age criterion should be relaxed and its renewal capex programme deferred partially.

IE indicated that it had spread its estimated renewal expenditure disallowed in the 1999 determination across the forthcoming period. The nature of this item needs clarification.

Further consultation with the DNSPs is required to determine the extent of reductions in projected expenditures in this area.

Renewal and Replacement Capex (Environmental, Safety, Statutory and Other)

Table 7 shows differences in the reporting of environmental, safety and statutory expenditures with CE reporting none. This needs clarification with CE.

Growth-Related Capex

AI's growth-related expenditure is for non-network assets, as is its projected reliability expenditure.

Examination of selected projects confirmed that projects proposed for implementation later in the period are generally not yet planned or designed in full detail and that decisions will be taken later on whether, when, and in what form they proceed. Forward capex programmes are tentative to this extent. This is generally the case in network planning, especially at the distribution level. The projected expenditures may, however, be representative of capex requirements overall and could possibly be accepted on this ground based on consideration on their overall magnitude and not on their composition. IPART, anyway, will reflect the aggregate capex programme of each DNSP in its modelling without naming the constituent works. Acceptance of this approach is accompanied by the expectation that DNSPs will be able to show, at the end of the period, that the magnitudes of their expenditures were in line with the projections. This outcome, however, was clearly not achieved in respect of the period FY 1999-2003.

An alternative approach would be for the projected expenditures to be reduced by a factor to allow for the expectation that not all foreseen works will pass the requisite tests when investigated fully and that a portion will be deferred, modified or abandoned. The 1998 review did not consider this approach but this review does.

Our review showed that, subject to further consultation with the DNSPs:

- It was difficult to link the established need for certain works to the timing proposed for the expenditures although further investigation may show the proposals to be reasonable;
- Extreme high temperatures cited by IE would need to be tested against historical data to determine whether a reasonable probability of recurrence exists and, if so, what weight should be placed on it;
- The trend from winter to summer peaking in certain locations has been evident for some time and, whilst it justifies certain works, should not be over-played as a capex driver affecting the networks as a whole;
- We are still assessing EA and IE's growth capex projections but those of AI and CE appear reasonable, subject to confirmation;
- We may recommend deferral of a portion of EA and IE's growth capex to IPART unless the aggregate expenditures are considered reasonable and there is an expectation that there should not be overruns later;
- Such financing as is approved could then be prioritised to deal with needy cases and thus the integrity of the networks should not be jeopardised.

Capex for Reliability Improvement

As already mentioned, capex for reliability improvement as its prime purpose received little focus although all DNSPs made the point, correctly, that renewal and growth capex generally have the propensity to bring about reliability improvements.

In spite of a desire on the part of many regulators and industry commentators to draw a link between capex and reliability improvement, it remains a fact that the link is tenuous, firstly because of the difficulty in segregating expenditures that truly have a propensity for reliability improvement and secondly because SAIDI, SAIFI and CAIDI and the other reliability indicators in universal use are 'lagging' indicators. By that we mean that they reflect past practice and the resulting network condition rather than current practice and consequential future condition. They are also influenced heavily by exogenous factors including but not limited to weather.

Since expenditures under this category are verging on being immaterial we propose to accept them and concentrate on the other areas mentioned.

Projected Capex for Possibly Excluded Services

Projected capex for possibly excluded services relate mainly to customer-funded and developer-funded work and to a lesser extent to metering and public lighting. Sixty percent of CE's budget for possibly excluded services is accounted for by works funded by customer capital contributions and a further 22% by the proposed installation of time-of-use meters for small customers. The economy of installing such meters for small customers is unclear to us but CE advised us that they consider there is a good case for the investment. This requires discussion with CE.[8]

Other Projected Capex

Future expenditures on FRC are reported and will be discussed with IPART. There are obviously no future expenditures on Y2K.

Overall Level of Capex

Overall, capex in the region of 4% of network replacement cost, as proposed by EA and IE in particular, appears high in the projected low-growth environment and should be reassessed. However further discussion is required with DNSPs with regard to areas where we are considering recommending reductions to proposed levels of capex.

[8] We have not yet determined if other DNSPs have included projected expenditures for the installation of similar meters.

5.0 Operating and Maintenance Expenditure

5.1 Opex in FY 1999-2003

Next, we undertook a review of opex in the period FY 1999-2003 to help establish a view on past and future opex. Amounts projected and expended are summarised in Table 8 below. All figures are in nominal dollars.

To help determine the prudence of these expenditures we asked the DNSPs to break down their projected and actual opex under the headings shown in the table. CE entered “0” for its FY 1999 projected and actual expenditures and added expenditures in FY 2000 and 2001 in its template which it did not take into its total (the latter were found in the template). We adjusted the figures for FY 2000-2003 to include FY 1999 at the average of the other years but we did not include the two additions in 2000 or 2001. Our figures should be checked by CE and any necessary corrections advised to us.

EA entered ‘0’ for its FY 1999 actual expenditure and we adjusted for that as above. Our figures should be checked by EA.

AI gave us only a total figure for its projected costs other than line costs. Also, it presented its actual expenditures in real 1998 terms and we converted them to nominal figures using the escalation rates cited in CE’s template – the only ones available to us from the DNSPs.

CE advised that it was not able to provide a breakdown of its projections because they related to its predeceased constituent organisations. Additionally, CE’s actual expenditures were not split in all years, only in some. We were not able to deduce the information to correct these anomalies but the totals appear to be correct. CE has offered to provide estimates of the breakdown for prior years.

IE included its projected and actual expenditures for ‘possibly excluded services’ in its main projections. It also presented its actual expenditures separately as requested. It did not, however, present its projected figures separately. CE’s template says they also included the cost of ‘possibly excluded services’ in their main projections. We have not adjusted their figures.[9]

In IE’s case the actual expenditure figures reported in the table include line costs but it advised us this week (if it advised us earlier we overlooked it) that its 1998 projections did not. If line costs are added to its projections or removed from its actual expenditures then actual expenditures are close to the projections. This may also be the case with CE and EA.

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[9] In IE’s case we could have removed actual expenditures for ‘possibly excluded services’ from the main total but not the matching projections. Removal of actuals but not the corresponding projections from the total would have distorted the comparison of actuals with projections made in the table.

Further discussion with the DNSPs is required in these cases to ensure that the appropriate figures are cited.

Table 8: Opex, FY 1999-2003

	AI	CE	EA	IE a/
Projected – line costs ($m)	18	d.n.s.	0	0
Actual ($m)	**25**	**470**	**744**	**453**
Projected – network operation ($m)	0	d.n.s.	160	0
Actual ($m)	**1**	**64**	**164**	**108**
Projected – pole replacement ($m)	0	d.n.s.	20	0
Actual ($m)	**4**	**16**	**24**	**5**
Projected – reactive maintenance ($m)	0	d.n.s.	371	0
Actual ($m)	**5**	**160**	**229**	**66**
Projected – vegetation control ($m)	0	d.n.s.	0	0
Actual ($m)	**1**	**45**	**84**	**54**
Projected – other preventive maintenance ($m)	0	d.n.s.	0	0
Actual ($m)	**8**	**21**	**98**	**96**
Projected – transmission O & M ($m)	n.a.	n.a.	0	n.a.
Actual ($m)	**n.a.**	**n.a.**	**92**	**n.a.**
Projected – other operating costs ($m)	37	d.n.s.	551	820
Actual ($m)	**17**	**191**	**418**	**499**
Projected – Total ($m)	55	900	1,102	820
Actual Total ($m)	**62**	**968**	**1,850**	**1,280**
Actual expenditures as pct of total				
Line costs	40	48	40	35
Network operation	2	7	9	8
Pole replacement	7	2	1	<1
Reactive maintenance	8	16	12	5
Vegetation control	2	5	5	4
Other preventive maintenance	13	2	5	8
Transmission O and M	n.a.	n.a.	5	n.a.
Other operating costs	28	20	23	39
Total	100	100	100	100
Actual as pct of projected (excl. transmission)	**113%**	**108%**	**159%**	**156%**
Actual in 2003 as pct of actual in 1999	**114%**	**c.134%**	**c.140%**	**132%**
Network investment at replacement cost ($m) (ex Table 2)	260	7,909	c.10,927	c.6,208
Average actual p.a. as pct of network replacement cost	**4.8%**	**2.0%**	**3.4%**	**4.1%**

Subject to the comments made above about line costs actual expenditures overran the projections materially in all cases other than CE and to some extent AI. The expenditures also showed material increases over the period in all cases although least so in the case of AI.

Not surprisingly, AI has the highest opex as a percentage of network investment. CE has the lowest and is within our normal range. EA and IE are at an intermediate level.

Other than 'line costs' the biggest expenditures were in the 'other operating costs' category. IE cited adjustments to its superannuation provision, wage increases and insurance cost increases as the main drivers in this category (accounting for around three quarters of it) as well as the cost of customer service obligations which it said had been 'incorrectly booked to regulated networks operating units'. IE have advised us that this figure will be reduced substantially if 'possibly excluded services' are removed as noted above. The figures need clarification with the DNSPs concerned.

Where DNSPs gave a breakdown of their projections by category (not all did, as already mentioned) and we were thus able to compare them with actual expenditures by category, we found that the actual expenditures bore little relation to the projections under each category. The allocations did, however, appear to be consistent between DNSPs (where they were provided) as a percentage of total expenditures although IE's 'other operating costs' are high in comparison with the other DNSPs (see above).[10]

We asked the DNSPs to identify the reasons for departures from their projections under the following headings:

(a) Opex arising each year during the period as a direct result of the amalgamation of your DNSP with others;
(b) Opex resulting from the need to comply with new statutory obligations that came into effect during the period and describe the nature of the obligations;
(c) Opex resulting from non-network solutions and the extent to which it exceeded your projections;
(d) The balance of the difference between projected and actual opex;
(e) Opex incurred in relation to Y2K and full retail contestability during the period.

As in the capex case, DNSPs offered qualitative and in some cases quantitative responses to the questions and generally did not mention possible off-setting savings where new factors were adding to costs. This made it difficult for us to judge prudence.

Some explanations presented in response to our questions about the balance of the over-runs appeared to conflict with information presented in the templates.

[10] IE consider that it is not possible to make a valid comparison of 'other operating costs' because of expected different treatments of overheads but we do not necessarily accept the argument. We will however review the situation once the cost of 'possibly excluded services' or an estimate thereof is removed and the treatment of line costs has been clarified.

Opex costs associated with non-network solutions were minor in comparison with other expenditures and, in our opinion, should be absorbed within the normal limits of opex.

Notwithstanding a shortage of information, we reached the following preliminary conclusions:

- Some DNSPs identified merger costs in the year FY 1999 (IE quantified them). They may be accepted;
- Annual expenditures exhibited a rising trend over the period driven, amongst other things, by wage and salary inflation in NSW;
- New requirements for safety when working in confined spaces such as underground substations will continue to affect EA's costs in particular but the other DNSPs are not exempt from these pressures;
- On the other hand an increase in costs of around 30-40% over the period as cited by the DNSPs is equivalent to a compound annual rate of around 9% and is high in the prevailing low-inflation environment worldwide.

On the basis of the material presented and since further enquiries are required as noted above, we cannot say at the moment whether all opex over the period FY 1999-2003 was efficient or whether it may be considered to have been prudent at the time. We will report our final conclusions after further discussion with the DNSPs and IPART.

Possibly Excluded Services and Other Opex

Opex relating to possibly excluded services and other expenditures was requested and is summarised in Table 9 below. All figures are in nominal dollars.

AI, CE and IE entered 'nil' for their projections. In IE's case it has been confirmed that this was because the expenditure in this area was included in the main opex projections and not separately identified as requested. EA and CE both entered 'nil' for actual expenditures in 1999 and we have not adjusted their figures. They need to confirm what was spent in that year.

Table 9: Opex for Possibly Excluded Services and Other Opex, FY 1999-2003

	AI	CE	EA	IE
Projected – opex assoc. with customer-funded cons. ($m)	0	d.n.s.	0	0
Actual ($m)	**<1**	**0**	**0**	**0**
Projected – opex assoc with ancillary services ($m)	0	d.n.s.	0	0
Actual ($m)	**<1**	**5**	**18**	**2**
Projected – meter maintenance ($m)	0	0	0	0
Actual ($m)	**<1**	**0**	**9**	**0**
Projecte d – metering services ($m)	0	0	46	0
Actual ($m)	**3**	**26**	**50**	**28**
Projected – public lighting ($m)	0	0	47	0
Actual ($m)	**1**	**9**	**35**	**22**
Projected – total ($m)	0	0	93	0
Actual – total ($m)	**4**	**40**	**112**	**52**
Actual in 2003 as pct of actual in 1999	131%	c.211%	c.117%	165%
Other expenditures				
Projected – Y2K ($m)	0	0	0	0
Actual ($m)	**0**	**0**	**10**	**5**
Projected – FRC ($m)	0	0	42	0
Actual ($m)	**<1**	**7**	**0**	**6**

EA's actual expenditures bore only limited relation to its projected figures. All figures showed a significant increase over the period: CE had the highest increase and EA the lowest. In CE's case, however, we note that two items were not stated in their response and are therefore assumed to be zero. This should be checked by CE and any necessary corrections made to the data.

We noted that:

- FRC expenditures, which had not been budgeted for and thus could not be compared with actual, have been reviewed by IPART and others on their behalf already and accepted in part or whole;
- Y2K costs were minor in comparison with other expenditures and, in our opinion, should have been (and were, we believe) absorbed within the normal limits of opex as in other business sectors.

5.2 Cost-Based Performance Measures

We asked DNSPs to complete a table of cost-based performance measures to help us judge the efficiency of their cost structures. Their responses are summarised in Table 10 below for FY 2003. The terms used (direct and indirect costs) were defined as follows:

- *Direct costs:* Direct costs are those directly related to operating and maintaining the network business of a DNSP: (a) including all costs that (i) are directly related to managing the system or (ii) are for the purpose of maintaining the service potential of system fixed assets; (b) excluding indirect costs, capital expenditure, depreciation, interest, amortisation of goodwill and intangibles, subvention payments, expenditure in relation to leased assets, transmission charges, avoided transmission charges, corporate tax, GST and other taxes except those incurred in the procurement and delivery of equipment;
- *Indirect costs:* Indirect costs are those not directly related to operating and maintaining the network business of a DNSP: (a) including all costs that (i) are not directly related to managing the system or (ii) are for a purpose other than maintaining the service potential of system fixed assets; (b) excluding direct costs, capital expenditure, depreciation, interest, amortisation of goodwill and intangibles, subvention payments, expenditure in relation to leased assets, transmission charges, avoided transmission charges, corporate taxes, GST and other taxes except those incurred in the procurement and delivery of equipment.

Table 10: Cost-Based Performance Measures

	AI	CE	EA	IE
Total direct cost of opex ($m)	4	111	184	86
Total indirect cost of opex ($m)	5	85	75	78
Total direct cost per km of system length ($)	**440**	**608**	**3,897**	**2,536**
Total indirect cost per customer connected ($/cust)	**277**	**117**	**51**	**97**
Total direct+indirect cost per kWh sold (cents)	**2.2**	**1.9**	**0.9**	**1.0**
Total direct+indirect cost per system length ($/km)	**1,000**	**1,077**	**5,486**	**4,832**
Total direct+indirect cost per customer ($/cust)	**500**	**270**	**175**	**204**
Total direct cost – materials ($m)	d.n.s.	25	14	10
Total direct cost – labour ($m)	d.n.s.	66	107	78
Total direct cost – plant ($m)	d.n.s.	19	63	1
Total indirect cost – admin & other bus unit overheads	d.n.s.	73	55	52
Total indirect cost – corporate cost allocation	d.n.s.	12	20	26

IE's figures will change slightly if the cost of 'possibly excluded services' is removed – see the earlier text.

Table 11 below presents the same information for New Zealand DNSPs for comparison, based on their most recent (2002) information disclosures under the Electricity (Information Disclosure) Regulations. The New Zealand DNSPs are of interest because they have similarities in design and operational practice to the NSW DNSPs, have undergone significant rationalisation and commercialisation since the mid-1980s; have exhibited material efficiency improvements over that time, and have reliable performance data of the type required available.

Table 11: Cost-Based Performance Measures for New Zealand DNSPs in 2002

	Mean	Median	Minimum	Maximum
Industry profile				
System length (km)	5,000	3,700	240	30,000
Customer connections (No)	61,300	25,700	4,100	505,000
Cost-based performance measures				
Total direct cost per km of system length ($)	1,167	1,036	574	2,290
Total indirect cost per customer connected ($/cust)	63	62	23	144
Total direct+indirect cost per kWh sold (cents)	1.2	1.1	0.6	2.3
Total direct+indirect cost per system length ($/km)	1,925	1,550	783	6,083
Total direct+indirect cost per customer ($/cust)	187	171	116	447

Comparison of Table 11 with the figures in bold in Table 10 shows that:

- EA's direct costs per unit of system length exceed the New Zealand maximum by 70% but the rest of the NSW DNSPs are within the New Zealand range (AI's are significantly below);
- Not surprisingly, AI's indirect costs per customer connected exceed the New Zealand maximum significantly but the rest of the NSW DNSPs are within the New Zealand range;
- Total direct plus indirect costs per kWh sold are comparable but the minimum in NSW is 50% above the minimum in New Zealand;
- Total direct plus indirect costs per system length are comparable and the maximum in NSW is 10% less than the maximum in New Zealand;
- Total direct plus indirect costs per customer connected are comparable.

No adjustment has been made for currencies: the New Zealand data is presented in NZ dollars and the NSW data is in Australian dollars. Adjustment for currency, if considered necessary (we do not consider it so), would paint the NSW operations in a poorer comparative light.

We also asked for general information on the NSW DNSPs' operating and maintenance staff and facilities and Table 12 below summarises the main responses for FY 2003.

Table 12: Operating and Maintenance Staff and Facilities

	AI	CE	EA	IE
Operating and Maintenance Employees				
Managerial and professional	3	108	956	d.n.s.
Technician grade engineering, drafting and other	15	426	1,435	d.n.s.
Administrative and secretarial	1	246	891	d.n.s.
Field services	55	1,229	324	d.n.s.
Total	74	2,008	3,606	850
General Data				
Number of field service depots	7	104	19	15
Average service area covered by each (sq km)	22,200	5,600	1,200	1,600
Number of workshops for transformer overhauls	1	3	1	1
Percentage of activities carried out using HV live-line or glove and barrier techniques instead of dead line	<5%	17	15	29

The responses were generally as anticipated.

Data was also requested on unsatisfactory feeders, maintenance practices, operational logistics and practices, training programmes, information systems and databases, cost efficiencies arising from integration of previously separate businesses, and service standards and targets and the responses were generally as anticipated.

5.3 Opex Projections for FY 2004-2009

The DNSPs' opex projections for the period FY 2004-2009 were requested and are shown in Table 13 below. All figures are in real terms (CE presented their information in nominal terms and we converted the data at the rates they provided in their template).

Table 13: Opex Projections for FY 2004-2009

	AI	CE	EA	IE
Line costs ($m)	46	712	1,014	655
Network operation ($m)	3	162	249	153
Pole replacement ($m)	5	0	43	0
Reactive maintenance ($m)	1	430	405	101
Vegetation control ($m)	1	114	119	105
Other preventive maintenance ($m)	15	53	154	229
Transmission O & M ($m)	n.a.	n.a.	126	n.a.
Other operating costs ($m)	29	485	552	652
Total ($m)	**100**	**1,956**	**2,663**	**1,895**
Projected expenditures as pct of total				
Line costs	47	36	38	35
Network operation	3	8	9	8
Pole replacement	5	0	1	0
Reactive maintenance	1	22	15	5
Vegetation control	1	6	5	5
Other preventive maintenance	14	3	6	12
Transmission O & M	n.a.	n.a.	5	n.a.
Other operating costs	29	25	21	35
Total	100	100	100	100
Projected expenditure in 2009 as pct of 2004	99%	112%	119%	103%
Projected expenditure in 2004 as pct of 2003	108%	105%	106%	106%

Details of 'other' operating costs given by the DNSPs were:

- AI: overheads of various types;
- CE: meter reading and data services, customer services, advertising and marketing, public lighting and corporate/administration allocation;
- EA: not stated;
- IE: not stated.

Costs in this category need to be discussed with the DNSPs and identified especially in IE's case (it has the highest allocation to this category as a percentage of total projected opex) and in EA's case where no details were given.

The increase from the last year of the present regulatory period, FY 2003, to the first year of the next is noticeable in all cases and exceeds the total increase in the subsequent five years in two cases, AI and IE. The reason for this step increase needs explanation in all cases, especially as it occurs at the commencement of a new regulatory period.

Our preliminary conclusions are therefore that:

- Determination of a reasonable (efficient) starting-point in 2004 should take into consideration our conclusions in Section 5.1, when they are finalised, in respect of the prior period and current cost-based performance indicators;
- The increases in opex projected by the DNSPs for subsequent years appear reasonable but they should be applied to an efficient FY 2004 starting-point;
- The split in expenditure between categories appears reasonable.

5.4 Possibly Excluded Services and Other Expenditures

Opex projections relating to possibly excluded services and other expenditures over the period FY 2004 – 2009 were requested from the DNSPs and are summarised in Table 14 below. All figures are in real terms.

Table 14: Opex Projections for Possibly Excluded Services and Other Expenditures

	AI	CE	EA	IE
Associated with customer-funded connections ($m)	<1	0	0	0
Associated with customer-specific ancillary services ($m)	1	19	28	17
Meter maintenance ($m)	<1	0	12	0
Metering services ($m)	1	50	76	50
Public lighting ($m)	1	29	10	35
Total ($m)	5	98	126	102
Projected expenditure in 2009 as pct of 2004	85%	118%	71%	109%
Projected expenditure in 2004 as pct of 2003	90%	103%	104%	107%
Other expenditures				
FRC related expenditures ($m)	0	1	84	26

The increase from the last year of the present regulatory period, FY 2003, to the first year of the next is again noticeable in IE's case and almost matches its projected total increase in the subsequent five years.

EA included public lighting costs only in 2004: that is why their expenditure declines and the public lighting category appears anomalous.

Overall, the increases over the period in the projected cost of possibly excluded services appear reasonable except in CE's case where the percentage increase is high.

Only IE and EA projected material amounts for FRC. In EA's case the amount is significant. This needs to be explored.

6.0 Conclusion

6.1 Review by DNSPs

Since a considerable amount of information was received, including several late amendments to the data and several supplementary submissions, it is desirable that the DNSPs review the figures presented in this report and advise us of any apparent anomalies or inconsistencies with their understanding of the situation or with the representations they made.

We also expect to receive, through IPART, submissions from the DNSPs and other interested parties at or soon after the workshop scheduled for 11 July and we will take them into account when preparing our final report.

6.2 Further Matters Being Reviewed

In addition to the points identified earlier in the report we have still to review the following:

- The relevance of the alternative expenditure scenarios put forward (only EA put forward different growth rates in its alternative scenarios);
- Matters that have been the subject of recent correspondence including several specific cases of prospective investment on possible non-network solutions; and
- Whether opex in the prior period or projected opex in the forthcoming period includes the inspection and maintenance of private poles.