Response to the ACCC's Draft Decision on TransGrid's 2004/05-2008/09 Revenue Caps:

Section 4 of 6

MetroGrid

July 2004

4 METROGRID

4.1 Introduction

In its draft Decision, the Commission reduced the value of MetroGrid by $44 million and applied an incentive write-down on remaining future expenditure. The Commission sets out its reasons for a prudency adjustment for MetroGrid on page 8 of the draft Decision and again on pages 60 to 62.

In essence the Commission forms judgements about the adequacy or otherwise of TransGrid's processes and, on the basis of these judgements concludes that a prudency adjustment is required. The Commission then chooses an approach for calculating this adjustment that:

> *"is based on excluding the return that TransGrid would have earned on its investment in this project during the course of it construction. Accordingly the cash expenditure on this project has been written-down by $44 million. This equates to 84 percent of the current estimate of the current estimate of the total (nominal) cost of the project.*
>
> *In addition, as this project is not yet complete, the ACCC has decided to apply an incentive on TransGrid to manage the remaining costs of this project. The principle of this incentive is to extend the prudency adjustment to the remaining expenditure on this project. A simple way to do this is to allow TransGrid to include in the RAB only 84 per cent of the remaining capital costs."*

Sections 4.2 and 4.3 below show that this aspect of the Commission's draft Decision cannot be justified in terms of the relevant Code and other requirements. For completeness, Section 4.5 demonstrates that TransGrid's processes were sound.

The Commission's draft Decision also raises concerns that MetroGrid does not fully satisfy the modified N-2 reliability criteria. In TransGrid's view, in light of the complexity of this matter the Commission is correct to have not yet drawn any conclusions.

To assist in addressing this issue, TransGrid has commissioned a review of both the planning standards, and their application to the Sydney CBD and inner suburbs, led by an international authority on transmission network planning. While this review is still to be finalised initial findings, based on the same information as provided to the Commission, suggest that the Commission's concerns are unwarranted. This aspect is considered in more detail in Section 4.4 below.

4.2 Code Requirements

Clause 6.2.2 of the Code requires that:

> "The transmission revenue regulatory regime to be administered by the *ACCC* pursuant to this *Code* must seek to achieve the following outcomes:
>
> (b) an incentive-based regulatory regime which:
>
> (2) provides for, on a prospective basis, a sustainable commercial revenue stream which includes a fair and reasonable rate of return to *Transmission Network Owners* and/or *Transmission Network Service Providers* (as appropriate) on efficient investment, given efficient operating and maintenance practices of the *Transmission Network Owners* and/or *Transmission Network Service Providers* (as appropriate)"

The Commission has clarified the definition of "efficient investment" in its draft Statement of Regulatory Principles:

> "**Proposed Statement – S5.1**
> **Prudent investment**
>
> The capital base may be increased to recognise additional capital costs incurred in constructing new facilities for the provision of services.
>
> The amount by which the capital base may be increased is the amount of the actual capital cost incurred provided that:
>
> - the amount does not exceed the amount that would be invested by a prudent TNSP acting efficiently in accordance with good industry practice and to achieve the lowest sustainable cost of delivering services; and
>
> - one of the following conditions is satisfied:
>
> - the anticipated incremental revenue generated by the capital expenditure exceeds the investment cost;
> - the TNSP or users satisfy the Commission that the new capital expenditure has system wide benefits that in the Commission's opinion justify its inclusion in the capital base; or
> - the new capital expenditure is necessary to maintain safety, integrity or is approved under the NEC.
>
> Should the actual capital cost incurred be deemed excessive by the Commission then the prudent amount of expenditure will be added to the regulatory asset base. The excess amount may be recorded in the regulatory accounts and rolled forward at the regulatory rate of return for possible transfer to the regulatory asset base at a later date." (Emphasis added).

The Code defines good electricity industry practice as:

> "The exercise of that degree of skill, diligence, prudence and foresight that reasonably would be expected from a significant proportion of operators of *facilities* forming part of the *power system* for the *generation, transmission* or *supply* of electricity under conditions comparable to those applicable to the relevant *facility* consistent with *applicable regulatory instruments*, *reliability*, safety and environmental protection. The determination of comparable conditions is to take into account factors such as the relative size, duty, age and technological status of the relevant *facility* and the *applicable regulatory instruments*."

Thus, to comply with the requirements of the Code and its own draft Statement of Regulatory Principles, the Commission should have:

1. established that, under the circumstances to which TransGrid was subject at the time, there was a different course of action which would have been taken by a prudent operator acting in accordance with good electricity industry practice, which would have resulted in a lower cost outcome; and

2. calculated the prudency adjustment as the difference between the actual cost of MetroGrid and that which would have been incurred by a prudent operator acting as described above.

In essence the Commission needs to establish that, in relation to the MetroGrid project:

(i) TransGrid did not act in accordance with good industry practice, and

(ii) a lower cost project would have been delivered if it had.

Both aspects of this test need to be met to justify an adjustment to the expenditure that should be rolled into the Regulatory Asset Base. It is not sufficient, of itself, to establish that there was any deficiency in practice or process.

However, if no deficiency in process or practice by TransGrid can be proven, it follows that the actual delivered cost of the project should be rolled in.

We note that the draft decision makes a number of assertions about the adequacy of the process adopted by TransGrid in planning and delivering the MetroGrid project. TransGrid rejects these assertions. This matter is dealt with in more detail in Section 4 below.

We also note that the Commission has arrived at its conclusions in this regard on the basis of input from Mountain Associates and PB Power. While PB Power's contribution has not been made public, and therefore cannot be assessed, the Mountain Associates report is available and is assessed in more detail in Section 4.3 below.

In the unlikely event that the Commission could establish that both the above conditions have been met, it remains for the Commission to quantify, on some reasonable basis, the difference in the cost of the actual project and the cost of a project that would have been delivered without any deficiency in process and practice. While this is potentially an

onerous task, an arbitrary selection of the quantum difference is not consistent with sound regulatory practice.

The key point is that, even if the Commission is correct in its assertions that TransGrid's processes in relation to MetroGrid are not in accordance with good industry practice, it is necessary to establish that this resulted in a sub-optimal outcome and to establish the resultant cost difference.

Mountain Associates, in their report to the Commission titled "An assessment of the prudency of TransGrid's investment in the MetroGrid project", attempted to deal with this issue. In essence, this report identified only two matters that the Commission could rely on in quantifying the level of prudent expenditure on MetroGrid as follows:

1. That once major increases in the expected cost were recognised, TransGrid should have halted the project and implemented DSM measures whilst reassessing whether to continue with the MetroGrid project or to adopt another option. On the basis of this assessment the Mountain Associates report concluded that $42.7 million (2004 dollars) of the cost of MetroGrid was imprudently incurred by TransGrid and should be removed from the Regulated Asset Base.

2. That, even after completion, the MetroGrid project did not achieve the modified N-2 criteria.

In relation to the first matter, the Commission did not accept this finding. TransGrid agrees with the Commission in not accepting this recommendation. TransGrid's reasons as to why the Mountain Associates report is incorrect on this matter are set out in Section 4.3 below.

In summary, the Commission's approach does not satisfy Code requirements. Moreover, while the Mountain Associates approach is more in line with the requirements of the Code and the draft Statement of Regulatory Principles, the Commission, correctly, rejected the relevant findings. Accordingly, the Commission has no sound basis for determining that the amount of expenditure by TransGrid on MetroGrid exceeds the amount that would be invested by a prudent TNSP acting efficiently in accordance with good industry practice.

In relation to the second matter raised by Mountain Associates, TransGrid agrees with the Commission that this is a complex issue warranting further consideration. Section 4.4 below includes further comments on this matter. Accordingly, and correctly, the Commission have yet to draw any conclusions based on this consideration.

4.3 The Mountain Associates Report Conclusions

TransGrid notes that a number of the conclusions in the Mountain Associates report support TransGrid's view that the MetroGrid project was developed in a manner consistent with good industry practice. In this regard, we note that Mountain Associates:

1. Acknowledges the need for MetroGrid[1].

[1] Section 7.2.1 on page 42

2. Concludes that it is "inappropriate for the Commission to take a view on the planning standard adopted by TransGrid"[2].

3. Acknowledges that TransGrid and EnergyAustralia's justification for the timing of implementing the revised reliability standard "seem logical and consistent with good industry practice"[3]

4. Supports TransGrid and EnergyAustralia's evaluation of non-network options[4]. We consider Mountain Associates view of the depth of analysis of network options prior to conducting the Regulatory Test and on investigating local generation in the CBD in greater detail, to be unrealistic. We elaborate on these aspects in Appendix 4A.

5. Concludes, in relation to changing to a generation option once the increase in the cost of MetroGrid became apparent, that:
"…it would have been unreasonable to expect TransGrid to have pursued generation alternatives at this stage"[5].

6. Discounts DSM as an option to satisfy the modified N-2 criterion[6].

7. Concludes that the cost effectiveness analysis conducted by NERA is objective.[7]

However, as already noted above, the report also concludes that once major increases in the expected cost were recognised, TransGrid should have halted the project and implemented DSM measures whilst reassessing whether to continue with the MetroGrid project or to adopt another option. On the basis of this assessment the Mountain Associates report concluded that $42.7 million (2004 dollars) of the cost of MetroGrid was imprudently incurred by TransGrid and should be removed from the Regulated Asset Base.

Mountain Associates assert that halting the project would have been made possible by temporarily relaxing the reliability criteria applicable to the inner metropolitan area and implementing demand side management. It was proposed that this time could have been taken by TransGrid and Energy Australia to reassess the options for achieving the modified N-2 criteria.

TransGrid rejects this assertion for the following reasons:

- The move to establish the modified N-2 level of reliability for the inner metropolitan area as quickly as reasonably possible is endorsed by the NSW jurisdiction as an appropriate objective.

- To delay the project on the basis of relaxing reliability to an N-1 level in conjunction with reliance on uncertain DSM outcomes in this area is inconsistent with accepted international practice.

[2] Section 4.2 on page 12
[3] Section 7.2.1 on page 42
[4] Section 7.2.2 on pages 42 and 43
[5] Section 6.4 on page 38
[6] Section 6.4 on page 38
[7] Section 7.2.2 on page 43

- The level of DSM required would be far greater than estimated by Mountain Associates making the proposal to implement DSM impractical to achieve in any case.

In relation to this last point the Mountain Associates report:

1. Misinterprets load data to conclude that actual load growth has been within the range expected when the Regulatory Test was conducted. This is a critical error as assuming lower than actual growth is fundamental to Mountain Associates' contention that DSM would have given sufficient demand reduction to allow TransGrid time to reassess its options.

2. Miscalculates the cost of implementing DSM. The cost of DSM is a key input in quantifying the magnitude of the supposed "imprudent expenditure".

These issues are discussed in greater detail in Appendix 4A.

4.4 MetroGrid Service Outcomes are Consistent with Good Industry Practice

This section addresses concerns raised that MetroGrid does not fully satisfy the modified N-2 reliability criteria.

It is important that care be exercised in interpreting load flow results previously provided to the Commission. They show network conditions immediately following single or double contingency events rather than conditions after subsequent modification of voltage profiles (to manage VAR loadings), network reconfiguration, load transfers, etc.

As previously advised there is limited scope to reconfigure the network pre-emptively (refer to response to ACCC-040326-58-8).

Under a small number of modified N-2 events at high load times, it may be necessary to interrupt some load pending reconfiguration of the network (including minor load transfers within the EnergyAustralia network) to restore the majority of load.

The most critical of these modified N-2 events is outage of the new Sydney to Haymarket cable (42 cable) coincident with an outage of one of the two Beaconsfield West transformers. The potential impact of this particular contingency is minimised by the availability of a "standard" system spare 375 MVA transformer (which is compatible with the transformers at Beaconsfield West).

Following receipt of the draft Decision, TransGrid has commissioned a review of both the planning standards and their application to the Sydney CBD and inner suburbs, led by an international authority on transmission network planning. Given the complexity and importance of this matter, this expert review is not yet complete. However, early discussions with the consultants have indicated that they consider:

1. That the modified N-2 planning standard is broadly in line with good industry practice, with one reservation:

   a. Given the nature of deterministic standards, scope should have been provided to allow limited 'economic review' where the additional costs of enhanced security of supply would clearly outweigh the benefits. This provision is normal in deterministic planning standards to avoid providing 'security at any cost'.

2. That, based on the information available at the time of the application of the Regulatory Test, the conceptual design for MetroGrid was broadly in line with good industry practice, given the following comments:

   a. The conceptual design of MetroGrid did not fully meet the requirements of the modified N-2 planning standard as set out in the NERA Report, as there were still a small number of low probability contingencies that could result in load shedding.

   b. Due to the nature of these contingencies, a network augmentation that addressed them would require a further circuit into the Sydney CBD (over and above the MetroGrid cable).

   c. Based on the discussion in 1.a. above, it would not have been good industry practice to plan to develop this additional capability to cover this small number of low probability contingencies for October 2003.

3. That the forecast cost information available at the time of the application of the regulatory test, was broadly in line with good industry practice, subject to the following qualifications:

   a. The forecast cost information available at the time of the application of the regulatory test was sufficient for a prudent operator to proceed with the development of the Environmental Impact Statement and tender documents.

   b. Without detailed environmental studies, route development and contract information, it is not possible to accurately forecast costs of this nature. TransGrid's response to this challenge was consistent with that of a prudent operator including, for example, the commissioning of independent reviews.

   c. This was an urgent project. It would have been good industry practice to have reviewed the risks and probabilities of significant delays or increases in costs in more depth at this stage. Given the comments in 3.b. above, it is a matter of considerable speculation, however, as to whether this would have allowed the identification of a quicker or cheaper option.

   d. In any event, a stress test of +40% (arising from a recommendation in an independent review) was applied to the MetroGrid forecast costs in the regulatory test.

4. That the acceptance of a *de facto* N-1 planning standard in the Sydney CBD and inner suburbs had not been in line with good industry practice. Consequently, it would not have been good industry practice to delay the move to a modified N-2 planning standard.

TransGrid intends to make the expert report available to the Commission when it is complete.

4.5 TransGrid's Processes Were Sound

Cost increases over time do not, of themselves, imply that the processes associated with the planning, financial control and delivery of a project are in some way deficient. Responsible management of essential service infrastructure involves processes that appropriately balance costs with consequences.

A key consideration in relation to the MetroGrid project was to ensure the timely delivery of transmission capacity needed to service the largest and most economically significant central business district in Australia. The economic consequences of failing to ensure that internationally accepted standards of reliability for the inner metropolitan area transmission network were evident in 1998 when the Auckland cable network failed leaving that city without electricity for weeks. More recently the New York blackout, involving economic losses of billions of dollars, underlined the importance of these considerations.

Demand for electricity in the inner metropolitan area has been growing at rate at the top end of the forecast range for some years now. As load grows the ability of a transmission network to meet accepted reliability standards declines. A point is reached where capacity improvements simply cannot be delayed.

The need to improve the capability of the inner metropolitan network was identified as early as 1998. The option selection process and regulatory approval process were commenced at that time. Since that time there have been increases in the rate of growth in electricity demand coupled with project delays. These delays have included delays in regulatory approval (including the delayed promulgation of the regulatory test by the Commission) and unprecedented conditions of environmental approval. Key examples of this include over 160 conditions of approval in relation to the cable route alone.

In essence, the combination of these delays and an increasing rate of growth in demand for network capability resulted in a significantly compressed period in which a project of this scale and complexity could be delivered. Put simply, as the project progressed, stopping the project in response to cost changes to consider and implement alternative approaches becomes increasingly unrealistic. It is in this context that TransGrid's processes for managing this project must be evaluated.

Ample evidence of the thoroughness of TransGrid's processes in relation to this project has been provided to the Commission and the Commission's advisers. Examples include:

1. As this was the first time that the Commission's Regulatory Test was to be applied, TransGrid engaged NERA (expert economists) to assist in ensuring that this Test,

delivered the early selection of the most cost effective network reliability solution, and to ensure that the Test was conducted rigorously and in a theoretically sound fashion.

2. 13 options for addressing the reliability needs of the inner metropolitan area were developed in conjunction with EnergyAustralia (as part of the well established TransGrid/EnergyAustralia joint planning process) and NERA, and were evaluated in some considerable detail before recommending the MetroGrid option.

3. A cost effectiveness analysis was published with TransGrid and EnergyAustralia's regulatory consultation documents to stimulate submissions and to advance the debate from generalities to specifics.

4. When finalisation of the Regulatory Test was delayed, placing additional time pressure on the project, TransGrid (through the NSW Government) applied for a derogation to apply a draft version of the Regulatory Test in order to eliminate delays.

5. TransGrid commissioned an independent review of cost estimates for the network options. This was undertaken by Sinclair Knight Merz (SKM). The outcome of this review was that, whilst there were differences in the estimated costs of some components of the project, the SKM and TransGrid/EnergyAustralia estimates differed by less than 5%.

6. Following comments on the estimated cable cost made by Ewbank Preece, a 40% "stress test" was included in the Regulatory Test analysis to ensure that cost changes associated with the MetroGrid option did not affect the ranking in relation to other options. By the time MetroGrid project costs had exceeded this level more than a year had passed since the completion of the Regulatory Test and other options were either unable to be completed in the remaining time frame and/or would have been subjected to similar cost pressures. For example, the environmental approval processes and the tendering processes for key components of an alternative project would have needed to be recommenced.

7. In line with TransGrid's normal practices, competitive tenders were called for the MetroGrid works.

8. As environmental approval was delayed, some contracts were let with provision for modification to accommodate conditions of consent once they became known.

9. An expression of interest process with transformer manufacturers and advice from an independent specialist was used to determine the appropriate way to manage the Haymarket space/environmental constraints.

10. A review of transformer technology and technical risks by a recognised expert in this field, Professor Dennis Allen, was commissioned to assist with the challenging issues of transformer selection having regard for the location of the Haymarket Substation site.

11. Discussions/negotiations with approving authorities (Planning NSW, Sydney Harbour Foreshore Authority, Sydney City Council) were held throughout the approval process.

12. TransGrid sought to purchase the block adjacent to the Haymarket site to alleviate the constraints imposed by the "tight" Haymarket site. [The owner did not respond to requests].

Considerable commentary on TransGrid's processes in relation to MetroGrid is contained in the Mountain Associates report. Mountain Associates' assessments, in this regard, do not always appear to be founded on a balanced consideration of the facts or a complete appreciation of the practicalities of assessing the impact of environmental requirements in advance of environmental approval processes. The judgements formed in the Mountain Associates report are considered further in Appendix 4A.

4.6 Conclusion

The approach adopted by the Commission to calculate a prudency adjustment is not consistent with the requirements of the Code and the Commission's own Statement of Regulatory Principles. Accordingly, there is insufficient basis for excluding any of the capital expenditure, or associated returns on investment, resulting from the MetroGrid project from being rolled into the Regulatory Asset Base.

The approach adopted by Mountain Associates of attempting to estimate the costs which would have been incurred by a prudent operator acting in accordance with good industry practice, is sound. However, some of the conclusions drawn by Mountain Associates, particularly that the project could have been delayed with the assistance of Demand Side Management, are incorrect.

Once the errors in the Mountain Associates report are corrected, it supports TransGrid's position that TransGrid's expenditure on the MetroGrid project is prudent.

APPENDIX 4A - Further Comments on the Mountain Associates Report

Growth in Demand

In Section 6.3.1 on page 33 Mountain Associates state:

> "We have examined the diversified demand at the time that the decision was made to augment the project (between February 2000 and July 2001 when the cable contracts were let). This evidence suggests that for the summer of 1999/2000, the Inner Metropolitan Area Diversified Summer Maximum Demand was above both the EnergyAustralia and NIEIR demand forecasts. However, for the summer of 2000/2001 the demand was in line with the lower EnergyAustralia forecasts. A simple trend analysis on the basis of these two data points and knowledge of the historical demand suggests a trend growth in demand consistent with the NIEIR demand forecast.

and;

> "TransGrid's claim that demand was higher than forecast at the time of the Regulatory Test is correct for 1999/2000 only, and at any rate the trend rate of growth at the time was the investment decision was made is entirely consistent with the Regulatory Test forecasts".

In addition footnote 38 states:

> "As an aside, we note that the evidence of actual demand to-date remains within the range used in the Regulatory Test".

These statements are fundamental to Mountain Associates contention that 100 MW of demand management would have been sufficient to delay the need for MetroGrid and should have been implemented.

Figure 1 below shows the NIEIR and EnergyAustralia forecasts and the actual demands to summer 2000/01, together with linear and exponential projections of the actual demands. It is clear that the trend projections of the actual demands are considerably above both the EnergyAustralia and NIEIR forecasts. Thus, the Mountain Associates assertion that they are "entirely consistent with the Regulatory Test forecasts" is incorrect.

As the 2000/01 maximum demand is well above even the NIEIR forecast, it is also clear that Mountain Associates are mistaken in their assertion that:

> "…for the summer of 2000/2001 the demand was in line with the lower EnergyAustralia forecasts".

Figure 1 - EnergyAustralia and NIEIR Forecasts and Actual Maximum Demands to 2000/01

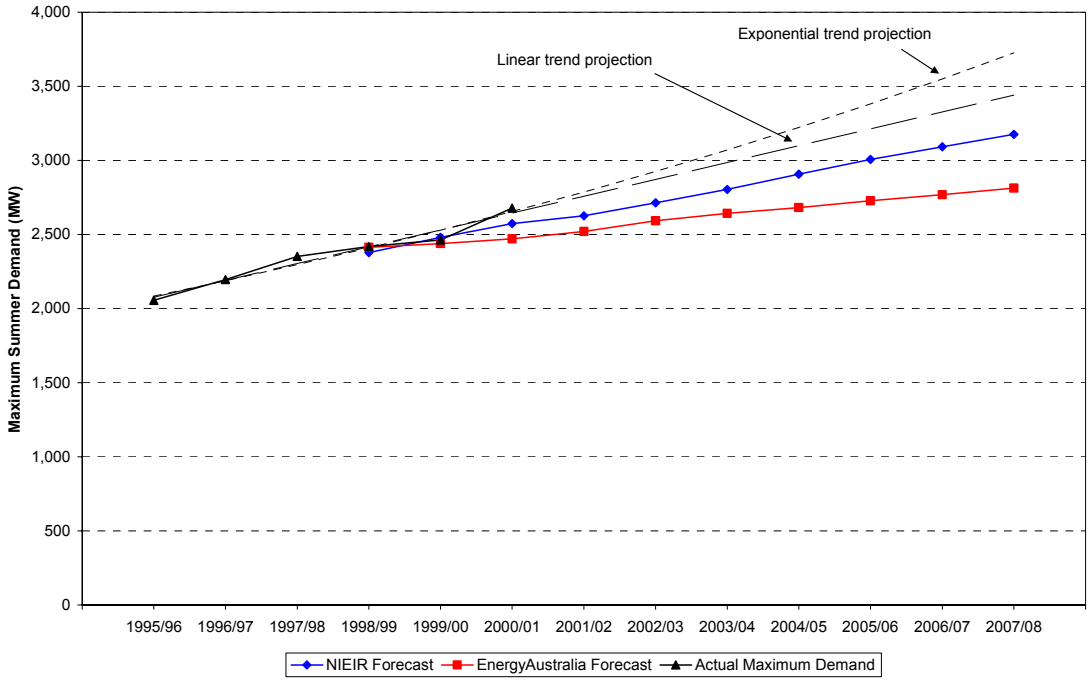

Figure 2 - EnergyAustralia and NIEIR Forecasts and Actual Demands to 2003/04

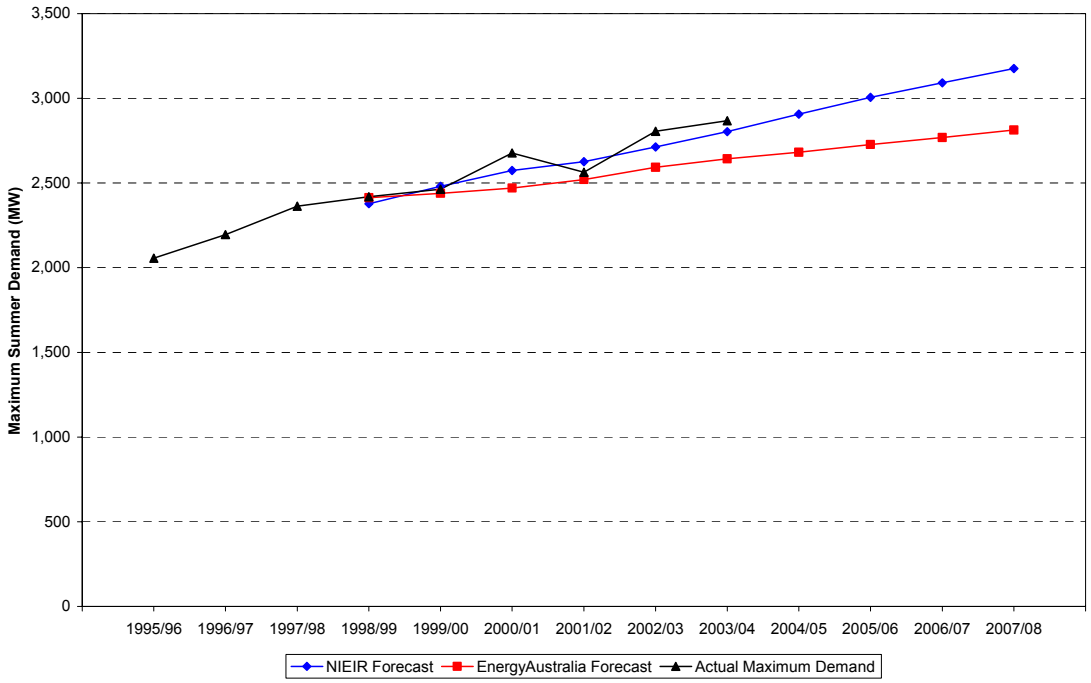

Figure 2 above shows the NIEIR and EnergyAustralia forecasts and the actual demands to summer 2003/04. Over the five years 1999/00 to 2003/04, actual demand has exceeded the NIEIR forecast by an average of 49 MW each year. It is clear that the demand to date is

outside the range considered in the Regulatory Test. That is, Mountain Associates assertion in footnote 38 is incorrect.

The Mountain Associates assumption about demand growth is flawed and consequently their analysis understates the amount of demand management required (and the length of delay in the need for MetroGrid that such a reduction may afford).

Demand Management

In the Executive Summary Mountain Associates state:

> "TransGrid's consultants had described the implementation of demand management programs as a "no regrets" strategy. In our view, it was imprudent for TransGrid to have knowingly proceeded with a project that it knew was significantly more expensive than planned, when other less expensive alternatives that would have been able to maintain and possibly improve the reliability of the network, were available".

The "no regrets" comment was actually made by Ewbank Preece[8], the Commission's consultant, in relation to demand management as a "second stage" development i.e. after MetroGrid was completed to enable future developments to be delayed.

The Ewbank Preece report was completed prior to finalisation of the Regulatory Test. At that stage it was not clear what the Regulatory Test would entail and whether environmental issues such as CO_2 emissions would be included. On page 19, the Ewbank Preece report states:

> "NERA's analysis shows that (with the exception of the Kurnell cogeneration option including CO_2 emissions and also under the preliminary evaluation of customer benefits), bundling demand side programmes with other options improves their value (reduces the NPV of their costs). It should be noted that in NERA's analysis, the effect of demand side initiatives was to delay developments which would be required beyond 2003, rather than the actual development required by November 2003. (Emphasis added).
>
> NERA's analysis indicates that implementing demand side programmes may be a "no regrets" strategy provided that demand reductions of the magnitude assumed by NERA (100 MW) can be achieved at the costs assumed by NERA ($905,000 per MW). Further refinement of the scope and cost of demand side programmes appears to be warranted".

In Section 5.4.1 (page 25) of their report Mountain Associates describes its "correction" of NERA's estimate of the weighted average cost of demand management programs. It is based on the assumption that a cost mid way between the costs of implementing the minimum amount of demand management at the minimum cost and the maximum amount at the highest cost, is a realistic estimate of the weighted average cost.

[8] Ewbank Preece report to the ACCC titled "Review of Proposed Augmentation of Supply to the Sydney CBD Final Report", April 1999.

Leaving aside the debate about the validity of this assumption, we note that Mountain Associates has made a mathematical error. As shown in Table 1, the figure of $888/kW used by Mountain Associates in their analysis relates to the cost of implementing the minimum amount at the minimum cost, rather than the "mid point cost". The "mid point cost" is in fact $1,021/kW. Thus the Mountain Associates analysis underestimates the cost of implementing demand management and hence overestimates the magnitude of the supposedly imprudent expenditure.

Table 1 Cost of DSM Programmes based on NERA's Table B.1 in Appendix B of the MetroGrid Final Report

Programme	Min Amount (MW)	Max Amount (MW)	Mid Amount (MW)	Min Cost ($/kW)	Max Cost ($/kW)	Mid Cost ($/kW)	Min Cost ($ M)	Max Cost ($ M)	Mid Cost ($ M)
Ice storage/gas fired A/C	9	9	9.0	500	740	620	4.5	6.7	5.6
Retrofit gas a/c	60	60	60.0	700	740	720	42.0	44.4	43.2
Improved a/c	10	50	30.0	880	880	880	8.8	44.0	26.4
Cogen	20	20	20.0	1,400	1,400	1,400	28.0	28.0	28.0
Efficient lighting	15	50	32.5	1,200	1,700	1,450	18.0	85.0	51.5
Total	114	189	151.5				101.3	208.1	154.7
Wgtd Av. Cost ($/kW)							**889**[1]	**1,101**	**1,021**

Note 1: Mountain Associates calculated $888/kW, the difference appears to be due to rounding.

Development of Cost Estimates for Network Options

The Mountain Associates report makes a number of critical comments about both TransGrid's process for developing cost estimates and the depth of analysis underlying the cost estimates.

Depth of Analysis

Mountain Associates appear to believe that it is possible and practical to undertake investigations to an "intermediate" level between those undertaken by TransGrid and EnergyAustralia before the Regulatory Test (when all options were potentially the preferred option) and that undertaken for MetroGrid after the Regulatory Test (when the preferred option was known). The view of Mountain Associates is one that is easy to reach with the benefit of hindsight but ignores the practical reality that the majority of changes to the MetroGrid project occurred as a result of, or subsequent to, the environmental assessment or to meet more stringent environmental standards.

Many of those changes were made to accommodate specific local considerations and to meet conditions imposed by approving authorities. TransGrid's report to the Commission of 18 March 2004 titled "MetroGrid Supplementary Report to the ACCC" provided details of the project changes. A cursory examination of that report can identify almost $47 million of additional costs directly attributable to additional environmental requirements, all of which could not have been reasonably forecast at the time the Regulatory Test was completed. This additional cost excludes any additional costs from the delays in environmental approval and additional costs for additional service providers, and additional design and project management flowing from the additional requirements. Table 2 below summarises the particular items from the earlier report which comprise the $47 million. The "Report Section" column in the Table refers to the relevant section of TransGrid's "MetroGrid Supplementary Report to the ACCC" which provides the details of the changes.

Table 2 – Additional Costs Flowing from Environmental Requirements

Item	Report Section	Cost/Cost Change
CABLE SUB-PROJECT		
Increased Route Length -	5.3.2	$3.9 million
EIS and Conditions of Approval	5.3.5	$4.2 million
M5 Cycleway	5.4.1	$1.5 million
Other Agency Costs	5.4.2	$1.5million
Road Restoration	5.4.3	$1.0 million
Cable Sub-Total		**$12.1 million**
TUNNEL SUB-PROJECT		
Increase in Tunnel Length	6.3.1	$20.5 million
Tunnel Sub-Total		**$20.5 million**
HAYMARKET SUBSTATION		
Underground development	4.3.1	$4.5 m
Security System Requirements	4.5.2	$1.0 million
Haymarket Substation Sub-Total		**$5.5 million**
TRANSFORMERS		
Gas-insulated transformers	3.3.2	$5.0 million
Gas-insulated Reactor	3.3.2	$1.0 million
Incremental cost for "dry" cooling	3.3.5	$2.7 million
Transformers Sub-Total		**$8.7 million**
INCREASE DIRECTLY ATTRIBUTABLE TO ENVIRONMENTAL REQUIREMENTS		**$46.8 MILLION (excluding delay and disruption costs, additional costs for service providers and project management costs)**

The depth of investigation which was practical was an area of debate with Mountain Associates, the essence of which is summarised on page 23 of the Mountain Associates report:

> "TransGrid's categorical position on this issue is that "*it would not be practical for these detailed processes to be carried out before the Regulatory Test was applied*". We disagree with this. The rigour of the so-called "detailed processes" is not absolute and the decision is not between undertaking "detailed processes" or not. Rather the issue is

> judging how much rigour would be appropriate to ensure that an adequately informed investment decision can be made".

To assess local factors and likely conditions of consent, it would be necessary to undertake a quasi environmental approval investigation of each option involving community consultation and detailed consideration by approving authorities. Given that there were 13 options (made up of four network developments, three generation developments and DSM either alone or bundled) this would have been a formidable task.

While there may be some argument that TransGrid could have or might have anticipated some of the environmental conditions or constraints which led to additional costs, this is not supported by the facts. Both SKM (for TransGrid) and Ewbank Preece (for the Commission) broadly supported TransGrid's position on the cost estimates used for the options and ranking used in the Regulatory Test. This is discussed later in this report.

The evaluation of the possible development options was completed to a level to provide confidence on the ranking of the alternatives (as was required by the Regulatory Test). They were subject to public scrutiny. None of these environmental issues were raised in the consultation. The majority of the environmental changes came to light only as an outcome of very detailed investigations, site and community specific investigations and consultation and detailed design work. It would be impractical to undertake such work on a large number of alternatives. Such an approach would not be prudent nor would it be consistent with good industry practice.

TransGrid's view is that it is neither sensible nor practical to "partly do" a community consultation or to submit a partly completed assessment to an approving authority for comments.

It is also worth considering whether conducting a detailed investigation of each of the options would have been practical and yielded meaningful information.

First, it is doubtful that approving authorities and stakeholder agencies would be willing to devote their resources to a detailed assessment of a number of options, knowing full well that only one may come to fruition.

Secondly, it is not clear that running a number of community consultations concurrently would be particularly revealing. It would have been necessary to acknowledge that each of the options was one of several and may not proceed. It is not certain that community responses in these circumstances would necessarily be the same as those to a project which has been assessed as being the best option and is proposed to be implemented. In TransGrid's experience, in these circumstances, community comments tend to focus on why the option which affects that particular section of the community should not be adopted, rather than on the impacts of that project and ways in which they can be ameliorated.

Thirdly, equipment manufacturers and suppliers have limited resources which must be allocated between prospective orders. They are in a similar position to approving authorities in that they are unlikely to devote significant resources to help to refine a number of options when only one may come to fruition. In addition to the normal risk that their

tender may not be successful, in these circumstances they also face the risk that an option other than the one for which they may be able to tender is selected.

In summary:

1. Mountain Associates' assertion that some intermediate level of investigation was practical, cannot be supported.

2. Even if such an investigation was possible, it is doubtful that an intermediate level of investigation would have:

    - been acceptable to approving authorities;
    - revealed the full range of community concerns about the various options; and
    - encouraged the necessary inputs from equipment manufacturers and suppliers.

Process for Estimating Costs

The Mountain Associates reports includes a number of criticisms of TransGrid's process for estimating the cost of the network options, which involved commissioning independent checks of the cost estimates. Mountain Associates claim (on page 26 of their report) to have reviewed the Ewbank Preece report and the report of the independent review by SKM of the estimated costs of the four network options, and to have found "no reason to believe that they provide a meaningful verification of the costs of developing a 330 kV cable and substation in the CBD".

On page 27 of their report Mountain Associates state:

> "SKM pointed out that "*it was not possible to make a direct comparison of total estimates as neither TransGrid nor EnergyAustralia provided an estimate for the full scope of works required*" and that the installed cable is the most significant cost item but that "*time did not permit investigating the feasibility of the proposed routes or the length*".

This gives the impression of an incomplete or superficial assessment. However, it is instructive to note SKM's comments in full. It should be noted that, as MetroGrid is a joint project, TransGrid and EnergyAustralia each provided scope and cost estimates for the works they were to undertake, which SKM then combined.

> "Sinclair Knight Merz produced unit cost estimates based on its existing database and in some cases from estimates provided by suppliers. A scope for the works required was produced by combining information provided by TransGrid and EnergyAustralia. The cost of installed underground cables is the most significant component of all options but time did not permit investigating the feasibility of the proposed routes or their lengths. The Sinclair Knight Merz estimates are based on the route lengths provided by TransGrid and from a desk top study of the relevant mapping they are considered to be reasonable.
>
> Sinclair Knight Merz unit costs were compared with those of TransGrid and EnergyAustralia and with one exception are within ±10% for the significant items.

> The main difference in estimates was for 132 kV GIS feeder bays where the TransGrid estimate was about 25% below that of Sinclair Knight Merz.
>
> It was not possible to make a direct comparison of total estimates as neither TransGrid nor EnergyAustralia provided an estimate for the full scope of works required. A comparison was made by adjusting the TransGrid estimate to include some EnergyAustralia 132 kV works not included in their estimate".

The SKM report then gave a table comparing TransGrid/EnergyAustralia estimates and SKM's estimates for the four network options. It showed excellent agreement, with the largest variation being approximately 3%.

In relation to the Ewbank Preece report, the Mountain Associates report states (on page 27):

> "The Ewbank Preece report was commissioned by the ACCC to review TransGrid and EnergyAustralia's proposals to augment supply to the Sydney CBD and surrounding suburbs. The review took the form of a "*high level audit*" of the initial cost-effectiveness analysis report produced for TransGrid and EnergyAustralia by NERA. Ewbank Preece explained that it did not attempt "*to replicate the cost estimating process for the transmission options undertaken by TransGrid and EnergyAustralia*".
>
> Instead it commented only on the "*generic costs*" (for cable, switchgear, transformers, etc) used by TransGrid in developing their network cost estimates. It is notable in this regard that while Ewbank Preece agreed with TransGrid's substation cost estimates – based on the type of substation TransGrid proposed – it cautioned that international experience suggested that TransGrid may have underestimated the cost of the installed cable by around 40%. As it turned out, TransGrid underestimated the installed cost of the cable by even more than this".

While Ewbank Preece may not have replicated TransGrid's cost estimates, they did check the "building blocks" from which they were developed. With the exception of the cable cost, this provided confidence that TransGrid's costs were reasonable. In relation to the cable costs, the Ewbank Preece report stated (in the Executive Summary):

> "Our cable cost estimates, expressed as a cost per kilometre, are about 40% higher than those used by TransGrid. Costs expressed in this way are not particularly useful as actual cable costs are influenced by factors unrelated to the route length. While the Australian cable market may be more competitive than other markets, it would be prudent to consider the possibility of cable costs being more in line with those we would expect. This could be readily incorporated in the sensitivity studies undertaken as part of the economic analysis. None the less, the approach used by TransGrid to obtain budget estimates for cable costs is sound. The best way to obtain better estimates would be to call for firm quotes from cable manufacturers".

In order to be able to call for firm quotations (tenders), it would be necessary to develop each of the options to the tender stage. That is, complete the route selection/environmental assessment process and acquire the necessary environmental and other approvals. Essentially, Ewbank Preece is endorsing TransGrid's view that there is no sensible

intermediate level of investigation between that undertaken by TransGrid and EnergyAustralia before the Regulatory Test and the much more detailed investigations undertaken subsequently (to be able to call tenders).

Subsequently, in line with prudent practice, TransGrid asked NERA to include a "stress test" involving a 40% escalation of cable costs in the analysis. This made little impact on the ranking of the options. In the Executive Summary of their report NERA noted:

> "We have tested the sensitivity of the results of the analysis to a variety of other changes in the underlying assumptions. The sensitivity analysis showed that the results were largely invariant to the assumptions made. This is the case even when network capital costs were "stress tested" by increasing them by 40 percent, and when the running regime of the cogeneration plant was significantly reduced".

On Page 28 of their report Mountain Associates discuss whether it was practical for TransGrid to have developed more accurate cost assessments. This discussion focuses on TransGrid's internal resources and the time available. It states, in relation to developing cost estimates to a level similar to that of the MetroGrid project 18 months after the Regulatory Test was completed:

> "Developing all five possible network options to the same level of accuracy would have been a significant undertaking. But it certainly would not have meant five times the amount of work since there are economies in such analyses. A more robust cost assessment of all five network options at the stage of the Regulatory Test could have been expected to be well within TransGrid and EnergyAustralia's capabilities. We understand that this point is generally accepted in TransGrid – during interviews it explained to ACCC staff that its investment appraisal process has been substantially improved in the recent past by placing greater rigour at the beginning of the process (the Regulatory Test stage).
>
> With respect to the implication of bringing assessment work forward to the time of the Regulatory Test, we note that more than three years passed from the time that a major investment in capacity in the CBD was formally discussed and the finalisation of the Regulatory Test process in 2000. In fact, consideration at various levels had occurred on the need for a second cable to the CBD more than 10 years before the Regulatory Test. TransGrid was able to develop a much more accurate costing of the MetroGrid project just 18 months after completion of the Regulatory Test. On this measure, TransGrid had time to develop more accurate cost estimates *before* running the Regulatory Test".

This is a somewhat simplistic view. Development of more refined costs involves more than just TransGrid resources and time. It requires, inter alia, meaningful input from:

- approving authorities and the community, to define the scope of works required; and
- manufacturers/suppliers to refine the costs of those works.

As mentioned previously, the ability to obtain more refined or meaningful inputs is limited until such time as the preferred option is identified.

In summary:

1. The abbreviated quotations from the SKM and Ewbank Preece reports included in the Mountain Associates report give a misleading impression.

2. TransGrid commissioned an independent review by SKM of its cost estimates, which confirmed that they were reasonable.

3. Ewbank Preece independently reviewed the "building blocks" on which TransGrid's estimates were based and, with the exception of the cable costs, found them to be reasonable.

4. In relation to the cable costs, Ewbank Preece:
   - agreed that TransGrid's approach to estimating the cost was sound;
   - suggested that considering costs being 40% higher than TransGrid's estimate would be prudent (which TransGrid subsequently did via a "stress test"); and
   - suggested that the best way to obtain better estimates would be to call for firm quotes.

5. In order to be able to call for firm quotations (tenders), it would be necessary to develop each of the options to the tender stage. That is, complete the route selection/environmental assessment process and acquire the necessary environmental and other approvals. Essentially, Ewbank Preece is endorsing TransGrid's view that there is no sensible intermediate level of investigation between that undertaken by TransGrid and EnergyAustralia before the Regulatory Test and the much more detailed investigations undertaken subsequently (to be able to call tenders).

6. The "stress test" did not materially alter the ranking of the options in NERA's analysis.

Investigation of Local Generation in the CBD

Section 5.3.2 of the Mountain Associates report discusses, inter alia, location of a 250 MW OCGT generator in the CBD area. It comments that this is not unusual and occurs in major cities throughout the world, although the nature of air quality issues in the Sydney basin is not acknowledged.

Mountain Associates appear to consider that the inclusion of this option in NERA's analysis may have been inappropriate as there was doubt about whether environmental constraints would have precluded it. On page 22 of their report Mountain Associates state:

> "If it subsequently turns out that building an OCGT in the CBD is not in fact a plausible option, or that it would have cost substantially more or less than expected, or taken substantially longer to build than envisaged, then why was this option included in the Regulatory Test assessment? Our view is that TransGrid and

EnergyAustralia should have investigated the option of locating a generator in the CBD in greater depth to obtain greater certainty on this option".

It is important to consider the circumstances at the time the Regulatory Test was carried out. At that stage, it was not certain whether environmental approval would or would not be granted. In the absence of a specific proposal, it was not possible for the Environment Protection Agency (EPA) to be definitive. Consequently, the option was included both for completeness and in an attempt to elicit specific proposals from proponents (about which the EPA may have been able to be more specific).

The Regulatory Test analysis revealed that this was a "mid ranking" option. It ranked behind options 3, 4, 10 and 12 in each of the four scenarios considered and also behind options 2, 3A, 7 and 13 in at least two of the scenarios. In the absence of a proponent, in light of the doubts about approvals and considering its "mid ranking", it is unreasonable to expect that a prudent operator would have devoted resources to investigating it in any greater depth.

We note that in its discussion on pages 37 and 38, Mountain Associates gives a reasonably lucid summary of the difficulties of establishing generation at short notice and concludes that once TransGrid had commenced MetroGrid, it would not be reasonable to have expected it to have stopped and implemented generation instead.

In summary, the facts are:

1. It would be unreasonable to expect a prudent operator to undertake an in depth investigation of an option:
   - which did not have a proponent;
   - for which environmental approval was uncertain; and
   - which consistently ranked behind a number of other options.

2. Mountain Associates concludes that once TransGrid had commenced MetroGrid, it would not be reasonable to have expected it to have stopped and implemented a generation option instead.