MAJOR ENERGY USERS INC

THE VOICE OF ENERGY CONSUMERS

Australian Energy Markets Commission

Reliability Panel

Comprehensive Reliability Review

Comments on the RP Issues Paper 11 May 2006

by

The Major Energy Users Inc

And

Major Employers Group Tasmania

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CONTENTS Page

Executive Summary

In 1999 the Reliability Panel sought an increase in VoLL to $20,000/MWh and subsequently received approval to increase VoLL to $10,000/MWh. At that time, this was seen as essential to provide reliability in the NEM as there had been insufficient investment in new generation when VoLL was set at $5,000/MWh.

In the period from 1995 to 2002 under NEM1 and then the NEM, reserve trader powers were used once in 1998 by VPX.

In 2002 VoLL increased to $10,000/MWh. In two of the four years since then (in 2004 and 2005) NEMMCo was required to use its reserve trader powers to cover an anticipated shortfall in reserves in the SA-Vic region. Obviously the increase in VoLL has not resulted in the expected outcome in terms of new generation capacity sufficient to prevent intervention in the NEM, and it could be argued that the value for VoLL itself has had little if any impact on investment in base and intermediate load generation needed to provide reliability.

Nowhere in the Reliability Panel's Issues Paper has this fact been stated explicitly.

What consumers have experienced is a number of adverse consequences identified by the ACCC as potential problems when it granted partial approval for the NECA recommendation for VOLL to increase to $10,000/MWh.

The MEU is convinced that another option (other than VOLL) is needed to incentivise new generation investment, reduce price volatility and reduce the costs of power by eliminating the costs of risk management engendered by this price volatility.

The NEL states that the NEM is for the long term benefit of consumers. Consumers want a competitive price for electricity, long term availability, high reliability, stability and high quality.

The Major Energy Users Inc (MEU) and the Major Employers Group, Tasmania (MEG) consider that:-

- The NEM is currently not a well-performing competitive market
- A market which increases or even continues with the current level of price volatility is contrary to the interests of consumers

- A well-functioning competitive market would facilitate and incentivise new base and intermediate load generation which is required in the very near future.
- Reliance on the current level of VOLL, or even increasing it, will not increase generation capacity or reliability.
- The NEM is characterized by increased concentration and the dominance of a few players. Incumbent generators have enhanced their profitability through the exercise of market power.
- The NEM's energy-only market exhibits the following features: high volatility, high risk, poor signals which act as a deterrence to new base and intermediate load generation and to new entrants, and continuing weakening of competitive drivers. These features are also seen in overseas energy-only markets.
- Most overseas jurisdictions, however, do not rely on VOLL to ensure reliability and new generation capacity. Indeed, the level of VOLL in the NEM when compared with overseas jurisdictions is seen as excessive and has contributed to the relatively poor competitive performance of the NEM. A reduction in the current level of VOLL accompanied by a more focused approach to incentivising new generation is essential to reverse the weakening of competitive drivers in the NEM, which have financially disadvantaged consumers with little or no potential benefit in enhancing reliability in the NEM.
- Experience in overseas jurisdictions can provide useful insights and options for ensuring reliability applied overseas are worth exploring. These options do not appear to result in financially disadvantaging consumers, and have enhanced reliability in electricity markets.

The challenge for the Reliability Panel is to find a solution for incentivising new base and intermediate load generation in order to maintain or increase reliability, but at the same time **reducing the incidence of volatility that is associated with high levels of VoLL.**

That such an outcome has been achieved in overseas jurisdictions indicates that the solution may well lie with experiences in these jurisdictions.

1. Introduction

The MEU and MEG

The Major Energy Users (MEU) (comprising the Energy Markets Reform Forum (NSW), Energy Consumers Coalition of South Australia and the Energy Users Coalition of Victoria) with Major Employers Group Tasmania between them represent some 30 major energy using companies in NSW, Victoria, SA, Tasmania and Queensland. We welcome the opportunity to provide comments on the Reliability Review

Analysis of the electricity usage by the members of MEU and MEG shows that between them they consume about 7% of the electricity generated in the NEM. Many of the members are located in regional parts of Australia, some distance from the major centres. They are highly dependent on the transmission network to deliver the electricity essential to their operations. Being regionally located, the members have an obligation to represent the views of their local suppliers and of the regionally based workforce on which the companies are dependent. With this in mind, the members require their views to not only represent the views of large energy users but also those of smaller power consumers located near to their regional operations.

The companies represented by the MEU and MEG (and their suppliers) have identified that they have an interest in the **cost** of the energy network services as this comprise a large cost element in their electricity and gas bills.

The businesses all operate in the open competitive market for their products. In order for them to ensure that they will be profitable into the future they must have a high degree of certainty of their future costs. They are not interested in prices that fluctuate excessively as this creates uncertainty. The excessive volatility in the NEM has been of great concern, and as a result most businesses "lay off" the risks inherent in the NEM to electricity retailers, but at a cost. This demonstrates that **stability** and certainty are much preferred over volatility. Businesses need to have stability in their input costs, as this is needed to ensure forecast costs for the products made are within the expected price range for sale.

Although electricity is an essential source of energy required by each member company in order to maintain operations, a failure in the supply of electricity or gas effectively will cause every business affected to cease production, and members' experiences are no different. Thus the **reliable supply** of electricity and gas is an essential element of each member's business operations.

With the introduction of highly sensitive and sophisticated equipment required to maintain operations at the highest level of productivity, the **quality** of energy supplies has become increasingly important with the focus on the performance of the distribution businesses because of the central role they play in terms of the control over the quality of electricity and gas delivered. Variation of electricity voltage (especially voltage sags, momentary interruptions, and transients) and gas pressure by even small amounts now has the ability to shut down critical elements of many production processes. Thus member companies have become increasingly more exposed to the quality of electricity and gas services supplied.

Each of the businesses represented here has invested considerable capital in establishing their operations and in order that they can recover the capital costs invested, long-term **sustainability** of energy supplies is required. If sustainable supplies of energy are not available into the future these investments will have little value.

Accordingly, MEU and MEG are keen to address the issues that impact on the **cost, reliability, quality** and the long term **sustainability** of their gas and electricity supplies.

Section 2 discusses how consumers view the electricity industry and the operation of the market. It highlights the major findings of an important report commissioned by major energy user groups and draws on analysis of the NEM which show fundamental problems have arisen in the NEM, particularly the increasing concentration of the industry through vertical and horizontal integration, the weakening of competitive drivers, the increased volatility of the NEM compared to other energy markets, spurred on by the increase in VOLL in 2002, and the inappropriateness of using VOLL to incentivise investments in order to increase reliability.

Section 3 discusses the tools currently used in the NEM to ensure reliability and assesses whether they have performed as expected. The NECA and ACCC arguments in favour of increasing VOLL in 2002 are reviewed and assessed to have been not in the public interest.

Section 4 reviews the experiences of electricity markets in overseas jurisdictions, drawing heavily on work undertaken by two overseas experts. A key conclusion that an energy only market is unable to provide certainty and timeliness of adequate generation reserves in the long term is consistent with our observation of NEM operations and performance. The FERC approach of adopting a capacity instrument and the associated yearly auction to promote vigorous competition for future supplies is presented as a worthwhile option warranting further investigation.

Section 5 provides the MEU's response to the specific questions raised in the RP's Issues Paper.

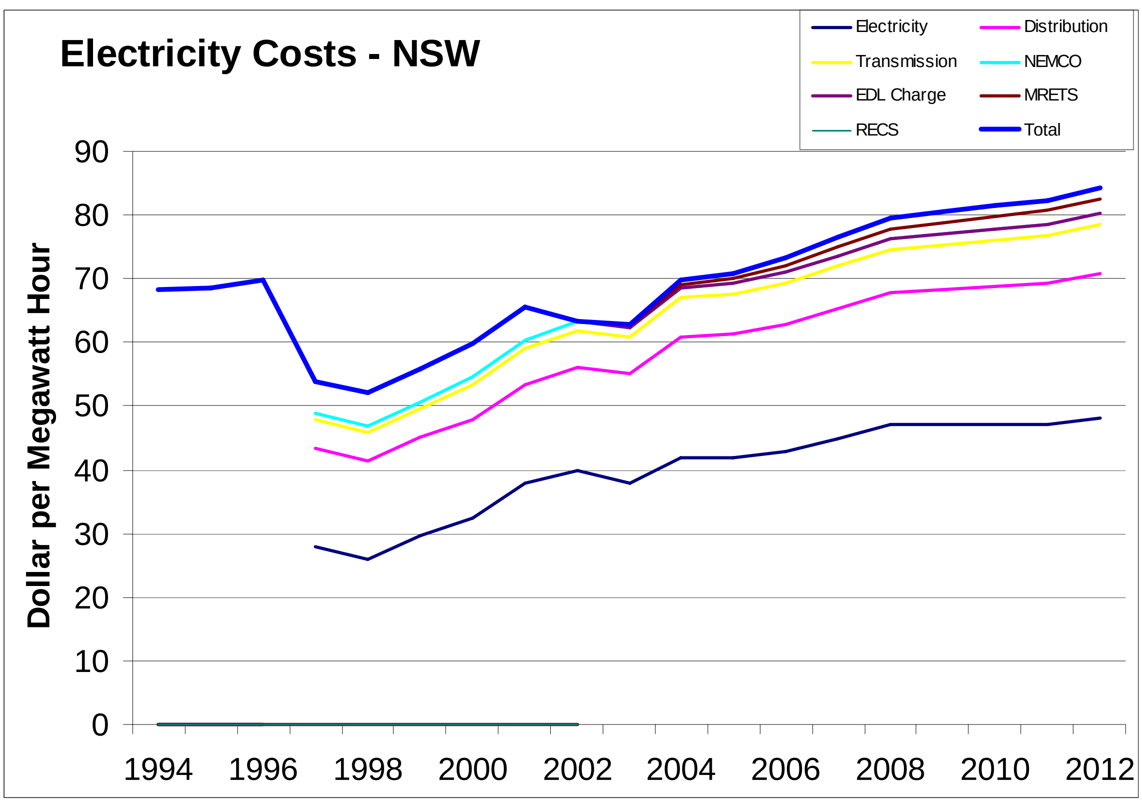
An appendix summarises overseas jurisdiction's approach to dealing with reliability in electricity markets,

2. The consumers' view of electricity supplies

2.1 How do consumers see the electricity industry?

Major energy consumers see the energy industry as crucial to Australia's international competitiveness and to the well-being of Australians. This was also foremost in the minds of policy makers, when Australia embarked on the programme of National Electricity Market reforms in the early 1990's. Electricity was traditionally seen as a crucial competitive factor in Australian's comparative advantage (and remains so) and hence a locational base for trade-exposed energy intensive industries.

Early gains were made by the electricity supply industry, with good productivity and efficiency achievements enabling price reductions and improved standards of performance across the industry chain. However, as we enter the second decade since the introduction of energy reforms, electricity prices (faced by major industrial users) are above levels pertaining prior to the commencement of energy deregulation (see diagram below). Significantly, the structural market reforms responsible for the early gains are now under threat, and the competitive drivers in the NEM are so weakened that the future competitiveness of trade-exposed energy intensive industries in Australia is of concern.



Source: Energy Markets Reform Forum

2.2 How do consumers see the operation of the electricity supply market?

The concerns with the electricity industry identified by consumers are supported by a recently released report[1] on the NEM. The Report (which was commissioned by several energy consumer organizations, including the organizations comprising the MEU) covered the following issues that have been of (and still are) concern to major energy users:-

"

- examines the characteristics of the NEM; the general behaviour expected in well-functioning electricity markets, and the legal concept of market power.
- examines the history of wholesale prices in the NEM, both in terms of pool prices, and the effective revenue able to be earned by generators.
- examines the way the generators in the NEM operate both in general and when price spikes occur.
- assesses the performance of the NEM by comparison with Long Run Marginal Costs (LRMC), the FERC criteria for well-functioning electricity markets, price volatility levels and the effect on end user retail tariffs.
- examines the impact of industry structure in the NEM and the likely results of the trend towards both vertical and horizontal integration.
- looks at the experience in overseas electricity markets and the lessons which have been learnt in those markets.
- looks at possible steps which could be taken to control or mitigate the harmful effects of market power on end consumer tariffs and security of supply, including the need to ensure that the generation sector has the opportunity to remain financially viable and to be able to invest in new facilities."[2]

The conclusions of the Report, which are endorsed by the MEU member organizations, included the following:-

"

- the characteristics of the NEM — a small number of independently-owned generators, limited interconnection capacity, a compulsory energy-only market, a high bid cap, lack of effective demand-side response, and the freedom afforded to generators, makes the NEM vulnerable to the exercise of market power (Sections 2.3, 6.1));

[1] Bardak Ventures Pty Ltd, "The Effect of Industry Structure on Generation Competition and End-User Prices in the National Electricity Market", May 2005

[2] Op. Cit. Page 9

- well-functioning competitive markets have characteristics which can and have been defined, but the NEM as presently structured does not satisfy the requirements to be regarded as well-functioning (Sections 2.4, 5.5);

- regional pool prices in the NEM have varied over the five years of its operation, and showed signs of converging to similar levels in 2002 and 2003, but recent trends have widened the gap between highest and lowest regional pool prices (Section 3.1);

- the pool prices show evidence of extreme volatility — well beyond that needed to signal times of shortage or of excess capacity — due to a small number of very large price spikes occurring each year, and not necessarily at the times of peak load or when the supply/demand balance is tight. As much as 30% of the annual average pool price can be due to such spikes (Section 3.1);

- pool prices are showing an upward trend in 2004 and 2005 (Section 3.1);

- generators publishing Annual Reports are comfortably profitable at average annual revenues of around $34-35/MWh in 2003/04, and generally achieve a markup of at least $5/MWh above pool prices each year. This figure is close to the Long Run Marginal Cost of new generation based on the latest independent estimates (Section 3.2);

- the design of the NEM trading system is such that generators must bid above their marginal costs and cause price spikes to occur when conditions are conducive to them, in order to achieve a satisfactory level of annual revenue. Bidding on a fully competitive basis, on Short Run Marginal Costs (SRMC), will not produce sufficient revenues for existing or new generators. The difficulty is — how much noncompetitive activity is tolerable and how is this to be measured? (Section 4.1);

- generators achieve price spikes by withholding capacity — both physically and economically — by their bidding and rebidding practices and by exploiting limited interconnection capacities. The practice of “parking” large amounts of capacity at prices close to the maximum allowed is prevalent (Sections 4.1, 5.1);

- the change of VoLL from $5,000/MWh to $10,000/MWh in 2002 led to generators roughly halving the number of price spikes but doubling the value of them, achieving about the same level of annual revenue. This increased the level of price volatility and risk significantly (Section 5.1); generators appear to have succeeded in achieving annual revenue significantly above Long Run Marginal Costs in four of the five years of NEM operation. Based on the analysis in this report, the average markup above LRMC is estimated to have been 21%. This is significant both in magnitude and duration (Section 5.4);

- end-customers pay higher tariffs because of generator behaviour — through pool and hedge contract prices that are higher than necessary; through less efficient operation of generation, and through the additional costs associated with covering the risk of pool price volatility (Section 5.6);

- the NEM depends on vigorous competition at the wholesale level to restrain the use of market power, and any reduction in the number of participants should be a cause for concern by end-users (Section 6.1;

- horizontal merger activity is of particular concern in Victoria and South Australia, where concentration of ownership has increased in recent times, and concentration of ownership remains a difficult problem given common Government ownership of companies in New South Wales and Queensland (Section 6.2);

- vertical integration is also of concern as it inevitably reduces competition in both wholesale and retail markets. The risk of operating in the NEM is such that vertical integration is a natural risk management strategy (Section 6.3);

- market concentration in generation and retail in the NEM is a problem, where, on the basis of ultimate ownership, the NEM would be regarded as being "highly concentrated" by normal measures. Concentration levels equivalent to those in well-functioning overseas markets could only be obtained if all major power stations were placed in separate independent ownership and a strong, essentially constraint free, transmission system were to be put into place (Section 6.1);

- existing ACCC merger guidelines are not appropriate for the electricity sector, where participants with a very small market share can exercise market power and significantly affect pool prices (Section 6.1);

- overseas markets provide useful examples of competitive markets which function well and those where industry concentration is a problem. Lessons learnt from the overseas markets are valuable in understanding the problems of the NEM and what needs to be done to improve performance. Extensive market monitoring and market power mitigation measures — to a degree not seen in Australia — are a feature of well-functioning competitive electricity markets overseas (Section 8);

- the experience in England and Wales is particularly relevant to Australia, where an initially unsatisfactory market structure and pooling system has been replaced by a competitive structure (at least in horizontal terms) and a better pooling and trading system. However, the degree of vertical integration and declining reserve plant margins have emerged as problems (Section 8.4);

- measures routinely used to assess market power in overseas markets do not find ready application in Australia. This is because most of them measure performance against a base-line of perfectly competitive behaviour by participants.

- A comparison of generator revenues with LRMC is a useful measure. Herfindahl-Hirshmann Indices provide a useful screening system, and Price Cost Markup Indices are useful also, if interpreted carefully (Section 7);

- overseas experience shows the value of strongly integrated transmission systems in minimising the opportunity to exercise market power both in general terms and in specific regions (Section 8);

- the increasing penetration of wind generation, with its inherent variability, has the potential to increase the market power of generators able to vary output in a short time frame. This factor will need to be watched carefully. (Section 4.1)

- measures available to improve the industry structure and to control market power more effectively include increased structural separation of the generation sector; increased interconnection capacity between the States; the introduction of capacity payments and reduced bid price caps; and changes to the design of the NEM trading system to bring it into line with latest overseas practices (Section 10)."

On the basis of the Report and based on observations and experiences in operating in the NEM, the MEU and MEG would especially point to the following key concerns with the existing market:-

1. The potential for the exercise of market power in the NEM is increasing as evidenced by the increasing concentration of the electricity supply industry through vertical and horizontal integration and facilitated by increased constraints (including those engendered by generator bidding strategies) applying to interconnections between regions.
2. Objective indicators – such as statistical measures (HHI indices) and FERC tests – show the NEM as "highly concentrated" and not a "well functioning competitive market". The competitive drivers in the NEM have been considerably weakened.
3. There is ample evidence of the increased exercise of market power in the NEM through
   - Physical and economic withholding of generation capacity
   - Use of complex bidding strategies to maximize returns by parking capacity in high priced brands, and to create congestion in the interconnectors to constrain inter-state generation flows (as have

been demonstrated through Snowy Hydro's bidding strategies involving Murray and Tumut.[3])

4. Electricity users have been penalized by:-
   - higher electricity prices as generators deliver returns in excess of LRMC or through excess profits (the Bardak report estimates that over the five years of NEM operations, average generation revenues have been at levels approximately 21% above LRMC)
   - higher electricity prices as a result of generator operational practices that draw on higher cost plants in preference to lower cost plants (there are also social costs arising from operating less efficient plants)
   - higher electricity prices as a result of substantially increased levels of price volatility and risks following the increase of VOLL in 2002 from $5,000/MWh to $10,000/MWh
5. There is limited ability to engender a more competitive industry structure, reflecting the continued existence of State Government-owned corporations and inadequate statutory teeth provided to the ACCC on mergers and acquisitions, as reflected in increased vertical and horizontal integration of the industry.
6. A fundamental change in the design of the trading system (as happened in England/Wales) is overdue but whilst there is resistance to changing the basic design of the trading system, there needs to be alternative solutions to limit the opportunities for generators to undertake predatory bidding strategies and other anti-competitive market practices (such as the introduction of capacity payments associated with a lower price cap. This matter is referred to in more detail later in this submission).

In the context of this review by the Reliability Panel, reliability has a quite focused point – that of ensuring there is sufficient generation available to meet the regional demand peaks, with sufficient reserve capacity to permit the unexpected failure of some of the normally dispatched generation. To date, major energy consumers have little to fault in respect of generation reliability. There have been black-outs following generator failure (e.g. NRG Flinders in South Australia in 2004 following issues concerning a failure to implement NEMMCO technical standards) but on the whole, these have been only a few incidents. When compared to supply failures caused within distribution networks, the supply reliability from generation to date must be seen as excellent, although caution must accompany this statement as it is well

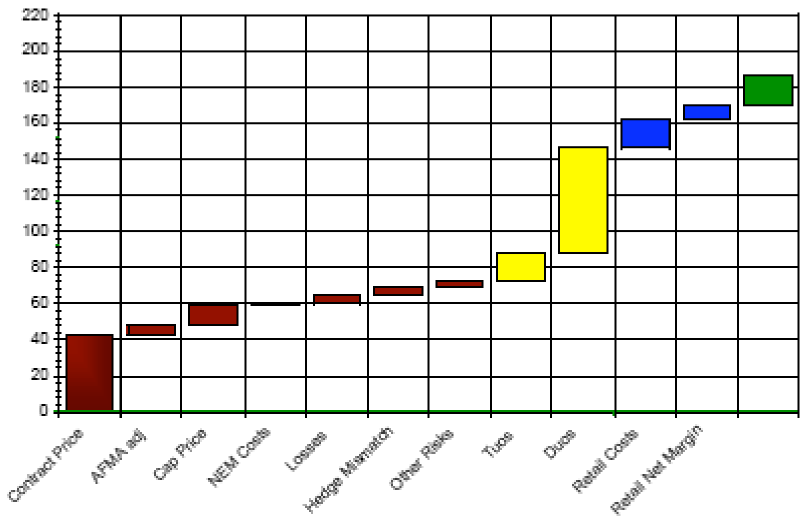
[3] Energy Markets Reform Forum, Confidential Submission to the AEMC, June 2006

recognized that the NEM commenced with a significant amount of surplus capacity.

2.3 Reliability and price

Having observed from experience that power generation has achieved a high level of reliability compared with the other elements in the NEM supply chain so far, it is important to assess whether this reliability has come at a price. We can obtain some useful insights if we consider the work by the SA regulator in setting the retail price cap for small consumers in South Australia in 2002. As Bardak points out in its report, the risk premium paid by consumers for the reliability of power generation under the NEM Rules is quite high.

> "The exercise of market power in the NEM results in a small number of very large price spikes, which increase volatility greatly and which make trading in the NEM very risky indeed. We have seen that the exercise of market power has had the effect of increasing the average generator revenue above the LRMC of new generation, thus increasing the cost base to all end users.
>
> These price spikes are not seen directly by most customers, especially in the residential sector, but they have a major effect on the longer term price of wholesale electricity. The increased volatility and the cost of mitigating against the risk of being caught unhedged when one of the price spikes occur, have a direct and powerful effect on retail tariffs.
>
> Bardak has been seeking to encourage the use of an "effective wholesale price" having to be paid by retailers, which makes up a high proportion of end user tariffs. It covers:
>
> - purchase of bulk power under hedging contracts:
> - purchases made from spot market;
> - the cost of risk management, including the cost of cap contracts and other financial instruments:
> - allowances for uncovered loads and miscellaneous risk elements; and
> - cost of ancillary services and NEM fees.
>
> The differences possible between the "effective wholesale price" and prevailing pool and contract prices has been dramatically illustrated in the case of South Australia, where the regulatory authority (ESCOSA) has examined the various elements of the effective wholesale price for the purpose of establishing standing contract prices for small consumers, making up some 50% of the South Australian market.

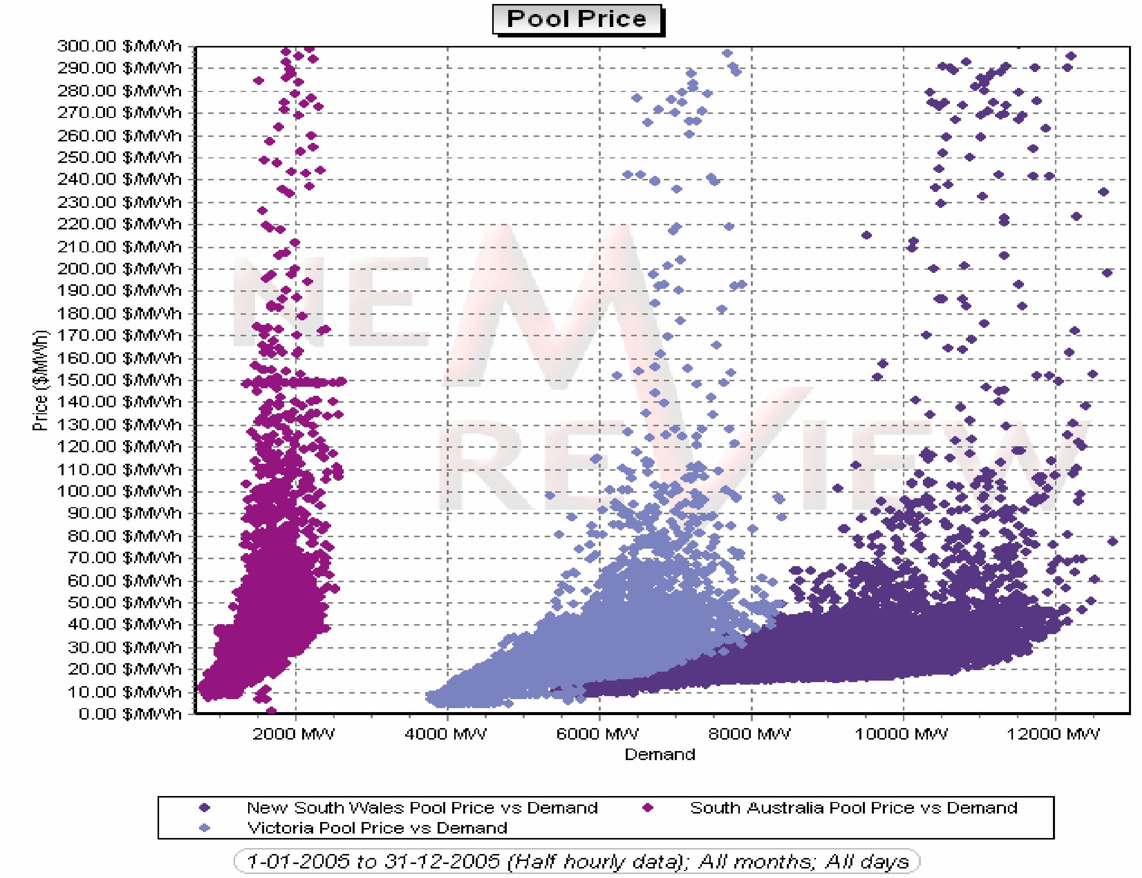
> Fig 5.13 illustrates the components used by ESCOSA in making up the average retail price paid by these small customers in South Australia, identifying those which make up the effective wholesale price in red.
>
> *Fig 5.13 Components of End Tariffs in SA*
>
> 
>
>
> **Source: Bardak**
>
> During a period when pool prices in South Australia were around $30-35/MWh and contract prices for flat loads were being quoted at around $40/MWh, ESCOSA derived an "effective wholesale price" of $72/MWh — fully 80% above prevailing contract prices at the time. Most of this increase was due to the cost of risk mitigation (AFMA adjustment, Cap Price, Hedge Mismatch, Other Risks in the graph). NEM costs and losses were relatively small."

The purpose in referring to the South Australian regulator's analysis of contract prices is to point out that the operation of the NEM introduces risks to generators and retailers, both of which are separated activities. That a risk faced by a retailer is sometimes countered by an equal but opposite risk by a generator is still an added risk which must be paid for by consumers. This applies to a lesser degree in NSW and Queensland where the ETEF and BPA schemes tend to cancel some of these opposing risks out, resulting in an overall reduction of risk to all parties (but, of course, at the expense of reducing retail competition).

2.4 Generator market power – the reliability and price impacts

A review of the normal operation of the NEM shows that the relationship between price and demand demonstrates a reasonable degree of correlation (as would be expected from economic drivers), but only up to a price point which appears to be at about 3-4 times the average price of supply (i.e. about

$100.MWh). The following graph shows that the price/demand scatter is certainly consistent and reasonably predictable up to a price level of $100/MWh, but beyond this point the correlation between price and demand is much less, and as the price increases, the degree of correlation continues to reduce.

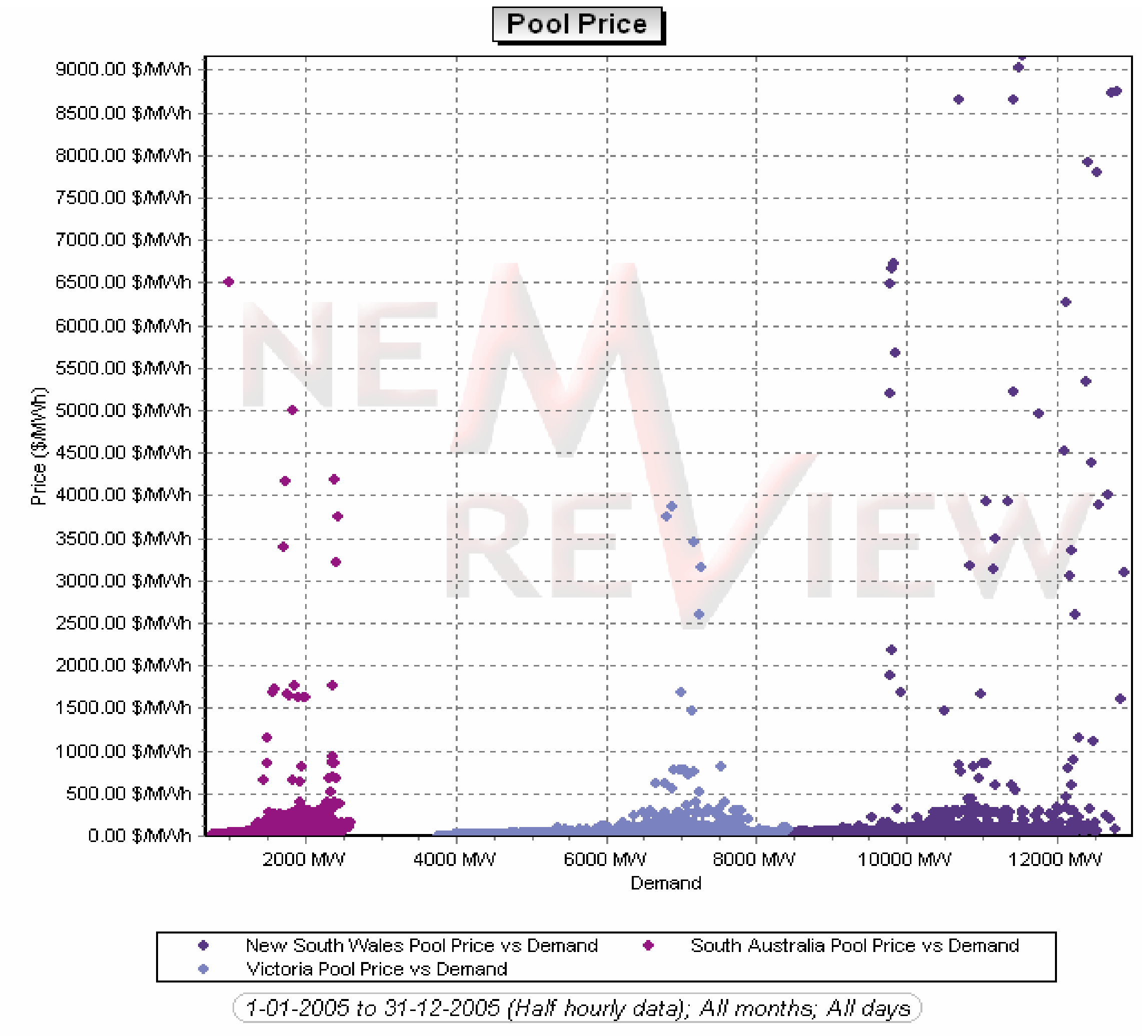


Source: NEM Review

Selecting a benchmark price of $300/MWh as a reasonable expectation of maximum regional pool prices[4], represents about 10 times the average pool price and a premium at which most buyers would not normally enter into a purchase. An expectation of a price premium is essential in the NEM, as electricity prices are not seen until ex-post.

It would appear that using a $300/MWh cap for a price/demand indication shows a reasonable relationship between price and demand than does capping the price at $10,000/MWh as the following graph shows.

[4] This is the point up to which many retailers take "pool risk" and thereafter seek price caps from peaking generators



Source: NEM Review

Analysing pool prices for 2005 shows that the pool price exceeded the amount of $300/MWh for only 128 half hourly periods in the four regions of Queensland, NSW, Victoria and SA. These 128 half hour periods represent less than 0.2% of all half hourly periods in the four regions. The following chart shows the price impact of these 128 spikes as a proportion of the average annual price for each region. Snowy data is excluded as it has little demand and Tasmania data was excluded as it did not operate in the NEM for the full year.

States	Qld	NSW	Vic	SA	NEM (excl Tas and Snowy)
% of average annual volume weighted price caused by >$300 price spikes	19.6%	36.6%	7.6%	10.1%	24.6%
Av annual time weighted regional price $/MWh	25.17	35.83	26.29	33.60	30.22
Av annual volume weighted regional price $/MWh	27.12	40.84	27.83	36.76	33.44
# price spikes >$300/MWh in 2005	26	67	24	35	128

Source data: NEMMCo and NEM Review

In 2002, the impact of price spikes above $300/MWh was to inflate the average pool price in the NEM by 28%[5].

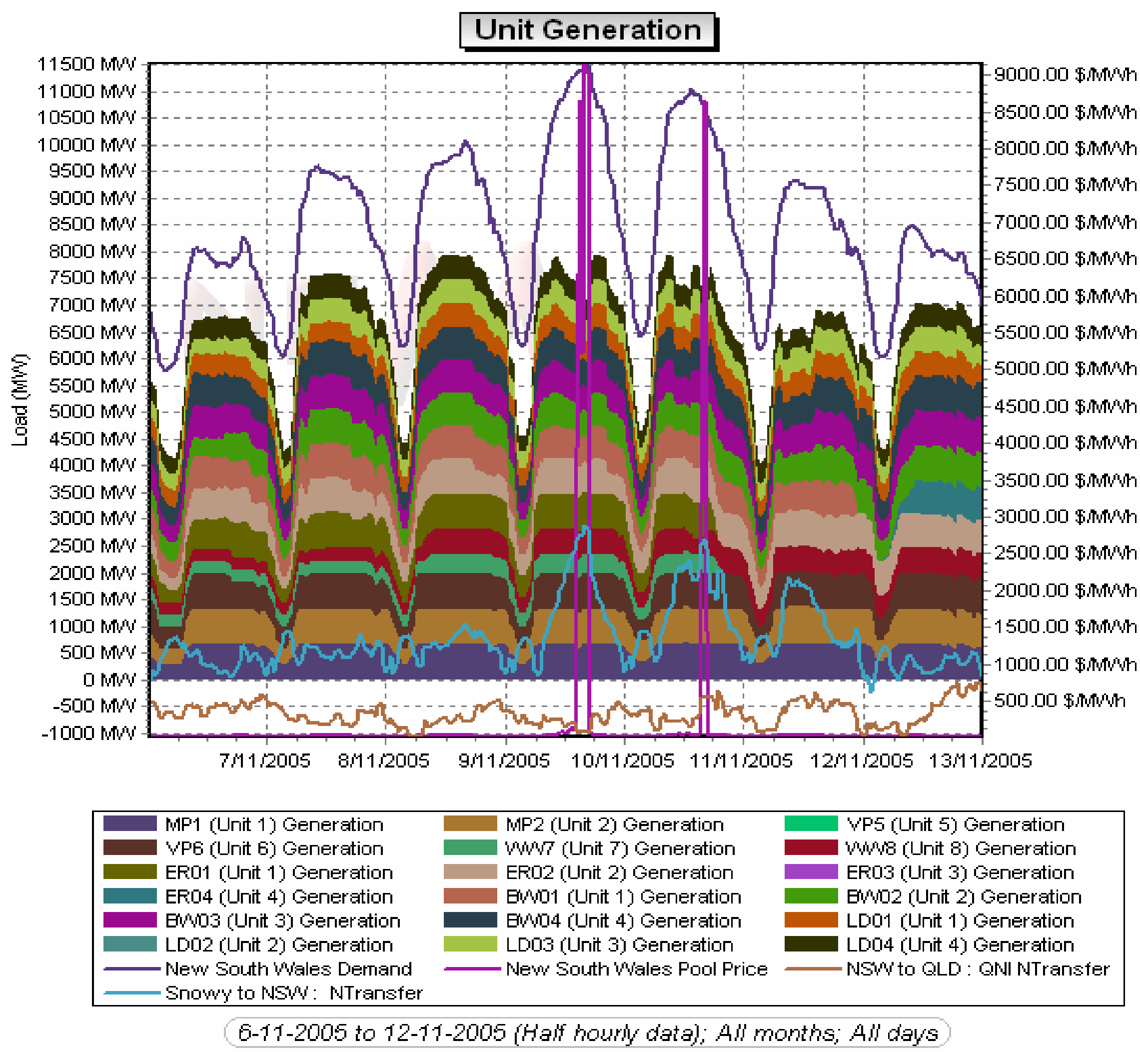
In 2005, the impact of these price spikes above $300/MWh added over $8/MWh to the average annual volume weighted NEM pool price. Because of the severity of these relatively few price spikes, retailers must add significant premiums to accommodate the risks they face should such a spike occur. The very randomness of the price spikes prevents reasonable attempts to mitigate the impact of the price spike other than to buy expensive "insurance". Additionally, generators add a risk premium to manage the risks they face from these price spikes when they contract with retailers.

These price spikes tend to occur when generators are aware that the interconnections between regions are constrained and so allow the regional generators to set prices. This is often achieved by the dispatched generators withdrawing capacity (effectively achieved by reallocating already bid generation into a higher price range) in an increasing demand period. The common ownership of the three large generation groups in NSW allows this practice to regularly occur in NSW.

[5] Bardak P/L, "The Effect of Industry Structure on Generation Competition and End-User Prices in the National Electricity Market", May 2005

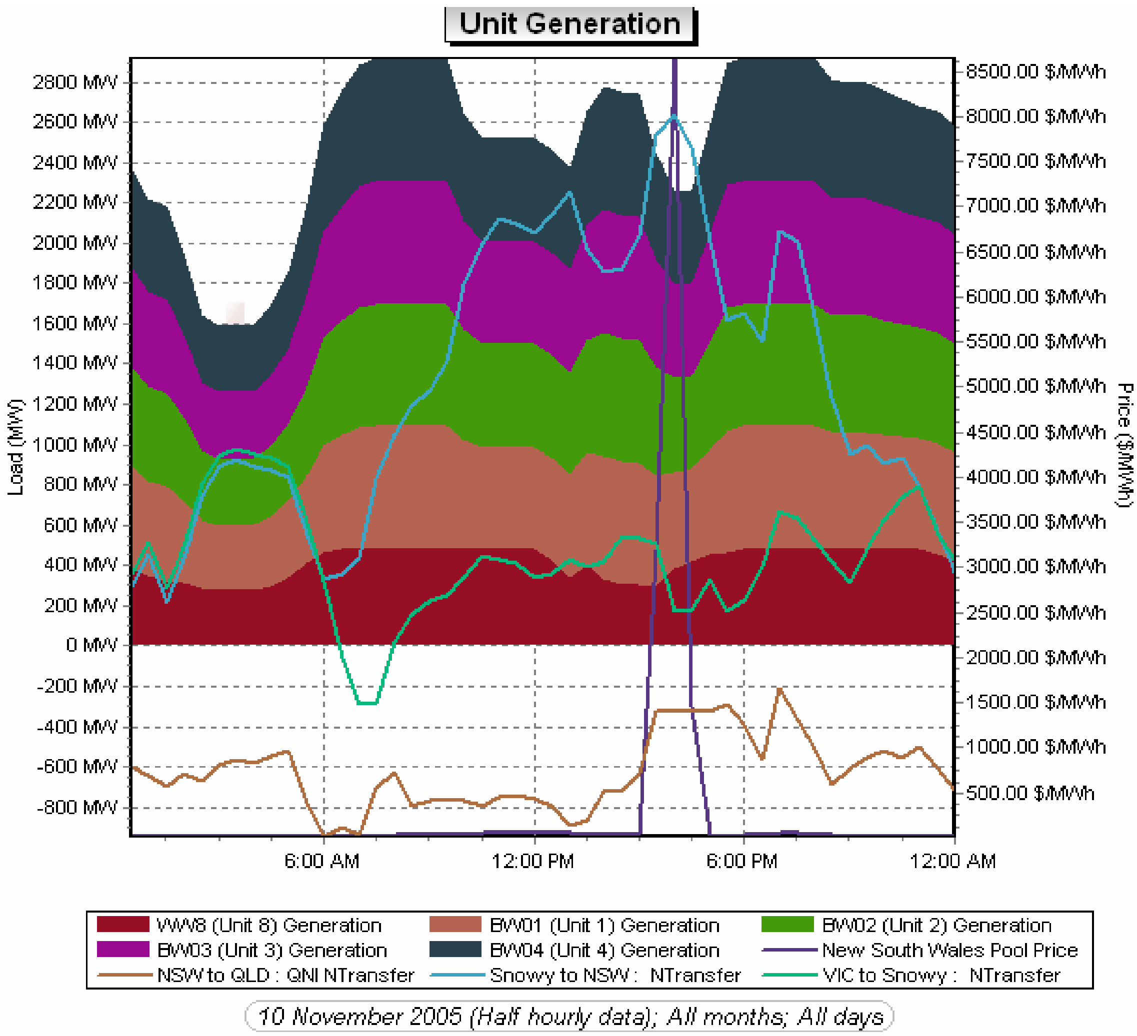
Thus it is clear that when generators use their market power, they do have a significant impact on regional pricing levels.

It is clear how the generators can easily exercise their market power. The basic concept is that when the generators see an opportunity of certain high demand and constrained inter-connectors, the generators withdraw capacity from a lower price band and rebid this at a higher price band. A review of the AER weekly report for week commencing 7 November 2005 shows this quite clearly. The price for power reached over $9000/MWh on 10 November 2005, caused by a significant withdrawal of power by base load generators from levels of dispatch they easily achieved the day before and did so later in the day examined and again on the following day. Why the price spiked was due to the constraint on the interconnectors, which when the base load generators withdrew capacity, forced higher priced generation to be dispatched.



Source: NEM Review

Examining the issue in more detail shows that demand peaked on two consecutive days, but on the first day (10 November 2005) there was a significant reduction in supply from certain base load power stations, totalling about 700 MW. At this same time the price spiked to nearly $9,000 and stayed high for an hour. Looking closer at that day we see who did what at this critical time.

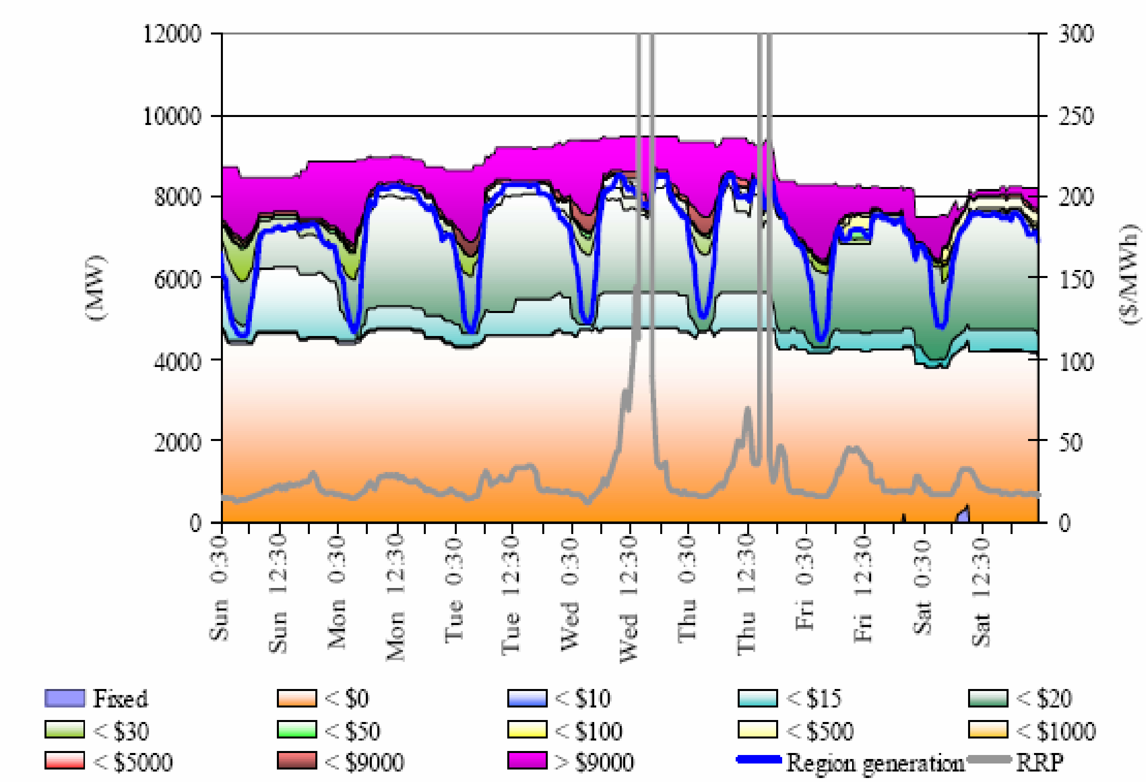


Source: NEM Review

There was a reduction of output from five power station units, requiring Snowy to make up the difference. From the AER weekly report we see that Snowy "parks" much of its output at >$9000/MWh which the base load generators knew. Note in the following charts (courtesy of AER weekly reports) that the introduction of the >$9000/MWh (purple) band on 10 and 11 November occurs at a much lower afternoon demand level than on the other days which had a similar high demand. By marginally reducing output, requiring Snowy to generate, the five generators included in the above chart made more money than by being dispatched. We also note that at this time Snowy increased output of its Murray power stations, reducing power transfer on the interconnection between

Victoria and Snowy, preventing lower priced generators in Victoria being dispatched.

Figure 52: New South Wales closing bid prices, dispatched generation and spot price



Source: AER Weekly report 6 Nov 05 – 12 N0v 05

The actions of five NSW based power stations, knowledgeable of Snowy practices, provided the perfect conditions for spiking the power price in NSW, uncoupling prices from those in the others states.

There is a noteworthy comment[6] made by Alan Kohler during the time when Snowy was being readied for sale.

> "…yet last financial year [Snowy generated power at] 13.5% of its capacity. … Snowy Hydro is not really a power company … it is an insurance company. …Snowy makes revenue in three ways: power generation (the least of the three), insurance contracts with power retailers, including guaranteed price caps and swaps, and, third, settlement residue auctions, which involve collecting on the difference between price across a particular interconnect – say between NSW and Victoria …"

This accurately describes the operations of Snowy, which uses its assets to increase the value of its "insurance products".

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[6] The Age, 24 May 2006

The purpose in describing this easy ability of generators to use regional market power is to highlight that any action taken by the Reliability Panel must be seen in the context that generators will **always** seek ways to maximize their revenue irrespective of any Reliability Panel Review recommendations.

The very structure of the NEM permits, even encourages, generators to use their market power to create the price spikes seen in the NEM. **The primary tool used to encourage reliability in the NEM (particularly that of increasing VoLL) provides the mechanism for generators to further use their market power to maximize revenue and profits.** If reliability can be achieved or enhanced at the same time as **by reducing market volatility** this must be seen as a preferable decision when compared to the less palatable alternative of maintaining or increasing volatility.

Thus there should be an incentive for the Panel to ensure that its decisions lead to a reduction in the market power of regional generators, with the likely outcome of volatility being reduced.

2.5 The issue of price volatility

Price volatility has been identified as a significant issue for the NEM. Indeed in 2002 the Parer Report stated that price volatility is an issue but cited the disaggregation of the NSW and Queensland generator companies as being the solution to this identified problem.

The Federal Government White Paper[7] on energy went a little further in stating:-

> "peaks [in pool prices] lasting for only 3.2 per cent of the annual duration of the market accounted for 36 per cent of total spot market costs. Reducing the magnitude and costs of these peaks will reduce overall system costs."

NECA introduced a "measure of volatility" in its weekly reports (and this practice is continued by the AER). Unfortunately for consumers (and those aficionados of statistics), the underlying principles used by NECA to develop this measure have been severely constrained, as NECA decided to develop an index using a control which has

> "the width of the central 75% of the price distribution divided by the median price"

As this measure clearly **excludes** the very few (but extraordinarily influential) price spikes which provide such a large element of the annual median price, the measure has to be treated with extreme caution!

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[7] Australian Government, "*Securing Australia's Energy Future*", July 2004.

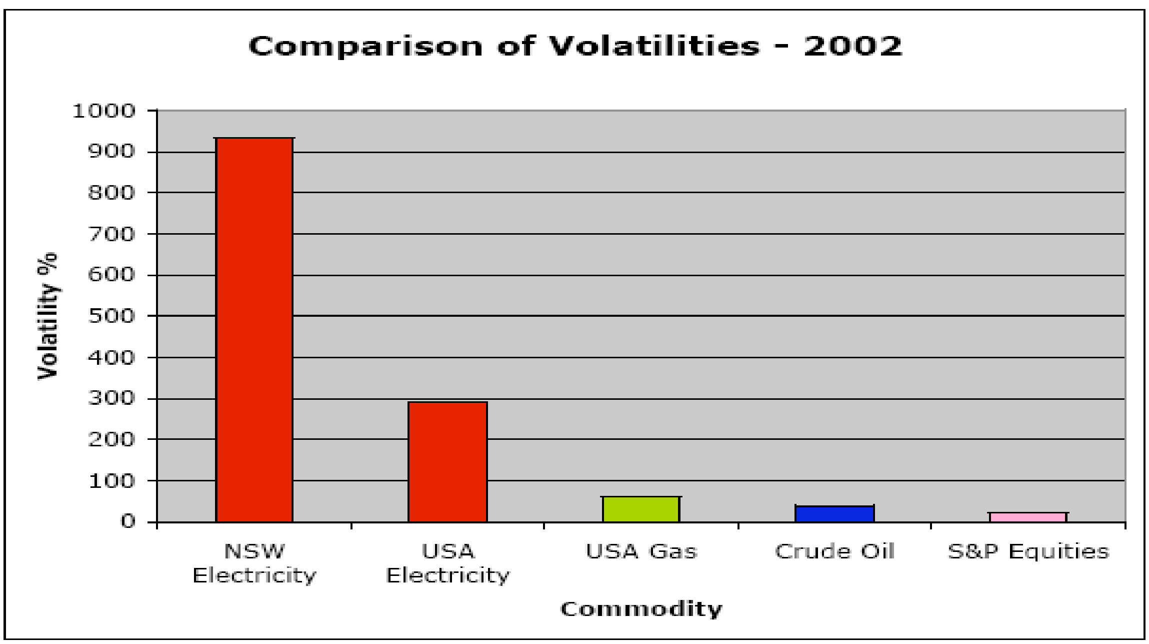
The Bardak report provides considerable attention to the issue of price volatility and comparisons with other jurisdictions.

In highlighting the extent of NEM price volatility and its causes Bardak points to the work of ACCC consultant D Biggar, "*The Exercise of Market Power in the NEM: An analysis of price spike events in the NEM January to June 2003*", April 2004, and CSIRO scientists Hu, Grozev, and Batten "*Empirical Observations of Bidding Patterns in Australia's National Electricity Mark*et", Energy Policy, Vol. 33, 16, 2005, 2075-2086.

Bardak goes on to compare the volatility in the NEM with electricity prices in the US and other so-called highly price volatile commodities. Bardak also points to the concerns of FERC in the US, after the well publicized "California Crisis" to establish whether the California pricing was reasonable, and to its views on what constituted a reasonable volatility measure. In developing the following comparison,

> "Bardak applied the method in the same manner as did FERC[8] for the pool prices for New South Wales in the year 2002 — the same year used by FERC in its analysis."

Fig 5.9 Comparison of Volatilities



Source: Bardak

Bardak comments:-

[8] FERC, "*State of the Markets Report*", January 2004, available from www.ferc.gov

> "As might be expected given the much higher price cap, and the freedom available to generators in the NEM, the sample Australian electricity pool price has a far higher volatility, correctly calculated, than do electricity prices in the USA — themselves far more volatile than prices of natural gas, oil and stocks on Wall St.
>
> Clearly, a more complete examination of the application of the FERC approach to the NEM is warranted, but it is not the intention of this report to extend to this detail. It is a matter to be raised with the new Australian Energy Market Commission when it begins operation.
>
> Periodic comparisons of Australian electricity price volatility with that experienced in electricity prices in other countries, as well as prices in other industries, would be quite valuable. Clearly, some volatility is desirable to indicate periods of shortages and to give some price indications to guide the actions of participants in the market. But the issue is — how much volatility do we need?"

Bardak refers to work by Henney and Bidwell[9] – Bardak also acknowledges the considerable assistance of Henney in the preparation of its report – in which Henney and Bidwell quote Stephen Stoft[10] as saying that:-

> "High price spikes not only cause more day-to-day fluctuation in profits, they also cause more year-to-year fluctuation. A cool year may have none; a hot year may yield several years' profits in a few days. Such year-to-year volatility represents a real business risk because it makes the long-run average rate of return difficult to predict. Investors always demand a risk-premium on risky investments, so the cost of funds in a high-price-spike market will be higher. This is a real cost and may be significant.
>
> Currently US power markets are viewed as very risky, a fact that must be attributed largely to the effects of high price spikes and the related long periods of insufficient profit that bring short run profit down to the right long-run average. This level of perceived risk has a significant cost, especially when compared with the extremely low risk level that was achieved under regulation.
>
> Preliminary investigations of these market power effects indicate the long-run average cost of market power is higher in a high-price spike market."

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[9] Henney A, Bidwell P, "*Will NETA Ensure Generation Adequacy?*" Power UK, Issue 122, April 2004.

[10] Stoft, S, "*Power System Economics: Designing Markets for Electricity* ",Wiley, -IEEE Press, New York,2002, page 171

When this observation is taken in context with the **even greater** volatility observed in the Australian market, there can be little doubt that the excessive volatility observed (and measured) in the NEM, can only be seen as extremely detrimental to achieving the goals of the NEM. Certainly any negative outcome identified from volatility observed in other jurisdictions can only be seen as greatly amplified in the NEM.

2.6 The impacts of price volatility on reliability

The risk premiums added to consumer prices are a direct result of volatility of prices in the NEM. There is a low correlation of price spike occurrences to any identifiable predetermined affect. Whilst there is a degree of correlation between demand and price, this is relatively weak, as shown in the table above where it is seen that 0.2% of price periods contributes nearly 25% of the annual average price in the NEM.

In addition to the risk premiums added to consumer prices for power there are a number of other aspects of this volatility which impact negatively on consumers. These are described below.

1. **DSR.** The ability of demand side responses to price signals requires two fundamental features. These are forewarning of an event and certainty of outcome. The current NEM approach precludes effective DSR as price spikes are generally of short duration, and in many cases prices return to realistic levels before consumers generally are even aware there has been a spike. Secondly there is no certainty of a financial reward if the consumer responds to any other impetus (such as forecast high temperatures) than price
2. **Secondary markets.** A secondary market will develop if there is some method of predicting both the timing and extent of price spikes. The fact that the electricity secondary market is essentially confined to generators like Snowy, is indicative that the market is sufficiently unpredictable to preclude a strong and viable secondary market
3. **New base load generation.** Base load generation requires a high degree of certainty of future electricity pricing to underwrite the very large capital injection involved. With so much of the annual average price (and therefore hedge contract price) dependent on such a large proportion on such a small number of time intervals, detracts significantly from the viability of investment for new generation.
4. **Peaking generation.** The bulk of new generation capacity added to the NEM since its commencement has been low capital cost peaking plant,

often being open cycle gas fired gas turbine generators. Many of these plants have been constructed by **existing retailers** to provide a physical hedge against the highly volatile and unpredictable NEM pricing.

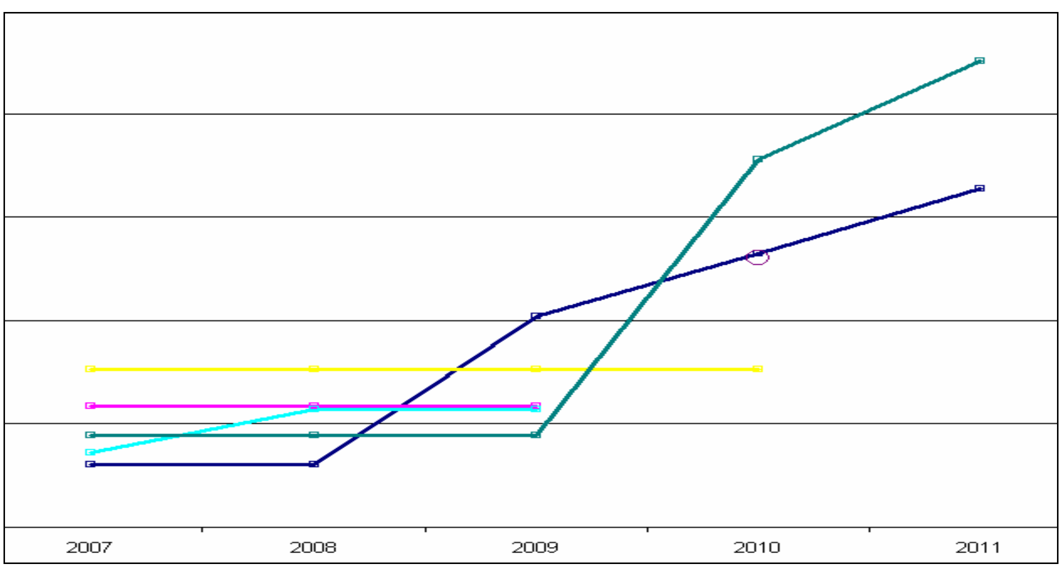
5. **Self generation.** Many consumers have contemplated self generation as a mode of protecting themselves from high risk premiums due to volatility. Unfortunately the structure of the market and the costs of the networks needed for standby supply, preclude any large scale move towards this type of DSR.

6. **Short termism in the NEM.** The high degree of volatility in the NEM has tended to drive consumers, retailers and the secondary market into an extreme form of short termism. Consumers seeking contracts longer than 3 years see the prices for years beyond year 3 rising dramatically. Retailers advise that this results from generators taking a very conservative view as to what will happen in the future as the volatility in the NEM is so high and unpredictable.

   This is further demonstrated by the futures market as the forward market only goes forward for 12 quarters and there is very thin (or no) trade for the last four quarters.

   The following chart is based on a number of tenders recently received for a specific customer, with a constant load for the next five years. For reasons of confidentiality much of the data has to be deleted, but the left axis is the cost per MWh for electricity. The three year pricing generally sits in the range of $30-$50.

Price vs Year movements for retail electricity



Source: MEU member information: Confidential

> This real life pricing comparison supports the contention of short term approaches being used, and that prices for years later than three year outlook most commonly used, show a significant rise in years 4 and 5. There is little or no competitive pricing offered beyond five years.
>
> With what appears to be a common practice on the part of retailers in only offering (or being able to secure) short term pricing, we observe that this militates against the fundamentals essential for investment in new base or intermediate load generation, as events show that the high prices forecast in the later years are not realised.

The focus of the Reliability Panel has been to maintain or increase system reliability, particularly with reference to increasing generation in the market. However, we consider that price volatility does little to encourage investment, other than to drive participants to attempt to provide a physical hedge against the expectation of random high price spikes. Even in attempting to manage these (having an ex post market where a price spike for a standard five minute period provides no opportunity to address the price spike), a single 5 minute price spike to VoLL results in a minimum average 30 minute price of $1667/MWh. This half hour pricing can result even if there are demand side responses available or standby fast start plant available – even an open cycle gas turbine requires 2-3 minutes to start generation from cold, and then more time is needed as the turbine goes from closure onto the bus to peak output.

What is absolutely NOT required, is a method of reliability which provides strong incentives for generators to use their market power to cause the price spike in the first place.

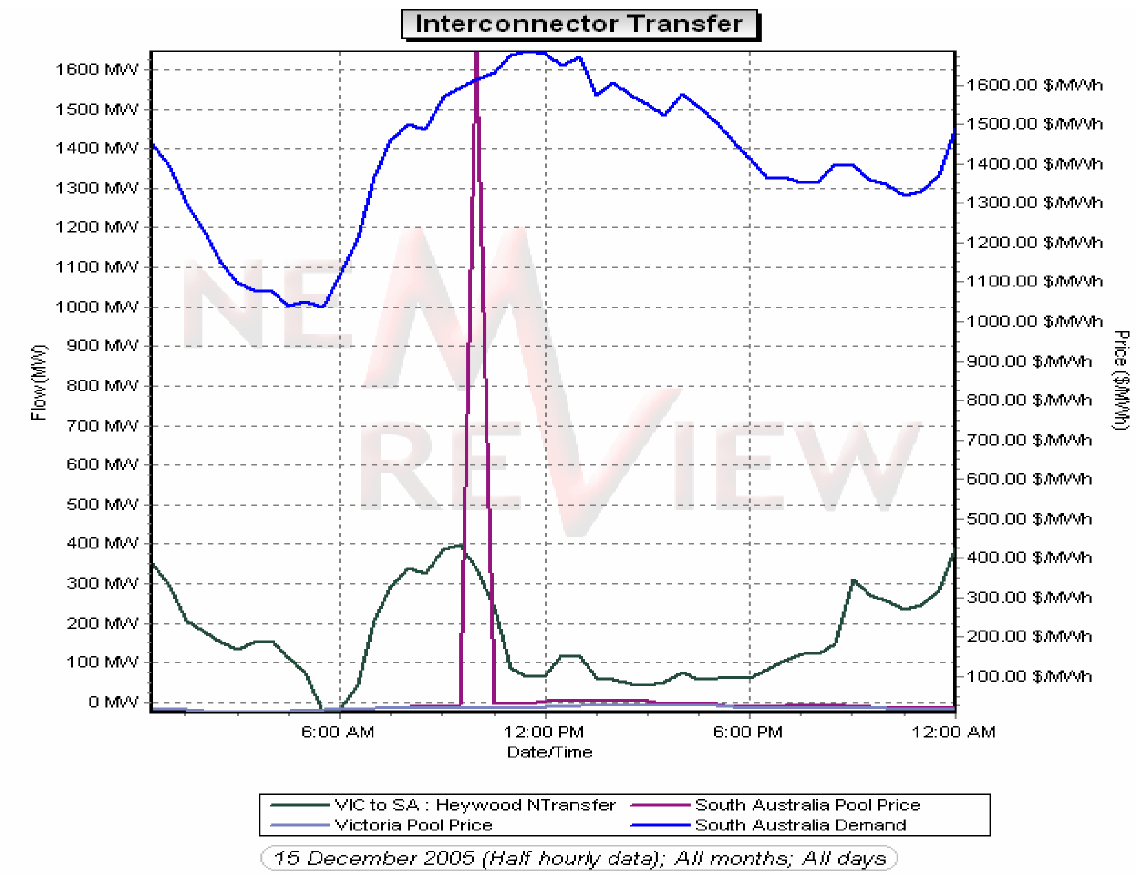
Further, with the current approach in the NEM incentivising generators to use market power in order to achieve adequate profitability and with generation profitability being so dependant on these very few high price events, there is a clear disincentive for demand side responsiveness, new base load generation, cogeneration options, and the emergence of a thriving secondary market.

The Reliability Panel must examine alternatives to the view that further encouragement to generating new capacity (if such is needed) will only come from increasing the level of VoLL.

2.7 The NEM is a series of interconnected regions, not a national market

The so called national electricity market is in fact a series of interconnected regions, with the interconnections not especially strong. The strongest interconnection delivers no more than 30% of the regional demand, with the others being much smaller. This effectively allows the generators in each region to frequently set the price for each region. Thus the national market allows generators in each region the ability to use their market power to set prices.

That this is happens is readily identified by the following analysis of regional pricing. When a small increase in demand in a region cannot be accommodated by increased transfer between regions, we see the regional prices "uncouple" with one spiking as the interconnector is insufficient to permit the increased flow and the regional generators use market power to increase prices. This can be seen in the following graph.



Source: NEM Review

This shows the impact of a constraint on V-SA (Heywood) where the capacity of Heywood (normally 460MW to SA) was reduced to 275MW for a short period. The five minute price in the SA region was $9999.99/MWh for the period 9.55 am to 10.00 am on 15 December 2005. Both before and after this 5 minute period the SA price was less than $30.MWh. It was the short term impact of this 5 minute that spiked the half hourly price by nearly 60 times.

Analysis of the regional pool prices shows that these spikes are relatively infrequent. However, the severity of them when they occur is enormous.

2.8 Summary Points

The Reliability Panel must take a wider perspective in the current review, including the impacts on customers, the risks and the deterrence to new entrants engendered by the high volatility of the NEM. Ensuring reliability of supply – it should have cognizance of:-

- Reliability of electricity supplies is assessed by consumers at the point of usage, not at the point of generation.
- Reliability does have a cost, but when the costs are toted up, the outcomes indicate that the risks inherent in the NEM have a major impact in pushing up prices.
- Generators use their bid strategies in the market to increase prices. That such a high proportion of the average pool price is derived from a small number of high price events, must be of concern, as such distortions in the market have a negative impact on new entrants to generation.
- One approach to increasing reliability in the NEM is to encourage industry to reduce its demand when electricity prices spike. Some companies have such demand management practices to minimize risk exposure. However, the implications of such strategies are that industrial output and employment levels are adversely affected.
- The NEM is not a national market but a series of interconnected regions with varying degrees of interconnectivity, regional market structures and competitive drivers. As a result, until there is stronger interconnection and improvements in competitive drivers, it may be essential for the RP assess the reliability of the NEM on a regional basis rather than attempting to have a "one size fits all" view of the NEM.

As a result of the issues observed and discussed above, the MEU has come to the conclusion that it is a matter of priority for the Reliability Panel to develop a mechanism for ensuring reliability of the NEM through measures which lead to a reduction (rather than a further increase) in the volatility observed in the NEM.

Unless the new measures do result in a reduction in volatility, consumers could readily point to the fact that the market objective of the NEM will not be achieved. The National Electricity Law states quite simply:-

> "The national electricity market objective is to promote efficient investment in, and efficient use of, electricity services **for the long-term interests of consumers of electricity** with respect to price, quality, reliability and security of supply of electricity and the reliability, safety and security of the national electricity system." *(emphasis added)*

The MEU does not see that maintaining the current levels of volatility (or even increasing them) can be in the long term interests of consumers, as volatility increases prices, increases risks to Market Participants (causing increased prices), does not provide clear signals for new base load generation investment, deters new entrants and, in not providing useful signals to consumers, acts to the detriment of demand side responsiveness.

3. The NEM operations and tools

3.1 Reliability is assessed only for generation adequacy

The main focus of the Reliability Panel review appears to be essentially related to the adequate provision of generation, and the extent to which sufficient generation is encouraged to be undertaken. The encouragement of transmission and distribution network development is the responsibility of the AER and the AEMC. Thus in the context of this review reliability is principally focused on maintaining sufficient generator capacity to meet the needs of consumers.

The RP points to a number of settings that are supposed to lead to the:-

- minimization of Unserved Energy (USE) to consumers,
- encouragement for the demand side to reduce demand when capacity is close to supply limits
- least amount of regulatory interference in the market (i.e. reserve trader and administration of prices), and
- incentives to build new needed generation.

To assist the market maintain reliability of supply, the RP uses various guides and analyses to assess the degree of reliability inherent in the market, such as:-

- the forecast of the probable levels of demand(e.g. 10% PoE), and comparing this to the level of installed generation capacity
- reserve plant margins
- scheduling of generator downtimes to periods of expected lower demands
- setting of the market price cap (referred to erroneously as the value of lost load – VoLL), and
- setting of the cumulative price threshold (CPT) to minimize the exposure of risk to market participants

In its Issues Paper the RP provides an appendix (appendix 4) which describes the tools used in other overseas jurisdictions to assist in the assessment of reliability and the tools used to achieve reliable supplies of electricity. There are four jurisdictions examined.

The appendix contains a 21 page description of four regions (Ontario, PJM, Ireland and UK), including how they measure reliability.

With regard to ensuring there is sufficient capacity in each region

- Ontario uses a reserve trader such as is currently used in the NEM
- PJM requires generators to have a fixed % of contracted power held as a reserve

- Ireland has generator capacity payments, backed up by reserve trader
- UK has nothing, relying on the market to ensure adequate reliability.

Unfortunately there is **no** analysis of the effectiveness of each approach, other than to state there have been no problems to date, and that there has been adequate supply. The descriptions do not address the financial implications of the different approaches used nor of the impacts of each on consumers. These are surely the significant criteria for assessing reliability.

3.2 Reliability is managed only for generation adequacy

The NEM has three basic tools to manage reliability. These are

- Setting the maximum amount of unserved energy (USE) over the long term of 0.002%. This is equivalent to every consumer not receiving power for about 10 minutes at average demand each and every year. Using this figure NEMMCo identifies the amount of reserve capacity needed to ensure that this setting is achieved, using a "Monte Carlo" approach.

  In the early years of the NEM the outcome of this analysis was that there was sufficient standby generation equal to the loss of the largest single generator unit in each region.

  USE sets the basis for identifying the degree of "unreliability" that is deemed acceptable to each consumer. Reducing this figure axiomatically results in the need for increased standby (reserve) capacity, with attendant costs. Unless the market structure actually leads to encouragement for base load and intermediate load generation, then reducing the USE will not achieve anything, other than an increase in the failure rate to achieve the benchmark (KPI) performance standard.

  Without the encouragement to increase the level of generation, all that reducing USE will do is to identify that the market operator will have to seek more reserve capacity in its role as reserve trader. This will result in increased transactions and energy costs to consumers.

  Thus modifying the level of USE will achieve nothing of itself, unless the market encourages new generation.

- Setting VoLL at a level which is deemed to provide incentives to install new generation. Accompanying this is the cumulative price threshold (CPT) which minimizes financial exposure to market participants

  At the start of the NEM, VoLL was set at $5000/MWh. After a review in 1999, VoLL was to be raised to $10,000/MWh in 2002, which occurred. This level of VoLL has been maintained since that time.

Increasing VOLL may increase encouragement for new generation, but this has not been proven. Whilst increasing VoLL does present generation with the opportunity to increase profits, the enhanced resultant price volatility does not create the certainty needed for a major investment (or for a new entrant), whether this is by way of increasing demand side responsiveness or by investing in new base and intermediate load generation, which are the low cost ways to increase reliability.

The 2002 increase in VoLL did lead to more peak load generation, with retailers being the main investors in this generation. The generation plants built tended to be low capital cost open cycle gas fired generation which is not thermally efficient and uses a high cost fuel. The result of this trend is to increase the cost of electricity to consumers. The plethora of these low capital cost generation plants is a direct result of the uncertainty of earning a reasonable return, driving those retailer/investors who need the physical ability to hedge contracts, into the minimum capital expenditure needed to minimize their financial exposure.

Low cost increases in reliability require large investments in thermally efficient generation using a low cost fuel. Such investments require certainty of earning a return on the investment.

Thus rather than increasing VoLL and perpetuating the current trend of seeking to increase reliability in a manner which cannot be seen to provide a long term solution to reliability and which causes volatility and further risks (and costs) to consumers, alternatives to using VoLL as the (only) tool to encourage investment in generation must be found.

- Cumulative Price Threshold (CPT) is really a subset of VoLL. Its prime (perhaps only) purpose is to provide a limitation on the exposure a retailer might have to an extended period of high VoLL prices. Once the CPT has been reached, NEMMCo is empowered to set the price of electricity in the market at an Administered Price Cap (which is $300/MWh for peak times and $50/MWh for off peak times). Thus CPT is a trigger point for the exercise of price setting by NEMMCo. The purpose of the price setting is for financial risk mitigation purposes.

- Providing NEMMCo with the power to act as reserve trader when reserves are too low, and with the power to direct a generator to dispatch.

NEMMCo is only permitted to use its reserve trader powers when there is a perceived insufficiency in reserve generation to meet the 10% PoE point in a specific region. This reserve trader power is only to be used for the season (usually summer or winter) where there is expected to be a shortfall of supply. This prevents an investor seeking a contract term longer than perhaps 6-9 months of supply, and this is patently insufficient for any significant investment to earn a return. Reserve trader powers (which are essentially very short term tools) do not encourage new investment in low cost (capital intensive) generation.

As it is the level of USE that identifies at what level of installed generation is needed to meet the 10% PoE in each region, the concept of having different levels of USE in different regions only results in setting the point where NEMMCo will start to use its reserve trader powers to ensure there is an adequate provision to ensure that there will be sufficient generation for those consumers who require electricity supply.

It must be noted that generation in the NEM has transited from being predominately dependent on high reliability plant to include large elements of quite unreliable plant, such as **wind and solar sourced power**. The drive to increase embedded and renewable generation has resulted in a number of small power plants being included in the distribution networks.

The Rules require generation considered to have an output which might be "seen" by NEMMCo during normal operation must provide NEMMCo with full details of the generation characteristics. NEMMCo uses this provided information to assess the impact each of these generation plants might have on the NEM.

Small embedded generation is seen more as "negative demand" and the output is accommodated in the NEM analysis as demand side responsiveness and built into the forecasts of future demand.

The introduction of generation which is less reliable than the traditional thermal plants inherited from the state owned utilities, does introduce a feature to the NEM which cannot be ignored. This plant can be assumed to deliver the nameplate rating for their outputs but this would result in an overstatement of potential reserve plant. Equally to exclude such plant from the assessment is to significantly understate reserve plant margin available.

The MEU suggests that the RP has a role to play in assessing the diversity and contribution these less reliable plants may have on the NEM and its reserve levels. We suggest, for the reasons outlined above, that the RP should include in their assessment of USE (which is provided to NEMMCo) rules which accommodate the type of contribution made by less reliable forms of generation.

Thus the RP should consider the degree of contribution made by these other forms of generation (e.g. wind, solar, renewable, run of river hydro, etc) on a class/category basis, and then to attribute an impact of locational diversity to each class. By this we mean that (say) wind power plants which are adjacent to each other could not be additive as if the wind were to fail for one generator, then it would be expected that adjacent generators would be similarly affected.

However, if the wind generators were located far from each other and different climatic conditions are likely to prevail then the output of the two plants could be additive.

In this way the RP should be setting the rules for assessing the availability of different types of generating plant in the NEM and providing directions for NEMMCo to follow.

3.3 The impact of the NEM tools currently used to ensure reliability

It is of concern to consumers that the NEM participants and regulators recognize that the NEM does have high risks attached to it. The RP in its Issues paper notes this and provides discussion about how these risks can be managed. One of the greatest risks is exposure to an unforeseen or unexpected high price spike in the pool.

The energy only market proponents point to the need and the availability of risk management tools available to manage these risks. These tools include hedging contracts, price caps, physical hedging, secondary markets, a market price cap (VoLL), CPT and such like.

What is consistently overlooked by all parties (except consumers) is that the costs incurred to use these tools are not only high, but are then passed onto consumers. The higher the risks, the higher the costs to consumers are. Thus any tool used to manage risk becomes an increased cost to consumers.

We note that there has not ever been a cost benefit analysis carried out to assess whether the costs incurred by using these tools delivers a benefit to consumers.

Supporters for increasing VoLL to further incentivise investment in generation to improve reliability have never provided an analysis as to whether the costs incurred by taking such a step will provide a benefit of equal cost to consumers.

Adjusting USE does nothing of itself to encourage new investment in generation, adjusting CPT provides only a limitation to financial exposure and the reserve trader powers of NEMMCo do nothing to encourage new investment. Thus the only tool currently used by the NEM to encourage investment in generation is the adjustment of the level of VoLL

When there is analysis carried out on the performance of the NEM based on the use of these tools, we note that whenever there has been a change in the settings used there should have been some ability maintained to compare the outcomes (including cost changes) of the changes. What there is, shows:-

- Setting of USE has not been changed since the NEM commenced. Therefore there is no benchmark against which any changes can be measured
- Reserve trader powers have always been available to NEMMCo to have short term contracts to provide power in the event that there is a perceived likely short fall in generation for the next high demand season. There has been no change to the ability of NEMMCo to use this power.
- VoLL has been changed from $5000/MWh to $10,000/MWh, along with a decision to remove the "Force Majeure" provisions and include a market risk exposure cap called the Cumulative Price Threshold (CPT), which limited the exposure of market participants to an extended period of VoLL pricing. Where is the analysis of the outcomes of this change?

At the time these changes were recommended by the Reliability Panel, it was stated[11] that:-

- Analysis of market outcomes … since market start demonstrates … that the current level of reliability … would be only maintained with central intervention. While there are … new investments occurring and planned … in Queensland and South Australia … they do not demonstrate the core principle is being met purely from market signals at peak times, although average prices provide a basis for investment in their own right.
- … the Panel believes that the core principle can be achieved across the [NEM] with maximum prices, and therefore VoLL, in a range up to $20,000/MWh tightly linked to enhanced risk management provisions.
- Efficient inter-regional trade can only occur if prices for investment and risk management are consistent across the whole market
- … time should be allowed for further development of risk instruments, for example the manage inter and intra region network related risks, further demand management initiatives to emerge …

The ACCC had to authorise the recommended changes and in its final decision[12] stated that:-

> "[NECA] has argued that the essential public benefit from an increase in VoLL is that at its existing level there can be no assurance that historical levels of reliability of supply can be maintained. NECA claims a higher VoLL provides the incentive for reliability of supply through investment in peak generation, demand side facilities and network investment.

[11] NECA Reliability Panel, Final Report - Review of VoLL in the national electricity market, July 1999

[12] ACCC Determination, Applications for Authorisation, VoLL, Capacity Mechanisms and Price Floor, 20 December 2000, page (ii)

> NECA argues that investments that ensure reliability during system peaks may only earn revenue from an energy only market, such as the NEM, for a few hours per year. The Reliability Panel examined the price that would be required to provide incentives for these investments in making its recommendations on both the level of VoLL and the CPT.
>
> Following consideration of the issues, the Commission considers [with a high degree of accuracy as it turned out] that the proposed VoLL Code changes may involve significant public detriment, primarily due to:-
>
> - the additional risk which a higher VoLL introduces to the market, which is not easily accommodated by market participants;
> - concerns over how generator market power may manifest itself with a higher level of VoLL; and
> - the likelihood of higher prices across the NEM as a consequence of the proposed increase in VoLL.
>
> The Commission acknowledges that the proposed increase in VoLL provides public benefit, as it encourages investment in peaking capacity in circumstances where demand peaks occur for only a few hours a year (such as is currently the case in Victoria).
>
> However, the Commission does not consider that the other major public benefit argued by the applicant, that VoLL provides the incentive for reliability of supply through improved demand side response, has been demonstrated. As such, the Commission does not believe that an increase in VoLL to $20,000/MWh delivers sufficient public benefit to outweigh the anti-competitive detriments noted above.
>
> …The Commission has also proposed further conditions of authorisation requiring more stringent market monitoring measures in the NEM to address concerns that a higher level of VoLL could translate to higher energy prices across the NEM given current concerns about generator market power."

Essentially the ACCC was not convinced by the arguments that VoLL needed to rise as high as NECA proposed in order to achieve the desired responses. It is pertinent to note that the Reliability Panel considered that the driving force behind the increase in VoLL was to ensure that there was adequate peaking generation available to meet demand peaks. The panel opined that the only way that such plant could be funded was by matching the total cost of a peaking plant operating for short periods of time with the expected revenue which would come from this very short period of operation.

Between them, NECA and ACCC opined that increasing VoLL would result in a number of NEM benefits and detriments, being:-

1. Increased amount of fast start peaking generation plant
2. Increased incentive to base load generation
3. Institutionalised generator market power with associated increased generator profitability
4. Enhanced inter-regional connection
5. Increase demand side involvement
6. A reduction in central intervention
7. Higher prices in the NEM
8. A higher VoLL would increase risk

The use of increases in VoLL, while expected to increase reliability in fact leads to a number of perverse outcomes. It is important to understand the actual operation of the NEM as a result of the 2002 VoLL increase.

Examining each of these in turn we observe:-

Peaking generation
We have observed that such short term peaking plant can and often does operate for much longer periods than envisaged, but despite that, these have earned significantly more revenue from not generating but by providing insurance (see the article in section 2.3 above by Mr Alan Kohler in reference to the source of profitability of Snowy Hydro) against the high prices expected in the NEM. Retailers themselves have been the driver of installing such fast start plant as they have needed the physical hedge (insurance) provided by the existence of their "in-house" peaking plant.

Base load generation
Other than Millmerran in Queensland, **no** base load generation has been built or is planned. This is notwithstanding a demand from large industrial users for low cost long term bilateral contracts with new base load generators.

Increased market power and generator profitability
The ACCC referred to their concerns that a higher VoLL would lead to generator market power being institutionalised in order to improve generator profitability. This very concern has been realised. As pointed out by Bardak[13], generator profitability has been enhanced since VoLL increased to $10,000/MWh and in

[13] Bardak P/L, "The Effect of Industry Structure on Generation Competition and End-User Prices in the National Electricity Market", May 2005, section 3.2

section 2 above we have demonstrated how this can occur, with generators strategically driving prices to VoLL.

Inter-regional connection

NECA stated an expectation that a higher VoLL would lead to increased inter-regional connections. In fact, the only new interconnector of magnitude built since the increase in VoLL has been Basslink and this was developed effectively under a guarantee from Hydro Tasmania. The two market based interconnectors (Murraylink and Directlink) have both reverted to regulated status as they were not commercially viable as market interconnections. There has been minimal other increase in interconnection capacity. Thus an increase in effective inter-regional trade has not occurred. This is evidenced by the impact of price de-couplings between regions being such a high proportion of annual average regional prices (see section 2.3 above).

Demand side responsiveness

Both NECA and the ACCC expected to see improved demand side responsiveness to higher NEM prices resulting from a higher VoLL. In fact, there has been limited DSR, despite the increase in VoLL. The reasons for this are in part developed above and are also addressed in the Bardak report.

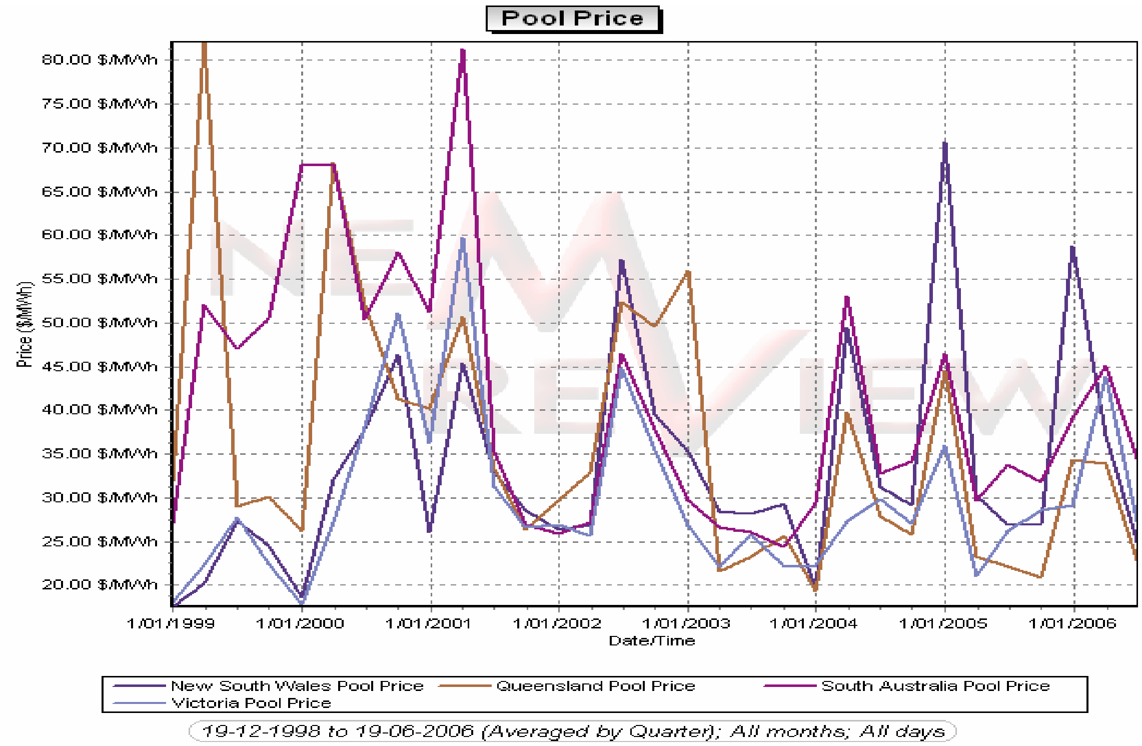
Essentially there is a need for two criteria to be realised for DSR – certainty of the reward and fore-knowledge of when the demand shedding is required so that a timely response is possible without too much impact on the activities of the load shedding enterprise. All of the successful DSR programs initiated overseas depend on these two criteria. The difficulty in the NEM is that firstly there is no certainty that the expected reward will occur if load shedding is provided, and secondly no one in the NEM can predict when the load shedding will be required so that appropriate actions can be taken in anticipation of the timing of the load shedding.

A reduction in central intervention

The fact that NEMMCo instituted reserve trader provisions for the summers of 2004/05 and 2005/06, indicates the failure of this supposition.

Higher prices in the NEM

The following graph shows average pool prices for each quarter since NEM commencement.



Source: NEM Review

Analysis of the average quarterly price in the four regions of the NEM shows that the greatest impact of price modification has been caused by the advent of QNI and competition occurring in South Australia. The advent of the VoLL increase in 2002 would seem to have resulted in increased prices in the biggest market of the NEM – in NSW, with a modest impact on Victorian prices. A review of the AER "market snapshot" long term trends confirms this analysis.

Thus on a volume weighted basis, prices have increased since the increase in VoLL. This was to be expected because it facilitates generators' ability to increase their profitability, and has thus led to a "transfer of wealth from consumers to generators".

A higher VoLL increases risk

There is no publicly available indicator of the risk management costs[14] available to indicate any change between VoLL rising from $5000/MWh to $10,000/MWh. Each retailer and generator assesses this risk in their own way, and has differing tools to manage the risk.

The fact that such a high proportion of the average pool price is a result of the impact of a very few high price events, and that the proportion of the average pool price caused by these events (Bardak noted that this was 28% in 2002 and

[14] The WEPI (wholesale electricity price index was not developed until late in 2003. A comparison of WEPI before and after the 2002 VoLL increase might have provided some indication.

above it is observed that in 2005 this proportion was 25%) would indicate that the risk (and the associated costs) certainly has not fallen.

Intuitively, if the potential for a risk occurring remains the same (this is the case as there is no certainty as to when a price spike might occur) but the severity increases, then the cost of risk management (or insurance) must increase. Information from MEU members would seem to indicate that risk margins have increased, if only as measured by the difference between pool price and firm contract prices being offered.

In addition to these potential outcomes identified by the ACCC and NECA, there have been a number of other worrying trends which have occurred:

- An increase in generation concentration
- An increase in retailer concentration
- An increase in vertical integration between retail and generation

Each of these has been described extensively in the Bardak report.

Summary Points

The above strongly demonstrates that the expected benefits from raising VoLL in 2002 have not been realised. Indeed, the concerns that were flagged at that time - by the ACCC and major energy users – have been realised. Additionally, we have seen a major shift in concentration in generation, retailing and vertical integration between retail and generation. In other words, the competitive drivers in the NEM have been considerably weakened.

This conclusion throws considerable doubt as to the efficacy of using VoLL as a tool to achieve the price stability and reliability required by consumers and intending investors. Indeed, there are a number of negative outcomes which were not identified earlier and would appear to be a direct result of the increase in VoLL. On analysis of the outcomes, it is easy to see why there has been a reduction in competition and a rationalisation of the retail and generation functions. Any increase in risk or exposure would need to be mitigated. Retailers have addressed their risk by physical hedging (i.e. acquisition of generation).

It is difficult for retailers to seek to build new generation and so their approach is to acquire existing (especially base load) generation, although retailers have also increased their in-house holdings of peaking plant as well.

Retail risk is high. One way of managing this risk is by increasing the breadth of the market – geographically and by customer type. Those retailers that cannot manage this diversity stand to be exposed to a limited market, which has an inherently higher risk due to a lack of diversification.

But of greatest concern is the deterrence of new entrants into the NEM.

3.4 Tools used to measure and provide reliability

Australia has a compulsory energy only "gross pool" market. This means that all electricity has to be traded through a central dispatch arrangement and that the only payment to generators is based on the amount of energy they dispatch in a given interval, multiplied by the price of the highest ranked generator dispatched. This approach results in a high volatility of prices for each interval and encourages generators to attempt to encourage high price plant to be dispatched in preference to lower priced plant. Because of the high volatility of pricing and the uncertainty of when these high prices might occur, generators and retailers (and potential new entrants) face very high financial exposure.

In Australia, to overcome the potential shortcomings of the energy only market, the reliability tools used are:-

Reserve plant levels

In a centrally controlled electricity system, reliability is monitored and new plant built to meet the expectations of demand changes. Traditionally, the jurisdictional vertically integrated power companies used as their prime measure for reliability, the amount of reserve plant available to match expected future demands. Initially this was a set figure, but during the 1970s the use of the "Monte Carlo" multiple contingency approach became widespread. NEMMCo still uses this approach to measure the statistical likelihood of there being sufficient plant availability to meet expected demands. NEMMCo tends to use the 10% possibility of exceedance (10% PoE) as the measure of reserve plant availability.

NEMMCo reserve trader

When NEMMCo is convinced that there is a potential shortfall of capacity to meet future needs, it has reserve trader rights to negotiate and pay for (short term) additional capacity to be available when needed.

3.5 Proposed new tools

Appendix 2 suggests that there are a number of basic approaches that might be used to improve the management of reliability

1. Change the settings of USE, VoLL and CPT
2. Introduce new ancillary service of 30 minute reserve
3. Introduce compulsory contracting
4. Introduce a net pool

5. Capacity payments for generators
6. Require a number of generators to be reserved for emergencies

Options 2, 5 and 6 are seen as variations to a similar concept.

The RP considers that options 1 and 2 could be readily incorporated in to the current structure whereas options 4 and 5 are seen a major departures from current arrangements. The RP notes that options 3 and 6 are significant modifications.

These options have all been attempted in other jurisdictions with varying degrees of success. Supporters of the energy only market point to the lack of competition in a capacity market approach, neglecting to recognize the high risk mitigation costs incurred in the energy only market.

3.6 Reliability and inter-regional connection

Appendix 3 of the RP Issues paper, reviews a number of examples of failure to provide service. The appendix points to the fact that inter-regional transmission capability impacts heavily on the provision of service. In particular, the appendix highlights that a regional generation failure might not have resulted in the loss of supply if the interconnectors to other regions had a greater carrying capacity.

Because of this weakness in inter-regional connections, it is appropriate for the RP to examine why this is so. If inter-regional connections were much stronger, then the challenges facing the RP with regard to reliability might not be as pressing – certainly there would be significantly more competition in the market, with regional generators having much less ability to exercise market power than they do.

Although the attention in the RP Issues Paper is being focused on generation adequacy, the Issues Paper does include information relating to network reliability, and which body is responsible for its assessment.

It is recognized that most causes for failure to supply lie within the distribution networks, but it is also recognized that transmission networks generally provide adequate capacity for intra-regional needs. This is not unexpected as each of the regional transmission networks were developed by the various jurisdictional vertically integrated generation and transmission entities. Under the jurisdictional controls the transmission system had to be adequate to deliver the generation supplied by the same entity. Thus intra-regional generation and transmission were developed in concert to ensure that there was certainty of supply at the various bulk load supply points.

Where the transmission system has failed is in the area of **inter-regional** transfer. That this is the case is again not unexpected as each jurisdiction tended to focus its attention on local issues. The single exception is the decision to use Snowy resources to provide back up to the NSW and Victorian markets, but even this is really a hang over from the earlier jurisdictional controls. NSW owns some 58% of the Snowy scheme with Victoria having 29%. This meant that these two states treated their entitlements from Snowy output as part of the portfolios of generation. Notwithstanding this relatively strong connection of NSW and Victoria to Snowy, most inter-regional connection is still very weak.

The following table shows that the strength of interconnection between regions (compared to peak demands) is at best modest, supporting the views made above. These calculations assume that the full capacity of the interconnections will be available to suit the peak demands in each of the regions, and there is sufficient capacity in the adjoining region to provide the full capacity.

Region	Qld	NSW	Vic	SA	Tas
Peak demand MW	8295	13096	8680	2872	1718
Max Interconnection from east	0	0	0	460 + 220*	0
Max Interconnection from west	0	0	288 + 112*	0	0
Max Interconnection from north	0	1050 + 175	1725	0	300
Max Interconnection from south	817 + 180	3200	600	0	0
Interconnection as % of peak demand	12%	34%	31%	24%	17%

Source: NEM Review

* assumes that Murraylink operates at full capacity which due to constraints in SA and Victoria it cannot at critical times.

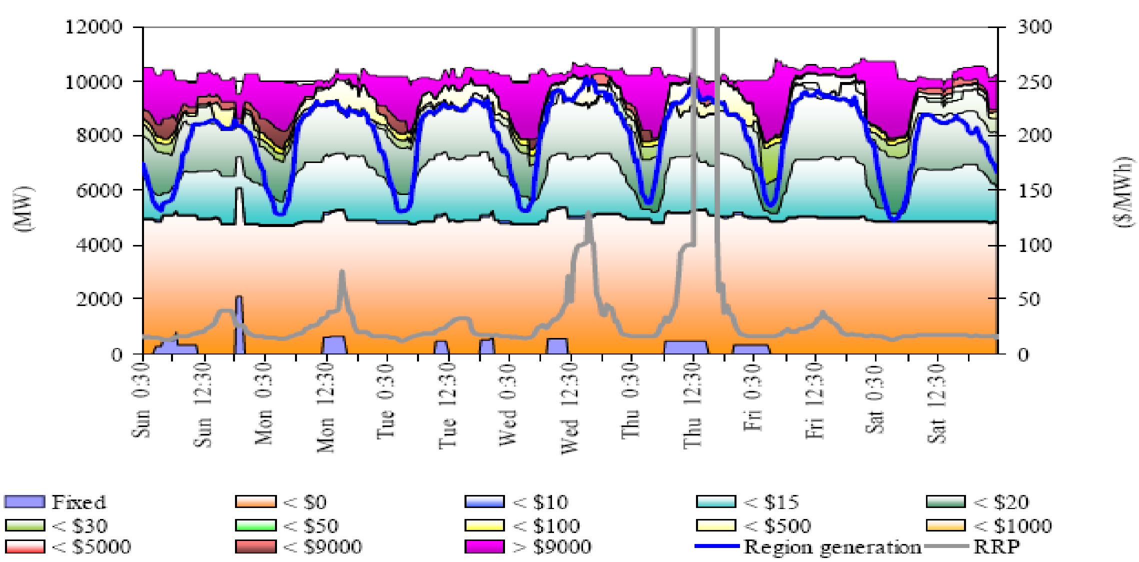
In section 2.6 above, it is clearly stated that the NEM is a series of interconnected regions, rather than a national market. From our perspective, the RP should not approach this review as if there is a national market until there is significant strengthening of the inter-regional connections.

With this in mind the RP should consider recommending to the AEMC (and the MCE) that the Regulatory Test (RT) be examined to identify if it prevents strengthening interconnection between regions. Currently the RT excludes the benefits to consumers that would come from reducing the power of regional generators to set regional prices when interconnection between regions is constrained. If this benefit is added to the RT then there would be much more opportunity by the transmission companies to get approval for strengthening interconnection.

Stronger interconnection will allow greater generator competition, and allow better use of existing generators to supply into markets where there are non-coincident high demands. For example demand peaks in NSW and Victoria tend to be non-coincident. With a high demand in NSW, stronger interconnection between the two regions would allow a greater ability for Victorian generators to provide into the NSW market. Currently, once the interconnection between Victoria and NSW (via Snowy) is constrained, the two regional prices uncouple with NSW price tending to soar, despite there being surplus generation in Victoria willing and available to be dispatched.

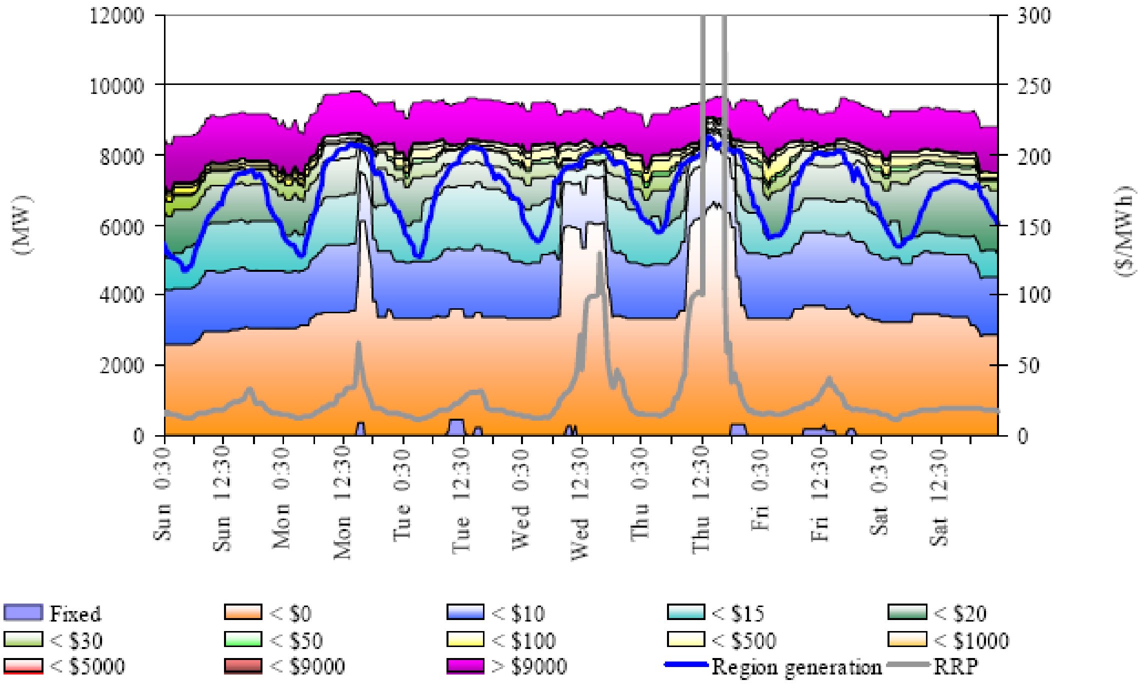
The following series of charts shows this feature. On 2 February 2006, the interconnection between Snowy and NSW was constrained. The NSW regional price spiked to over $8000/MEh for 2½ hours in mid afternoon. Capacity was withdrawn at lower prices at the time of the spike, and rebid at higher prices.

Figure 52: New South Wales closing bid prices, dispatched generation and spot price



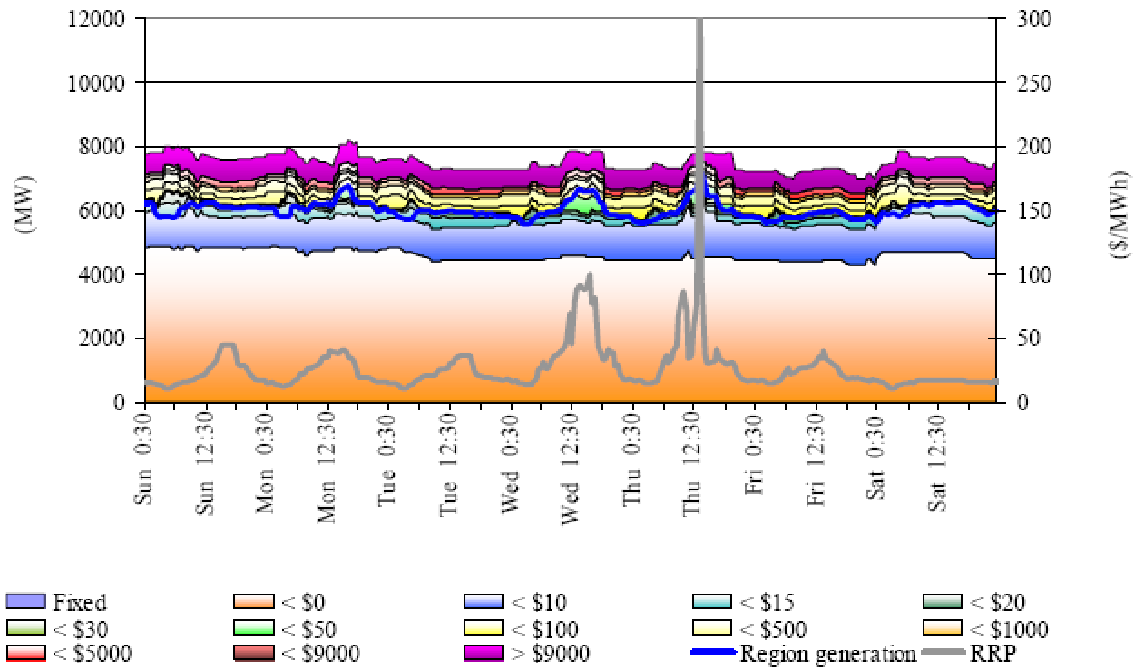
Queensland prices also rose, tracking the NSW prices, but not to the same extent.

Figure 51: Queensland closing bid prices, dispatched generation and spot price



In Victoria prices rose to just under $400/MWh for one half hour

Figure 53: Victoria closing bid prices, dispatched generation and spot price



South Australian prices matched Victoria and in Tasmania they did not rise at all.

Figure 54: South Australia closing bid prices, dispatched generation and spot price

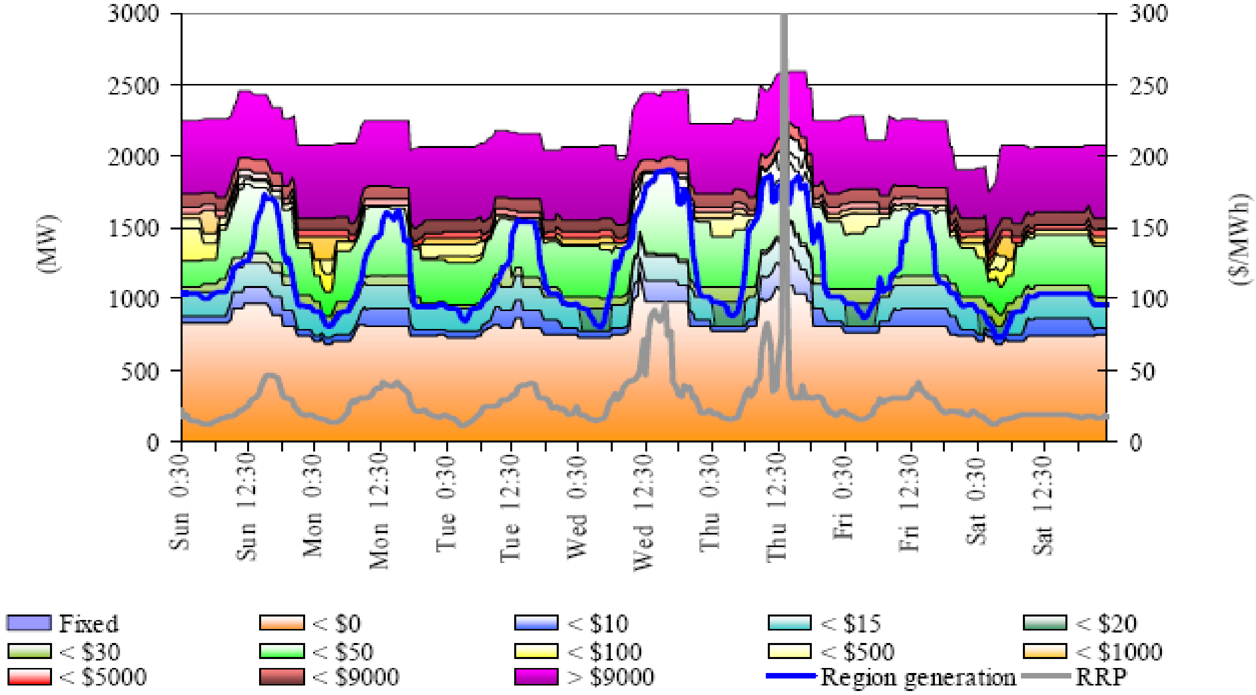
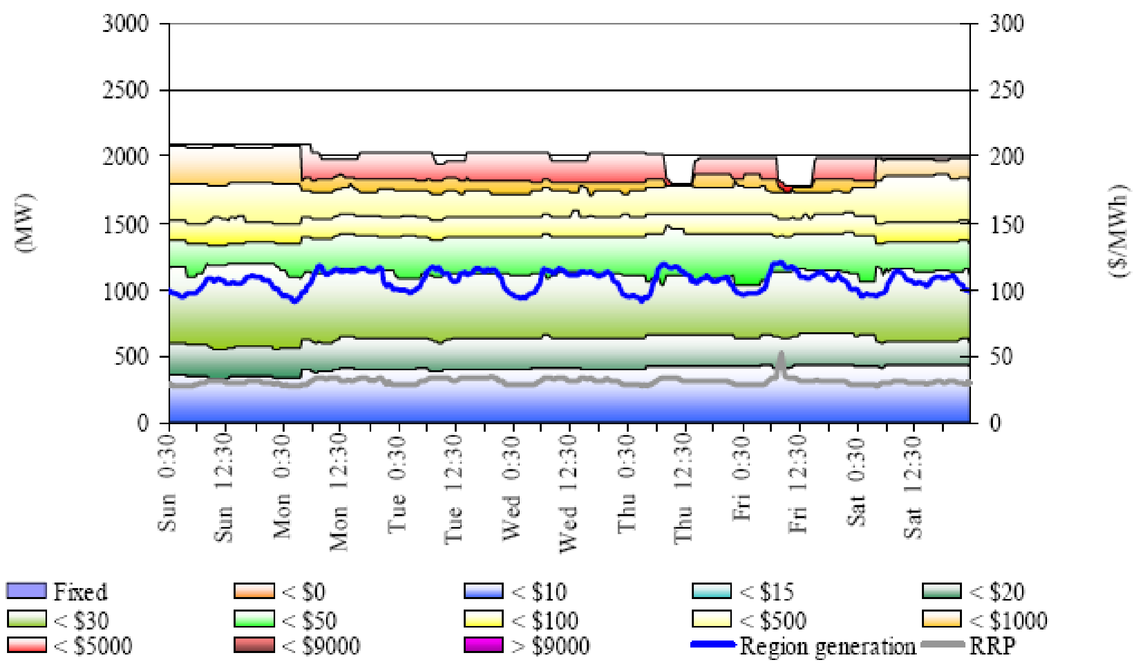


Figure 55: Tasmania closing bid prices, dispatched generation and spot price



As can be seen from the various prices and capacities offered in the other states (sourced from AER weekly report 29 Jan- 4 Feb), there was over 1500 MW of generation available in Queensland, over 2000 MW of generation available in the SA-Vic region and some 1000 MW available in Tasmania.

Stronger interconnection would have prevented the NSW and Qld spikes occurring, saving some $400 million from the NEM costs. To put this into context, QNI reportedly cost less than $400 million to build[15]. Certainly stronger interconnection increases the ability of generation in one region being used to support a forecast shortage of generation in another region, with the overall benefit being the increase in reliability.

[15] Robert R Booth "An assessment of the first six months of operation of the QNI Interconnection" (see www.bardak.com.au)

4. The Overseas experiences

The RP Issues Paper has limited detail as to the experiences of electricity markets in overseas jurisdictions. As a result MEU sought access to a series of reports on generation adequacy developed by EEE Ltd in conjunction with Bidwell Associates, Inc (Henney and Bidwell). They provided three reports, and a summary report which is attached as appendix 1 to this submission. These reports and summary are confidential and are not available for public disclosure.

1. A review of practices and proposals in various jurisdictions (referred to as euro 1)
2. The behaviour of energy-only markets: Will they ensure generation adequacy? (referred to as euro 2)
3. The RO method of assuring adequacy (referred to as euro 3)

These reports were commissioned by others but have been made available under strict conditions of confidentiality.

Henney and Bidwell analyze the various market structures used in electricity supplies, with specific attention to reliability of supply. Their analysis addresses both the physical needs, the economics of the options and the incentives needed to secure investment in new generation. They identify the advantages and disadvantages of the options available to ensure adequate reserves.

They particularly note that an energy only market (such as used in Australia) is essentially unstable; subject to violent swings in pricing and exercise of generator market power, and that these provide an overall disincentive for the timely investment in new generation needed to ensure adequate reserves.

The following comments on the different market approaches rely heavily on the work by Henney and Bidwell.

4.1 Important observations from the O/S reports

Henney and Bidwell point to the range of views as to how to secure generation adequacy. They point to the

- UK and Australian markets where the energy only approach is used but highlight that in both cases, there are quasi backstops in place
- Nordic markets where the debate continues, although in Holland, the system operator is required to buy short term (< 1year) contracts to ensure there will be sufficient power in the next winter
- Spain, Ireland, Argentina, New Zealand, Singapore and the US FERC all consider a capacity payment is essential to ensure reliability.

The interpreting note of the European Commission to its directive for ensuring adequacy of electricity supplies states that generation adequacy can be achieved by:-

1. The transmission system operator can buy standby for reserve purposes

2. Reward generators with capacity payments for being available

3. Impose a capacity obligation upon suppliers requiring them to buy capacity to meet their peak demand plus a margin

4. Capacity subscriptions. Each consumer has to buy an electronic fuse which potentially limits its consumption, and signals the price at which the consumer is still willing to pay for his or her electricity. These fuses put a price on reliable supplies for individual consumers. The generators sell the fuses and can do so only if they are covered by available capacity. The transmission system operator can activate the fuses in times of scarcity

5. Reliability options contracts whereby the transmission system operator is obliged to buy call options from the generators. When the options are called, the generators have to pay the difference between the market and the strike price. If they do not cover the options with capacity, they lose when the options are called. During periods of scarcity they do not have an incentive to withhold capacity from the market[16]

It would appear that the European Commission effectively supports capacity payments in some form.

Henney and Bidwell sum up the various experiences in the different jurisdictions. Of concern is the fact that many of the issues MEU members have identified as being flaws in the NEM, have been widely reported as issues in overseas jurisdictions, yet there has been little attempt made in Australia to recognize that the problems we see here have been addressed overseas. Henney and Bidwell state that:-

- Questions can be asked about those jurisdictions which are relying on an energy-only market. Namely the market in Britain has yet to be tested, while the market in Australia relies on the state (*i.e.* publicly) owned generators in Queensland and New South Wales creating price spikes, but not overdoing them. Furthermore, if there were any prospect of a shortage in Queensland and New South Wales, the governments would doubtless lean on or instruct the generators to build [*Note: The building of Milmerran PS in Queensland could well be seen in this light!*]. The test will come in Victoria and South Australia, where during the first business cycle the development of peaking plant was both late and excessive. Will the next one be late and inadequate? Although authorities in both markets have loudly proclaimed that

[16] This fifth way, Reliability Options, can provide a method for implementing the second way, capacity payments for being available.

they are energy-only markets, both have introduced a non-market fix. Under pressure from the regulator National Grid in Britain has contracted for the last three winters "supplemental reserves" for the winter peak period, while the Australian market has a "reserve trader" arrangement which can procure either generation or load response to cover a summer peak [*as was seen for the last two summers!]*.

- The administered capacity adders used in the Pool in England & Wales, in Argentina, and in Spain were effective both in keeping older plant available and in supporting the development of new plant. But the adder in the Pool was manipulable.

- The Nordic countries require their transmission system operators to contract forward capacity, but these arrangements are not regarded as a long-term solution. A Nordel working group has proposed developing financial contracts for hedging peak prices which will occur when energy is short, and believes (but did not identify) that demand-side response could increase by up to 12GW. But the effectiveness of the first measure in promoting the development of peaking plant is questionable. The second measure may to a significant degree be feasible because of the very high proportion of power supplied to energy-intensive industries in Norway, Sweden and Finland (*viz* smelting, chemicals and pulp and paper). The Netherlands is proposing a similar approach of requiring TenneT to contract forward, and similar qualifications apply which are discussed below.

- The New Zealand government has sponsored the development of a dry year reserve plant, and required the Electricity Commission to operate a dry year reserve scheme. The approach of developing new dry year reserve plant which is ring-fenced from the market except when the price rises above NZ$200/MWh is flawed first because it implies that new plant will sit by idly for most of the time (*i.e.* during non excessively dry years) when it might be economic to run it. In practice the ring fence would probably break down. Second, the proposal that an authority would contract the "peaking" plant would ensure the market would not invest in such plant, and could undermine and distort general investment incentives leading to an electricity system that is not dynamically efficient[17]. A consultant has just prepared a report advocating a form of option which are also a price cap, and appears to prefer that generators sell them in a centralised auction run by the Electricity Commission.

- The Energy Market Authority in Singapore is proposing to introduce a "Capacity Assurance Scheme" which allows it to direct the Energy Market Company to invite offers for a contract to make up any forecast deficit.

[17] Dynamic efficiency in the context of an electricity generating system is the property of providing price signals to investors such that over time investors choose to build the types of generating plants, and the amounts of generating plants, that minimise the total cost of generating the desired amount of electricity at the desired level of reliability. As we will discuss below, any form of market intervention must consider how it will affect dynamic efficiency. The absence of dynamic efficiency can lead to an unnecessarily expensive, inefficient mix of power plant types.

- The North-eastern markets of New York, the PJM, and New England all began by introducing a capacity market that was an evolution of the previous obligations on the utilities in the power pools. Namely each utility had to either own or contract sufficient capacity to meet the forecast of maximum demand of its native load plus a planning margin of 18-20% for the forthcoming peak period. When the power pools became independent system operators that operated markets, the obligation was altered to requiring retailers (called load serving entities in the US) to contract for sufficient "unforced capacity" (*i.e.* firm capacity allowing for outages) to meet their forecast peak load plus a margin either by bilateral contracts or by buying capacity tickets at an auction. *The approach is decentralised*. Since retailers can win and lose consumers and smaller ones do not have much credit strength:-

  * It is necessary to run short-term auctions to allow retailers to adjust their capacity positions as they win and lose consumers.

  * It is not possible to require them to contract for much capacity over a significant period. The maximum period of capacity strips offered at auctions is a year.

4.2 Does an Energy Only Market provide adequate signals for reserves?

Henney and Bidwell devote their second paper ('The behaviour of energy-only markets: Will they ensure generation adequacy") to analyzing by observation and from an economics viewpoint, whether the energy only market approach will result in adequate generation reserves.

They point to the essential characteristics of an electricity market which must be met[18]:-

- Electricity cannot be stored so that the amount being generated and consumed must be equal. This is a major cause of the next two characteristics

- In the short term in most systems both demand and supply are very inelastic when the system is tight and consequently spot prices tend to spike in thermal systems and can remain high for long periods in hydro systems[19]

- Market power is a pervasive problem when supply and demand elasticities are both very inelastic. Indeed in order to recover their capital costs generators may have to exercise market power

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[18] Henney and Bidwell Euro 2 'The behaviour of energy-only markets: Will they ensure generation adequacy" page 5

[19] The use of market power can prolong the price spikes. In California, some price spikes lasted for several months with devastating effects on the economies of the western United States.

- In most markets there is currently no economic way for the majority of consumers to express their preferences for the level of reliability they want, which inhibits a market response to reliability

- Revenues from energy and ancillary services may not be remunerative at the level of reliability that is desired

- Investors face an asymmetric risk profile. Building more than the socially optimal (defined below) amount of generation leads to prices that are not remunerative while having less than the optimal amount of generation is highly remunerative[20]. Exhibit 3, below, illustrates the asymmetric risk profile

- Risk aversion may limit the timely provision of new plant, especially when there is non-trivial political and regulatory risk, and lead to investment cycles. Indeed several markets have already gone through boom and bust cycles

- There are significant economic externalities as well as public goods aspects in the consumption and production of electricity reliability which must be accommodated (internalised) by proper market design

From this basis Henney and Bidwell analyse two forms of energy only markets which are firstly a simplification of the idealized competitive energy only market and secondly one based on the first but assuming consumers see their usage in real time, and by allowing for scarcity pricing (the VoLL model). They then examine whether the drivers for investment in new generation that come from the energy only market will deliver the required outcome.

In this second report Henney and Bidwell conclude that some intervention is required in an "energy-only market" by way of:-

- "Obliging either the TSO or consumers/retailers to purchase more capacity than they need to meet the forecast load through capacity markets, *i.e.* to meet a reliability target

- Requiring the TSO to buy a high level of short-term operating reserves

- Requiring the TSO to contract forward for high levels of reserve generation and pass the costs on to consumers through uplift charges

[20] As they explain below, depending on the market structure, it is possible that competitive prices will not be remunerative even at the optimal level of generation.

- Providing the remuneration to generators by having them sell call options on electricity output equal to the amount of output plus reserves that are thought to be necessary to maintain adequacy (the RO approach), which we describe in our final report

Alternatively an administered capacity adder of some type or a capacity market … will be required. To quote a recent paper by Fabien Roques, David Newbery, and William Nuttall[21]:

> "Ultimately, the choice between a well working energy-only system and a market supplemented by capacity payments or obligations is a policy choice as regard to the level of volatility that policy makers are willing to see in the market. One could indeed consider the introduction of capacity payments as a proactive measure in the form of a mandatory hedge or insurance that will assure that prices stay within a socially acceptable range, which indeed bears a cost…make such an argument to defend the requirement of a capacity obligation in FERC's SMD, by saying that the volatility of energy-only markets has a socially and politically unacceptable cost. Thus, while electricity markets may be delivering adequate levels of investment, price spikes are testing government commitment to allow markets to sort things out."

MEU would concur with the view of Roques, Newberry and Nuttall, in that the degree of volatility experienced in the Australian electricity is socially an unacceptable cost as noted in section 2 above.

The UK has a system similar to that used in the NEM, i.e. an energy only market. There was considerable dissatisfaction with the original market design and in 2001 NETA[22] was implemented. Part of the introduction of NETA was a disaggregation of generation, with the HHI[23] falling significantly. The direct result of this disaggregation was a major fall in the electricity spot price.

Interestingly before NETA, there was a capacity payment approach incorporated in the UK system.

Henney and Bidwell observe:-

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[21] Roques, Fabien A., Newbery, David M., William J. Nuttall, "Investment Incentives in the British Electricity Market: from the Pool to NETA," Berlin, Germany, 9 October 2004.

[22] Henney notes that although formally NETA does not have a capacity arrangement, the National Grid Company would want the balancing mechanism to encourage over-contracting at times of peak demand. To this end it promoted a proposed modification P136 which sought to change the system-buy price [and system sell-price] to a marginal basis. Note that whereas the system averages ~800MW long over the whole year, the mean system length notably declines to ~0MW for the 80 winter peak half-hours; and on two of the three highest demand half-hours during winter 2002/3, the system ended >1000MW short.

[23] Herfindahl-Hirschman Index – and indication of market concentration. The higher the index, the more concentrated the market

"The Pool of England & Wales, which operated from 1990 until the end of March 2001, incorporated a capacity payment which became significant during periods of high load or scarce generation. The capacity payment was equal to the value of lost load (VOLL) multiplied by the probability of losing load (LOLP). Part of the capacity payment was an unscheduled "availability payment" (also based on LOLP * VOLL), which was paid to plants that were available to run but did not run, and remunerated plants that ran very occasionally to ensure that there was sufficient generation capacity to meet very occasional very high demands. VOLL was set at £2000/MWh[24] in 1990 and subsequently indexed by the Consumer Price Index, reaching £2930/MWh in 2000. Together, these payments were theoretically constructed to pay generators an amount equal to the carrying cost of a new peaker when the system had the desired amount of reserves, so that the market would have a stable equilibrium at the point where reliability was optimal, and new investment would be remunerative whenever the system needed additional reserves. The capacity payment (sic) in the last years of the Pool were:-

	94/95	95/96	96/97	97/98	98/99	99/00	00/01
LOLP (£/kW p.a.)	32	44	32	8	9	27	45
Approximate total capacity payments (£m)	1441	2419	1743	459	537	1512	2441
of which availability unscheduled payments (£m)	267	335	283	87	104	403	439

It is generally agreed that as the LOLP calculation incorporated an exponential function, and when the market was tight a little withdrawal would increase VOLL significantly, in consequence the capacity payment was readily manipulable and it attracted much adverse comment."[25]

Henney points out that after NETA, there was disaggregation of generation, and those generators which were not vertically integrated (some 40% of capacity) became "financially distressed", with owners walking away from their investments leaving the banks owning the assets. This resulted in no new investment, which compared to investment of 25 GW of new generation between 1990 and NETA start in 2001.

"In consequence by 2001, although demand on the system increased by 4GW, plant available (net of decommissioning of 12GW) increased by 9GW with a further 5GW mothballed which could be recalled at short notice. Britain was not short of plant."[26]

[24] The VOLL was in principle originally derived to meet the traditional planning standards that supply will not be discontinued in more than nine years in any 100 years, and that voltage or frequency will not be reduced below operational limits in more than one year in any 30 years.
[25] Henney and Bidwell Euro 1 A REVIEW OF PRACTICES AND PROPOSALS IN VARIOUS JURISDICTIONS page 7
[26] Ibid page 8

This is in contrast to the consistent need for National Grid to contract capacity on an ad hoc basis since NETA in order to ensure adequate reserves. It would seem that incorporating capacity payments for new generation does encourage new generation, but relying on energy only pricing signals might lead to a shortage.

In summary, it would seem that disaggregation of the UK generation market led to a spot price reduction. Combining this with the loss of capacity payments resulted in a disincentive for investment in new generation. National Grid has subsequently had to use its "reserve trader" role to ensure generation adequacy.

The parallel for Australia is that if there were to be disaggregation of the NSW and Queensland generation companies, this would result in greater competition and a general reduction on spot pricing. Extending the parallels, we could see that reliance on energy only signals in Australia might not result in sufficient new generation being constructed.

Henney offers this view of the Australian market based on the experiences observed in the UK:-

> *"There has been no substantive analysis in Australia of the long term viability of an energy-only market. Part of the reason may be that in Queensland and New South Wales the question of whether a commercially driven energy-only market will be viable has thus far not been a relevant question. The respective state governments own the major generation companies and if there are signs of a shortage they will encourage or allow the companies to build new plant. Part of the reason may be that the generators in New South Wales and Queensland can create price spikes which in an ad-hoc manner remunerate plant. And because the plant is government owned, they will not push the spike income too far beyond their requirement for an acceptable return. Yet the need for new plant is currently greater in Victoria and South Australia where generator market power is currently less than in Queensland and New South Wales because ownership is more fragmented, and the cost of new plant in South Australia appears to be higher than in the other states. The behaviour of the market raises the question whether reliance largely on publicly owned generators exercising market power to create spikes (but not too many of them) in a quasi-random manner is a satisfactory basis for a market? In particular will they provide a satisfactory basis for remunerating commercially based peaking generators in Victoria and South Australia?"*[27]

4.4 The Nordic approach (Demark, Finland, Norway, Sweden)

Denmark has short and long term powers to provide reserve capacity – short term powers cover contracting regulating reserves, and the long term powers

[27] Ibid page 12

allows the operator to retain a certain amount of capacity as a reserve. These long term provisions have not been required.

The Finland system operator has ownership and contracts for back up reserves – the costs of which are effectively an ancillary service.

Norway runs an options "capacity market" for the winter season. This is not an approach to encourage new capacity but more one of ensuring adequate capcity for the balancing market

There has been pressure on Statnett (Norway's operator) to have responsibility for long term adequacy. This has been achieved by it contracting long term bilateral contacts for new generating capacity. This has resulted in infrastructure being built to allow gas turbines to be rented or purchased at the time should there be a shortage envisaged.

Sweden's parliament passed a Capacity Reserves Act to empower the system operator to contract for peaking generation. This plant is sourced using annual auctions for supply either on a availability price (fast start) or an availability price plus a "warm up price" (slow start). This plant is only to be used if there is insufficient generation offered and for transmission constraints. So far this plant has not been required to run.

The Council of Nordic Ministers has concluded that regardless of the liberalization of the electricity market, ultimately governments must ensure whatever market system is used, responsibility for supply lies with the state and their appointed system operators. These system operators propose introducing new "Contracts for peak Capability" for hedging against price spikes.

Overall these powers are still in their infancy but new generation is being encouraged by the relaxation of development constraints and Finland building a new nuclear plant. These efforts will ensure adequate supply/demand balance in the Nordic market for a decade.

4.5 Netherlands

A recent report from the Dutch Ministry of Economic Affairs points to a central question:-

> "In what way can it be ensured, under market conditions, that demand for and supply of electricity can remain in balance in the coming decades in such a way that security of supply for Dutch consumers is safeguarded, in so far as these consumers are not able to do themselves?"

The report concludes there are five ways to secure generation adequacy

1. The system operator has a reserve of its own
2. Generators can be paid for availability

3. large consumers and retailers have to contract for a fixed amount of reserve capacity above contracted demand
4. The system operator could periodically contract capacity for a fixed period in the future
5. There could be centrally contracted reliability as a "call option".

The government allows the system operator to contract reserve capacity by means of an auction. If the market cannot meet demand, the reserve capacity is deployed. An independent review by the Brattle Group comments that this approach serves the Dutch market and is seen as cost effective. The cost of this reserve is paid for as an ancillary service, but to date has not been called for.

4.6 Countries where capacity payments are made

Capacity payment regimes apply in Argentina, Spain, New Zealand, Singapore and the US.

The Argentinean negative experiences relate mostly to the base price set for capacity availability, although when it was set too high, it certainly encouraged new generation, but recent experiences with low capacity prices have led to government investment rather than market investment.

The Spanish market operates a capacity payment based on a fixed proportion of actual availability coupled with the average of the previous five years availability. Henney comments:-

> *"Like the Argentinean approach, the scheme is simple and very effective in keeping older units open, and has contributed to supporting the development of new capacity. But it is open to many criticisms. In 2004 the government asked an independent consultant, Professor Ignacio Perez-Arriaga to write a White Paper proposing reform the electricity supply industry, which was published in July 2005[28]. He criticised the capacity payment as "a costly mechanism to generate an adequate supply of generation that guarantees very little". In particular "it does not provide an incentive to generators to make a special effort to be available and producing electricity when there is a real need for it, and it does not guarantee there will be a reasonable volume of installed capacity to meet the demand at all times". The White Paper noted that in view of the concentrated ownership in Spain it would not be desirable to run an auction … to settle the capacity payment for all the generators in the system, but proposed an administered variant. Namely generators would receive an administratively calculated capacity payment price in exchange*

[28] An English summary is provided in "Redesigning competitive electricity markets: The Case of Spain", Ignacio Perez-Arriaga, Instituto de Investigacion Tecnologica (IIT), Comillas University, Madrid, ignacio@iit.upcomillas.es.

> *for … a strike price that would be set administratively, and when the Pool price increased above it generators would repay the income received above the strike price and, in addition, might pay a penalty if not available to generate. If there were a risk of insufficient capacity being developed, the regulator would run an auction for new capacity to be available in 3 years time. The generators would bid for a 5 year subsidy that would be paid in addition to the capacity payment. Every generator installed before that point in time would have the right to receive this payment until it is five years old".*[29]

In New Zealand there is an approach which will contract reserves for "dry years". This plant will be "ring fenced" but can be bid into the market at the election of the operator. New Zealand also faces an environmental issue of its own making. It has limited reserves of natural gas which it proposes for power generation, but has ample reserves of coal on the South Island which it sells to Asia for power plants, but is reluctant to burn for local power generation. Licences for new hydro power are also difficult to obtain. New Zealand has not determined yet how the incentive program will work in detail, and large generators have commissioned CRA to provide a view. Understandably considering the sponsors of the report, this report is not sanguine about how the New Zealand approach might be implemented.

Singapore has a massive surplus of capacity but "as a precaution" it is proposing to introduce a "capacity assurance scheme". In the event of a future shortfall in reserve capacity, contracts will be called for capacity on a two way CfD for a period of 5 years.

4.7 The US markets

The US market has been characterized as a pendulum swinging from the *laissez faire* before the California crisis to one of restricting market power of generators.

FERC has observed that a spot market does not provide adequate signals for initiating new investment in generation. In particular, it is concerned that the spot market price signals will require action within a time frame too short to match the long time required to build new generation plant. FERC concludes that demand and supply (both generation and transmission) respond too slowly to the spot market price signals.

Henney quotes an independent study by Prof P Joskow of MIT where Joskow summarizes his empirical studies of the New England electricity market:-

> "The conclusion that I draw from this analysis is that the spot hourly energy and ancillary services markets in New England have not provided scarcity rents that are nearly sufficient to make it profitable for reserve

[29] Op cit page 21

> "peaking" capacity to enter the market through new investment or to continue operating consistent with conventional levels of reliability. These results are consistent with those contained in related studies done for PJM and the New York ISO…these calculations reinforce the conclusions in the FERC SMD that spot energy and operating reserve markets alone are unlikely to provide adequate incentives to bring forth enough generating capacity to maintain traditional reliability levels."[30]

This clearly supports the FERC view, and would certainly seem to confirm the experience in Australia.

The New York system requires 18% of expected demand provided as a reserve. Retailers are required to provide these capacity reserves by directly (self or bilateral), seasonally based auctions or monthly auctions. When reserves exceed the benchmark auction prices can be very low, but much higher when reserves are tight, creating a degree of volatility – this volatility has resulted in short term contracts, where longer term contracts are preferable for building new capacity. This leads in turn to a concern for lead times to build new plant and a "boom and bust" result and an ability for generators to exercise market power. Henney comments[31]:-.

> *"It is apparent that the problem of price volatility in short-term capacity markets is caused by the fact that both the demand curve and the supply curve are very inelastic … It follows that a solution could be achieved by making either curve less inelastic. The choice here is between replacing the demand curve with an administratively determined price/quantity schedule or changing the form of the capacity product and the type of auction so that the market supply curve becomes a less inelastic market supply curve that can interact with a vertical demand curve in a way that produces price stability and predictable levels of reliability. The first approach represents an administered non-market solution. [The Reliability Option] makes the supply curve more elastic, and represents a market solution, albeit one that still requires an administratively determined vertical demand curve set at the point that will produce the optimal reliability level."*

PJM required its retailers to meet its share of the installed capacity reserve requirement. This is achieved by retailers contracting with generators for unforced capability. To permit this program to work PJM runs auctions for varying times and to allow long or short positions. Auctions are for day ahead, month strips and multi-month strips up to 12 months and for the summer months. Henney comments that this approach results in a volatile market which does not provide adequate market signals

[30] Op cit page 28
[31] Op cit, page 36

In 2006 FERC approved a new approach for PJM – the Reliability Pricing Model. This requires retailers buying forward over a 4 year planning period. Whilst the principle is supposed to overcome the lead time for building new plant, Henney comments that the approach is flawed[32]:-

> *"For a start it requires retailers to buy forward, which only the financially strongest (e.g. the incumbent utilities acting as a provider of last resort) would be able to do. And even then they may have an incentive to assess their load conservatively. Next it continues to use unforced capacity as the product. Consequently generators receive a payment for steel in the ground with no particular obligation to perform when most needed by the system. Next, RPM has been designed to address the need for load-following and thirty-minute quick-start capabilities in the PJM system because PJM is concerned that it does not have a sufficient number of quick-start and flexible generating units. But some of the CCGT units that used to be flexible have become increasingly inflexible, which is in part a consequence of the flawed design of the capacity product that does not remunerate flexibility adequately. Namely by paying the same price to capacity at all times PJM has provided a price signal that emphasizes average reliability. Since there is no additional benefit for being flexible or quick to respond during a time of system stress, generators have rationally, in plant design, traded off the ability to be flexible for a slightly lower heat rate, which will make the plant more profitable in the energy markets without reducing profitability in the capacity market. Predictably, PJM now finds itself short of flexible units"..*

In New England, there was an attempt to follow the FERC guidelines but NE identified that they did not have the resources implement a locational capacity system. This is particularly of concern in that although there is adequate capacity the demand for power has outstripped the transmission system to deliver in certain areas. [To a degree this is similar to the Australian problem as noted in section 3.6 above!] To overcome this problem the independent system operator – New England (ISO-NE) provides financial support to local generation with reliability must-run agreements, which provide a cost of service based service using a capacity charge and variable costs. FERC does not accept this approach and wanted locational capacity (LICAP) payments. There was universal opposition to the FERC approach and after much debate FERC finally approved a proposal by ISO-NE which is called a "Forward Capacity Market" based on an article "Reliability Options: A market oriented approach to long term adequacy" published by Miles Bidwell. This approach is detailed by FERC[33] and has two fundamental structural elements:-

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[32] Op cit page 40

[33] Federal Energy Regulatory Commission, June 16, 2006 re Devon Power LLC dockets # ER03-563-030 and ER03-563-055

1) a capacity instrument like a Reliability Option (RO) has both physical and financial characteristics designed to ensure long-term system adequacy and increased short-term system reliability through a series of plant availability reward and penalty mechanisms that operate when the system needs plants to be operating; and

2) a yearly auction that is specifically designed to promote vigorous competition among generators and potential new entrants and which will allow generators to enjoy a stable income stream from selling the capacity instrument to the ISO at a price of capacity that averages about the minimum incremental cost of new entry.

A key feature if the yearly auction is that it permits contracts for up to four years ahead, essentially allowing new entrants time to build new plant to match the contracts.

4.8 MEU conclusions from the overseas review

All approaches used in the overseas jurisdictions examined to date show disadvantages of one kind or another:-

1. Volatility (whether in an energy only market or a capacity market) is seen as not only not providing sufficient or timely signals for new generation investment, but adding considerably to the costs incurred by consumers.
2. The degree of market concentration has an impact on new investment, either when it is too concentrated resulting in high prices in both energy and capacity markets or when it is competitive, pricing signals tend to be short and therefore do not provide adequate time to build new generation.
3. Increasing market concentration is an expected outcome of a highly volatile price for electricity either as in an energy only or capacity market; this is to be expected as it is necessary to provide a physical hedge against the risks endemic from a highly price volatile market.
4. An energy only market has to be supported by a reserve trader mechanism. In their second paper (euro 2) Henney and Bidwell show by observation and by economic analysis that an energy only market is not able to provide certainty of adequate generation reserves in the long term.

   The observations of the NEM we have undertaken also support the Henney/Bidwell contentions. The NEM has been operating for eight years and for 3 years before that as NEM1 (with NSW and Victoria). During this period, there have been three interventions (one under VPX in 1998, and two under NEMMCo in 2004 and 2005). The fact that under the original Code, the expected need for a reserve trader was that the need would only last for five years (i.e. to July 2004), and that the market would support itself has been clearly demonstrated as very optimistic.

That the reserve trader is still required after eight years indicates that Henney/Bidwell are correct and that the energy only market cannot provide adequate signals for new investment

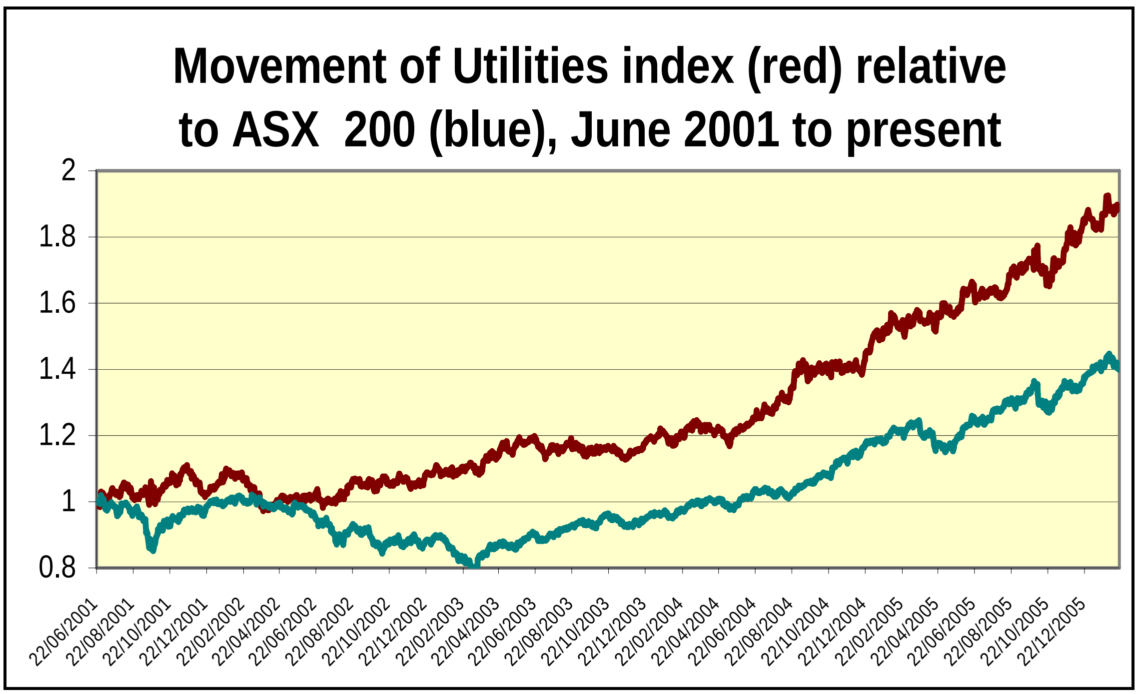
5. Governments cannot abrogate their responsibility in ensuring adequate reserves and relying exclusively on market mechanisms, as the result will be failure of supply of an essential service, to which political ramifications will follow.
6. Capacity payment mechanisms show distinct disadvantages, whether these are based on physical supply or secured against financial instruments. They allow exhibition of generator market power and to bid high prices, volatility tends to drive purchasers of reserve capacity into short term buying, there is no certainty that capacity contracted will be available, and that capacity made available might not be located in the place needed.
7. Build times for new generation requires a long lead time and neither short term capacity contracting nor energy only markets provide adequate signaling in time for the requirement of construction times for the new plant.
8. The Reliability Options proposed by Bidwell and its companion approach Forward Capacity Market proposed by ISO-NE and approved by FERC might well provide an option which meets the needs for investment but avoids the pitfalls of the energy only approach and the current approaches to capacity mechanisms.

5. Responses to questions raised in the Issues Paper

The foregoing sections sought to highlight how consumers see the NEM and in particular the implications of the various proposals made to maintain or increase reliability of supply of electricity to consumers. Specifically, MEU drew attention to the National Electricity Law objective which states:-

> "The national electricity market objective is to promote efficient investment in, and efficient use of, electricity services **for the long-term interests of consumers of electricity** with respect to price, quality, reliability and security of supply of electricity and the reliability, safety and security of the national electricity system." *(emphasis added)*

Consumers agree that continuing investment is needed in the NEM. In this regard the RP should be aware that the listed Utilities sector is significantly outperforming the market itself, (as shown in the following graph) suggesting that the sector is profitable. Thus care should be taken when assessing the need for providing further encouragement of investment in the NEM through provision of excessive rewards.



Source: CommSec

In the Issues Paper the RP notes:-

> "The Panel considers that an assessment of any need for, and changes or improvements to, the current reliability settings, should be undertaken on a basis consistent with the NEM objective. In this

context, the Panel is of the view that an effective approach to reliability should achieve the following:

1. It should deliver a level of supply reliability that meets the broad expectations of consumers;
2. It should maximise efficiency in investment and use of electricity;
3. It should provide clarity in respect of the reliability standard and settings and certainty in respect of how the relevant mechanisms operate; and
4. In the event that changes to the reliability settings prove desirable, there should be minimal disruption to the market. "

The MEU agrees in general with these broad observations.

4.1 Questions to stakeholders:

The responses to the following questions are intended to be short, but they are based on the analyses covered in the earlier sections of this submission.

Section 1.1.3

1. Is there now, or is there likely to be in the future, a problem with supply reliability in the NEM?

Yes. As discussed above there has been a lack of new investment in base and intermediate generation, there has been little investment approved for increasing interconnection between regions, the volatility of the NEM disincentivises new generation, the degree of market power exhibited by incumbent generators deters new investment, and the energy only market itself does not incentivise base or intermediate load generation

2. If yes, is there now, or is there likely to be in the future, a problem with the reliability settings?

The reliability setting of USE (0.002%) is the basis for assessing the degree of capacity reserve assessed as being needed. This setting then determines when NEMMCo is permitted to use its reserve trader powers. Based on the analysis provided in table 4 above, it would appear that the USE setting of 0.002% is one of the highest used in a number of other jurisdictions. Setting USE at a lower figure would result in a higher reserve plant margin than NEMMCo currently assesses for the NEM regions.

From a consumer viewpoint, as most of the unreliability and unserved energy in the NEM occurs in the distribution network, it would appear that increasing reserves in generation might not achieve the results sought.

Equally, as many consumers do have reasonably reliable supplies in the distribution network it would be unnecessary and inappropriate to increase the USE level above the current levels.

3. **If yes, is it serious enough to cause material dislocation to suppliers and users in the future?**

Yes. This is discussed at some length above. The current setting of VoLL (the prime driver used to incentivise investment in generation) results in excessive price volatility, with the result that there is a high premium paid by consumers to buy insurance products. Also, the volatility has deterred investment in new base and intermediate load generation.

Further, the time lag needed for new base and intermediate load generation is too great when compared to the period of time the current market signals provide.

4. **If no, what improvements to the operation of the reliability settings should be made?**

5. **Otherwise, what changes to the reliability settings should be contemplated that would be beneficial?**

The current setting of USE is probably on the high side of correct, but when this is assessed in keeping with reliability in transmission and distribution, it probably does not need adjustment at this time.

It is recommended that the relativities between generation adequacy, transmission reliability and distribution reliability be assessed in detail to ascertain whether there is a commercial need to reduce USE to a lower figure.

Section 1.2.4

6. **Are there additional useful ways that the relationship between the reliability settings and key themes should be characterised?**

These matters are discussed above.

The current market exhibits too much volatility and this causes unnecessary price premiums, and does not achieve the goal of incentivising investment in generation, transport or environmental outcomes.

Base and intermediate load generation are not incentivised by the current approaches. Incumbent generators are incentivised to derive too high a proportion of their income from market volatility. Whilst it is observed that the government owned generators may well only use their market power to achieve a return on investment that the government owners see as politically and commercially achievable (i.e. avoiding price shocks), the mere fact that this can occur is of concern. In the event that the Parer Review's suggestion for greater disaggregation and private ownership of NSW and Queensland generation are fulfilled, there is the potential that the current government constraints might be removed, with generators becoming totally unrestrained.

Demand side and environmental options require certainty of cash reimbursement, but the current approach does not provide these outcomes.

An energy only market will always require intervention by NEMMCo in its role as reserve trader. This is supported by extensive research in other jurisdictional markets.

Reaggregation of generation and retailing is occurring, reducing the competitive pressures promised by deregulation. It is the result of a poorly functioning NEM that is driving this process, and to be fair to the retailers and generators, it is probably the only way they can ensure that they can remain viable in such a volatile market. On the other hand, a concentrated industry sector provides opportunities for the exercise of market power and achieving high revenues.

7. In assessing stakeholder responses to the key Review questions, how should the Panel approach the relative importance of particular relationships?

The outward signs of market failure in the NEM are the excessive volatility, the addition of risk premiums to electricity prices and lack of investment in new base and intermediate load generation. The objectives advanced by NECA for raising VOLL in 2002 have not been realized.

The degree of price separation between regions caused by inter-regional constraints indicates that incumbent generators can and do cause this volatility by exercise of market power. Where interconnection has been strengthened (e.g. QNI) regional price differences have been minimized and suggest that this aspect of market constraint needs attention.

As highlighted in section 3.6, there is probably adequate reserve generation in the NEM to handle most regional demand spikes *if interconnection was essentially unconstrained.* Thus the RP must address inter-regional constraints as an essential element to the review.

Section 1.3

8. In conducting its analysis of the reliability settings, are there particular kinds of analysis or methodologies that the Panel should undertake or follow?

MEU has undertaken a much more detailed approach to assessing options for achieving generation adequacy than has the RP in its Issues Paper. The MEU is prepared to provide more detail from this research but we highlight that much of this research is confidential and is not available publicly.

9. Which scenarios in Appendix 2, if any, would you like to see further developed in the Panel's analysis and why?

The MEU has provided a much wider view of the various approaches used in overseas jurisdictions to that provided in appendix 2 and by CRA in appendix 4.
The RP is encouraged to identify and assess alternatives such as the recently FERC approved Forward Capacity Mechanism (and the associated Reliability Options) used to improved generation adequacy.

Section 3.1.1

10. Is a measure based on unserved energy the most appropriate form of standard?

The NEL objective refers to the long term interests of the consumer. Thus any measure used to assess the performance of the NEM must also reflect the needs of the consumer. Accepting that supply of electricity is an essential service, the amount of energy that a consumer does not receive is the best measure that can be used to demonstrate a failure in the market.

The assessment of electricity transport performances relate to a range of measures such as SAIDI (average time off supply – equivalent to USE), SAIFI (frequency of loss of supply) and CAIDI (loss of supply related to the number of customers). Additionally there are other performance measures based on attendance to consumers needs. There are attempts to refine these measures to specific locations (e.g. by feeder to identify the worst supply points)

In a gross pool electricity market, there are no similar measures to these for generation.

When comparing the various tools for measurement of generation adequacy, it is best to look at how consumers measure loss. It is the duration of time off supply, the frequency supply is lost at a given time, and the need to ensure that there will be sufficient electricity over the life of the investment made (whether this is assessed at a residential level or a business level).

LoLP does not provide a measure of the magnitude of a current or future supply problem.

LoLE does provide a measure of the frequency of losses, but only on a cumulative basis over a number of years.

LoEE, system minutes and USE are related. USE relates the magnitude of the loss in proportion to the demand customers place on the system.

Therefore, MEU supports the use of USE as the basic measure of performance of the supply of electricity. From the value accorded to USE, NEMMCo is able to determine the degree of future adequacy of the supply system.

11. If not, what would be a more appropriate form of standard for use in the NEM and why?

Whilst USE is seen as the appropriate basic measure of performance, this does not mean that other measures as an indication of performance should not be also used. MEU supports having these other indicators calculated and published.

12. Is it desirable, and are there ways, to broaden the form of the standard to incorporate a range of reliability-related considerations?

The setting of USE allows NEMMCo to assess the reserve requirements needed in the system to ensure a high likelihood that there will be adequate supply of generation to serve the needs of consumers.

Currently, NEMMCo calculates the reserves needed in each region. What is absent from these calculations is that by augmenting inter-regional connections, there would be greater supplies available, but with a lower risk of exceedance due to greater diversity of demand between regions. For example, whilst there may be a high coincident demand between SA and Vic regions, by increasing their interconnection with NSW and Queensland, which are less likely to have a coincident demand peak with SA-Vic, there would be greater reserve provided for all consumers, increasing reliability.

This point was made when examining the challenges face in New England with their locational constraints and determination to increase transmission to reduce these constraints.

If so, which considerations and why?

The Reliability Panel cannot exclude the impacts of augmenting the transmission system as an element from its deliberations

Section 3.1.2

13. Should the standard be determined on a NEM-wide basis or separately for each region?

Setting separate standards of supply for different regions totally detracts from the concept of a national electricity market. The setting of USE is the precursor step to identifying the future adequacy of supply for each region.

Thus setting a national level of USE provides the same benchmark and identifies the same proportional future needs for all NEM consumers.

The setting of the same USE does not result in the same degree of reserve adequacy – it only provides a common measure of what is thought to be needed for reserve adequacy in each region.

That there is a degree of reserve adequacy in each region is a function of investment. If the measure shows that there is adequate reserve then no immediate action is required. If the measure indicates there is inadequate reserve it provides a signal to NEMMCo to use its reserve trader powers, to governments that there is a risk of loss of future supply and to investors that investment in generation might provide an adequate return on a investment.

The MEU supports the use of a single national measure as this allows comparisons between regions of the amount of reserve capacity actually held.

Section 3.2.1

14. Is the level of the current NEM reliability standard appropriate?

Using the current level of USE has not resulted in significant loss of supply when compared to outages seen in the distribution networks.

The level of USE used in the NEM is seen to be higher than that apparently used in other jurisdictions (see table 4). Reducing the level of USE without changing other settings (e.g. the 10% PoE currently used by NEMMCo to forecast the reserves required in each region) would result in an increase in the required reserve margins, with a resulting increase in costs to consumers.

The question raised cannot be answered without a significant amount of further analysis – what would the cost be, would there need to be a change in the PoE level used, does the marginal benefit from reducing the USE increase the overall reliability of supply as seen by consumers at the energy delivery point.

In particular the immediate impact of reducing USE would result in the greater use of NEMMCo reserve trader powers. Analysis is needed to identify whether the reduction in USE would result in greater investment in generation. On balance, this is unlikely as the current levels of forecast inadequate reserves have not initiated new base or intermediate load generation in any region.

Without significant analysis undertaken, MEU is of the view that there is little value in reducing the current level of USE, when taken in context with the more frequent loss of supply incurred in the distribution networks.

If not, what level would be appropriate and why?

The level of USE should not be increased, but we would like to see analysis made available to support a decrease at this time

15. What level of VCR is appropriate and how, and on what basis, should it be measured? Provide reasons or analysis to support your views.

There is no single value for VCR and those who profess to be able to provide a single figure is incorrect. Even the use of averages is misleading. Many of the studies relate heavily to the range of uses electricity is put to, failing to recognize that industry is by far the greatest user of electricity.

The level of VCR varies with the:

- amount of notice given for a potential shortfall, with longer notice having a downward pressure on VCR
- frequency of the loss
- duration of the loss.

Wealth creation for the nation comes from industry, and industry accounts for some 70% of the total amount of electricity used in the NEM[34]. Residential demand for electricity accounts for some 20%[35] of all electricity consumed, with the balance used for commercial purposes.

In industry, loss of supply in the short term can cause major loss of production from production of sub standard product and long periods to return to saleable product. In some industries, short term loss can be addressed with minimal cost but with major costs if the loss of supply extends, with not only loss of product but even loss of capital equipment.

In a residential environment, loss of supply can range from inconvenience to loss of large amounts of food. In extreme cases loss of supply can lead to death of those dependent on machines to survive.

In a recent decision the ESCoV accepted that loss of supply for the commercial centre of Melbourne could be many times higher than VoLL.

MEU is of the view that attempting to set a single value for VCR is a pointless exercise and will always be subject to so many influences that its use becomes meaningless.

[34] Estimate from Australian Industry Group
[35] Calculation based on the number of residences in Australia.

MEU does not support the use of a single figure for VCR,

Section 3.2.2

16. Should the reliability standard be treated as a cap or as a target?

USE can only be a target. USE is measured ex post; therefore it cannot be a cap, as there is no way actions can be undertaken to rectify any exceedance of USE.

USE is not an end in itself. It is used in an ex ante fashion to identify the degree of reserve plant needed to give a high certainty of continuing supply, and to trigger reserve trader powers. By the appropriate use of the reserve trader powers, and ensuring a degree of buffer above forecast demand, the level of USE provides an ex ante approach (i.e. target) to minimize the loss of supply of electricity to a target amount.

If the latter, should the standard be expressed as a range for NEMMCO to target?

No. USE must remain a single figure so that it can be used to develop the controls essential to achieve the target. Being an ex post calculation the outcome can be assessed to identify if a different approach is necessary to achieve the desired outcome. As pointed out there have been very few occasions in the NEM where the target has not been achieved.

USE is a long term average and should not be seen as an annual benchmark performance figure.

Section 3.2.3

17. Should the standard be defined more precisely, for instance in terms of an average or a maximum over a period of time?

Setting USE is only part of the calculation. NEMMCo uses USE and combines it with 10%PoE to identify the degree of reserve generation.

To achieve USE as a maximum requires the setting of a target USE at a lower figure, such that the outcome will effectively result in an a level of USE which is a maximum. Thus the RP would have to set a maximum USE and NEMMCo would have to establish a target USE to achieve the desired outcome. A reduction of USE for the setting of the target will result in increased costs. Before that should be permitted, (as pointed out above) there needs to be analysis to assess whether t6he cost of a lower target USE will have a material impact on reducing loss of supply.

Based on the fact that there has not been a significant overrun of USE since the NEM commenced, it would seem that little significant improvement would result from the expectation of major costs from new generation investment.

18. Should the standard be reviewed regularly and, if so, how often? Alternatively, should there be specific triggers for initiating a review?

No setting in the NEM should be allowed to remain in perpetuity. Thus there should be regular reviews of USE. The reason for changing the target would be if there is a move where changing the target would result in a significant improvement in reliability as seen by consumers i.e. at the point of delivery.

A trigger for a review could be where the improvement in reliability of the distribution network has reached a point where a reduction in USE would lead to an improvement in the reliability of supply as seen by consumers.

If so, what should those triggers be and why?

Section 3.3.1

19. Should there be greater clarity in terms of the definition of bulk transmission?

The MEU considers that the reliability standard USE is primarily a tool for assessing the degree of reserve generation and as a trigger for reserve trader powers.

To confuse this very clear purpose with additional confusing inputs detracts from the core purpose. Regulators assess and measure the performance of the transmission system, and based on these measures approve capex and opex to achieve the standards identified. Therefore these measures must be left to the regulators.

What does need to be assessed by the RP is the inter-relationship between generation reliability and the locational impacts of generators. Specifically, the regular constraints on interconnectors do impact on the reliability of supply from generation. Constraints on interconnection (and the frequency of these constraints) preclude available generation from being dispatched to serve consumers when there is a need. Currently the most likely outcome of these constraints is price volatility and high prices.

The RP must consider that transmission constraints do impact on reliability of supply, and that by augmenting transmission to minimize constraints may result in a much lower cost impact than adjusting USE settings.

The MEU considers that the RP is only carrying out half its task if it excludes the impact of transmission constraints in its identification of supply reliability.

Whilst USE provides the clear identification of reserve generation needs, transmission constraints can prevent the availability of needed generation to achieve the target level of USE.

Thus the RP must highlight that the use of reserve trader or low reserve margins for supply could well be a direct result of transmission constraints and that relief of these constraints could be the lowest cost option for achieving the costs of low plant reserves and reserve trader costs.

If yes, how should it be defined?

20. Are there additional considerations which should be included in the standard to reflect regional concerns, for example, stricter standards for high-load areas such as CBDs?

The RP must consider the impact of the reliability of generation. It has no power to assess the reliability impacts of transmission which are the determining factors for supply to specific centres. Thus the RP has no reason to consider whether reliability to specific locations should receive a higher (or lower) standard.

In the event of any power shortage, it is NEMMCo which determines which centres will receive reduced supplies. NEMMCo applies this power as determined by governments and advice from the various transport companies.

Section 3.3.2

21. Should there be a role for the NEM reliability settings in compensating for potentially lower reliability outcomes further down the supply chain?

NEMMCo uses the USE setting to determine the required capacity to achieve the degree of reliability in the NEM.

NEMMCo calculates the amount of capacity available in the NEM and its degree of reliability. The difference between these two figures is the reserve generation and the calculations determine the trigger point for reserve trader.

NEMMCo should be aware of all significant generation in the NEM and its operating profile as this information must be provided to NEMMCo as a condition of connecting to the NEM regardless as to whether this is to transmission or distribution. Small generation is seen as a negative consumer load.

Thus the role the RP might have in relation to the variety of generation types would relate to an assessment of the degree of reliability each might have so that this assessment is used by NEMMCo in its assessment of existing available generation and any discounting that is considered appropriate (e.g. installed wind power might be set by the RP at a discounted output of X%, whereas installed thermal power would be discounted by a much smaller percentage)

In this way a change in generation mix is automatically adjusted by the agreed discounting factors to be used by NEMMCo in assessing the relative amount of installed and available capacity.

Section 3.3.3

22. Should the scope of the standard be extended to encompass matters currently treated as system security issues such as multiple contingency events? Should near misses be reported?

The design of the NEM, being a "gross pool" arrangement effectively eliminates the need for multiple contingency events being assessed for generation supply. The use of USE and PoE levels identifies the amount of reserve capacity needed in each region. The only concession made to contingency is when the amount of reserve capacity needed is less than the output of the single largest generator in the region – in that case the reserve capacity is set at the level of the single largest generator output.

The approach to system security (N-1, N-2, etc) is an issue for the regulators of the transmission and distribution systems where the design of the network allows only a single path of supply to a customer – thus a single event may affect supply to a consumer. In the case of generation there are multiple ways supply can be matched to demand, and therefore the concept of a single event or multiple contingency events have little meaning.

The security of supply is an amalgam of a number of differing controls, and under the NEM no single party is responsible for the reliability of supply. NEMMCo is not responsible, the regulators and the transport companies are not responsible and neither are the generators responsible – each is only responsible for an element of the supply chain.

As noted in section 4.8 above, governments cannot abrogate their responsibilities to ensure that an essential service is provided and is reliable.

That being accepted, it must be seen that the RP should be addressing the level of reserve generation needed to meet the levels of USE stated as being the target required by consumers. As observed above, reliability of supply is also a function of interconnection between regions. Currently the carrying capacities of interconnectors are dependent on the degree of redundancy approach used by transport businesses. Loss of, or a reduction in capacity of, an interconnector impacts on generation reserves in the two regions connected. Not only is the direct sized capacity lost but also the protection accorded by diversity reduced.

The MEU considers that the RP does have a responsibility in ensuring there is security provided by critical interconnection but that the cost of augmenting interconnection is assessed as part of the mix of ensuring there is adequate generation reserve provided.

Currently when NEMMCo assesses the existing generation for a region, this is based on the current capacities of interconnection. It then identifies a short term need which cannot be addressed by long term fixes (such as new generation or increased interconnection).

The RP needs to assess whether the current Rules in relation to the Regulatory Test for investment in regulated transport impacts on reliability in the NEM and if augmentation provides a solution for system reliability, how this factor can be incorporated into the Regulatory Test.

23. If *yes*, how should such matters be defined to ensure that supply adequacy is appropriately monitored in the context of power system security?

The Regulatory Test needs to be reviewed by the RP to ensure that augmentation is possible under the Test to provide increased reliability.

Section 3.3.4

24. Should specific 'exogenous' matters such as industrial action be included or excluded?

The generation and retailing functions in the NEM are seen as contestable sectors.

The NEM Rules provide certain protections to the regulated asset owners because of a perception that the risks and rewards they face are asymmetrical.

Businesses operating in a competitive environment do not have protection against exogenous factors, and are expected to manage their affairs to be able to address these as and when they occur. The MEU members are not able to get protection from exogenous factors when conducting their businesses and therefore do not support generators and retailers being able to avoid their liabilities by fiat in the NEM. Generators do contract in the NEM for making profits and so should not get any special consideration.

As NEMMCo uses USE and the PoE as the basis for determining the availability of reserves and the trigger point for reserve trader, these factors should include for the impact of exogenous factors such as strikes, lightning, etc. If they do not then NEMMCo should ensure they do. However this would provide no reason for benchmark performance of generators to exclude these factors in their calculation.

If so, what factors and why?

Section 4.1.1

25. Do the current price mechanisms encourage appropriate investment? Explain why or why not.

The MEU has provided significant explanation as to how this vexed question might be answered, and it all revolves around the energy only market and the value of VoLL. CPT has little impact on incentive for new generation (other than as an outworking of VoLL and that generators can have their profitability impacted by setting an administered price).

An energy only market and a high VoLL causes excessive volatility in the market and only provides short term price signals. Henney and Bidwell in their paper euro 2, conclude that in theory the energy only market will not deliver adequate signals for new generation.

Equally the experiences in markets using capacity payments point to generators using their market power to increase revenue. At the same time it is difficult for guaranteeing the availability of the generation where capacity has been paid for.

Whilst it would appear that capacity payments probably do increase reliability the down side is that this might well be at a higher cost than is required.

What is needed is a mechanism that delivers a higher level of certainty of delivering capacity to ensure adequate reserves, but with controls that do ensure availability when the reserves are required. At the same time consumers need to know that any capacity payment is demonstrably competitive but which give investors a higher degree of certainty of reward than can be delivered by an energy only market.

26. If *not*, how should the mechanisms be modified to improve that effectiveness?

The MEU considers that the approach suggested by Henney and Bidwell (they refer to it as "Reliability Options") might well provide a solution to these competing needs. The fact that FERC has approved a variant on this proposed approach indicates that the approach warrants closer examination by the RP.

Section 4.1.2

27. What is the impact of price volatility on the reliability mechanisms?

This matter is discussed at length in section 2.6 above.

Suffice to state that excessive volatility is detrimental to new investment in generation, increases the cost of risk management, prevents a secondary market, deters demand side involvement and has a severe cost impact on consumers.

The severity of price spikes in the NEM is a direct result of the high level of VoLL currently used in the NEM, and it is not proven that this higher level of VoLL has added to the reliability in the NEM. There are concerns that this high level of VoLL and the associated severity of price excursions may well have deterred investment.

28. Are the current price mechanisms appropriate tools for limiting the exposure of market participants to extreme price outcomes?

The CPT element of the price mechanisms acts to limit exposure to market participants. No participant has left the NEM through involuntary means, indicating that the financial exposure to the NEM has been adequately controlled.

Equally there has been few (if nay) new entrants who might have been deterred by the financial exposure in the NEM and therefore have not committed to being a participant. The absence of any significant secondary market supports this contention.

The degree of vertical and horizontal aggregation that has occurred is seen as a reaction to the financial risks of the NEM.

It must be accepted that although CPT is intended to limit the financial exposure of the NEM participants, the costs of all risk mitigation tools are worn by consumers. Thus when there is discussion about tools and risk management mechanisms being available for participants to use, the cost of these is ultimately carried by consumers.

29. If no, what are the most appropriate alternative mechanisms? What are the relevant settings and why?

Excessive price volatility must be constrained as this adds risk premiums and deters new investment. The only tool of significance used in the NEM which might encourage new investment is to increase VoLL as recommended by NECA in 1999. The downsides of this approach have been discussed in detail in previous sections. The MEU does not consider increasing VoLL will achieve the goals that NECA suggested might occur from the RP review of 1999.

The MEU believes that an alternative approach is needed and recommends a deeper investigation to the Reliability Options suggested by Henney and Bidwell.

30. What impact will the changing generation mix, particularly the increased use of non-scheduled generation such as wind, have on reliability outcomes?

Increased diversity of generation types in the NEM increases the exposure to NEMMCo not developing the most appropriate forecast of reserve plant margin. The MEU has discussed this concern in more detail in section 3.2

Should there be improvements to the price mechanisms to take that impact into account?

Yes. This particular matter is more fully developed in section 3.2

Section 4.2.1

31. Would the introduction of improved forward market mechanism contribute to reliability outcomes?

It is all very well to talk of an improved forward market but what has developed so far is a direct reflect of the excessive price volatility in the NEM. In section 2.6 MEU points to the lack of forward pricing and the premiums added to pricing beyond 3 years. This window is too short for new investment, particularly when the high degree of uncertainty as to prices in this forward market is considered.

Provide full details of your proposal and supporting data.

MEU considers that an alternative mechanism is required to ensure sufficient certainty of future revenue is available to intending new entrants. A capacity payment is a solution but this has been discredited to a degree by how this approach has been implemented.

The Henney/Bidwell Reliability Options is a forward market approach to securing certainty of capacity in the future, but retaining a competitive element to securing this reliability. It has potential to overcome the disadvantages of the conventional approach to capacity payments, and allow some of the benefits of a competitive market that an energy only market provides.

The MEU is not convinced that this approach is the ultimate solution as significant analysis is required to demonstrate its effectiveness. However we are convinced that it has sufficient merit to warrant a detailed examination. We would be prepared to participate with the RP to develop this option further.

Section 4.2.2

32. Are there ways that NEMMCO could improve its forecasting accuracy that would enhance reliability outcomes?

The observation implicit in this question is based on an assumption that the demand side could provide a better indication of their needs over the medium term.

Electricity supply of itself does not create wealth for the nation; electricity supply is a support (albeit an essential support) to the creation of national wealth. The question effectively puts the electricity supply industry as an end in itself. This is an incorrect assumption and the electricity supply arrangements must be seen in context with how electricity is used. The NEL attempts to do this by only referring to the benefit of consumers.

Industrial consumers are required and do provide an indication of their needs for electricity supplies. The key concern about forecasting future demand is more related to the demands placed on the system by residential consumers using electricity to drive air conditioning when it is hot and heating when it is cold. The needle peaks in electricity demand are driven more by the weather than poor forecasting of the bulk of electricity usage.

The times that NEMMCo forecasts peak demands are weather related. It is the peak demands that are used to calculate reserve margins and the need for the reserve trader.

Attempts to encourage industry to reduce its demands at peak times begs the question as to why industry which creates national wealth should reduce its activities to meet the short term needs of consumers seeking greater comfort from air conditioning and to a lesser extent for heating.

The MEU considers that the key questions are how weather conditions can be better estimated 3 and 4 years ahead (to build new generation) and whether there is a national benefit for industrial activity to be constrained when demand peaks occur.

Section 4.2.3

33. Are consumers able to signal their reliability-related prices to the wholesale market effectively?

This question is answered in part in the response to question 32.

As noted in section 2.6, demand side responsiveness requires two essential elements for it to be effective – these are forewarning of the need and the certainty of the outcome. The NEM as currently structured fulfils neither of these needs.

The NEM provides the costs of service ex post – the cost of electricity is not known until after it is used. Thus “smart meters” will not assist in reducing demand – they only identify that electricity was used and this is then combined with a price which is calculated after the event.

Consumers are more interested in other matters than the price of electricity. As a result they seek prices from retailers usually on a two or three price basis – peak time, off peak time and in some jurisdictions at shoulder times. This is the least complex approach for consumers. Consumers prefer simplicity.

Thus in their contracts for electricity supply consumers do not see price signals.

With regard to reliability load shedding tables are developed by governments, with only modest input from consumers. Usually such tables reflect the ease of load shedding and the cycling of load shedding between geographic groups of consumers rather than being based on a price signal. At times some consumers are offered lower pricing based on the right to be constrained off.

The challenge then is to provide adequate forecasting of the need and certainty of the reward for being constrained off. Unfortunately the NEM design does not provide these conditions seen as essential by most consumers.

If no, why not and how could that signalling be improved?

Forecasting of the need to be constrained off and certainty of reward for being constrained off are conditions of DSR for most consumers. If these conditions can be fulfilled, then DSR is possible.

34. What do stakeholders see as the role of DSR in terms of supply reliability outcomes?

Electricity is needed by all consumers – it is an essential service. Electricity is used to add value to consumers' activities. The concept of deliberately not using electricity when it would otherwise add value to the consumers' activities must be seen as contrary.

Yet if there is not sufficient electricity supply to meet demand then load shedding is required i.e. there is an involuntary response for contributing to reliability. The NEL refers to the electricity supply arrangements as being assessed in light of the interests of consumers. Therefore to contemplate that to achieve NEM reliability, that some consumers must consider that they will not always be able to use electricity to add value to their activities, runs counter to the concept of electricity being a service for consumers.

So for the purposes of ensuring adequate supplies of electricity (i.e. there is reliability of supply) the MEU concludes that reliability in the NEM should be seen basically as a supply side matter, and only using DSR to address short term needs.

Section 4.2.4

35. Are there operational or other changes that could be made to improve the effectiveness of the price mechanisms in terms of their impact on supply reliability outcomes?

This is addressed extensively in preceding sections.

- VoLL is not a good tool to encourage investment
- Increasing VoLL will not result in necessary investment, but will increase the severity of price spikes and result in increased costs to consumers.
- An energy only market does not and cannot provide adequate signals in time for appropriate investment, and a reserve trader need is required
- Capacity payments for generation have been demonstrated as having detriments and their applications have resulted in unnecessary costs to consumers
- A net pool addresses some concerns but the detriments of an energy only market remain

- A necessary feature is to ensure forward capacity. This requires certainty by an investor, and there must be adequate time to build the new facility before its need is overwhelming
- There is generally capacity in the market for most occasions. The issue is that this capacity must be available when it is needed. Generators can and do use market power to withdraw capacity for economic reasons to the detriment of consumers. If availability can be required through a form of payment, then generators do not need to withdraw capacity for economic reasons.
- MEU considers that Henney/Bidwell Reliability Options or a derivative of this approach could deliver certainty but also retain a competitive environment.

Section 4.2.5

36. How often should the price mechanism settings be reviewed and why?

In the current arrangements, there is no need to regularly review USE as the standard for supply reliability.

The discounts and reliability assessments for the various types of generation in the NEM and used for developing notional installed capacity need to be refined based on observation over a period of time.

The only other tools where settings are required are VoLL and CPT.

CPT is merely a mechanism for controlling financial exposure of NEM participants. It is not in the interests of consumers that new entrants are prevented due to a financial exposure, nor is it in the interests of consumers that due to influences controlled by generators, other generators and retailers can become bankrupted, causing financial exposure to consumers. The value of CPT and the prudential requirements for participants are interlinked. If one is varied so there is a need to assess the impact on the other.

VoLL is the prime tool used by the NEM to control prices and to encourage investment. There is sufficient evidence now that increasing VoLL does not achieve the investment required and that a high VoLL imposes high costs for risk mitigation which are passed onto consumers. If the energy only market is retained and VoLL is used as the tool for investment incentive, then there needs to be adequate time between changes for the market to adjust to the new value, and for it to remain static to identify whether it has achieved the expectation.

As the increase in VoLL from $5,000/MWh to $10,000/MWh has failed in most of the expectations of it, MEU is of the view that a further increase in

VoLL will not result in any benefit to consumers but will result in increasing the costs they incur b y pr4oviding for the additional risk management needed to sustain the financial position of market participants.

37. Are the triggers as currently specified appropriate?

The key trigger for reliability used in the NEM is where the forecast reserve capacity in a region is considered insufficient, causing NEMMCo to act as reserve trader. The secondary trigger is where CPT is exceeded and NEMMCo administers the pool price. The third trigger is where there is insufficient capacity to serve demand and NEMMCo initiate load shedding.

Each of these triggers is seen as an essential element of the current NEM structure.

What additional triggers would be useful?

The current arrangements do not adequate signal and ensure new investment in the long term, such as is needed for base and intermediate load generation. The current market signals are essentially short term and extremely volatile. As such they do not provide adequate certainty for new entrant investors in generation.

Section 5.1

38. Does NEMMCO intervene in the market too often?

NEMMCo has intervened as reserve trader twice in the NEM in eight years, although VPX also intervened in the Victorian market in 1998. Thus it could be identified that intervention as reserve trader has occurred once every three years. There have been other times when load shedding has occurred, indicating NEMMCo intervention.

The energy only market supporters state that the NEM is assumed to be self clearing and requires no intervention. In fact the original design assumed that reserve trader would not be needed after four years. If this had occurred then reserve trader intervention in 2004 and 2005 would not have been required as there should have been adequate reserves in place. The fact that in the last two years has required intervention supports the view espoused in sections 4.2 and 4.8 above that the energy only market does not provide adequate long term signals for new investment, and that reserve trader is essential.

Should intervention be seen as part of the 'normal' workings of the market, or should there be continued effort to treat intervention as exceptional and to expect the market to deliver investment sufficient to maintain reliability to the level of the reliability standard?

MEU has come to the conclusion that intervention is essential in an energy only market, and that an energy only market is unlikely to provide adequate long term signals needed to build new base and intermediate load generation.

39. Does the reliability safety net remain an appropriate mechanism for managing against the risk of market failure?

If yes, should NEMMCO's intervention powers be extended indefinitely or for a specific period of time and why? If no, what constitute appropriate alternative measures?

If there is a continuing need to extend the reserve trader and other NEMMCo powers (such a s administered price) and compulsory dispatch of generation, this explicitly supports the view that the energy only market has failed in the expectations. MEU is of the view that observations of the past 12-13 years of NEM1 and the NEM, that NOT having these fallback powers exposes consumers to significant risks and an unreliable supply of electricity.

An alternative to the current approach is essential. The MEU suggests a close examination of the Henney/Bidwell Reliability Options and its derivatives

40. What considerations are relevant to determining the period of extension?

MEU is convinced that the intervention powers of NEMMCo will be required indefinitely unless there are changes to the NEM.

Section 5.2

41. Can the intervention mechanism or the Panel's guidelines be further improved?

MEU is convinced that the current approaches impose too high a risk(with resultant costs) on consumers. An alternative approach is needed to ensure that there is adequate generation of appropriate cost into the future. MEU is concerned that current approaches will not provide adequate future generation.

Section 5.3.1

42. Is the current approach to NEMMCO's operationalisation of the standard through the reserve margin thresholds appropriate?

The mathematical and statistical approach currently used is supported. The outcomes of this approach have resulted in a reliability of supply over the past eight which consumers see as adequate. The approach was used by the regional system operators before NEMMCo and is widely used overseas. MEU sees no reason to change for this approach.

However, what is of concern is the degree of optimism or conservatism that is used for the inputs. Using a USE of 0.002% is seen as high when compared to other jurisdictions, although MEU suggests that before changing USE to a lower figure, there should be analysis to identify if it would result in an enhanced reliability as seen by the consumer and the point of consumption.

If USE is seen as an input with a high value, then other inputs must be seen as conservative to in part recognize this fact.

If no, what improvements are suggested to the framework and/or the methodologies and why?

43. Should the Panel explicitly approve NEMMCO's reserve margin calculations or should the Panel undertake the calculations itself?

It is the RP responsibility to set the degree of USE acceptable for the NEM. NEMMCo uses this and other inputs to develop the required reserve margin for each region. NEMMCo should advise the RP of the outworkings of the calculations and advise the RP what the impact of the calculations will mean for consumers. It is the role of NEMMCo to manage the market and for the RP to instruct NEMMCo how best this might be done (in the view of the RP) is to prevent NEMMCo from accepting its full responsibilities as system operator.

The RP should define what outcomes are required and place the responsibility on NEMMCo to achieve these outcomes.

The RP should not approve the NEMMCo calculations, but recognize they have been carried out in order to seek a specified outcome as it will be seen by consumers.

What POE or POEs should they be expressed in relation to (for example, a 10 per cent, 50 per cent or weighted average?

The use of a liberal USE (as compared to other jurisdictions) implies that a conservative PoE level should be used which will result in a higher reserve plant margin, as by doing this there is the expectation that the level of USE trends towards being a cap rather than being a target (see response to question 16 where MEU accepts that USE must be a target, but consumers would like to see this value not being exceeded).

44. Should the fuel issues and changing generation mix described above be factored into the reserve margin calculations?

Yes. See section 3.2

If *yes*, explain why and how?

Fuel supplies do have a major impact on availability of generation. With the increasing use of wind, solar and run of river hydro, weather conditions will impact on the availability of fuels for these generation sources. We note that NEMMCo assesses wind generation as a % of installed capacity.

What is needed is an assessment of the likelihood of appropriate wind speeds at times of high demand periods.

For example

- In SA-Vic region, high peak demands occur with persistent hot weather – hot north winds are associated with hot summer weather. Is the incidence of these sufficient to increase or decrease the estimated impact of wind generation in SA-Vic region?
- High demand peaks occur in summer, but with the reducing rainfall is the capacity of run of river hydro generation impacted?

At the same time consumers have seen that supplies of gas for gas fired plant have been constrained in the past (e.g. in SA gas supplies have been affected in the past two summers). Gas fired generation is becoming more prevalent in Victoria and in Queensland. In all three states (Qld , SA and Victoria) during the life of the NEM (and NEM1) we have seen constraints in gas supplies. If a shortage occurs during a peak demand period, consumers can suffer involuntary load shedding. Until the advent of SEAGas and SW interconnector in Victoria, there have been pipeline constraints which have impacted electricity supplies and other gas users. Brisbane is served by a single pipeline which is frequently constrained. Commercial gas reserves associated with Moomba are declining rapidly.

To exclude the impacts of fuel supplies from the calculation of reserve plant is extremely misleading and can lead to inappropriate signals for reserve plant levels and signals for new generation.

In section 3.2 MEU suggests that the RP should define the criteria for assessing the impacts of differing generation types for NEMMCo to use in its calculation of reserve plant.

Section 5.4

45. Would the effectiveness of the reliability settings be improved by explicitly defining contingency, short term and/or medium term capacity reserve standards?

NEMMCo uses the reserve capacity as a trigger for exercising its powers for intervention in the NEM. This is essentially a short term measure, and this has worked reasonably well to date for the short term needs.

What is absent is an assessment of the long term needs of the market to ensure reliability in the medium and long terms. At least a forecast window of 4 years is required for building new base an intermediate load generation. NEMMCo must be required to identify the medium and long term needs in sufficient time for this long build time plant to be available. The current NEM design does not provide appropriate signals for this new plant to be provided so that it will be available when needed.

Thus a new approach is required to fulfill this need

If *yes*, how should they be determined?

MEU has suggested above that a new ability is needed to provide certainty of outcome for a new investor in generation.

Section 5.5

46. When should the Panel next review the effectiveness of the reliability settings as a whole and why? What form should that review take?

This question cannot be readily answered in the absence of knowledge as to what the changes will be. The more drastic the change, the greater the need for continuing attention to ensue that the desired outcomes will eventuate.

Despite this reservation, the outcomes of any change must be examined to identify if the expected outcomes have been achieved. Equally if no change is made, then a review is essential to identify if the decision not to change has provided any identifiable outcomes, or whether the NEM reliability has deteriorated.

There has been no effective and detailed review of the outcomes form the 1999 decisions until now. This review will be complete five years after the changes were implemented and eight years after they were initiated. This is probably too long, particularly as the outcome has been for NEMMCo to have implemented reserve trader power for two of the four years since the increase in VoLL.

If the VoLL increase was to have incentivised new generation, why has there been a requirement for reserve trader? This question should have been asked two years or more ago.

The fact that NEMMCo has had to institute reserve trader powers twice since the change in VoLL which was to have avoided the need for intervention should have triggered concerns before now.

Of particular concern to consumers is that the RP recommendations must not create greater risk in the NEM as this will result in higher costs to consumers. Thus the RP must review the outcomes of the changes made to identify if their actions have resulted in any unexpected cost impacts being incurred by consumers

A review of any change must be carried out two years after the change is announced and again two years after the implementation of the change. The key outcome must be that there is a definable trend that new generation appropriate to suit the generation mix required in the NEM to improve reliability. This would have to be in the form of new generation plant that can be assessed to be that which provides a high degree of certainty that it will be there when system peaks are expected.

47. Is there a clear case for implementing transitional arrangements if the current reliability settings are adjusted or changed?

When these settings were changed in 1999, the ACCC rightly required a lead in period and a notice period for any other changes. This was to allow the market to adjust to the expectation of likely impacts resulting from the changes.

The MEU agrees with the ACCC that reasonable notice of changes is essential.

If *yes*, demonstrate why and what arrangements would be appropriate.

Appendix 1

The following report by Alex Henney and Miles Bidwell summarizes the three detailed reports provided by Henney and Bidwell titled:-

1. A review of practices and proposals in various jurisdictions (referred to as euro 1)
2. The behaviour of energy-only markets: Will they ensure generation adequacy? (referred to as euro 2)
3. The RO method of assuring adequacy (referred to as euro 3)

Alex Henney has an extensive exposure to the UK electricity deregulation. From 1981 to 1984 he was chairman of the London Electricity Consultative Council and Board Member of the London Electricity Board, and was one of the first people in Britain to advocate a competitive electricity Pool when as Chairman of the Centre for Policy Studies Working Group of the Electricity Supply Industry he published "Privatise Power", which advocated a competitive restructuring of the ESI of England and Wales with competing generators, a separate grid, a pool, and competition for medium and large customers.

He was one of the first to advance structured criticisms of the competitive electricity Pool in public when in 1997 he published “Reforming the Pool of England & Wales”. He has since written critiques on electricity in a competitive environment such as “The Illusory Politics and Imaginary Economics of NETA” published by Power UK, “An Independent Review of NETA” and in submissions to House of Lords.

He has examined competitive market restructuring issues in the Nordic countries, the Netherlands, Spain, and North America and has studied the different approaches used across Western Europe, North and South America and Australia, New Zealand and Singapore to ensure reliability, competition and security.

Miles Bidwell has over 25 years of experience in electricity economics, including market design, cost analysis, pricing, project valuation, and antitrust issues. He served as Chief of Regulatory Economics at the New York Public Service Commission. He has extensive experience as a consultant on electric, telecommunications and water issues, including ten years as a Vice President of NERA. Dr. Bidwell played an active role in the transformation of power markets in England, New York and California. He has testified frequently before federal and state regulatory authorities, and in state and federal courts on issues related to the utility industry's transition from strict regulation to increased competition. Recently, he has been testifying before the FERC on matters related to California Energy Crisis and working with several European countries to make their electricity markets more stable, and efficient by developing new methods for assuring resource adequacy. Dr. Bidwell holds a Ph.D. from Columbia University.

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