

# **Determination**

## **Applications for Authorisation**

### **VoLL, Capacity Mechanisms and Price Floor**

**Date: 20 December 2000**

**Authorisation nos:**

A90711  
A90712  
A90713

**File no:**

C1999/865

**Commissioners:**

Fels  
Shogren  
Bhojani  
Cousins  
Jones  
Martin  
Wilkinson



## Summary

On 29 September 1999, the National Electricity Code Administrator (NECA) lodged applications for authorisation of changes to the National Electricity Code (Code) (A90711, A90712, and A90713) with the Australian Competition and Consumer Commission (Commission). The proposed amendments to the Code outlined in the applications dealt with:

- the NECA review of capacity mechanisms;
- the Reliability Panel review of the Value of Lost Load (VoLL); and
- the Code requirement that negative spot prices be allowed within twelve months of market commencement.

The applications were submitted under Part VII of the *Trade Practices Act 1974* (TPA). Amendments to the applications were received on 26 April 2000. The Commission granted interim authorisation to the administered price floor Code changes on 2 December 1999. On 21 June 2000, the Commission revoked its 2 December 1999 interim authorisation and granted a new interim authorisation covering the same provisions as that initial interim authorisation, but also covering the capacity mechanisms provisions. A draft determination outlining the Commission's analysis and views on the applications was issued on 21 June 2000.

Authorisation under Part VII of the TPA provides immunity from court action for certain types of market arrangements or conduct which would otherwise be in breach of Part IV of the TPA, where the Commission concludes that the public benefits of the arrangements or conduct would outweigh the anti-competitive detriments of such arrangements or conduct.

The Commission's public consultation process has highlighted that the proposed changes to VoLL are clearly the most contentious. Therefore, a great majority of the discussion in this determination deals with the VoLL Code changes.

VoLL is a cap on regional reference prices in the National Electricity Market (NEM). Currently, in situations where determination of dispatch prices would otherwise result in a dispatch price greater than VoLL at any regional reference node, the dispatch price at that regional reference node must be reduced to VoLL. In such situations, all generators able to produce electricity to help meet demand receive the price cap for their output. The level of VoLL therefore represents the maximum spot price for wholesale electricity in the NEM. VoLL is currently set at \$5,000/MWh. The price of electricity most often sits between \$20/MWh and \$60/MWh.

To date it has been widely accepted that a cap on the energy price in the NEM is warranted due to the immature state of development of risk management instruments and the limited level of demand side participation, both being affected by franchise tariffs and vesting contract arrangements.

In its 10 December 1997 determination on the Code, the Commission questioned the need for a price cap in the NEM. The Commission considered that a price cap would be unnecessary in a competitive market that had efficient market clearing mechanisms. Nevertheless, the

Commission accepted that there could be good reasons for having a price cap on the market clearing price provided the need for, and the level of any cap, was kept under constant review.

As a result of that decision, clause 3.9.4(c) of the Code was amended to require the NECA Reliability Panel to conduct, in consultation with market participants, annual reviews of the level of VoLL in the NEM. The recommendations of the Reliability Panel's first such review resulted in NECA submitting the following VoLL Code changes for authorisation:

- increasing VoLL in two steps, to \$10,000/MWh in September 2001 and to \$20,000/MWh in April 2002;
- introducing a rolling three-year schedule of VoLL extended by one year in each annual review; and
- imposing a cap on the market price if the cumulative effect of high spot prices exceeds a threshold level. If the spot price in the preceding week (336 trading intervals) exceeds a cumulative price threshold (CPT) of \$300,000, the market price cap is reduced to the Administered Price Cap (APC). The APC is \$300/MWh in peak times of the day and \$50/MWh in off-peak times of the day. A cumulative spot price of \$300,000 would require 7.5 hours at a VoLL of \$20,000/MWh or 30 hours at a VoLL of \$5,000/MWh before the APC is applied.

The Commission has prepared this determination outlining its analysis and views on the key competition issues arising from the applications for authorisation of the VoLL, capacity mechanisms and price floor arrangements.

The applicant 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. 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 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 therefore proposes to limit the increase in VoLL in the short term to \$10,000/MWh. The Commission considers that this will provide an additional incentive to promote investment in peaking plant whilst capping risk in the market at a level lower than that proposed. The Commission further proposes to reduce the CPT to \$150,000 thereby reducing the risk of market participants being exposed to prolonged periods at high prices.

Additionally, the Commission proposes to delay increasing VoLL to \$10,000/MWh until April 2002 to allow market participants sufficient lead-time to put in place the necessary arrangements to accommodate the increase in risk.

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.

The Commission is satisfied that the price floor and capacity mechanisms provisions provide public benefit sufficient to outweigh any anti-competitive detriment that may arise and proposes to grant authorisation to these arrangements.

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## Glossary

<b>ABARE</b>	Australian Bureau of Agricultural and Resource Economics
<b>AGL</b>	AGL South Australia
<b>APC</b>	Administered Price Cap
<b>BCA</b>	Business Council of Australia Energy Reform Task Force
<b>CPT</b>	Cumulative Price Threshold
<b>EAG</b>	Energy Action Group
<b>EMEAL</b>	Edison Mission Energy Australia
<b>EMRI</b>	Electricity Markets Research Institute
<b>EMRF</b>	Energy Markets Reform Forum
<b>ERSU</b>	South Australian Electricity Reform and Sales Unit
<b>ESAA</b>	Electricity Supply Association of Australia
<b>EUG</b>	Energy Users Group
<b>FRC</b>	Full Retail Contestability
<b>IES</b>	Intelligent Energy Systems
<b>IPA</b>	Institute of Public Affairs
<b>MWh</b>	Megawatt hour
<b>NECA</b>	National Electricity Code Administrator
<b>NEM</b>	National Electricity Market
<b>NEMMCO</b>	National Electricity Market Management Company
<b>NPS</b>	National Power Synergen
<b>OFGEM</b>	Office of Gas and Electricity Markets
<b>PIAC</b>	Public Interest Advocacy Centre
<b>TPA</b>	<i>Trade Practices Act 1974</i>
<b>VoLL</b>	Value of Lost Load

# 1. Introduction

## 1.1 The Applications

On 29 September 1999, the Australian Competition and Consumer Commission (Commission) received applications for authorisation (A90711, A90712 and A90713) of changes to the National Electricity Code (Code). The applications were submitted by the National Electricity Code Administrator (NECA) under Part VII of the *Trade Practices Act 1974* (TPA). The proposed amendments to the Code outlined in the applications dealt with:

- the NECA review of capacity mechanisms;
- the Reliability Panel review of VoLL; and
- the Code requirement that negative spot prices be allowed within twelve months of market commencement.

On 12 November 1999, NECA requested that interim authorisation be granted to the Code changes outlining the administered floor price arrangements, such that the Y2K arrangements could be given effect to.<sup>1</sup> On 2 December 1999, the Commission granted interim authorisation to these price floor Code changes.

A number of typographical amendments to the applications were lodged with the Commission on 26 April 2000.

On 6 June 2000, NECA requested that the Commission's revoke its 2 December 1999 interim authorisation of the price floor Code changes and grant a new interim authorisation covering the same provisions as that initial interim authorisation, but also covering the capacity mechanisms provisions. On 21 June 2000, the Commission revoked its 2 December 1999 interim authorisation and granted interim authorisation to the proposed price floor and capacity mechanisms Code changes.

The Commission's public consultation process has highlighted that the changes dealing with VoLL are clearly the most contentious. Therefore, a great majority of the discussion in this determination deals with the VoLL Code changes.

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<sup>1</sup> On 20 October 1999, the Commission granted authorisation to the Y2K Code changes. These amendments set a ceiling price of \$300/MWh and a floor price of \$0/MWh for the electricity spot market in the Y2K pricing period. As part of these Y2K Code changes, there was a clause 3.14A.3 that referred to replacing the *administered price floor* for the Y2K pricing period. However, NECA advised staff that the *administered price floor* was not in the Code at that time, but rather was part of the Code changes which are the subject of this determination. Therefore, NECA argued that the sections of this application dealing with the administered price floor needed to be granted interim authorisation for the Y2K Code changes to be put into effect.



## 1.2 Statutory test

These applications were made under sub-sections 88(1) and 88(8) of the TPA. The TPA provides that the Commission shall only grant authorisation if the applicant satisfies the relevant tests in sub-sections 90(6) or 90(8) of the TPA.

Sub-section 90(6) provides that the Commission shall grant authorisation only if it is satisfied in all the circumstances that:

- the provisions of the subject, arrangements or conduct would result, or be likely to result, in a benefit to the public; and
- that benefit would outweigh the detriment to the public constituted by any lessening of competition that would, or would be likely to, result from the arrangements or conduct.

Sub-section 90(8) provides that the Commission shall grant authorisation only if it is satisfied in all the circumstances that the proposed provision or conduct would result (or be likely to result) in such a benefit to the public that the proposed contract, arrangement, understanding or conduct should be allowed.

In deciding whether it should grant authorisation, the Commission must examine the anti-competitive aspects of the arrangements or conduct, the public benefits arising from the arrangements or conduct, and weigh the two to determine which is greater. Should the public benefit or expected public benefits outweigh the anti-competitive aspects, the Commission may grant authorisation or grant authorisation subject to conditions.

Determining just what is a benefit to the public is therefore a key issue. Public benefits recognised in the past include:

- fostering business efficiency;
- industry rationalisation;
- expansion of employment;
- promotion of industry cost savings;
- promotion of competition in industry;
- promotion of equitable dealings in the market;
- development of import replacements;
- growth in export markets; and
- arrangements which facilitate the smooth transition to deregulation.

If the Commission determines that the public benefits do not outweigh the anti-competitive detriment, the Commission may refuse authorisation or alternatively, in refusing authorisation, indicate to the applicant how the applications could be constructed to change the balance of detriment and public benefit so that authorisation may be granted.

The value of authorisation for the applicant is that it provides protection from action by the Commission or any other party for potential breaches of certain restrictive trade provisions of the TPA. It should be noted, however, that authorisation provides exemption only for the particular conduct specified. Authorisation does not provide blanket exemption from all provisions of the TPA. Further, authorisation is not available for misuse of market power (section 46).

### **1.3 Public consultation process**

The Commission has a statutory obligation under the TPA to follow a public process when assessing an application for authorisation.

The Commission received the initial application for authorisation of the changes to the Code on 29 September 1999. Notification of the application and a request for submissions was advertised in *The Financial Review* of 12 October 1999 and placed on the Commission's web site. Interested parties were asked to make submissions to the Commission regarding their views on the issues of public benefit and anti-competitive detriment arising from implementation of the proposed changes.

Eight interested parties initially provided submissions (see Appendix A). All submissions have been placed on the Commission's public register. The Commission also interviewed a number of the parties that provided submissions.

The Commission produced a draft determination on 21 June 2000 outlining its analysis and views on the authorisation application. The Commission invited the applicant and other interested persons to notify it within 14 days, whether they wished the Commission to hold a conference in relation to the draft determination. AGL South Australia so notified the Commission on 3 July 2000.

The pre-determination conference was held in Melbourne on 18 July 2000. In excess of 50 interested parties attended the conference.

Interested parties were given an opportunity to lodge further submissions with the Commission following the pre-determination conference. The Commission received 29 submissions addressing issues raised at the conference or in the draft determination (see Appendix B). This determination takes into account the issues raised at the pre-determination conference and in these submissions.

The Commission has released this final determination outlining its analysis and views on the application for authorisation according to the statutory assessment criteria set out in section 1.2. A person dissatisfied with this determination may apply to the Australian Competition Tribunal for its review.

## 2. VoLL: Introduction

The basic principle of spot price determination in the NEM is that the price at each regional reference node should reflect the marginal value of supply at that location and time, this being the price of meeting an incremental change in load taking into account all relevant constraints and transport losses.

Under the mandatory pool arrangements of the NEM, a ‘dispatch price’ at each regional reference node is calculated by the National Electricity Market Management Company (NEMMCO) every five minutes, in accordance with the above principle. The spot price at a regional reference node (the ‘regional reference price’) for a particular half-hour is set equal to the average of the dispatch prices applying through that interval. Finally, the spot prices to apply to electricity traded at individual connection points are obtained by adjusting the regional reference price for transport losses.

VoLL is a cap on these regional reference prices and is currently set at \$5,000/MWh.<sup>2</sup> Currently, in situations where determination of dispatch prices would otherwise result in a dispatch price greater than VoLL at any regional reference node, the dispatch price at that regional reference node must be reduced to VoLL. In such situations all generators able to produce electricity to help meet demand will receive the price cap for their output.

To date it has been widely accepted that a cap on the energy price in the NEM is warranted due to the immature state of development of risk management instruments and the limited level of demand side participation, both being affected by franchise tariffs and vesting contract arrangements.

In its 10 December 1997 determination on the Code, the Commission questioned the need for a price cap in the NEM. The Commission considered that in a competitive market that had efficient market clearing mechanisms, a price cap would be unnecessary. Nevertheless, the Commission accepted that there could be good reasons for having a price cap on the market clearing price provided the need for, and the level of, any cap was kept under constant review.

As a result of that decision, clause 3.9.4(c) of the Code was amended to require that the NECA Reliability Panel conduct, in consultation with market participants, annual reviews of the level of VoLL in the NEM.

The terms of reference for the first such review required the Reliability Panel, amongst other things, to recommend a level of VoLL that would:

- promote reliance on price based signals to deliver the reliability standards determined by the Reliability Panel both immediately and over time;
- encourage appropriate demand side, as well as generation, response to those price based signals; and

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<sup>2</sup> Unless otherwise noted all prices are quoted in Australian dollars.

- reduce the likelihood of intervention through the use of the reserve trader or other mechanisms and of NEMMCO's use of its power of direction.

The Reliability Panel's Final Report was published in July 1999.<sup>3</sup> The report recommended an increase in VoLL in two steps: first to \$10,000/MWh by September 2001 and then to \$20,000/MWh by April 2002. This increase would be linked to a mechanism to limit the market's exposure to VoLL once cumulative prices exceed a pre-determined threshold. The timing of the two proposed increases is intended to reflect the time required to allow the market to develop appropriate risk management and insurance mechanisms, and to allow scope for enhanced demand side participation. The timing was also designed to reflect the timetable for the expiry of the jurisdictional vesting contracts and franchise tariff arrangements.

The Panel proposed that VoLL should in future be set for three years in advance, with a new third year being added at each annual review.

The recommendations of the Reliability Panel resulted in NECA submitting the following VoLL Code changes for authorisation:

- increasing VoLL in two steps, to \$20,000/MWh. The timing of these increases is as recommended in the Reliability Panel report;
- introducing a rolling three-year schedule of VoLL extended by one year in each annual review; and
- imposing a cap on the market price if the cumulative effect of high spot prices exceeds a threshold level. If the spot price in the preceding week (336 trading intervals) exceeds a cumulative price threshold (CPT) of \$300,000, the market price cap is reduced to the Administered Price Cap (APC). The APC is \$300/MWh in peak times of the day and \$50/MWh in off-peak times of the day. A cumulative spot price of \$300,000 would require 7.5 hours at a VoLL of \$20,000/MWh or 30 hours at a VoLL of \$5,000/MWh before the APC is applied.

The Code changes were submitted for authorisation because price caps may constitute a form of price fixing under section 45 of the TPA. The Commission must compare the potential anti-competitive detriment arising from an increase in the price cap to the benefits of improved supply side and demand side signals in the market that the applicant claims will result from increasing VoLL. In making this assessment the Commission will pay attention to market structure and institutional arrangements that may adversely effect competitive market outcomes, in particular, in the circumstances where the price cap is being relaxed.

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<sup>3</sup> NECA Reliability Panel, *Review of VoLL in the national electricity market: report and recommendations*, NECA, July 1999.

### **3. VoLL: The applicant's arguments**

In its assessment of the public benefits of increasing VoLL to \$20,000/MWh, NECA argues that it is important to examine the increase in VoLL in conjunction with the development of the CPT. NECA claims that the CPT balances the increase in risk that is introduced into the market with the increase in VoLL.

NECA indicated that almost all participants support the changes to allow the Reliability Panel to set a forward path for VoLL. NECA argues that the imposition of any cap on the market, such as VoLL, is potentially anti-competitive and thus should only be imposed to the extent absolutely necessary. At the start of the market a market cap was proposed to ensure that the volatility of the market would not create unmanageable risks to the integrity of the market and deter participation. NECA therefore committed to reviewing the cap during the initial authorisation process.

NECA argues 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 notes that the existing level of \$5,000/MWh was accepted as a public benefit by the Commission because it was necessary to curtail risk in the early stages of the NEM as participants had little opportunity to manage higher levels of risk at that time. At the time the level was set there were no other codified risk management measures in the Code, contract arrangements were in their infancy and existing capacity available in the market was considered sufficient to ensure adequate reliability.

NECA argues that this position has changed. Reliability, it claims, is now a key focus and risk management tools in the market have improved.

The Reliability Panel has therefore concluded that a higher and less intrusive price cap is required and that any additional risks introduced are manageable through the CPT.

At the start of the market, risk in the spot market was limited by the level of VoLL and the design of the force majeure provisions. Hourly risk was capped by the level of VoLL to \$5,000/MWh. If involuntary load shedding occurred, risk over many hours was capped at a cumulative level of \$300,000. Once the cumulative effect of spot prices reached \$300,000 over any one-week period an administered price cap would then be imposed.

NECA argues that the joint impact of VoLL and the new CPT means that, while hourly risk is still capped to the level of VoLL, the cumulative effect is now capped by the CPT. The rate at which risk accumulates is directly related to the level of VoLL and therefore risk due to short periods of extreme prices is higher under the proposed changes but the accumulated level is capped by the CPT. The CPT has been deliberately set to the same level as the initial force majeure limit. This means that the APC is applied after 30 hours of VoLL if VoLL is at \$5,000/MWh and 7.5 hours if VoLL is set to \$20,000/MWh. NECA argues that the CPT therefore provides a more certain cap on risk, being based on price alone, than the previous force majeure administered price which could not be imposed unless there had also been a period of involuntary load shedding.

NECA claims VoLL provides the incentive for reliability of supply through investment in peak generation, demand side facilities and network investment. 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.<sup>4</sup> The Reliability Panel examined the price that would be required to provide incentive for these investments in making its recommendation on both the level of VoLL and the CPT. It also noted that if these investments were viable at lower prices then competitive market forces should ensure that they occur.

NECA argues that, in one form or another, the market will need to pay for peak investments if reliability is to be maintained. A number of alternatives were canvassed in the initial design of the NEM and in NECA's capacity mechanism review. These include:

- **capacity obligations and contracts.** This approach places obligations to contract for specified levels of capacity as a pre-condition for market participation by customers. This results in the emergence of separate capacity contract markets between customers and generators. NECA argues that it also requires a strong central presence to set the level of contract for each customer and the contribution each generator can make towards those obligations. It is unlikely that payment streams would be volatile but on the other hand they would also be centrally determined. A residual energy market would still operate, but it is likely to be less volatile.
- **separate pool capacity payment/bonus.** A separate payment can be added to the spot market, possibly along the lines of the original UK market design. Generators presenting capacity are paid for presenting capacity to the market and customers pay according to the load. A central agency must determine the incidence and allocation of these charges and payments. Depending on its design, NECA argues that this payment can be very volatile.
- **dependence on safety net.** The market operates but if a deficiency is forecast additional capacity can be acquired, possibly through reserve trader style contracting. A charge is then levied on market participants to pay for this contract. NECA notes that this is the concept behind the current intervention safety net and is regarded as distortionary and highly undesirable.
- **energy only market (NEM).** This approach allows prices to clear at the level which remunerates peak investments. NECA argues that this is the approach taken in the NEM. Generators receive revenue only when they generate and customers pay in accordance with their half hourly demand. Contracting to smooth the inevitably volatile payments is expected.

Each of the alternatives results in payment for capacity to provide reliability. NECA states that, all else being equal, the contract payments under an energy only market would equate with the price of a capacity contract plus residual energy market and with the average of a capacity bonus plus residual energy price. In one way or another payment must be made if the physical capacity is to be present. In each of the alternatives canvassed, capacity is accounted for either explicitly or implicitly. On this basis, NECA argues that increasing VoLL benefits the public by increasing the incentive for market responses by both the demand and supply sides, ensuring the future reliability of the system and reducing the price

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<sup>4</sup> A risk of between 3 and 7 hours of involuntary load shedding (that is net of voluntary demand side response) in the face of extreme demand conditions (10% probability of exceedance) is a common international standard. NECA claims that reliability in Australia has often been better than this.

distortion introduced by a market cap. NECA further claims that increasing VoLL reduces the anti-competitive nature of the market price cap and ensures balance between network and energy market measures. NECA argues that risk in the market is restrained, by use of the CPT, to near current levels on an overall basis.

## 4. VoLL: Initial submissions to the Commission

The Commission initially received eight submissions on the proposed Code changes (see Appendix A). Interested parties raised a number of issues concerning the proposed Code changes, each of which is dealt with separately below.

### 4.1 Supply side incentives

A broad range of interested parties argued that there are flaws in NECA's arguments that an increase in VoLL is necessary to provide adequate incentives for peak load generators to enter the market in order to maintain adequate system reliability.

The Queensland generator CS Energy argued that the current level of VoLL allows the market to clear on a voluntary basis. It claimed that incidents of VoLL have occurred because of genuine supply demand imbalances, rather than because there is insufficient incentive for generators to commit plant.

The South Australian retailer ETSA Power<sup>5</sup> argued that the current market arrangements facilitate voluntary clearing of the market and indeed have attracted sufficient new investment to ensure that the market continues to clear voluntarily into the future. ETSA Power stated that there is no basis for the statement that the ability of the market to clear would be enhanced by increasing the value of VoLL.

The Energy Markets Research Institute (EMRI) argued that evidence that there is a problem concerning future investment in new generating facilities has not been provided in the application. It added that evidence to establish that holding out special incentives for open cycle gas turbine generation facilities that will run only six hours a year will increase the public benefit has also not been provided. It claimed that other potential lower cost options (such as new gas turbine plant at existing generation facilities) and other developments impacting on future reserve capacity (such as the Basslink interconnector) have not been considered.

The Business Council of Australia Energy Reform Taskforce (BCA) and the Bardak Group (Bardak) stated that the argument that a higher VoLL is necessary in order for peaking generators, operating for just a few hours each year, to recover sufficient revenue to cover fixed costs and a reasonable return on investment is flawed. They contended that this argument does not take into account that peaking generators are most likely to be the recipients of revenue from ancillary service contracts. They added that the amounts of money involved in covering the cost of peaking plants is small relative to overall payments for energy in the NEM and that it is preferable to deal with this problem directly through capacity payments rather than allowing opportunities for all generators to lift pool prices where market power exists. Further, they argued that even if a case can be made for allowing peaking generators to bid up to the prevailing price cap, there is no justification for allowing all generators this degree of freedom.

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<sup>5</sup> AGL acquired ETSA Power in January 2000.



## *4.2 Demand side incentives*

CS Energy stated that the current level of VoLL provides sufficient incentive to develop demand side responses and that the only impediments to the development of demand side responses are jurisdictional transitional arrangements and time for the appropriate instruments to be developed and implemented.

CS Energy also argued that a higher level of VoLL can provide a disincentive for demand response. It argued that this would be the case if a retailer became over-contracted as a result of load shedding. In this case the retailer would receive large difference payments without having made payments in the energy market for the over-contracted portion and not have an incentive to reduce demand to relieve the VoLL condition.

Ergon Energy argued that the presence of franchise customers limits the capability for demand side management in the NEM.

The EMRI took issue with the argument that an increase in VoLL will lead to greater demand side response. It argued that with an increase in VoLL, retailers and end users will increase their level of hedge cover to minimise exposure to the pool price.

ETSA Power claimed that the current level of VoLL is achieving the required demand side response. It added that an increase in the level of VoLL would increase customer preferences for no pool exposure.

## *4.3 Risk management*

A range of interested parties argued that an increase in VoLL would increase the likelihood of price spikes and therefore risk in trading in the NEM. They argued this was particularly a problem at this stage of the NEM's development given the underdeveloped nature of the

CS Energy claimed the lack of firm access or compensation for network outages represents a revenue risk to generators that cannot be managed. It argued that any increase in VoLL would exacerbate this situation.

CS Energy considered that increasing the level of VoLL will considerably increase exposure to risk. It agreed with the WM Mercer report in concluding that more robust risk management solutions are required and that they will take a number of years to develop.

AGL Electricity believed that moving to a VoLL of \$20,000/MWh without first having tested the value of \$10,000/MWh is premature and may require the market to manage significant risks, which may ultimately prove costly to end customers.

The EMRI stated that increasing the level of VoLL has a threefold effect on end users. First, it increased the average energy price in the wholesale market. Second, EMRI argued that a higher VoLL leads to higher price volatility resulting in end use customers being faced with an increase in hedge costs to manage this volatility. Third, EMRI claimed that end users would also incur increased network charges from an increase in VoLL.

ETSA Power's submission argued that the NECA issues paper was predicated on the pretext that the current level of VoLL is set too low to allow voluntary clearing of the market,

without any detailed analysis to support this assertion. Consequently the NECA review recommended an increase in the VoLL.

ETSA contended that the level of wholesale pool spot prices and contract hedge prices in the South Australian electricity market has a direct relationship with the level of VoLL. Since the start of the NEM, the average pool price in South Australia has been significantly affected by price spikes in January, February and April 1999 where the half-hourly price has been as high as \$4400/MWh. Without these price spikes the average pool price would have been 20-30% lower (that is around \$35/MWh instead of \$50/MWh). ETSA argued that an increase in the level of VoLL will increase the potential size of price spikes, which will increase the average pool price. Since the hedge contract price is a function of the expected level and volatility of the pool price, it would also rise if the level of VoLL was increased.

ETSA argued that any increase in VoLL will potentially reduce the amount of liquidity in the contract market, as there will be an increase in risk for both retailers and generators. If either party finds themselves in an over contracted position and a higher VoLL pool price occurs, they will face a significant increase in financial risk compared to the current situation. ETSA noted there will also be an increase in counter-party credit risk that once again will affect market liquidity.

ETSA Power argued that due to the tight demand/supply balance in South Australia there is insufficient hedge cover available from generators in South Australia to cover all contestable and franchise exposures. As such, market participants are already exposed to excessive price risk at a \$5,000/MWh VoLL, let alone at a higher level of VoLL. Ergon Energy similarly argued that an increase in VoLL would make it difficult for retailers to obtain adequate contract cover.

In supporting the changes, Loy Yang Power argued that the proposed changes give adequate time for market development and for risk management products to be developed.

#### *4.4 Cumulative price threshold*

As noted previously, under the proposed arrangements, an administered price period is initially applied if the sum of the spot price in the previous 336 half-hour trading intervals exceeds the CPT of \$300,000.

AGL Electricity argued that the role of the price mechanism is to provide the appropriate signals to both generators and customers. It questioned whether an average pool price of \$1,786/MWh over a one week period is required to provide appropriate signals to the market. AGL Electricity stated that an average pool price of this level has the potential to bankrupt a participant should they have even minimal exposure over this period. For these reasons, AGL Electricity believed that the administered price cap should be lower for a force majeure event.

AGL Electricity also expressed concern that the potential exists for the administered price cap to remain in place for extended periods of time. Should the administered price cap be required for an extended period, AGL Electricity recommended that a 'phase down' of the actual level be adopted. This recommendation was made on the basis that enforcing a price cap for an extended period of time does not enhance the price signal, and has the potential to bankrupt retailers and customers with even limited exposure to the wholesale price.

#### *4.5 Market power*

Bardak argued that an increase in VoLL to \$20,000/MWh, without taking steps to eliminate all unnecessary price spikes due to market power problems, will inevitably lead to higher pool prices for end customers. It added that there is an increased possibility for gaming inherent in the proposal to increase the value of VoLL. It argued that better and more independent market monitoring activity, as well as market power mitigation measures, are required to address these problems.

Ergon Energy similarly noted problems of increasing VoLL where market power issues are a concern.

#### *4.6 Overseas evidence*

The BCA and EMRI noted that both the current and proposed levels of VoLL are well in excess of market price caps which apply in other electricity markets. For instance, the EMRI noted that, at that time, a price cap of \$US750/MWh applied in the Californian market.

The BCA stated that in the Californian market full investigation of pool prices above \$US150/MWh are common. Further in the England/Wales market, OFFER has investigated any bids above £60/MWh and has expressed concerns as to the frequency of such bids.

#### *4.7 Other issues*

ETSA Power argued that South Australia will be affected more by an increase in the level of VoLL than NSW or Victoria because it has less available capacity (currently) to meet peak demand than those states. Since South Australia entered the NEM, it has experienced more frequent and more extreme price spikes than the other states. As a result, ETSA argued that an increase in the level of VoLL would be expected to have a bigger increase on South Australia's pool price and contract price than in the other states, with a consequent detriment to the public.

## 5. VoLL: Issues arising from the draft determination

Following the release of the draft determination the Commission held a pre-determination conference in Melbourne on 18 July 2000. Over 50 interested parties attended the conference, the minutes of which are available from the Commission's web site.<sup>6</sup> The Commission also received 29 submissions (see Appendix B). Interested parties raised a number of issues concerning the Code changes and the Commission's draft determination. Each of these issues is dealt with separately below.

### 5.1 Supply side incentives

In the draft determination, the Commission agreed with NECA that an increase in the level of VoLL to \$20,000/MWh should deliver significant public benefits by encouraging investment in peaking plant. This argument was widely commented on at the pre-determination conference and in subsequent submissions.

A number of interested parties claimed that the current level of VoLL is sufficient to attract new investment. Macquarie Generation states that at a VoLL of \$5,000/MWh, a 100MW open cycle gas turbine would be required to run for just 13.4 hours a year to achieve an acceptable return on investment, excluding additional income available from ancillary services contracts and from generating at other times when the pool price is greater than marginal fuel cost. Macquarie Generation further argues that historical spot prices indicate that such a plant would have made a very good return at the current level of VoLL in Queensland and South Australia.

Macquarie Generation, CS Energy, and the retailers Great Southern Energy and Energy Australia contend that new investment is being attracted to NEM regions in which there is limited supply at the current level of VoLL. These projects include:

- in Queensland, gas turbines at Roma and new coal fired stations at Millmerran, Callide, Tarong and the proposed redevelopment of the Swanbank site;
- in South Australia, Pelican Point and Ladbroke Grove; and
- the development of interconnectors such as Basslink, the Queensland – New South Wales interconnector (QNI) and a South Australia – New South Wales link (SANI).

A number of parties also discussed the issue of reliability in South Australia and particularly in Victoria.

Citipower argues that the outlook for reliability in Victoria and South Australia in coming years may be improved by Murray Link, SANI and a proposed 300MW gas turbine in the La Trobe Valley. Citipower argues that all these plans have been based on a VoLL of \$5,000/MWh. Citipower contends that Murray Link and SANI would allow South Australia to access reserve capacity in NSW and free up some of the reserve capacity provided to South Australia by Victoria for use in Victoria.

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<sup>6</sup> <http://www.accc.gov.au>

AGL South Australia (AGL) argues that the proposed increase in interconnection between Victoria and South Australia and the new generating capacity being installed in South Australia has the effect of increasing the security levels for Victoria by raising the possible energy flow from South Australia. AGL claims that in total, there is committed and firm investment of 1018MW in new generation and transmission in SA.

However, a number of generators have argued that claims that the current level of VoLL drove these investments are flawed.

The developer of the Roma and Ladbroke Grove projects, Origin Energy, argues that its projects were built in anticipation of a future increase or removal of the price cap so as to support the economics of peaking capacity that is only required for limited hours a year in order to guarantee supply during periods of peak demand.

Snowy Hydro argues that investments in Queensland and South Australia were principally driven by commercial incentives to capture the eventual “green” credits that will be traded in Australia, rather than any impetus from the current VoLL level. Further, Snowy Hydro argues that as these new generation facilities are baseload, as opposed to peaking capacity, then this is evidence that investments in those regions were not primarily an outcome of current VoLL. Snowy Hydro notes that base load generation does not rely on VoLL prices to produce acceptable returns, unlike peaking capacity which captures part of its return through the likelihood of VoLL prices.

The Queensland generator Tarong Energy argues that there are special circumstances that explain the high current level of generation investment in Queensland. Tarong Energy argues that the Queensland load profile is such that demands within 10% of annual maximum demand occur for over 400 hours each year as opposed to less than 100 hours in other regions. Tarong notes that this means that peaking plant and interruptible loads used to supply only this top 10% of demand can be used for many hours and that peak prices can be expected to occur more often, and for longer, in Queensland than in other regions. Consequently, Tarong argues that, regardless of the level of VoLL, and so long as there remains limited interconnection between regions, new investment should occur in Queensland before other regions in the NEM.

There has also been considerable comment on what impact an increase in VoLL will have on investment decisions.

A number of parties have argued that an increase in the level of VoLL is necessary to promote efficient investment decisions. The generators Edison Mission Energy Australia Limited (EMEAL) and Loy Yang Power and the entrepreneurial interconnector Transenergie have argued that the proposed increase in VoLL is necessary to promote efficient investment decisions. EMEAL contends that new capacity needs in the NEM suggest that peak investment would be the most efficient form of investment. However, it is argued, the dampening of peak investment signals by the current level of VoLL is resulting in most investment that is occurring being in higher capacity base load generation.

National Power Synergen (NPS) argues that the increased use of air conditioning has led to an increase in the peakiness of demand, with very high summer peaks in South Australia, Victoria and to a lesser extent NSW over relatively few days each year. NPS argues that the current level of VoLL does not encourage the investment necessary to meet these infrequent very high peaks while at the same time meeting customer and market expectations about

reliability of supply. NPS states that its modelling indicates that additional peaking capacity only becomes viable if VoLL is increased.

Origin and Southern Hydro argue that with an increase in VoLL, they will develop further generation capacity in response to growing demand.

TXU notes that Putnam Hayes and Bartlett's evaluation of SANI, carried out for NEMMCO in 1998, identified that the price cap was too low to enable supply side investment in low duty peaking plant.

TXU contends that on the basis of the current price cap it would be cheaper to experience 13 hours of load shedding with prices at VoLL, than to pay to install a new gas turbine, an outcome that is not consistent with the reliability expectations of customers. EMEAL similarly argues that the consequential cost of load shedding of customers will far exceed the cost of building the capacity to achieve the desired levels of reliability.

The Institute of Public Affairs (IPA) argues that there is a need for high needle peak prices. The IPA contends that the community's toleration of power failures is reducing, due in part to the greater need for constant power due to modern electronics. The IPA argues a higher requirement for reliability may mean a greater need for peak plant that will seldom operate and hence require high remuneration when it does.

Tarong states that a VoLL of \$5,000/MWh has failed to attract sufficient peaking generation capacity in Victoria. Further, even though investment in South Australia has occurred through Pelican Point, Tarong contends that it is arguable that this development has occurred too late to ensure adequate reliability of supply for that region during last summer, and that this delay was due to the lack of appropriate market signals.

Vencorp contends that there is reasonable evidence, including studies of VoLL carried out by Monash University and by the University of Manchester, to show that the appropriate level for VoLL for the purposes of transmission investment decisions is at least \$20,000/MWh.

The IPA argues that intervention to force prices lower than those that emerge from market processes will distort investment decisions and result in higher overall prices.

However, a number of parties, including Energy Australia, the Energy Action Group (EAG) and the Public Interest Advocacy Centre (PIAC), question whether an increase in VoLL is likely to elicit this supply side response. Energy Australia contends that new entrants contemplating investment consider contract prices and spot price distributions more so than the level of VoLL.

AGL similarly believes there is serious doubt about whether increasing the level of VoLL to \$20,000/MWh will significantly change the economics for peaking plant in Victoria. It argues that in Victoria there is excess base line plant, which has a much lower marginal cost of production than even the most efficient combined cycle gas plants. AGL argues that strong competition between these generators has led to low average pool prices, and therefore lack of investor interest in peaking plant in Victoria is less a function of the level of the price cap than a response to this low average pool price.

CS Energy contends that the argument that the current level of VoLL is a barrier to new emergency generation plant is flawed. CS Energy argues that volume risk (estimate of run

hours) for investing in plant that is expected to run only a few hours each year would make such an investment unbankable irrespective of the level of VoLL. CS Energy notes that hedges or caps based on this plant would be expensive due to the requirement to recover fixed costs with little generation and risks due to start failures at times of VoLL.

The EUG similarly argues that information obtained from potential new entrants in the Australian market confirms that revenue from random and infrequent VoLL-type events will not justify their investment and that, ultimately, "imperfections" in the market require them to cover investment risks through forward contracting.

The EUG and EMRF argue that potential investors will assume that some revenue might be derived from periods of high price volatility, but are more likely to make the assumption that these would be brief, infrequent and unreliable sources of income. It is argued that they will also assume that high price periods would be less likely to occur after their new capacity was brought on line. The EUG and EMRF contend that, in practice, any new generating plant would be expected to operate whenever the pool price was higher than the incremental cost of operation - once the initial investment was made.

The EUG believes that any reasonable investor would invest if they had sufficient confidence that they could recover their investment (including a reasonable level of profit) over the life of the investment. The EUG argues that such an outcome does not require VoLL to be set at a high level.

Southern Hydro, however, rejects the view that low capacity factor peaking plant investments will not be able to be financed. Citing its own privatisation as an example, Southern Hydro argues that when the certainty of revenue from premium income is accounted for investors will be willing to finance peaking plant.

TXU similarly rejects the argument that it is average price that drives investment and that therefore an increase in VoLL is unnecessary. TXU argues that while average prices drive investments in base load plants, investment in an intermediate load plant targeted at workday 7am to 11pm running is driven by prices in the corresponding time periods. TXU believes, therefore, that investment in low duty peaking and reserve plants are driven by the revenue potential in the few hours in which they run.

Interested parties also raised further issues on the link between the level of VoLL and investment incentives.

The EUG argues that an increase in VoLL would do little, if anything, to resolve the well known transmission problems which contribute significantly to capacity constraints in the NEM. It argues that transmission augmentation would provide a lower cost mechanism to address supply constraints in the southeast regions of the NEM than would investment in new generation plant. The EUG states that failure to facilitate transmission augmentation provides a clear disincentive for investment in peak load plant (because of the expectation that the transmission augmentation will eventually proceed and allow mothballed capacity to be "dumped" on the market).

Pacific Power similarly argues that enhanced interconnection between regions will ensure greater reliability. Pacific Power notes that NEMMCO has on a number of occasions temporarily increased the transfer capability rating of the interconnection between Snowy and Victoria from 1500MW to 1750MW. Pacific Power argues that were this rating increased to

2000MW on a sustained basis through construction of increased interconnection capability this would provide increased reliability. Pacific Power also notes that interconnectors are already planned between Victoria and South Australia and Tasmania and Victoria, which Pacific Power argues, should solve the reliability problems in Victoria.

PIAC argues that different levels of VoLL should apply for different categories of supply. VoLL could be increased for short-term and peak generators rather than a blanket approach being taken for all generators.

AGL notes that in California, the price cap of US\$750/MWh, reduced recently to US\$500/MWh, has not deterred investment. Firm and committed investment for the period to January 2002 totals US\$4.5 billion for approximately 7,000MW of additional generation plant.

## *5.2 Demand side incentives*

In the draft determination, the Commission argued that greater demand side response could be encouraged through an increase in the level of VoLL. This drew considerable comment from interested parties at both the pre-determination conference and in subsequent submissions.

NPS, EMEAL and Loy Yang Power agreed that increasing VoLL will provide a greater incentive for end users to consider the impact of rising electricity costs on production and curtail consumption if the price of electricity begins to materially add to the costs of the business.

Southern Hydro and TXU similarly note studies conducted by Monash University prior to the start of the NEM which indicated that some consumers would reduce demand for prices of between \$1,000/MWh and \$90,000/MWh with a significant demand response available by about \$25,000/MWh.

Macquarie Generation argues, however, that sufficient demand side response is developing at the current level of VoLL. Macquarie Generation cites the example of the Queensland retailer Energex who currently provides customers a demand side product to reduce consumption during periods of high NEM prices. Macquarie Generation notes that Energex can either quickly respond by automatically controlling load, or manually by switching with prior notification, resulting in Energex having 10 to 40MW of controllable load. Macquarie Generation argues that this trend will continue as vesting contracts cease and retailers are forced to purchase an increasing proportion of their requirements from the pool, and that therefore an increase in VoLL is not necessary in order to facilitate greater demand side participation.

Energy Australia agrees that dramatically increasing VoLL may lead to greater demand side response. However, it believes that demand side response is limited by available technology and will develop over time at levels of VoLL similar to the current level.

Great Southern Energy and Citipower argue that while a higher VoLL may attract additional demand side measures, the volume can be expected to be minimal over and above a \$5000/MWh VoLL. Citipower states that experience to date suggests that where demand side management opportunities are available, they are possible to access at the existing level of VoLL.



A number of interested parties pointed to significant difficulties in securing greater demand side response in the NEM.

The EUG argues that end users have a “cultural” expectation developed from decades of state ownership of the electricity industry that reasonably priced electricity will always be available. The EUG contends that this contributes substantially to the very low price elasticity of demand for electricity. The EUG believes that a change in these cultural expectations is required. It adds that a massive increase in price might, or might not, facilitate this cultural change, but if it did it would do so at an unacceptably high cost to end users. The EUG contends that cultural factors not only act to suppress responses from end users, but they will flow through into a still immature electricity market, providing substantially greater scope for generators to increase prices to end users without a sufficiently competitive brake on their powers to abuse the market.

The EUG contends that there are also major practical constraints on the ability of electricity users to respond to high prices. Many end users do not currently have access to effective demand management technologies that are useful or effective in the time frames necessary to match the 5-minute time intervals for dispatch in the NEM. It argues that:

- Large industrial or commercial users may not be able to interrupt a production process within the very short time frames required to respond to or send appropriate price signals from/to the market. These users may need periods of notice much longer than the 5-minute dispatch intervals in the NEM to schedule production interruptions without suffering economic loss. They may also need to make additional investments such as to separate supply to critical and non-critical plant. It may simply be very costly for these users to lose even partial supply.
- Large numbers of small business and residential end users may not even have access to the technology that allows them to respond in a way that limits the inconvenience they suffered. Many small users may be totally unaware of the consequences of their continued use of electricity at times of high system demand (and high price) - and therefore have no information on which to make a decision to react.

The EUG adds that end users are not solely responsible for providing access to such technologies, which will only be provided through a co-ordinated effort involving end users, the supply side, governments and regulators. As a result, the EUG states that in the short-term, end users are constrained from sending the price signals necessary to impose individual and voluntary price caps.

The EUG argues that incentives for demand side responses will be enhanced by simplifying Code rules and removing infrastructure impediments that inhibit such responses, not by an increase in VoLL. The EUG argues that the vast majority of end users will not be incentivised, or be able, to implement effective demand side responses unless they can do so without major inconvenience, such as through complex notification and bidding procedures as required by Code rules, unless their electrical installations are wired to allow discretionary shedding of less critical loads, and unless the electricity supply system is configured to facilitate and automate demand side responses.

A number of interested parties argue that franchise load characteristics make it difficult for retailers to develop demand side response.

The retailer Integral Energy and PIAC contend that the volatility of franchise load has been the cause of periods of peak demand. Integral argues that such load is not price sensitive and this, together with the flat load profiles of non-franchise customers, results in retailers experiencing considerable difficulties in developing demand side response capability. Therefore, they argue, increasing the level of VoLL will not result in any meaningful signals being given to the retail market.

AGL similarly contends that with fixed prices to retail customers, it cannot pass price signals through. As these customers currently account for around 74% of total South Australian demand, AGL claims that its opportunity to manage demand is restricted to the remaining 26% of the market.

A number of interested parties argue that even with full retail contestability (FRC), potential demand side response will be limited. Integral argues that the likelihood of manual read interval metering followed by a metering and settlement solution of net system profiling for FRC will result in a continuation of the current situation of customer load which is not price sensitive. Integral adds that as the retail market remains immature it should be permitted to develop over a longer period with the existing level of VoLL.

The EUG similarly believes that proposals to implement load profiling for all end-use customers without interval meters will grossly distort the market by insulating up to 45% of the market load from NEM price signals. AGL notes the 2003 introduction of FRC in South Australia and the delayed introduction in the other jurisdictions will effectively fix prices for around 47% to 74% of the market throughout the period when the proposed VoLL increase is to be phased in. Therefore, AGL argues that a price which cannot be passed through to customers cannot be a market signal.

A number of parties also suggest that large customers are often not willing to participate in interruptable load schemes, thereby further limiting the potential for demand side response.

AGL argues the potential for retailers to contract for demand management is limited by the availability of potential customers, the size of this potential relative to total demand, and the willingness of large customers to participate in interruptable or curtailment schemes. AGL contends that of the customers it has approached with demand in excess of 2MW, not one was prepared to enter into an interruptable arrangement. AGL contends that customers currently under contract for demand management are only prepared to enter into an offer and acceptance scheme, usually negotiated on the day. AGL notes that this creates significant difficulties in forecasting the level of the aggregated customer response.

AGL notes that even where large customers with the potential to load shed may exist, they tend to be customers of the generators. AGL states that, as a general rule, a generator would not want to demand side manage these large, often interruptable loads if it would lower pool prices when they were generating and had uncontracted volumes. Therefore, AGL argues, the belief that high prices stimulate demand side responses is not valid at all times.

As such, while demand management is simple in theory, AGL notes that in practice its experience to date has not found this to be the case. AGL states that developing the capability to contact, get agreement and co-ordinate with customers when there is a need to manage demand has proved challenging. AGL notes that its preferred option, remote control for demand management, has not been possible as customers are not prepared to lose control of their plant or operation.

Additionally AGL argues that while a retailer is attempting to respond to five minute pricing signals, customers can take at least one hour to respond, which limits the efficiency of demand management as a risk management option. Therefore, AGL argues demand management is only worthwhile for events with a duration of at least three hours.

Citipower similarly argues that demand side management is difficult to implement. It notes the following impediments to demand side management:

- consumers don't like interruptability because it is expensive to install the equipment and plan for an interruption which affects their core activities (regardless of the financial benefits);
- there are technical limitations on the flexibility with which a retailer can respond – demand response tends to be lumpy and uncertain because some customers may not be either willing or able to respond to all requests for load curtailment, or respond only after sufficient notice is given;
- jurisdictional licensing requirements for reliable supply prevent interruption by retailers;
- competitive pressures prevent demand side management being offered; and
- many consumers don't have or don't want exposure to spot market volatility.

Citipower argues that for demand side management to work consumers must be exposed to energy market volatility and be provided with opportunities to avoid this volatility. Citipower believes that this requires a significant shift in the way consumers have dealt with electricity utilities in the past. It is argued that this shift will take time and require considerable consumer education and incentives that offer value to customers and retailers.

AGL contends that in promoting demand management as a market-based response to high prices, the possible response of generators should be taken into account. AGL notes that retailers institute demand management when there is an expectation of a period of high pool prices. However, AGL argues that experience in South Australia suggests that as demand is withdrawn in the expectation of lowering prices, generators rebid capacity into higher priced bands when the opportunity presents itself, thereby offsetting any decline in demand.

The EUG argues that the fact that this behaviour can occur under the Code rules is alarming. The EUG contends that detailed analysis of generator bidding behaviour might well produce evidence that shorter-term price movements (seasonal, daily, and hourly) do not always reflect the underlying variations in supply and demand.

The EUG also notes that NECA is currently considering how to improve the ability of the demand side to participate in the NEM. The EUG notes that a range of possible responses is being examined and a reference group has been formed.

### *5.3 Risk management*

In the draft determination, the Commission argued that increasing VoLL should provide greater incentives to manage risks. At the pre-determination conference and in subsequent submissions, there was considerable debate about whether risk management products will be available with a higher VoLL.

Snowy Hydro, Tarong, Loy Yang and NPS believe that it is fallacious to suggest that the market should not move to a higher VoLL because products managing price risk to \$20,000/MWh are not currently available. NPS contends that these products will become available once that risk materialises and there is a market for such products. NPS and Snowy Hydro argue that the introduction of higher levels of VoLL will inevitably encourage more analysis, development and innovation of appropriate risk management instruments that will ultimately be beneficial to the market in several aspects including:

- increasing the liquidity and range of instruments which will enable a greater ability to manage risks; and
- reducing spot volatility that results from greater certainty of portfolio positions.

NPS and Snowy Hydro contend that they are already very active providers of risk management products. NPS argues that an increase in the level of VoLL will create an environment for more variety and volume in risk management products. NPS adds that it has the ability and experience to offer risk management products to the market in order to manage risks associated with an increase in VoLL.

Transenergie similarly believes that market participants have a choice, if they view the risk of exposure to the new level of VoLL as unacceptably high, of contracting to mitigate that risk.

AGL, the EUG, Pacific Power, Energy Australia, Great Southern Energy, Bardak and CS Energy argue that while a higher VoLL will lead to an increase in demand for risk management products by retailers, it will also lead to an increase in risk for generators. For example, in circumstances where generators have difficulty in meeting their contract commitments due to plant failure, a generator might have to purchase from the market at \$20,000/MWh. It is argued that as a result generators are likely to contract more conservatively if VoLL is increased in order to limit exposure to spot prices in the event that generation plant is unavailable. In this case, contract cover up to the physical capacity of the market will not be available. Consequently, it is argued that while there may be an increase in demand for risk management products there may, however, be a decrease in supply.

Citipower, the EUG and the EMRF note that the cost and liquidity of risk management products varies with the expected level and volatility of pool prices. They argue that at times when pool prices are expected to be high, liquidity in many financial products dries up as it becomes more attractive for sellers of insurance to make more from the energy market than from financial caps.

AGL adds that there are indications that some generators intend to write future contracts only to the existing level of VoLL at \$5,000/MWh, requiring new products that fill the gap between \$5,000/MWh and the proposed increased level of VoLL. AGL notes that if this happens those generators would keep their market risk at the same levels but retailers will be more exposed (unless the new products exist). AGL contends that a retailer does not have the same opportunity to shift risk.

AGL also notes the WM Mercer report's conclusion that more robust risk management solutions are required in the NEM, irrespective of an increase in VoLL, and that an increase in VoLL would make the need to develop these solutions even more critical. AGL notes that this report concluded that such solutions are likely to take time to develop.

Further, Energy Australia notes that market makers such as banks that add liquidity and depth have been exiting the market with the proposed increase in VoLL cited as one reason.

Great Southern Energy argues that while the ability to understand risk in the energy market has improved and become more sophisticated, risk management tools in the market have not developed. Great Southern Energy believes that there is insufficient liquidity in the market to provide confidence to participants that the financial risks can be controlled if a higher VoLL is introduced.

NPS, TXU, Tarong, Southern Hydro and Loy Yang contend that those arguing against an increase in VoLL are in essence asking the ACCC to manage their risk for them, rather than allowing a market based solution to develop. Snowy Hydro adds that the current price cap provides “free insurance” to participants, thereby taking away incentives to minimise risk.

There was also comment on the impact of an increase in VoLL on the price of risk management products.

TXU notes that increasing the price cap has the potential to increase energy market risk, but believes that this increased risk is necessary to enable the energy market to provide appropriate price signals to fund investment in peak generation and demand side initiatives, particularly in Victoria and South Australia.

Southern Hydro states that an increase in VoLL may put additional risks into the market that will eventually be paid for by consumers. However, Southern Hydro argues that the risks are there now in the form of risk of lack of supply, and the costs of blackouts or brownouts.

Loy Yang and Tarong argue that the higher premiums for these insurance products reflect a future tighter demand supply balance. The premiums are therefore a clear signal to encourage the building of new capacity and hence reflect the market responding to supply shortages before they occur.

AGL argues that retailers are prepared to pay a fair price for risk management products. However, AGL argues that the concept of any offer being a good one is not valid. AGL believes it is critical that there is a clear understanding of the additional costs a change of this nature would be to all market participants, and more importantly end users.

The EUG argues that raising VoLL would massively increase the financial risks faced by contracted generators and uncontracted retailers that would, inevitably, be passed through to end users twice. The EUG argues that end users will pay for generator self-insurance through higher spot prices, plus the cost of hedging "insurance" cover that has to be taken out by retailers.

Pacific Power argues that the development of cap or hedge products to \$20,000/MWh would require a substantial increase in either the risk premiums offered on swaps or a very large increase in premiums offered for cap products.

A number of other risk impacts of increasing VoLL were raised by interested parties.

AGL takes issue with the Reliability Panel’s argument that volatility in commodity markets is normal and that risk management should be relatively straightforward. AGL notes that the rolling 14 day variation of the AUD/USD exchange rate is typically in the 0.8% range with the greatest variation in the two months to August 2000 being 1.8%. Similarly over the last

two years the rolling 14 day variation in daily closing stock prices for BHP is approximately 3% with the largest variation being 9%. AGL contrasts this with the rolling 14 day variation on the daily average pool price in South Australia which is closer to 50% with the least variation being 15% and the most over 1200%.

AGL notes that energy prices vary greatly and there is random volatility. AGL states that as the level of volatility in this market is not typical of commodity markets then it is misplaced to suggest that the response of the risk management sector would be typical of commodity markets.

AGL argues that the lack of availability of risk management products is exacerbated by the regional, rather than national, nature of the wholesale pools. Interconnection constraints, AGL notes, can have the effect of isolating the markets at either end of the interconnector with prices in the isolated region then determined by the level of its capacity available and the extent of demand. AGL claims that the islanded regions will then work as separate systems, allowing prices to diverge, potentially quite sharply. For example, AGL notes that in March this year, when the pool price in South Australia reached \$2,429/MWh, the pool price in Victoria was just \$32/MWh. AGL argues the price risk posed by these possible events is such that few participants are willing to expose revenues across interconnectors. AGL contends that the proposed increase in VoLL may cause prices to diverge between regions by more than they do currently, further reducing the likelihood of participants offering inter-regional hedges.

AGL argues, therefore, that liquidity in the hedge market is effectively limited to the installed generator capacity available in either of the importing regional markets. AGL states that successful inter-regional risk management requires a liquid market with diverse participants. AGL believes talk of creating and innovating new products fails to acknowledge this limitation.

Energy Australia, AGL and Pacific Power argue that the recent high prices in the market have resulted in onerous prudential requirements. They claim that maximum credit limits which determine the size of bank guarantees have increased by 50%. In addition, retailers have been hit with short notice margin calls for very high amounts. For instance, AGL notes that in February this year it was required by NEMMCO to make a same day payment of \$36 million to avoid a breach of its NEMMCO trading limit in South Australia due to high pool prices.

Energy Australia, AGL and Pacific Power believe that increasing VoLL to \$20,000/MWh will significantly increase prudential requirements and the possibility of margin calls. As well as increasing cost, they claim that this could also lead to a retailer defaulting. They note that under last resort supply provisions, a defaulting retailer's customers are transferred at short notice back to the host retailer or distributor merely adding to the prudential requirements and market risk of host retailers. This domino effect could lead to financial distress in the entire market.

AGL further argues that a major effect on all market participants as a result of the proposed VoLL change is an increase in credit risk bought on by counterparty/credit risk. AGL contends that a counterparty may be unable to settle due to insolvency, a result of being intentionally unhedged.

Citipower argues that without demand side management and with less than 100% contract cover, retailers could reduce or eliminate the risk posed by exposure to high spot prices if they were able to pass through these prices to their customers. However it is argued that at present their ability to do so is hampered by jurisdictional licensing requirements and competitive pressures. Similarly, AGL contends that no provision exists in franchise tariffs for additional costs for extra risk management of VoLL moving to \$20,000/MWh or demand side initiatives.

#### *5.4 Market power*

In the draft determination, the Commission expressed concerns about potential generator market power in the NEM and the detrimental impact on consumers of any exercise of market power with an increased level of VoLL.

At the pre-determination conference and in subsequent submissions, a number of interested parties raised concerns about the impact of raising VoLL when market power problems exist.

The EUG argues that raising VoLL will provide an extended opportunity and increased incentive for existing generators to practice market abuse. The EUG claims that existing NEM rules allow unacceptable market abuse to occur through withholding or withdrawal of capacity, or re-bidding, simply to force prices to unreasonable levels. It is argued that raising VoLL in this environment will impose unreasonably high costs on end users before any new capacity can be brought on line, particularly as end users can not implement effective demand side responses due to other Code, market, infrastructure and operational impediments.

PIAC similarly argues that to substantially raise the existing price cap provides an invitation for existing suppliers to raise their prices.

Bardak argues that reliance on an increased level of VoLL to bring forward investment, increase competition and lower prices is a flawed concept. Bardak contends that this would take too long; it is highly likely that the incumbent generators would be the new investors, thereby concentrating market power; and it would only add to the already unacceptably large number of possibilities for generators to initiate price spikes and exploit market power.

Citipower argues that there is great potential for market power to be abused in the contract market. Citipower states that implementing a \$20,000/MWh price cap before new peak capacity can compete in the hedging market provides existing providers of price caps with the opportunity and incentive to drive up prices in the energy market, reduce liquidity in the contract market, and drive up the price of risk management instruments.

Citipower believes that in the period before new peaking capacity comes into the energy market, existing sellers of swaps will be in a position to raise the price of risk of management products by withholding capacity from the contract market. Citipower contends that the consequences of this are likely to include increased energy market prices as generators raise bid prices towards VoLL, resulting in higher prices to customers.

Enron Australia notes that there is no legal mechanism that will effectively discourage generators from using market power and that an increase in the level of VoLL should not be authorised until this is resolved.

A number of interested parties focused on what they believe are examples of market abuse in the NEM.

The EUG argues that lack of demand elasticity (or ability of users to effectively respond to high priced periods) means that producers can use information in the market (about other producers outages or transmission system constraints) to "fix" prices during periods of actual constraint; or to reschedule (off) part of their capacity so that prices are higher than they might otherwise be. The EUG states that a clear incentive in these circumstances is to set high prices knowing that users will not, or cannot easily, respond by reducing demand.

The EUG believes that the elimination of market abuse should be placed above any changes that would increase the incentive to practice it. It notes that increasing VoLL creates incentives for generators to leave some portion of their capacity uncontracted and to "game" the market. The EUG contends that there is already significant evidence that the rules of the Code allow "gaming" to occur. The EUG argues that these must be identified and rectified, and realistic measures implemented to both discourage market abuse and punish those who practice it.

AGL argues that a very significant feature of the wholesale pools is that spot prices of \$5,000/MWh are not simply a phenomenon of peak demand. It states that disruptions to the supply side that may result from generator outage, interconnector constraints or outages offer many situations for generators to bid higher prices in the tight market. AGL contends that while high prices (of over \$2,000/MWh) usually occur at times of peak demand, they also frequently occur in times when demand is well below peak levels.

AGL argues that the major cause of supply side disruption in South Australia is constraints on the interconnector. AGL states that analysis of supply side disruptions during the period since market inception reveals that up to 70% of all such events have been associated with the interconnector. AGL expresses concerns that raising the price cap to levels in excess of \$5,000/MWh will simply allow the generators to extract a greater price than they currently achieve for any given supply side disruption. It contends that until regional markets are more closely integrated, systems such as South Australia will remain exposed to this pricing power.

Great Southern Energy has concerns about potential gaming and generator bidding behaviour in prospective or known lack of reserve situations, particularly in regard to base load generators with multiple generating units.

AGL and Bardak discuss market circumstances in regions of the NEM where market power concerns are particularly relevant.

AGL argues that there is clearly a significant level of market power in South Australia because of the small size of the market. Further, the nature of the capacity of the individual generators limits the extent of competition. In particular, AGL notes that only one generator provides most of the mid range variable generation role and spinning reserve and only one generator provides fast start back up and peaking generation. AGL argues that the mid range generator frequently sets price without real competition. If the interconnector is constrained, and when circumstances require fast start plant, the price setting role tends to transfer to the other generators.

AGL argues that in South Australia when the interconnector is constrained (58 percent of the time in 1999) any response to a demand increase or generator failure must be provided by



unused generator capacity in South Australia. AGL notes that this capacity is usually the spinning reserve of the mid range generator and, after a delay of one or more dispatch periods, the fast start plant. In these circumstances AGL argues both these generators are often well placed to determine higher price levels of their own choosing when local supply disruptions or interconnector capacity reductions occur.

Bardak argues that the lack of effective competition in Queensland and South Australia has led to unacceptably high pool prices and the use of market power to lift prices to levels well above the long run marginal cost of a new source of supply.

A number of parties used international experience to argue that the proposed level of VoLL is too high given market power issues and that market power mitigation measures similar to those in place in overseas markets are needed in the NEM.

Bardak argues that where market power exists price caps are regularly used to curb the excessive price which can result. For example, there are price caps of \$US1000/MWh in the north east of the USA, \$US500 and possibly \$250/MWh in California, \$C1000/MWh in Alberta, \$AUD250/MWh in Chile and \$AUD5000/MWh in the UK. Bardak believe there is a strong case for price caps in various states well below the \$5000/MWh in use in the NEM as a temporary control on the abuse of market power until proper competition is established (if possible). The EAG similarly refers to the experience of the Californian market.

The EUG argues that international precedent supports the necessity of a price ceiling to prevent abuse of market power that could materially damage electricity end users, at least whilst a market is not yet truly competitive. The EUG adds that overseas experience strongly suggests that more effective action needs to be taken in Australia, especially given the extent of market power evident in the NEM. The EUG therefore argues for the implementation of both independent market monitoring and, as necessary, market power mitigation measures along the lines of best international practice.

A number of interested parties outlined further potential solutions to the problems posed by the market power issue.

The EUG argues that the Commission should leave open the option of imposing a price cap at a level comparable to the current Administered Price Cap (that is, less than \$300/MWh) should market abuse or generator bidding behaviour impose unreasonably high costs on end users.

Further the EUG argues that that the Code needs to be changed to include conditions on authorisation requiring that:

- a “market abuse” condition is imposed on all generators similar in intent and force to that recently imposed by OFGEM on UK generators;
- every incident where generating plant “fit for service” is withheld or withdrawn be subject to prompt, independent, rigorous and fully effective monitoring and investigation;
- every incident where generator participant bids are unreasonably high be subject to prompt, independent, rigorous and fully effective monitoring and investigation; and

- a mechanism be developed for imposition of severe financial penalties on any market participant found to have breached the proposed market abuse conditions.

Great Southern Energy argues that to counter the potential for market-dominant bidding behaviour a separate bidding cap should be imposed on base load units, preferably at around \$1,000/MWh.

Great Southern Energy argues that while fast start gas generators should be able to bid up to VoLL, because they should be the generating source of last resort, it is not right that individual coal-fired units should be running and not despatched, just because say a single 500MW unit is bid in at or close to VoLL. It argues that the situation becomes even worse if this generator becomes the top of the stack price-setter and is despatched at near-VoLL prices.

Great Southern Energy believes that at the present time this risk of anti-competitive behaviour is even higher as significant numbers of vesting contracts are finishing, and there is a clear trend towards generators gradually increasing their unhedged positions with current high levels of average pool prices.

However, a number of generators responded to these market power concerns.

Snowy Hydro argues that the issue of market power is essentially one of structural design and is not directly related to whether the level of VoLL should be increased. Snowy Hydro supports the proposed measures to monitor participant actions with regard to behaviour in the market and argues that this along with the other developments, such as new entrants and investments, will provide adequate comfort on the concerns of market power.

Snowy Hydro argues that, as part of the wider review on the development of the NEM, the design and structural issues would be more appropriately resolved as an independent consideration. Snowy Hydro states that the issue of market power must not be an impediment to progress the competitive development of the NEM, in the context of the current applications for authorisation. Snowy Hydro notes that trying to resolve such an issue through inappropriately setting an artificially low level cap on the market will distort market outcomes and ultimately inhibit the longer term objectives of efficiency and supply reliability.

Loy Yang Power contends that an increase in VoLL will not increase market power concerns, as the Code and TPA still clearly regulate behaviour in this area. Given the regulatory and Code environment, Loy Yang believes market power is not an impediment to an increase in VoLL.

The IPA argues that the issue of market power in electricity markets is more pervasive than in almost any other market. Electricity's non-storability, a short term demand that is unresponsive to price and relatively few possible supply augmentations at particular times can lead to potentially frequent occurrences of market power. The IPA contends that this is one reason why markets for electricity have been more highly formalised than those for other commodities. However the IPA argues there is nothing illegal about gaming. The IPA notes that under the TPA a firm is not denied the liberty to reduce its supply to the market for whatever reason and under the Code the supplier may simply be asked to explain the reasons for a sudden change in its market offerings.

The IPA argues that price caps in California and the NEM cannot be accurately compared as California has a capacity payment approach in contrast to Australia's energy only market. The IPA argues that the Californian approach arguably invites market failure and a consequent need for more aggressive policing on the part of the market controller.

The IPA contends that the potential for monopolistic abuse is seldom best combated by price restraint and in fact that such restraint is likely to exacerbate adverse outcomes of such abuse by restraining new supplies. The IPA notes that the February 2000 market intervention by the Victorian government in response to power failures resulted in lower prices which are the opposite incentive to what the market required.

The IPA believes that occurrences of monopolistic ramping up of prices in the Australian market are rare and perhaps non-existent. This is, the IPA argues, notwithstanding that in NSW, Queensland and South Australia the structure of the supply industry is such that some generators potentially have market power. The IPA claims that voluntary transactions between participants in the market are the best insurance against suppliers (or customers) seeking to manipulate prices in periods when they have market power.

#### *5.5 Effect on contract and pool prices*

At the pre-determination conference and in subsequent submissions several interested parties have commented on the likely effects of an increase in VoLL on contract and pool prices.

Macquarie Generation argues that an increase in VoLL will result in windfall gains to some suppliers at times of supply stress at the expense of substantial losses by other NEM participants. Macquarie Generation estimates that the additional cost to the market in 1999/2000 had VoLL been set at \$20,000/MWh rather than \$5,000/MWh would have been \$2,069 million.

Macquarie Generation argues that this would effect premiums for property and liability insurance. It claims that there are increasing concerns in insurance markets about claims arising out of business interruptions. Macquarie Generation states that in the current round of insurance renewals, not only are insurance premiums increasing significantly (from 25% to 250% of existing premiums) but time deductibles are being applied to business interruptions meaning that once a forced outage or other event triggers a business interruption claim, insurance liability does not apply until the time deductible expires.

Macquarie Generation believes that increasing VoLL will further increase insurance premiums and time deductibles and in some instances lead to the withdrawal of insurance cover. Macquarie Generation argues that this will create a barrier for new entrants, force marginal participants out of the market and increase costs, which would then be passed onto consumers.

Energy Australia argues that the impact of rapidly increasing VoLL is to add cost and risk across the market, cost that will ultimately be borne by end use customers. Based on offers received from the market, Energy Australia estimates that increasing VoLL from \$5,000/MWh to \$20,000/MWh will add \$2/MWh to the market price.

AGL contends that price spikes due to constraints on the interconnector have increased the average SA pool price significantly and an increase in VoLL would further increase the impact on SA pool prices. AGL estimate that a value of \$20,000/MWh instead of

\$5,000/MWh in the periods involving a VoLL price in 1999/2000 would have increased the volume weighted South Australian pool price from \$69/MWh to \$84/MWh. AGL notes that pool price increases related to higher generator bids above \$5,000/MWh would have been additional to this.

The EAG argues that retailers faced with an increase in risk will raise their market risk premium to cover the risk of a VoLL event, with the effect of lifting costs to consumers of between \$10 - \$20/MWh.

Pacific Power argues that a higher level of VoLL would require NEMMCO to increase the coverage it has for market events resulting in higher market fees which would be passed on to end users.

However, NPS argues that increasing VoLL will cause prices to decline due to investment in peaking plant which target all medium and high price events, thus driving down the average system marginal price.

### *5.6 Timing*

Several interested parties have raised concerns about the timing of the proposed increases in VoLL given both delays in the introduction of FRC and the shortened timeframe between the issuing of the Commission's final determination and the first proposed increase in VoLL

The Electricity Supply Association of Australia (ESAA) notes that the majority of the members of its retail directorate argue that increasing the level of VoLL should be deferred in light of relevant market developments such as the introduction of FRC.

CS Energy, Integral, Citipower and Great Southern Energy argue that at present a significant portion of customers are franchise customers, not exposed to the market price and are therefore insensitive to price. The current timetable for retail contestability is not certain, nor is the framework within which this contestability will be conducted. Therefore, choice to consume based on price (demand side response) is currently limited to a small number of large customers who arguably place the highest value on supply reliability due to the nature of their processes. They contend that the proposal to increase VoLL is therefore based on outdated and incorrect information. They argue that as a greater number of smaller customers become contestable, price incentives will encourage development of demand response schemes enhancing market interactions. It is argued that the delay in FRC severely inhibits the ability of customers to see effective price signals and develop effective demand side management. Therefore, the timetable for increasing VoLL should be altered to reflect the likely FRC timetable.

Great Southern Energy notes that in both NSW and Victoria "safety net" or default regulatory arrangements will exist to provide a default supply at a regulated price to those customers who choose not to enter the market or who may not be attractive to competitive retailers.

Great Southern Energy argues that incumbent retailers will not be able to manage the risk of these default customers who remain with an incumbent retailer at regulated prices and are non-disconnectable. Great Southern Energy states that this issue will remain for an appreciable period after FRC and is very dependent upon the approach taken by jurisdictional regulators who are still to fully consider the matter. Therefore, Great Southern Energy argues there is a very large regulatory risk that the impact of the proposed changes to VoLL may not be foreseen in advance by regulators or that the regulated pass through price of energy to

these default customers may not be sufficiently flexible to reflect changing market conditions.

Great Southern Energy believes that it is essential for FRC to be fully implemented and bedded down prior to any change in VoLL. Great Southern argues that the existence of any type of regulated retail price would completely negate any demand side response to the proposed higher VoLL for residential and small business customers. Those customers comprise approximately 40% of the total energy market and contribute substantially to both summer and winter peak demand.

Citipower proposes that the increases in VoLL be phased in over a longer timeframe — September 2002 for the increase to \$10,000/MWh and April 2003 for the second increase to \$20,000/MWh. Citipower argues that this delay is necessary both because of delays in the introduction of FRC and the shortened timeframe following the draft determination in which to build new reserve capacity, be it transmission augmentation or peak load generation capacity. Citipower argues that the lead-time for bringing a small gas turbine into production is at least 2 years.

The IPA notes Citipower's argument that a longer phase in be adopted in view of contracting periods and lead times. The IPA argues that while these are legitimate issues, the ACCC is in no position to argue that the timing proposed by Citipower is preferable to that of NECA.

Energy Australia notes that over the next two and a half years the number of contestable customers will increase to 7 million, up from 30,000 at present. Energy Australia believes that VoLL should not be significantly increased whilst the market faces its greatest test to date.

AGL argues that the market is still in transition. Vesting arrangements and fixed price contracts now extend one year or more beyond the date expected in the original authorisation, and in South Australia, beyond the phase-in of VoLL to \$20,000/MWh. AGL argues that the price signals and increased risks will not be able to be managed by retailers, or passed onto customers, in South Australia prior to 2003.

AGL believes that the proposed increase in VoLL should not be implemented until at least January 2004 subject to a review of its appropriateness to be conducted by NECA during 2003. In AGL's opinion, a deferment would have the following benefits:

- subject to Queensland deciding to proceed, all states in the NEM should have implemented full retail contestability by 2004;
- all vesting contracts in the NEM will have been expired for at least one year; and
- key market structural issues such as generator TUOS, full nodal pricing, the treatment of entrepreneurial interconnectors, accountability of NEMMCO, NECA and network service providers, re-bidding, market directions, the application of VoLL pricing and VoLL scaling, the treatment of load shedding, and ancillary services should have been resolved.

TXU argues, however, that the current Code change timetable is adequate given the long time period that has already passed since these changes were first mooted.

### *5.7 Cumulative price threshold*

Energy Australia supports the maintenance of the CPT at the proposed level of \$300,000. However, it notes that at this threshold a physical purchaser the size of Energy Australia with an indicative spot exposure of 25% could lose \$300 million per week.

Citipower supports the introduction of the CPT agreeing with NECA that the CPT will provide a more effective means of capping risk than the Code's existing force majeure arrangements.

### *5.8 Commission's proposed conditions*

In the draft determination, the Commission imposed the following conditions of authorisation:

**C2.1 Clause 3.13.7 of the Code must be amended to require NECA to publish a report when the spot price exceeds \$5,000/MWh. The report must:**

- (a) describe the significant factors that led to the price spike;**
- (b) establish whether rebidding, especially rebidding close to real time, of price and/or quantities had contributed to the price spike; and**
- (c) identify the marginal unit(s), and all those units that bid above \$5,000/MWh, and compare the bids and offers with past bids and offers for the same unit(s).**

**C2.2 In undertaking the annual review of VoLL as prescribed in clause 3.9.4(c) of the Code, the Reliability Panel shall have regard, in addition to any other requirements of the Code, to the impact of the increases in VoLL on spot market prices, levels of investment and system reliability. The report by the Reliability Panel shall include an assessment of whether the level of VoLL and operation of the CPT have achieved the outcomes intended by the Code changes.**

TXU supports condition C2.1, arguing that this provides a reasonable degree of warning regarding possible market power abuse.

Enron argues that the Commission's draft determination does not set out the reasoning behind selecting \$5,000/MWh as the trigger for the review mechanism in condition C2.1. Enron expresses concerns that misuse of market power is associated with a pre-determined price level. Enron argues that generators could use market power to affect spot prices below this level. Further, it believes that the \$5,000/MWh trigger could act as a ceiling for generators who misuse market power. Therefore, Enron argues that further analysis is necessary to develop a more useful review mechanism.

Enron also questions the effectiveness of the review mechanism given that there is no provision for the imposition of penalties in instances where a generator has misused its market power.

The EMRF argues that given the extent of rebidding in the NEM, condition C2.1 needs to be tightened with reporting dates and penalties clearly specified. Additionally the EMRF argues that the ACCC should be involved in such reporting by NECA.

Loy Yang considers that while the Commission has a role to investigate significant price variations it would appear inequitable to suggest that all prices above \$5,000/MWh will be investigated when the market design is allowing for significantly higher values to occur. Loy Yang Power contends that regardless of price it should be the magnitude of variations that should be examined in both directions and not just those which are positive (demand side bids included).

The South Australian Electricity Reform and Sales Unit (ERSU) notes that over the next few years the NEM faces implementation impacts emerging from a number of major reviews into various aspects of the market as well as coping with the implementation of FRC. The ERSU argues that this suggests a need for a cautious approach with an emphasis on reviews providing support for any implementation of VoLL increases.

The ERSU therefore strongly supports the need for the rolling annual review process by the Reliability Panel to take into consideration the impacts of increases in VoLL on the market, as proposed in the condition C2.2. Furthermore, the ERSU argues that in adopting this approach there should be a clear expectation that the findings of such reviews would be appropriately acted upon, to ensure that appropriate levels of VoLL are adopted in accordance with the outcomes intended by the Code changes.

### *5.9 Other issues*

Great Southern Energy argues that a higher VoLL is likely to act as an impediment against small generation entering the market. While at first it would appear that small-scale generation would develop to meet future demand, Great Southern Energy argues that the added market risk as a result of a four-fold increase in VoLL is likely to over price this alternative development. Great Southern Energy contends that smaller generators and especially single unit generators will have very little opportunity to contribute to liquidity in the contract market as they will be exposed to the risk of the higher VoLL if they experience plant failure.

Great Southern Energy believes it is more likely larger generators with sufficient redundancy will be best placed to manage the risk and at the same time better able to influence the market. Further, the proposed higher VoLL will also tend to force generating entities with a small number of units into mergers or alliances with other generators

The EMRF argues that reserve plant margins in the NEM are well below that required to meet NEMMCO's reliability standard. The EMRF argues that an increase in VoLL should not be authorised until an independent review is undertaken into the appropriate reliability standard.

Great Southern Energy asserts that a reasonable assessment of the views expressed by retail participants in various forums and discussion would leave no doubt that there is only a small number of participants supporting an increase in VoLL as suggested in the draft determination. This present position of participants is therefore totally at odds with the assertion by NECA that participants would support the Reliability Panel having the authority to set an unqualified path for VoLL.

Southern Energy Consultants argues that the APC off-peak price of \$50/MWh is too low in relation to the APC peak price of \$300/MWh. It believes that the off-peak APC should be increased to \$100/MWh.

## 6. VoLL: The IES Report

While it is widely argued that an increase in VoLL will result in an increase in contract and pool prices across the NEM, there has been very little analysis of the size of this increase. In order to gain some understanding of the likely impact of an increased VoLL, the Commission engaged Intelligent Energy Systems (IES) to model the impact of various levels of VoLL and the CPT in the NEM. A copy of IES's report is available on the Commission's website. The report presents the results of the IES study on how an increase in VoLL could affect average annual spot price, price volatility and price incentives for new generation in the NEM.

The study was undertaken using IES's market simulation model, PROPHET, based on a "generic region", taken to be Victoria in the year 2006. This represents a medium size region on the verge of requiring additional supply side capacity.

The study modelled six independent variables.

1. Generator bidding	<i>Historical</i> (based on past 12 months); <i>Shadow</i> (highly competitive); <i>Generator market power</i> (historical + 2000 MW power station maximising profitability through rebidding under generating capacity positions of: 0% contracted; 75% contracted).
2. Generator outage	<i>Normal</i> (currently observed rates of up to 5%); <i>Catastrophe A</i> (1000MW of base load lost over the three winter months); <i>Catastrophe B</i> (2000 MW of base load lost over three winter months).
3. Generating reserve margin	<i>Low</i> (100 MW); <i>Medium</i> (600 MW); <i>High</i> (800 MW).
4. Demand management	<i>Low</i> (none); <i>Medium</i> (up to 3% at a spot price of \$3000/MWh); <i>High</i> (voluntary clearing of the market at a spot price of \$3000/MWh).
5. VoLL	<i>\$5000/MWh</i> ; <i>\$10,000/MWh</i> ; <i>\$20,000/MWh</i> .
6. CPT	<i>No limit</i> ; <i>\$300,000/MWh</i> ; <i>\$150,000/MWh</i> .

Specifically, under various demand management conditions the study investigated the effects of VoLL and the CPT on new entry price signals, market risk, supply reliability and generator market power. The levels of VoLL and CPT modelled were:

- A VoLL of \$5,000/MWh.
- A VoLL of \$10,000/MWh combined with CPTs of \$150,000 and \$300,000.
- A VoLL of \$20,000/MWh combined with CPTs of \$150,000 and \$300,000.

Model outputs were produced in four categories.



1. Average annual spot price	Measured in \$/MWh.
2. New entry premium	Applies to the component of average annual spot price above \$36/MWh. Measured in \$/MWh.
3. Risk premium	Applies to the component of average annual spot price above \$300/MWh. Measured in \$/MWh.
4. Generating reliability	Expressed in percentage of the total annual demand unserved.

The major findings of the IES report were:

- Given historical bidding patterns a VoLL of \$5,000/MWh is sufficient to support the level of economic generator capacity necessary to satisfy NEMMCO reserve levels.
- Depending upon the level of demand side responsiveness assumed, increasing VoLL from \$5,000/MWh to \$20,000/MWh increases price risk by up to a factor of four.
- Depending upon the level of demand side responsiveness, generator bidding assumptions and generator reserve levels, increasing VoLL from \$5,000/MWh to \$20,000/MWh increases average spot prices in the NEM by between \$1/MWh and \$7/MWh.
- The CPT will be ineffectual in capping market risk in all but the most extreme circumstances.

The results for average spot prices, levels of risk and new generation incentives for all combinations of bidding scenarios, generation reserve margins, demand management, levels of VoLL and CPT are presented in Appendix B of IES's report and are summarised below.

### *6.1 Supply side incentives*

NEMMCO has defined a reliability standard as each region having no more than 0.002% annually averaged interruption to non-interruptible customer demand. The IES report concludes that the regional reliability standard of 0.002% unserved energy would not require the level of generator reserve stipulated by NEMMCO. The report found that the Reliability Panel's assessment that a VoLL of \$20,000/MWh is necessary to achieve this reliability standard is overly conservative in two areas. First, generator forced outage rates were assumed to be higher than currently observed in the NEM. Second, it was assumed that new generation would operate only at times of scarcity (taken by NEMMCO to be 5 hours per year).

The study found that these assumptions resulted in NEMMCO requiring higher generation reserve margins and a higher level of VoLL than current market experience indicates is necessary.

Historically in the NEM, generator bidding has been characterised by risk-averse behaviour where contracted quantities are bid at near marginal cost and uncontracted quantities are bid at higher levels. This has resulted in pool prices being higher than would have been the case if uncontracted capacity had been bid in a more competitive manner.

The major finding of the modelling undertaken by IES was that, assuming generators continue to bid as in the past, VoLL at \$5,000/MWh is sufficient to support the level of economic generator capacity required to satisfy NEMMCO reserve levels. This was found to be the case irrespective of demand management assumptions, the reason being that outside periods of generation scarcity, peaking plant will obtain additional revenues during periods of high spot prices.

Under the assumption that generators bid competitively in future the modelling found that a VoLL of \$5,000/MWh would not be sufficient to support the level of economic generator capacity required to satisfy NEMMCO reserve levels. The reason for this conclusion is that peaking plant revenues would rely more heavily on prices during periods of generation scarcity.

With competitive bidding, the report finds that spot prices are reduced to the point where new entry for a gas turbine only becomes economic under extreme conditions of low reserve margin, low demand management, and VoLL levels of \$10,000/MWh or more.

## *6.2 Demand management*

IES found that the effect of increasing VoLL on risk and spot prices was highly dependent on the level of demand management assumed. Demand management in response to supply side constraints or demand spikes facilitates balancing of supply and demand thereby reducing market volatility. The modelling found that the higher the level of demand management assumed, the lower the impact of increasing VoLL on spot prices, new entry premiums and risk premiums.

IES modelled low (no demand management), medium (up to 3% at a spot price of \$3,000/MWh) and high (voluntary market clearing at a spot price of \$3,000/MWh) levels of demand management. The most recent NECA survey of demand management in the NEM estimates actual demand side responsiveness at 1.3% for customers with demand in excess of 1MW demand.<sup>7</sup> The level of demand management for customers with less than 1MW load can be expected to be significantly less than this.

The ensuing discussion of the impact of VoLL on risk premiums, spot prices and the CPT considers both the low and medium levels of demand management modelled by IES. At present, the actual level of demand management in the NEM at present sits at the low end of the range between the low and medium levels modelled by IES.

With regard to generating reserve margins, the discussion considers the medium reserve level case modelled by IES, 600MW, which is close to the minimum level defined by NEMMCO (this being 500MW for Victoria). This level of reserve corresponds to a reliability level substantially higher than the NEM standard. Results for low and high generating reserve margins are also considered in the IES report.

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<sup>7</sup> 'Survey of Demand Side Participation in the National Market', NECA, September 2000. NECA surveyed twenty customers with 2,154MW maximum electricity demand across 2260 sites, with load ranging from 1MW to 1000MW (although one customer represented 40% of total demand). A total of 817MW of load reduction was reported although one customer contributed 98% of this total. Excluding this customer the 17MW of load reduction reported out of 1254MW total demand represented 1.3% of total demand.

### *6.3 Price risk*

IES concluded that the impact of VoLL on the sensitivity of price risk in the market is highly dependent upon both the level of generation reserve capacity and the level of demand side responsiveness. Given historical bidding patterns and assuming low levels of demand management, increasing VoLL from \$5,000/MWh to \$20,000/MWh increases price risk by about a factor of four. However, the modelling found that demand management could eliminate this risk sensitivity to VoLL.

IES's modelling shows that an increase in VoLL from \$5,000/MWh to \$20,000/MWh increases risk premiums (annual cash flows associated with spot price margins above \$300/MWh) by \$6.55/MWh assuming low levels of demand management and by \$1.63/MWh assuming medium levels of demand management.

Assuming competitive generator bidding the study found that increasing VoLL from \$5,000/MWh to \$20,000 MWh increases risk premiums by \$4.29/MWh assuming low levels of demand management and by \$0.92/MWh assuming medium levels of demand management.

Further, the study found that generators exercising market power would significantly increase risk premiums.

The report also concluded that the ratio of maximum risk premium to average risk premium increases as the level of VoLL increases: the ratio is approximately 4 when VoLL is \$5,000/MWh and 10 when VoLL is \$20,000/MWh. This indicates additional uncertainty and risk at high levels of VoLL.

### *6.4 Spot prices*

The modelling results of the impact of an increase in VoLL on spot prices are outlined in Appendix B of the IES report. The modelling estimates that, given historical bidding behaviour, increasing VoLL from \$5,000/MWh to \$20,000/MWh would increase average spot prices by \$1.62/MWh assuming medium demand management and \$6.62/MWh assuming low demand management. Given current low levels of demand side participation in the NEM the actual impact on spot prices may be in the middle to high end of this range.

These estimates do not, however, take account of possible changes in generator bidding behaviour as a result of an increase in VoLL.

### *6.5 Market power scenario*

In order to measure the possible effects of generators exercising market power, IES undertook modelling of the incentives and market power of generators under various levels of VoLL and the CPT. This analysis was performed for a 2000MW power station maximising profitability through rebidding under both "no contract" and "75% contracted" positions.

The modelling found that significant levels of uncontracted capacity can improve generator profitability through capacity withdrawal, an incentive which increases with the level of VoLL. However a higher level of contracting will greatly reduce such incentives.

The modelling found that, assuming medium levels of demand management, increasing VoLL from \$5,000/MWh to \$10,000/MWh increases risk premiums from \$4.1/MWh to

\$8.1/MWh assuming a 75% contracted position and from \$13.6/MWh to \$20.4/MWh assuming an uncontracted position. Assuming low levels of demand management, premiums increase from \$4.5/MWh to \$9.1/MWh assuming a 75% contracted position and from \$9.7/MWh to \$16.9/MWh assuming an uncontracted position. When low levels of demand management combined with low levels of reserve were modelled, premiums increased from \$8.8/MWh to \$17.3/MWh for the 75% contracted position and from \$65.8/MWh to \$121.1/MWh for the uncontracted position.

Increasing VoLL from \$10,000/MWh to \$20,000/MWh did not increase risk premiums significantly above the \$10,000/MWh level due to the modelling parameters specifying a \$10,000/MWh peaking plant effectively capping price at this level.

The study found that for the 75% contracted position increasing VoLL did not significantly increase spot prices. However, the spot price duration curves show that for the uncontracted generator position spot prices increase significantly. Assuming medium reserve levels the percentage of hours with spot prices above \$125/MWh increases from less than 5% in the base case to greater than 20% resulting in a significant increase in spot prices. With low reserve levels the increase is from less than 10% of hours to greater than 30%.

As was the case with most scenarios modelled in the study, the CPT was largely ineffective in capping this increase in risk. Only in the extreme case of low reserve and no contracted capacity did a CPT of \$150,000 have any effect, reducing risk premiums from \$82.8/MWh to \$62/MWh. In this instance a CPT of \$300,000 had no impact.

#### *6.6 The cumulative price threshold*

The modelling found that with a VoLL of \$20,000/MWh, proposed values for CPT (both \$300,000 and \$150,000 were modelled) will not be reached under “normal” market conditions. Normal market operation includes the expected statistical behaviour of demand and generating plant outage, high demand spikes and generator breakdowns. This is because the spasmodic nature of the price profile and the virtual absence of periods of high price concentration means that it is unlikely that spot prices of \$20,000/MWh would ever be sustained for long enough for the CPT, set at \$300,000 or \$150,000, to be invoked.

The IES study also identified the role played by the CPT in capping market risk where there is a significant level of generator outage. In addition to the base case, IES modelled two catastrophic scenarios of generator outages based on the historic bidding case:

- *Catastrophic Scenario A*, the outage of 1000MW of base load capacity over the 3 winter months; and
- *Catastrophic Scenario B*, the outage of 2000MW of base load capacity over the 3 winter months.

The scenarios had the expected effect of significantly raising spot prices, new entry premiums and risk premiums, with the increase magnified the higher the level of VoLL. The modelling found the CPT to be largely ineffective in managing this increase in risk.

The report found that under Scenario A the CPT was not invoked, illustrating that market risk would not be expected to reach the level at which the CPT would operate even under loss of significant generation.

The modelling found that only in the case of Scenario B did a CPT of \$150,000 significantly reduce market volatility.

Based on these catastrophic scenarios the study concluded that 1500MW to 2000MW of base-load generator capacity would need to be lost if cumulative spot price over 336 consecutive dispatch periods is to reach suggested CPT levels.

The modelling did however find that demand management would reduce market volatility from either scenario.

## 7. VoLL: Commission considerations

When the Commission first considered the VoLL price cap, as part of its determination of 10 December 1997, the Commission noted many of the arguments, both for and against, concerning the existence and level of the VoLL price cap.

On the one hand, the Commission noted that the main rationale for VoLL was to act as a price cap to ensure that the market is not subject to large price shocks, particularly in the early transitional phases of the NEM.

Conversely, the Commission argued that VoLL created a number of market distortions. In particular, the Commission noted that VoLL restricts market outcomes by placing an upper bound on the prices and hence revenues that a seller in the market may earn and, in so doing, can distort the value of electricity and ensuing investment incentives.

At that time, the Commission concluded that, on balance, there was a public benefit in having VoLL as it protects customers against price spikes that may arise in periods of excess demand. This was considered to be an important factor given that the NEM was a new market arrangement where demand side responses to high prices were expected to take some time to develop.

Consequently, the Commission imposed a condition of authorisation which required an amendment to clause 3.9.4(c) to provide for the Reliability Panel to conduct yearly reviews of the value of VoLL. The proposed Code changes have resulted from the first of these yearly reviews.

The proposed Code changes seek to separate the economic price signalling and risk capping roles VoLL currently fills. It is proposed that VoLL be set primarily on the basis of the market clearing signal it provides with the revised force majeure provisions. The CPT would be the primary codified mechanism for capping risk.

In the draft determination, the Commission accepted that the proposed Code changes will increase investment in fast start plant and achieve improved demand side response. However, the Commission did express concerns about the impact of increasing VoLL to \$20,000/MWh where generator market power issues are a concern. After considering these two issues, the Commission concluded that, on balance, the public benefits would outweigh the anti-competitive detriments of the proposed Code changes provided that certain conditions were met. That is, in the draft determination the Commission proposed authorising the increase in VoLL to \$20,000/MWh and the introduction of a moving average price cap (CPT) of \$300,000, provided that NECA undertook additional market monitoring activities.

Since the release of the draft determination, interested parties have provided a range of views on the balance of these two issues. Moreover, interested parties have raised a number of other issues that can affect the likely balance of public benefits and anti-competitive detriments of the proposed Code changes.

This section assesses the various arguments put forward in relation to the proposed Code changes, taking into account issues raised following the release of the draft determination. This section concludes with the Commission's assessment of the balance of the arguments and the Commission's conditions of authorisation.

## *7.1 Supply side incentives*

In its 10 December 1997 determination, the Commission noted that if VoLL is set too low it may result in insufficient generation capacity being available in periods of excess demand, resulting in involuntary load shedding and serious disruption to the community. For example, if the spot price is capped at too low a level, investment in peaking, stand by and other generation plant, and market based network investment (or equivalent demand management techniques) may be less than they would otherwise have been. In addition, existing facilities in each of these categories may be disadvantaged.

The Reliability Panel and NECA made similar arguments in support of the proposed Code changes. For instance, the Reliability Panel argued that in regions where significant levels of demand occur for only a few hours per year, relatively high peak prices will be necessary to support marginal plant. NECA argued that the proposed Code changes provide a path for increasing VoLL to levels that will allow appropriate cost recovery for fast start plant acting in a peaking role.

In the draft determination, the Commission accepted the arguments that an increase in the level of VoLL would bring public benefits by increasing market signal based investment in peaking plant and market based network investment, thus improving system reliability. Subsequently there has been considerable debate over whether an increase in VoLL to \$20,000/MWh is needed in order to attract sufficient investment in peaking plant.

A number of interested parties, including Macquarie Generation, CS Energy, Great Southern Energy and Energy Australia, have noted that in regions where spot prices are more volatile (eg Queensland and South Australia), new investment in generation and interconnection is already occurring at the present level of VoLL. For instance, in Queensland, the Roma gas fired power station has been commissioned, new coal fired power stations are proposed at Milmerran, Callide and Tarong, and plans have been announced to redevelop Swanbank as a gas fired station. In South Australia, units at Ladbroke Grove and Pelican Point are now operational. It was even observed that at current levels of VoLL there are proposals to expand the capacity of interconnectors (eg Basslink) that would also mitigate the supply problems in regions such as Victoria where demand is peakier than elsewhere. As such it has been argued that even at the current level of VoLL appropriate investment signals are being provided in these jurisdictions.

Conversely, a number of market participants, but predominantly generators (eg NPS, EMEAL, Southern Hydro, Tarong and TXU) have argued that in jurisdictions where demand peaks occur for only a few hours a year (eg Victoria), there may be insufficient top end generation at the current level of VoLL. As such, it has been argued that investment in these plants is driven by revenue potential in the few hours they run, and therefore the current level of VoLL is too low to encourage investment in low duty peaking and reserve plants.

The Commission considers that there is merit in both arguments. The Commission believes that investment decisions in new generation are driven by a range of factors, but in particular investors would match the cost structure of alternative generation options and the expected future movements in electricity prices. In turn, movements in electricity prices would be expected to be linked to the growth in demand (as might be reflected in changes in the shape of the load duration curve).

Consequently, in regions where there is already a tight supply/demand balance (eg Queensland and South Australia), high average spot prices have persisted and this has been sufficient to stimulate new investment at the current level of VoLL. However, in Victoria, where significant levels of demand occur for only a few hours a year, an increase in VoLL would appear to be needed to encourage additional investment in generation plant.

This tends to suggest that an increase in VoLL is needed to encourage new investment in those regions with a “peaky” demand. However, it is less clear whether it justifies an increase in VoLL to \$20,000/MWh. On the one hand, the Reliability Panel argued that for a peaking plant to operate for a few hours a year, and for it to be profitable, it would need to earn \$20,000/MWh. Conversely, IES argued that peaking plant would derive revenue not only in periods of generation scarcity but also in other periods of high spot prices.

Indeed, the Commission believes it logical that any additional peaking plant bought into the market, once commissioned, would be likely to be bid into the market not only in times of generation scarcity, but whenever spot prices are expected to exceed the plant’s marginal cost of generation. Such plant is not likely, therefore, to derive revenue solely from random, infrequent VoLL type events.

Consequently, the Commission considers that while a VoLL of \$20,000/MWh will provide an incentive for greater investment in peaking plant, investment decisions will also be driven by certainty of revenue streams from both the spot and contract markets. As a result, a VoLL that sits below the \$20,000/MWh as proposed by NECA, is still likely to be sufficient to ensure investment in peaking plant capacity.

The Commission also notes that, as part of this application, NECA has sought a three year extension for the reliability safety net (see Section 8). Under this arrangement, should it become apparent that the market is not attracting sufficient investment in the supply and demand side resources necessary to achieve the reliability standards set by the Reliability Panel, NEMMCO has the option of contracting for additional capacity under these provisions. The Commission considers that where the possibility exists that the market cannot provide adequate reserve, these provisions provide a means of addressing this.

## *7.2 Demand side incentives*

NECA argues that an increase in VoLL will increase the likelihood of high prices which will provide additional incentives for customers to reduce demand in periods where the supply/demand balance is tight. The Commission believes that there are public benefits from an increase in VoLL if it leads to the better functioning of the electricity market. In particular, the Commission accepts that there would be public benefits if the occurrence of very high electricity prices resulted in voluntary reductions in demand and avoided the incidence of involuntary load shedding or mandatory restrictions in circumstances of a tight supply situation.

However, an issue of contention for interested parties and the Commission has been the extent to which an increase in VoLL will encourage a demand side response. Demand for electricity has traditionally been insensitive to price changes. Consequently, an increase in VoLL may have only a limited impact on the level of demand. Indeed, a range of interested parties (eg AGL, Citipower, Integral Energy, EUG and PIAC) has argued that the likely demand side response to a higher VoLL will be muted by the significant obstacles that remain in the market.



The Commission firstly notes the apparent reluctance of larger customers to enter into interruptible load contracts with retailers. As electricity is often just an input to the business, many customers do not wish to enter into electricity contracts which may involve interruptions to their core business activity. Moreover, many customers, it would appear, do not want any exposure to spot market volatility. Consequently, these two factors clearly impinge on the ability of retailers to effectively manage the demand of their larger customers.

Evidence was also presented that even when customers are willing to enter into interruptible supply contracts, there can be technical limitations preventing an effective demand side response. For instance, industrial or commercial users may not be able to interrupt a production process within the very short time frames required to respond to short term price spikes. It can also be the case that additional investments are required to implement new demand management technologies (eg to separate critical and non-critical plant). Interested parties, such as Citipower and the EUG, argued that the cost of developing this demand side participation can be high. Consequently, it may be that, in the short term, an increase in VoLL will do little to encourage greater demand side involvement in the market.

The Commission also notes that generally it is smaller retail customers (commercial and residential loads) who have volatile demand patterns that result in demand peaks. These customers do not presently see the impact of their volatile demand patterns in time-of-use prices. Without exposure to time-of-use prices such customers will not respond to the price signals inherent in a higher VoLL. This, once again, creates significant difficulties for retailers in developing demand side response capability.

The Commission notes further that there is considerable uncertainty at present about both the timetable for, and the structure of, FRC. Proposals to implement load profiling for end use customers without interval meters will insulate these customers from half-hourly price signals. As these retail customers are not facing time-of-use price signals, they will be unlikely to change their volatile patterns of demand. To the extent that the new FRC arrangements do impede demand side responsiveness, it can be expected that any improvement in demand side responsiveness will take some time to develop.

The Commission believes that there are still significant impediments to effective demand side responses in the NEM. Under such circumstances, an increase in the level of VoLL will have a less significant impact in reducing demand. Consequently, the Commission believes that the public benefits that an increased VoLL will have on demand responses will be limited at this time. Removing these obstacles will improve the demand side responses to volatile prices and will reduce the need for involuntary load shedding or mandatory restrictions in tight supply situations.

### *7.3 Risk management*

The Reliability Panel argued that VoLL acts as a cap on market price and therefore, at least in part, on risk. It claims that it is counter productive to limit the risk in the NEM where there are insufficient incentives to manage risk.

In the draft determination, the Commission accepted that risk is necessary to promote appropriate demand and supply responses in the NEM. However, a significant amount of material was presented to the Commission arguing that an increase in VoLL to \$20,000/MWh would lead to a dramatic increase in risks to retailers and that these increases in risk would be unmanageable at this time given the market's current structure and development of risk

management products.

The applicant argued that while risk due to short periods of extreme prices is higher under the proposed changes, the CPT constrained overall risk to near current levels. In contrast to this view, the IES study concludes that increasing VoLL to \$20,000/MWh could lead to a four-fold increase risk in the NEM. Further, the IES study found that the CPT is ineffective at capping this risk in all but the most extreme circumstances (for a fuller discussion of the CPT see Section 7.4). As such, the Commission shares some of the concerns of interested parties that the proposed arrangements may introduce substantial additional risk into the market.

The Commission notes the argument of several generators that a higher level of VoLL will increase the demand for, and therefore will encourage the development of, risk management instruments. Against this, however, the Commission notes that an increase in VoLL may in fact reduce liquidity in contract markets as the increased risk faced by both retailers and generators may increase their preference for no pool exposure.

For instance, while an increase in VoLL will lead to an increase in demand for risk management products by retailers, it will also lead to an increase in risk for generators. In circumstances where generators are vulnerable to meet their contract commitments (eg due to plant failure), a generator may be exposed to spot prices at or near the proposed VoLL of \$20,000/MWh. As a result generators are likely to contract more conservatively if VoLL is increased in order to limit exposure to spot prices in the event that generation plant is unavailable. Consequently, the Commission considers that while there will be an increase in demand for risk management products, there may not be an increase in supply and it is quite possible there will be a decrease in supply.

The Commission further notes the observation of several retailers that contended that they have already seen a drying up of liquidity in the market as a consequence, they argue, of a possible move to a VoLL of \$20,000/MWh.

The Commission also notes the conclusions of the WM Mercer report into insurance and risk management instruments for high price events. For instance, the report concluded that inter industry risk management arrangements are likely to become more difficult in the future as the need for available counterparties to cover all load increases. This situation would be exacerbated by an increase in VoLL. It was further concluded that whilst robust risk management techniques could be developed with non-industry participants, this is a complex process and the timeframe for new arrangements to be developed is expected to be significant.

The Mercer report also concluded that:

Once vesting contracts drop off, it is doubtful that there will be sufficient inter-participant capacity for reliable high pool price cover to continue to be readily available. For example, there are unlikely to be sufficient suitable counterparties available to contract for supply during an outage at a time of high prices if cover is being sought for total load, not just contestable load.

It was concluded that whilst an increase in VoLL would exacerbate this situation, it would not in isolation create the situation. Robust risk management instruments are required at \$5,000/MWh and an increase to \$20,000/MWh would simply appear to increase their necessity. Major impediments to the development of more robust risk management techniques include the vesting contract arrangements, market experience, contract diversity,

liquidity and time. It is likely that as the vesting contracts lapse and risk management techniques develop, increasing the level of VoLL to \$20,000/MWh may be more practicable without exposing participants to unmanageable risk. To increase the level of VoLL to \$20,000/MWh on assumption that such techniques will develop in the future may expose market participants to an unmanageable level of risk.

Moreover, in its submission, AGL noted that the level of price volatility in the NEM is far greater than that experienced in other commodity markets and that this has two consequences. First, AGL does not believe that suitably robust and liquid risk management products will emerge as readily as in other markets and that where such products do emerge, it can be expected that the premium for these products will be significant.

Secondly, AGL argued that a high level of price volatility, characteristic of the NEM, can place onerous prudential requirements on market participants. For instance, AGL and other retailers argued that a VoLL of \$20,000/MWh potentially exposes retailers to financial risks in the order of hundreds of millions of dollars in an environment where suitable risk management products have been slow to emerge and where potential liquidity in the market could dry up further as a consequence of generators contracting more conservatively.

The Commission also considers that an increase in the level of VoLL could impose substantial additional costs on end users. The Commission notes that, even for short periods of time, wholesale prices of \$20,000/MWh can have a significant effect on average pool prices over a whole year. For instance, IES estimated that pool prices would increase by between \$1/MWh to \$7/MWh, but by around \$4/MWh on its most plausible assumptions. These cost increases will ultimately be borne by end users.

In addition to increasing prices, the Commission believes that an increase in VoLL to \$20,000/MWh will also increase the risks faced by retailers. The Commission believes that while there may be an increase in demand for risk management products, there may not be a corresponding increase in supply. Consequently some consideration needs to be given to whether an increase in VoLL at a level less than \$20,000/MWh would still provide incentives, but within risks that are more manageable than those created by a \$20,000/MWh VoLL.

#### *7.4 Cumulative price threshold*

The Commission notes the applicant's arguments that the CPT provisions are intended to replace VoLL as the primary mechanism for controlling risk in the NEM. The applicant argues that any additional risk, introduced through an increase in VoLL, is manageable through the CPT. However, the Commission questions the degree of protection from high spot prices offered by the CPT as proposed by the applicant.

Under the proposed arrangements it seems that market participants are afforded a similar degree of protection from protracted periods of high spot prices as under the current force majeure arrangements. However, it appears that the proposed Code changes substantially increase risk borne by market participants from short periods of extreme price spikes. The modelling undertaken by IES indicates that a CPT set at \$300,000 would be ineffective in capping risk in normal market conditions. Were spot prices to spike to \$20,000/MWh, this price would need to be sustained for up to 7.5 hours before an administered price cap would apply. The Commission considers that the possibility of such a high spot price sustained for

this period of time imposes significant additional risk on market participants (in particular retailers) and that the level of VoLL would more often remain the defacto price cap.

The IES study found that, even where 1000MW of baseload capacity is constrained off for three months, a CPT of \$300,000 would be ineffective in containing risk. Indeed, it was only when up to 2000MW was constrained off for an extended period of time that a CPT of \$150,000 have some effect in capping risk.

The Commission considers that the proposed CPT does not abate the additional risk on market participants of an increased likelihood of higher price spikes and therefore higher average pool prices, due to the proposed increase in VoLL. The Commission notes that a level of VoLL less than \$20,000/MWh, and/or a lower CPT, would serve to mitigate this risk to an extent. The Commission therefore questions whether the proposed CPT serves to adequately cap the increase in risk associated with an increase in the level of VoLL. Under the proposed Code changes, in particular in instances of short periods of extreme price spikes, VoLL remains the defacto price cap. In those circumstances a substantial increase in VoLL would significantly increase the risk faced by market participants.

Reducing the CPT would alleviate some of the concerns as to risk associated with sustained moderate increases in prices increasing average pool prices. However, VoLL would still serve as the defacto price cap in instances of short periods of extreme prices.

### *7.5 Timing*

In recommending the proposed increases in VoLL, the Reliability Panel noted that sufficient time should be given before the increases are implemented to allow for further development of risk instruments to manage inter- and intra-regional network related risk; for further demand management initiatives to emerge; and for some transitional arrangements to expire. The Panel took these points into account in developing proposals for the timing of changes.

The Commission notes the concerns expressed about the timing of the proposed increases in VoLL given the lengthy time it has taken to finalise this determination and, as a result, the shortened timeframe between the issuing of the Commission's determination and the first proposed increase in VoLL. Interested parties also noted the delays in introducing, and uncertainty surrounding, the final form of FRC.

Based on the Reliability Panel's considerations and interested parties' concerns, it would now appear that the proposed increase in VoLL, commencing with an increase to \$10,000/MWh in September 2001, is premature. It also does not appear that, at present, adequate market mechanisms have developed to accommodate the increase in risk associated with an increase in VoLL. Nor have demand management initiatives developed to the extent where an increase in VoLL would significantly improve demand side responses in the market.

The proposed timetable is also linked to the expiration of transitional arrangements in NEM jurisdictions. The Commission notes, however, that while vesting arrangements in most jurisdictions are due to expire within the timeframe of the proposed increases there is some uncertainty about the regulatory arrangements that will replace them. In NSW the Government has introduced legislation to replace the vesting contracts with the Electricity Tariff Equalisation Fund. Vesting arrangements in South Australia are scheduled to extend beyond the dates of the proposed increases in VoLL. In addition, in NSW and Victoria jurisdictional licensing requirements for retailers are also under review with the possibility of such requirements being extended for some sections of the market. While such arrangements

are clearly designed to protect consumers from retail price rises, they may place significant additional risk on retailers who may be faced with the prospect of significantly higher and more volatile wholesale prices with no ability to pass this on to significant portions of the market.

Further, the timetable for, and structure of, FRC is still uncertain. The introduction of FRC will be delayed in some jurisdictions and large sections of the market will be subject to profiling. These factors serve to further inhibit the development of demand management schemes in the short term.

It would therefore appear that many of the assumptions underpinning the Reliability Panel's timetable no longer hold. Moreover, if VoLL were to increase in September 2001 this would leave market participants 10 months to put in place the necessary arrangements to accommodate an increase in VoLL. As noted in the Reliability Panel's initial recommendation it is important that adequate notice of the level of VoLL should be provided to market participants. The Commission does not consider that 10 months is adequate lead-time for market participants to put in place the necessary arrangements.

### *7.6 Market power*

In its report, the Reliability Panel commented on the impact of an increase in VoLL where there were concerns about generator market power. Specifically, the Panel noted that:

a further source of risk is the potential gaming of market price. It has earlier been noted that efficient market prices can be volatile, particularly over the short term. Provisions of the code which allow market participants to efficiently respond to that volatility also allow the possibility of abuse if there is insufficient competition to counteract its effect. An increase in the level of the market price cap recommended in this report will have the effect of increasing the alternatives for balancing supply and demand under extreme conditions when abuse is potentially attractive. It will also reduce any perceived need or justification to act in a non-competitive manner. However it will also increase the potential return from it.

In its draft determination, the Commission noted that it has held concerns over generator market power in the NEM since market commencement and that these concerns are a relevant factor in its consideration of the anti-competitive detriment of the proposed increase in VoLL.

In its 10 December 1997 determination, the Commission raised significant concerns with potential market power possessed by generators in the NEM. The Commission noted that the design of the NEM, and the industry structure in the participating jurisdictions, has important implications for developing effective competition in the NEM. It was argued that market power, leading to strategic behaviour in the NEM, could arise from either market structure and/or market design. It added that the use of market power imposes a cost on society that can diminish the public benefit from reform.

The Commission noted that market power in the NEM may stem from a number of factors and their interaction. The factors identified included:

- the non-disaggregation of generation, or insufficient disaggregation;
- anti-competitive conduct by and between generators;
- demand during certain times of the day, seasons or random fluctuations;

- the capacity of interconnection — the greater this capacity the less likely that an entity will have regional market power;
- the ease with which new entrants may be able to enter and exit the market; and
- the impact of market rules/market design on incentives.

However, the Commission's principal concern then, and now, was the influence of market structure on market power, and the apprehension that insufficient structural disaggregation may allow generators to exercise market power.

At that time, analysis of the structure of the NEM by the Commission's consultants, the Australian Bureau of Agricultural and Resource Economics (ABARE), indicated that the NEM was characterised by a significant degree of market concentration, particularly in South Australia and New South Wales.

ABARE argued that market structure was such that large generation portfolios in South Australia and New South Wales would be in a position to dominate particular segments of the market. ABARE claimed that this occurs because in periods where the level of demand is high relative to the capacity of rival generators, an individual generator may face a residual demand and hence be in a position to bid 'strategically' to maximise profits.

ABARE suggested that structural reform, such as further disaggregating generation assets, may be necessary to attain the competitive benefits from implementing the NEM. It argued that establishing more generation businesses to compete in the market should make it more difficult to exercise market power as it results in capacity demanded being distributed among a number of competing businesses. This means that it becomes much riskier for any one generator to assume that it will be the marginal producer, forcing it to bid into the pool at marginal cost to ensure dispatch.

The Commission acknowledged that market structure is not an issue addressed in the Code, but that it was a matter for the individual jurisdictions to determine. However, the Commission concluded that market structure issues were fundamental to realise the benefits arising from implementation of the Code. The Commission argued that the potential, both at the time and in the future, for generation businesses to exercise market power will reduce or negate the public benefits of the NEM reforms.

The Commission maintains these concerns about potential market power in the NEM. Since the commencement of the NEM, pool prices suggest that market power concerns are particularly relevant in South Australia and, notwithstanding the structural separation to date, in Queensland. The Commission also has concerns about potential market power in the NSW. However those concerns have not, as yet, materialised into systematically higher pool prices in that region.

While the Commission notes that significant generation investment and interconnection with New South Wales may help address generator market power problems in Queensland, and that new generation and interconnection is planned for South Australia, concerns about market power remain.

In response to the draft determination, interested parties argued that given the potential market power of generators, they were concerned about the likely future electricity prices as a

result of an increase in VoLL to \$20,000/MWh. In order to quantify the impact of these concerns, the Commission engaged IES to model the impact of VoLL in the NEM. Specifically, IES was asked to model the possible effects of a generator, with market power, strategically rebidding capacity into the market to maximise profitability. IES was not requested to examine the extent of market power or to assess the likelihood of its modelling being reflected in actual market outcomes. In this context, IES's modelling found that where a generator with market power has significant levels of uncontracted capacity it can improve profitability through the withdrawal of capacity, an incentive which increases with the level of VoLL.

The IES study also found that under the market power scenarios modelled, risk premiums increased and, depending upon the level of uncontracted cover assumed for a generator exercising market power, spot prices could also be significantly increased. As with most scenarios modelled by IES, the CPT was generally ineffective in capping this increase in risk.

Further, several interested parties, predominantly retailers and end users, have argued that evidence exists of generators withholding or withdrawing capacity or bidding capacity into higher price bands not only in periods of peak demand but also in periods of supply side constraints. It argued that increasing the level of VoLL would serve to increase rewards to generators, as well as increasing costs to end users, of such behaviour.

The Commission accepts the argument that to the extent that increasing VoLL promotes greater generation and market network investment peaking plant, this would serve to mitigate the market power of incumbent generators.

To the extent that an increased VoLL results in further investment in peaking capacity, this capacity will take some time to be brought on line. In this environment the Commission is concerned that an increase in the level of VoLL would appear to provide an increased incentive for existing generators to withhold or withdraw capacity, or to bid in a way to force up prices. The Commission notes the arguments of several interested parties, predominantly generators, that argued that while market power in the NEM may be a concern it is predominantly an issue of market design and not directly related to the issue of VoLL. While this may be the case, the Commission remains concerned that the detrimental impact on consumers of any exercise of market power will be magnified with an increased VoLL as proposed, and that the higher the level of VoLL then the greater the impact on consumers. Accordingly, given the current market design the Commission considers that increasing VoLL increases the potential for the use of market power, imposing a cost on the market that increases any anti-competitive detriment from the proposed changes. Therefore, any increase in VoLL needs to be coupled with enhanced market monitoring measures.

### *7.7 Overseas evidence*

As part of the Commission's examination of the proposed Code changes, the Commission has also examined the level of price caps and market power mitigation measures in other electricity markets.

The Reliability Panel's issues paper made comparisons of the reliability arrangements in a number of international competitive electricity markets. The vast majority of overseas markets examined by the Reliability Panel (predominantly North and South American) have

price caps below the \$1000/MWh level. Of those markets examined only the England/Wales market had a price cap similar to that in the NEM.<sup>8</sup>

The Reliability Panel's study highlighted not only the differing approaches taken but also the different market designs. For instance, unlike the other markets examined, the NEM is the only market where the spot price is intended to be the prime driver for remuneration for energy sold and capacity made available. This also lends support to the view that for reliability concerns, the price cap in the NEM should be higher than in overseas markets. It also tends to highlight the uniqueness of the NEM, as separate mechanisms have been used to manage capacity in most overseas markets.

As discussed above, the Commission has continuing concerns about how market power might manifest itself with a higher VoLL; in particular the ability of generators to game the market and force up prices. This concern is shared in many overseas markets, for example in California which has experienced significant price volatility over the last Northern Hemisphere summer. In this context, the Commission notes that many overseas markets have far more stringent mechanisms in place to mitigate market power possessed by generators than exist in the NEM. This, coupled with the trading arrangements in place in most overseas jurisdictions, means that the potential for large price spikes caused by generators gaming the market are more pronounced in the NEM than elsewhere.

Moreover where such behaviour does occur, those overseas markets appear to have more sophisticated mechanisms to deal with this problem. For instance, the California Power Exchange sets a benchmark of behaviour under perfect competition against which participant performance is monitored. Additionally, routine investigations of pool prices above \$US150/MWh occur. In the Pennsylvania, New Jersey, Maryland market, a market monitoring committee examines pricing outcomes, in particular when prices near the market cap of \$US1,000/MWh.

In contrast to these overseas markets, the NEM has less stringent market monitoring mechanisms. The Commission considers that differences in both the market design and market rules between the NEM and most overseas markets mean that the level of VoLL is more problematic in the NEM than would be the case in many overseas markets where other constraints on bidding behaviour serve to mitigate the potential to game the market. The potential for market power to be exercised to game the market is exacerbated by the lack of regulatory constraints on such conduct such as is in place in many overseas markets. The Commission's concerns over an increase in the level of VoLL would diminish should similarly stringent market monitoring measures be put in place in Australia.

## *7.8 Conclusion*

Most markets do not require a price cap or reserve trader provisions. Consistent with this philosophy, NECA has argued that an increase in the level of VoLL will increase investment in fast start plant and lead to improved demand side response. In this eventuality the market would voluntarily clear on a more regular basis, which is necessary to ensure system reliability.

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<sup>8</sup> For example the caps are currently \$US1,000/MWh in the north east of the USA, \$US500/MW/h in California (with a proposal to lower the cap to \$US100/MWh currently before the legislature), \$C100/MWh in Alberta, \$AUD250/MWh in Chile and \$AUD5,000/MWh in the UK.



The Commission accepts the intellectual strength of this argument, notwithstanding the reservations discussed in this determination. Indeed, the Commission recognises the need for the NEM to provide appropriate price signals to provide incentives to maintain supply reliability in the longer term. The Commission believes that, all things being equal, an increase in VoLL will lead to greater investment in peaking plant which will improve supply reliability.

However, the Commission believes that the public benefits of an increased VoLL and the ensuing increased investment, are likely to be limited to those regions where demand peaks occur for only a few hours a year, such as is currently the case in Victoria. As peaking plant is unlikely to derive all its income from VoLL events, the Commission believes that an increase in VoLL to \$20,000/MWh is in excess of that needed to lead to a sufficient increase in investment to address system reliability issues. The Commission also notes that alternatives, such as network investment, may have the capability of meeting peak demand in these jurisdictions thereby improving system reliability and such investment will be facilitated by an increase in VoLL.

An increase in VoLL will stimulate some reduction in demand at peak times or at times of system crisis. However, it is well recognised that electricity demand is insensitive to price fluctuations. This insensitivity is likely to be exacerbated at this early stage of the NEM's operation as many consumers do not currently face fluctuating prices. Market immaturity, lack of understanding of the market by the demand side, implementation costs, the inability of many customers to shut off loads in response to short term price spikes and transitional arrangements are all impediments to greater demand side participation in the market. An increase in the level of VoLL will not address these fundamental issues underlying the lack of demand side response in the NEM.

It was also argued that an increase in VoLL will improve incentives to manage risks, in particular, risks associated with infrequent involuntary load shedding events. Again, the Commission recognises the attractiveness of introducing a pricing mechanism to assist in rationing available supply at times of peak demand or system crisis. In particular as economic theory tells us that, in such circumstances, it is more efficient to have high prices and a market that voluntarily clears rather than lower prices but involuntarily load shedding (ie it is more efficient to have price rationing than it is to have quantity rationing).

However, market participants questioned whether sufficient risk management tools would be forthcoming in the event that VoLL was increased to \$20,000/MWh. As noted, the Commission believes that while there may be an increase in demand for risk management products, there may not be a corresponding increase in supply. Indeed, it is more likely that generators would be less willing to supply risk management products given the increased risks they would face by doing so. Equally, the Commission is concerned about how effective the proposed CPT mechanism will be in limiting such risks, in particular in the circumstances of price rises of a limited duration. In these circumstances, the Commission believes that an increase in risk faced by retailers, but without the availability of the appropriate risk management tools, could have an adverse impact on the orderly operation of the NEM.

In addition to the Commission's concern about the likely size of the public benefits of the proposed Code changes, the Commission is also concerned about the possible anti-competitive detriments of increasing VoLL to \$20,000/MWh in a market where there remains significant concerns over generator market power. The Commission considers that a rise in

VoLL increases rewards for generators to exercise market power. Given that generator market power concerns are still an issue in the NEM, the Commission believes that an increase in VoLL could translate to higher energy prices across the NEM.

On the balance of these arguments, the Commission has not been convinced that the likely public benefits are greater than the anti-competitive detriments of increasing the level of VoLL to \$20,000/MWh at this time. However, the Commission believes that the public benefits would outweigh the detriments if the increase in the level of VoLL is limited to \$10,000/MWh, with this increase being subject to a number of additional conditions.

First, the Commission proposes to delay the scheduled increase in VoLL to \$10,000/MWh until April 2002. This is in order to address concerns that the 10 month lead time for the scheduled increase in VoLL to \$10,000/MWh provided market participants with insufficient time to put in place the necessary arrangements to accommodate an increase in VoLL.

Second, the Commission proposes to reduce the CPT to \$150,000, thereby the administered price cap would still apply after 7.5 hours at VoLL. Notwithstanding the issues raised by IES, the Commission believes that this reduces the risk of market participants being exposed to prolonged periods at extreme prices before the administered price cap is applied.

Third, the Commission also concludes that the annual review of VoLL by the Reliability Panel should monitor the impact of the change in VoLL on the spot market, level of investment and system reliability. The purpose of this additional requirement is to evaluate whether the increase in VoLL and the operation of the CPT is achieving the objectives of the changes as set out in this application.

Fourth, the Commission notes market power and market monitoring measures implemented in overseas markets. The Commission considers that implementing similar measures in the NEM would alleviate a number of the concerns with an increase in VoLL. Consequently, the Commission has imposed a condition to extend NECA's current market monitoring functions in circumstances when spot prices exceed \$5,000/MWh.

In addition, the Commission has imposed a condition of authorisation that NECA review the NEM's market monitoring arrangements by no later than April 2003. This is 12 months after VoLL is increased to \$10,000/MWh but allows NECA to report earlier if it so decides. This review is to examine the adequacy of the NEM's market monitoring mechanisms in the light of Australian and overseas experience. The review is to examine whether the NEM's market monitoring arrangements should be extended from a reporting mechanism to one that would include instituting market behaviour rules with sanctions for breaches.

In coming to these views, the Commission notes that the proposed Code changes include a form of reliability safety net to replace the reserve trader arrangements. The Commission believes that if NEMMCO comes to rely on this safety net arrangement to meet reliability targets, then this should prompt a formal review of the NEM's "energy only" arrangements. Such a review could consider the arguments for and against introducing a capacity market.

### *Conditions of authorisation*

#### **C7.1 Clause 3.9.4(b) must be amended to provide that:**

- (a) on or before 31 March 2002 the value of VoLL is to be \$5,000/MWh; and**

- (b) on and from 1 April 2002 the value of VoLL is to be \$10,000/MWh.
- C7.2** Clause 3.14.1(c) must be amended to provide that the cumulative price threshold is \$150,000.
- C7.3** In undertaking the annual review of VoLL as prescribed in clause 3.9.4(c) of the Code, the Reliability Panel shall have regard, in addition to any other requirements of the Code, to the impact of the increases in VoLL on spot market prices, levels of investment and system reliability. The report by the Reliability Panel shall include an assessment of whether the level of VoLL and operation of the CPT have achieved the outcomes intended by the Code changes.
- C7.4** Clause 3.13.7 of the Code must be amended to require NECA to publish a report, which is to be available to market participants and other interested parties, when the spot price exceeds \$5,000/MWh. The report must:
- (a) describe the significant factors, including withdrawal of generation capacity and/or network unavailability, that led to the price spike;
  - (b) establish whether rebidding, especially rebidding close to real time, of price and/or quantities had contributed to the price spike; and
  - (c) identify the marginal unit(s), and all those units that bid above \$5,000/MWh, and compare the bids and offers with past bids and offers for the same unit(s).
- C7.5** In consultation with market participants and interested parties, NECA is to report to market participants and interested parties by no later than 1 April 2003 into the adequacy of current market monitoring provisions in the NEM and future market monitoring options. In performing these tasks, NECA must analyse:
- (a) market monitoring regimes in place in overseas markets, and outline which elements of these arrangements are suitable for adoption in the NEM;
  - (b) whether market behaviour rules, which establish examples of market behaviour that would trigger investigation, should be developed in the NEM;
  - (c) options for the sanctioning of market participants who engage in conduct that breaches market behaviour rules; and
  - (d) governance arrangements, including membership and funding options, for the body appointed to oversee these market monitoring roles.

## 8. Capacity mechanisms

Internationally there is no consistent approach in the way that capacity is rewarded and encouraged. In some cases energy and capacity are treated as separate goods and are separately priced in the spot market. In contrast to those arrangements, the NEM is designed as an energy only market with spot market revenues based on market clearing prices. No other payments are made in the spot market except those arising from specifically designed reliability safety nets. Reliability requires consistent, voluntary market clearing, that is balancing of the supply and demand side without involuntary load shedding or other market intervention in all but extreme circumstances.

Whilst the level of VoLL is designed to ensure consistent voluntary market clearing, the NEM also includes a reliability safety net given concerns about the market's immaturity. The reserve trader provisions of the Code precluded NEMMCO from entering into reserve contracts after 30 June 2000. The proposed Code changes replaced these provisions with a reliability safety net requiring NEMMCO to consult with jurisdictional representatives in determining the necessary level of capacity contracted and agree upon the cost sharing arrangements for such capacity with the nominated jurisdictional representatives. The changes provide that compensation for reliability directions be based on the higher of the prevailing compensation methods. As noted earlier, interim authorisation was granted to these Code changes on 21 June 2000.

The changes provide for extending of the time horizon for the proposed reliability safety net from six months to a rolling three-year period. The changes also provide for annual reviews of the necessity of the safety net mechanism as part of the Reliability Panel's annual reviews of VoLL and for removing of the safety net provisions should the panel so recommend. The proposed changes provide that, unless removed earlier at the recommendation of the Reliability Panel, the reliability safety net provisions will cease to have effect from 30 June 2003.

### *8.1 Issues for the Commission*

The Commission considers that the reliability safety net provisions could be anti-competitive in that they may diminish incentives for market based approaches, as participants may come to rely on central intervention.

### *8.2 What the applicant says*

In its application, NECA indicates that it initiated a review of the NEM's capacity mechanisms in order to address concerns that the current market design may not attract sufficient investment in the supply and demand side resources necessary to achieve the reliability standards set by the Reliability Panel. The review was also intended as a proactive assessment of the reserve trader arrangements and to establish a framework for the Reliability Panel's initial review of the level of VoLL.

NECA states that there is a need for an appropriate level of VoLL to achieve consistent voluntary market clearing. However, NECA argues that given that the current immaturity of the market, some form of reliability safety net will continue to be required, at least for a further, limited, period.

NECA's review of capacity mechanisms in the NEM reached the following conclusions:

- The reserve trader provisions in the Code should be replaced with a reliability safety net that extends the timeframe for its operation from the current six-month, to a rolling three-year, period.
- The reliability standard, currently expressed as a maximum level of unserved energy, should continue to be set by the Reliability Panel.
- NEMMCO should remain responsible for calculating the appropriate level of capacity required in each region to meet that standard.

The review further concluded that as this requires NEMMCO to make judgements about future demand and generating capacity which involve wider issues of legitimate public policy, NEMMCO should in future take this decision in consultation with experts appointed or nominated by the participating jurisdictions. This consultation is intended to provide judgemental input to address concerns as to the capacity of NEMMCO to make such judgements.

The review also proposed that the role of the revised safety net should be designed to diminish as the market matures. Further it proposed that the safety net should be removed entirely at the earliest opportunity in response to firm evidence of consistent voluntary market clearing, the development of a pro-active demand side response and development of more sophisticated contract and risk management mechanisms. The review proposed that the Panel should be required, as part of its future annual reviews of VoLL, to consider and report on whether such evidence yet exists. If the Panel concludes that it does, it was proposed that the safety net should immediately and automatically be removed. As a further safeguard to ensure that the safety net does not simply become institutionalised, the review proposed that the express approval of the ACCC should be required for the safety net to extend beyond 1 July 2003. NECA argues that these sunset arrangements were proposed, in particular, to reflect concerns expressed during its consultation process that there should be a defined end-date for the safety net arrangements, and that the end date should be as early as possible.

The review further recommended that the potential for individual participants to reduce the need for the safety net, for example through the submission of demand side bids, should be recognised and encouraged by the allocation of responsibility for funding those arrangements. It was proposed that the net costs of the safety net should therefore be allocated on an energy basis in benefiting regions in peak times during the periods when the safety net is in place and that exemptions should be available for demand side bids.

Therefore, the applicant states that the proposed Code changes have been developed to address concerns that the current immaturity of the market requires some form of reliability safety net at least for a further, limited period. The revised safety net is designed to ensure that its role can diminish as the market matures and be removed entirely at the earliest opportunity in response to firm evidence of consistent, voluntary market clearing, the development of pro-active demand side responses and development of more sophisticated contract and risk management mechanisms.

### 8.3 *What the interested parties say*

Interested parties expressed a range of views on the proposed Code changes. On the one hand Loy Yang Power supported the proposed Code changes, whereas AGL Electricity, the BCA and Bardak were more critical of the proposals.

AGL Electricity argues that the jurisdictional representatives chosen to consult on the level of capacity required and the cost sharing arrangements may not have the necessary expertise to determine supply and demand parameters, or could be exposed to conflicts of interest. Further AGL Electricity argues that jurisdictional regulators may not be in a position to determine a ‘fair market value’ of such services.

AGL Electricity is also concerned that tendering in the open market could potentially raise costs with the number of generators willing or able to participate likely to be few, creating market power problems. Further, it is contended that by going to the market and tendering for capacity, current contracts for capacity could be duplicated or the private sector crowded out.

With regard to the requirement for reserve trader provisions, AGL Electricity argues that the level of demand side bidding should not be used as an indication that such provisions are no longer required. AGL Electricity contends that customers with the capacity to provide demand side bids may have sound commercial reasons for choosing not to do so, for example if it is in their best interest to participate in the ancillary services market.

Loy Yang Power expressed its support for the proposed Code changes.

Bardak and the BCA argue that there are fundamental deficiencies in a mandatory, single-price pool energy only market.

The BCA argues that the single price pool involves limited demand side participation, is inherently (price) volatile, potentially subject to misuse of market power and is not an efficient competitive market. The BCA and Bardak both claim that continued government ownership of generation assets (which limits competition), the small number of large generators and the regional nature of the Australian power systems, suggest that the mandatory single price pool is inappropriate.

The BCA contends that the single system marginal price in each 30-minute period means there is inherent cross subsidies from industrial loads to domestic loads, as industrial loads cost less to supply. The BCA therefore argues that the trading system is not producing competitive outcomes.

The BCA argues that the review of capacity mechanisms should have analysed the whole NEM trading system. Further, the BCA and Bardak contend that the mandatory single price pool should have provision for capacity payments to enhance the chances of replicating the outcomes of a competitive market.

The BCA argues that:

- the energy only market should be rejected;
- provision be made for capacity payments to augment the conditions of a competitive market; and

- independent market monitoring and market power mitigation measures be implemented.

#### *8.4 Issues arising from the draft determination*

In its response to the draft determination, Bardak argues that if peaking capacity needs encouragement within the present market structure, it should be remunerated by a specific capacity payment. Bardak believes that the capacity payment should be available only to plant presenting itself for loading, and be set at the lowest marginal cost of providing additional peaking capacity (effectively, the fixed costs per hour of large open-cycle gas turbines).

#### *8.5 Commission considerations*

In its 10 December 1997 determination, the Commission argued that it was sensible that the reserve trader, and NEMMCO's power to direct, be available in the initial stages of market development. It was argued that without the reserve trader, a lack of market maturity may result in unnecessary breaches of the minimum reliability margin, which could lead to involuntary load shedding.

However, the Commission imposed a condition of authorisation that these reserve trader provisions of the Code end on 30 June 2000 to address concerns that the provisions may become entrenched to the detriment of free market trading. The Commission imposed a further condition that NECA review the adequacy of the reserve trader provisions. It was noted at the time that should there be sufficient evidence of the market still requiring a reserve trader function beyond this date, then an application for authorisation of amendments to, or extension of, the reserve trader function could be made at that time.

The Commission considers that many of the concerns raised at market commencement as to the immaturity of the market remain valid today. It appears that the ability of the market based signals to deliver adequate system reserves and reduce the risk of involuntary load shedding is still limited. Consequently the Commission considers that some sort of reliability safety net is necessary to accommodate the market, at least in the short term where a lack of market maturity may result in unnecessary breaches of the minimum reliability margin, which could lead to involuntary load shedding.

Such provisions should however minimise distortions and free market trading and should not inhibit the ability for market based alternatives to develop. In this regard, the Commission notes NECA's argument that the safety net should be removed entirely at the earliest opportunity in response to firm evidence of consistent voluntary market clearing, the development of a pro-active demand side response and development of more sophisticated contract and risk management mechanisms.

Notwithstanding that these Code provisions can be removed if there is firm evidence of voluntary market clearing, the Commission sees some inconsistency between the arguments supporting the extension of reserve trader provisions and the arguments supporting an increase in VoLL. The capacity mechanisms arrangements appear to recognise that the market cannot provide adequate reserve. The VoLL Code changes, however, rely on increasing the level of VoLL so that the market provides reserve. The very fact that the capacity mechanisms arrangements have been submitted for authorisation appears to indicate some lack of confidence in the ability of an increase in VoLL to provide reserve sufficient to ensure system reliability.

Interested parties have raised a number of concerns with the proposed Code changes.

The AGL Electricity submission argues that jurisdictional representatives may not have the necessary expertise to determine supply and demand parameters, or could be exposed to conflicts of interest. The Commission notes that whilst the proposed Code changes do require NEMMCO to consult with persons nominated by the relevant jurisdictions, ultimate responsibility for assessing future reliability and entering into reserve contracts rests with NEMMCO.

Clause 3.12.1(b) requires the Reliability Panel to annually review whether the reliability safety net provided for by the power granted to NEMMCO under clause 3.12.1 to enter into reserve contracts can be removed from the Code. AGL Electricity argues that the level of demand side bidding should not be used as an indication that reserve trader provisions are no longer required.

Discretion as to the terms of reference for the Reliability Panel's review of the requirement for reserve trader provisions rests with NECA. NECA's final report on capacity mechanisms in the NEM sets out a sound history of voluntary market clearing, the development of a global demand side response and development of more sophisticated contract and risk management mechanisms as the appropriate signals for the early withdrawal of the reliability safety net provisions. The Commission considers the reliability review process the appropriate forum for concerns as to the criteria for assessing the continuing need for reserve trader provisions to be raised.

The Commission has previously noted its concerns about the potential market power possessed by generators in the NEM. In regions where the number of generators willing or able to enter into reserve contracts are few this could potentially raise the cost of reserve contracts. One means by which such supply side market power concerns may be mitigated is the extent to which demand side capacity is contracted. The Commission notes NECA's intention to launch a renewed initiative to examine the scope for improving the broad regulatory environment for increased opportunity for demand side participation in the market.

Nonetheless, the Commission remains concerned about potential supply side market power in the NEM generally, and notes that such market power problems could potentially raise the cost of contracting for reliability. The Commission does not however consider that the proposed arrangements will necessarily raise such costs. The proposed Code changes provide for an annual review of the necessity of the reliability safety net by the Reliability Panel. Should it become apparent that market power problems are serving to raise the cost of contracting for reserves the Commission believes that the reserve trader provisions should be revisited as part of this review.

The Commission notes the concerns of Bardak and the BCA as to perceived deficiencies in the mandatory, single price pool energy only market. The Commission is continuing to monitor developments both overseas and in the NEM with regard to market design issues. However, the Commission believes that the issue of the appropriate trading system in the NEM is well beyond the scope of this authorisation. Nonetheless, as noted in the previous section of this determination, if these provisions are extensively relied upon to meet reliability targets, this should prompt a formal review of the NEM's energy only arrangements.



## 9. Price floor

Condition C8.6 of the Commission's 10 December 1997 determination required that the Code be amended to remove the zero spot price floor during an excess generation period within one year from market commencement. The Code changes proposed by NECA fulfil this condition.

The proposed changes to the Code:

- remove the zero price floor and the accompanying excess generation provisions that were necessary to allow controlled off loading of generators;
- implement a new negative price floor, initially set at - \$1,000/MWh. NECA proposes that the level of the market price floor be reviewed by the Reliability Panel concurrent with its next review of the market price cap of VoLL; and
- provide for negative administered prices, based on arrangements that precisely mirror the ceilings represented by the administered price cap at the top end of the market.

### *9.1 Issues for the Commission*

The main issue for the Commission is that the imposition of a floor price may constitute a price fixing arrangement in breach of section 45 of the TPA. These arrangements may detract from the overall public benefit of the market to the extent that they may distort market signals.

### *9.2 What the applicant says*

NECA argues that the proposed Code changes allow the market to move freely between positive and negative prices using the same mechanisms thus improving the price signals in the market by allowing customers to see the marginal value of electricity more often.

NECA adds that initially setting the market floor price at - \$1,000/MWh, significantly below the lowest current market outcome for dispatch prices, will ensure that it does not interfere with the normal clearing of the market while providing some protection to participants from extremely high prices.

Further NECA argues that as well as capping participant risk a price floor at some level is essential in order to set a bound on the dispatch algorithm.

### *9.3 What the interested parties say*

Loy Yang Power was the only party to comment on the floor price issue. It does not agree with the -\$1,000MW/h spot floor. It argues that the price, including a negative price, should be set by market conditions at the time, and so the size of the price would be determined by the bids / offers lodged. In particular it states that negative prices caused by constraint or IT issues should be capped at the greatest negative price bid of available generation.

### *9.4 Issues arising from the draft determination*

No issues were raised by interested parties on this matter.

## ***9.5 Commission considerations***

In its 10 December 1997 determination, the Commission allowed a zero spot floor price, but only as an interim measure. This was to address concerns as to the maturity of demand side responses at that time. The Commission considered that not allowing market customers to see negative prices has anti-competitive effects that impact upon the efficiency of market outcomes.

The Commission argued firstly that customers are denied the market benefits of negative prices at times of very low demand. In a market where customers are exposed to positive pricing outcomes in times of high demand there is generally no justification for asymmetry in the rare event of a negative price outcome.

Secondly, the Commission argued that non-negative pricing distorts price signals by not allowing the market to function unimpeded and formulate an appropriate response. Prices are a signalling mechanism to customers; if customers are not exposed to appropriate pricing then the efficiency benefits arising from changing demand patterns are lost.

In order to address these concerns, the Commission's 10 December 1997 determination required that the Code be amended to remove the zero spot price floor within one year of market commencement. The Commission considers that the proposed amendments to the NEC address these concerns.

The Commission notes the argument of Loy Yang Power that negative spot prices should be set by market conditions at the time. However the Commission accepts NECA's argument that some floor level is essential to set the bounds of the dispatch algorithm.

The Commission considers that a floor price of - \$1,000/MWh will provide customers with the benefits of negative prices at times of very low demand and will allow the appropriate market signals to be sent thereby removing a possible source of distorted market behaviour.

## 10. Determination

For the reasons outlined in sections 7–9 of this determination, after consideration of the issues raised including the amendments to the Code contained in the application received on 29 September 1999 (and amended on 26 April 2000) the Commission concludes that, subject to the conditions set out below, in all the circumstances, the proposed amendments to the Code:

- are likely to result in a benefit to the public which outweighs the potential detriment from any lessening of competition that would result if the proposed conduct or arrangements were made, or engaged in; and
- are likely to result in such a benefit to the public that the proposed conduct or arrangements should be allowed to take place or be arrived at,

as the case may be.

The Commission therefore grants authorisation to applications A90711, A90712 and A90713. This authorisation is subject to any application to the Australian Competition Tribunal for its review. Authorisation is granted subject to the following conditions:

**C7.1 Clause 3.9.4(b) must be amended to provide that:**

- (a) on or before 31 March 2002 the value of VoLL is to be \$5,000/MWh; and
- (b) on and from 1 April 2002 the value of VoLL is to be \$10,000/MWh.

**C7.2 Clause 3.14.1(c) must be amended to provide that the cumulative price threshold is \$150,000.**

**C7.3 In undertaking the annual review of VoLL as prescribed in clause 3.9.4(c) of the Code, the Reliability Panel shall have regard, in addition to any other requirements of the Code, to the impact of the increases in VoLL on spot market prices, levels of investment and system reliability. The report by the Reliability Panel shall include an assessment of whether the level of VoLL and operation of the CPT have achieved the outcomes intended by the Code changes.**

**C7.4 Clause 3.13.7 of the Code must be amended to require NECA to publish a report, which is to be available to market participants and other interested parties, when the spot price exceeds \$5,000/MWh. The report must:**

- (a) describe the significant factors, including withdrawal of generation capacity and/or network unavailability, that led to the price spike;
- (b) establish whether rebidding, especially rebidding close to real time, of price and/or quantities had contributed to the price spike; and
- (c) identify the marginal unit(s), and all those units that bid above \$5,000/MWh, and compare the bids and offers with past bids and offers for the same unit(s).

**C7.5 In consultation with market participants and interested parties, NECA is to report to market participants and interested parties by no later than 1 April 2003 into the adequacy of current market monitoring provisions in the NEM and future market monitoring options. In performing these tasks, NECA must analyse:**

- (a) market monitoring regimes in place in overseas markets, and outline which elements of these arrangements are suitable for adoption in the NEM;**
- (b) whether market behaviour rules, which establish examples of market behaviour that would trigger investigation, should be developed in the NEM;**
- (c) options for the sanctioning of market participants who engage in conduct that breaches market behaviour rules; and**
- (d) governance arrangements, including membership and funding options, for the body appointed to oversee these market monitoring roles.**

The Commission proposes to limit the period of the authorisations to 31 December 2010. This is the period of time set down by the Commission in its determination for authorisation of the Code.

## **Appendix A – Initial Submissions to the Commission**

AGL Electricity

Bardak Group

Business Council of Australia Energy Reform Task Force

CS Energy

Electricity Markets Research Institute

Ergon Energy

ETSA Power

Loy Yang Power

## **Appendix B – Submissions received in response to the draft determination**

AGL South Australia

Bardak Group

Citipower

CS Energy

Edison Mission Energy Australia

Electricity Industry Supply Association of Australia

Energy Action Group

Energy Markets Reform Forum

Energy Users Group of Australia

Energy Australia

Enron Australia

Great Southern Energy

Institute of Public Affairs

Integral Energy

Loy Yang Power

Macquarie Generation

National Power Synergen

National Electricity Code Administrator

Origin Energy

Pacific Power

Public Interest Advocacy Centre

Snowy Hydro Trading

South Australian Electricity Reform and Sales Unit

Southern Energy Consultants

Southern Hydro

Tarong Energy

Transenergie Australia

TXU

Vencorp