30 June 2006

The Chairperson
The Reliability Panel
Australian Energy Market Commission
PO Box H166
Australia Square NSW 1215

also sent via email to panel@aemc.gov.au

Dear Sir/Madam

Submission to the Comprehensive Reliability Review

Enertrade commends the decision to undertake a comprehensive review of the issue of reliability in the NEM. Please find attached our response in relation to the call for submissions.

Enertrade's view is that the issue of reliability can best be dealt with by allowing the market mechanism to work as intended. The VoLL and the CPT price caps are a significant restriction on the ability of generators to cover long-run marginal costs, especially for peaking generation units. These caps do not contribute to the delivery of the reliability standard but may over the investment cycle materially hinder its attainment.

Our submission argues for the removal or increase these price caps. At the least, these caps should be set at the price at which users would switch off. Enertrade proposes that a VoLL cap of $30,000 and a CPT level of $450,000 are more efficient in delivering the incentives to generators to deliver the reliability standard.

Enertrade looks forward to further participation in the review. Enertrade wishes to attend the upcoming presentation forum and the public hearings process in December. Enertrade's contact is Luke Berry, who may be contacted on 07 3331 9945 or 0417 077 342.

Yours faithfully

Luke Berry
Manager
Regulation and Compliance

Enertrade Submission

to the

Australian Energy Market Commission

Reliability Panel

Comprehensive Reliability Review

June 2006

Executive summary

Enertrade considers that the most efficient and optimal delivery of reliability in the National Electricity Market would be achieved by removing or significantly lifting the current restrictions on the operation of the market price mechanisms, namely VOLL and the Cumulative Price Threshold (CPT). The current caps on the price mechanism are a direct cap on the revenue earnable by generators and represent a significant restriction on the recovery of long-run marginal costs especially for intermediate and peaking generation units. These caps undermine the delivery of the reliability standard.

The NEM is an energy-only market with no separate capacity payment system. Accordingly, unlike a number of other energy markets around the world, there is no direct reward for providing security of supply, and revenues only come from being dispatched. The reliability standard requires a significant surplus of reserve capacity. This surplus plant is only dispatched in rare circumstances, and the impact of a cap on its revenues severely discourages the construction of new plant, particularly intermediate and peaking plant.

To enhance system-wide reliability, investment needs to be encouraged in new generation plant, and in particular intermediate and peaking plant generation. Intermediate and peaking units only run during peak times so that their capacity factor is quite low. Consequently, their long-run marginal costs are much higher than their short-run marginal costs[1]. As these units run infrequently, when they do run they require a return sufficient to recover their long-run not merely their short-run costs.

Enertrade feels that the projected forward prices in the NEM may not currently be sufficiently attractive to encourage sufficient investment to deliver enough generation to deliver the required reliability standard. Previous research (ACCC 2000) has shown that a substantial increase in the level of VoLL is necessary to impact on the overall price level. Two previous studies on the Value of Customer Reliability (VCR) established VCR levels of approximately $30,000 per MWh. As there is, or should be, a close link between VoLL and VCR, this supports the argument that, if the VoLL cap is to be retained at all, it should be increased to $30,000 per MWh. Arguments for higher reliability standards are simply an effort to require more surplus plant and thus lower prices in the wholesale market.

In the same way, the Cumulative Price Threshold (CPT) puts unnecessary restrictions on the price mechanism and is an impediment to the efficient delivery of reliability. The CPT threshold should be raised to $450,000 with the subsequent administered prices being $450 per MWh in peak times and $300 per MWh in other times.

[1] For example, in 2005/06 the short and long-run marginal costs for a Queensland closed cycle gas generator was estimated to be $28.9 per MWh and $ 44.9 per MWh respectively. For open cycle gas turbines the costs are even higher, $72.6 per MWh for the short-run and $498.7 per MWh in the long-run: ACIL Tasman.

Abbreviations

ACCC	Australian Consumer and Competition Commission
AEMC	Australian Energy Market Commission
CCGT	Closed cycle gas turbine
CPT	Cumulative price threshold
LRMC	Long-run marginal cost
MWh	Megawatt hours
NEM	National electricity market
NEMMCO	National Electricity Market Management Company
NER	National Electricity Rules
NGF	National Generators Forum
OCGT	Open cycle gas turbine
RRP	Regional reference price
SRMC	Short-run marginal cost
USE	Unserved energy
VoLL	Value of lost load
VCR	Valuation of consumer reliability

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1 Introduction

1.1 Background

The Australian Energy Market Commission (AEMC) is undertaking a comprehensive review of the reliability settings and its interaction with VoLL, CPT and the wholesale energy market (NEM). The review is being conducted by the AEMC's Reliability Panel with an emphasis on supply reliability. In broad terms, supply reliability is defined as relating to "an adequate level of generation and network assets being available" (AEMC 2006b) to meet the reliability standard. The review is limited to reviewing the generation and transmission sectors of the NEM - the impact of the distribution network on reliability is not part of the review's scope.

1.2 Current NEM Reliability Settings

The current NEM reliability settings can be summarised as being:

- The application of a specific reliability measure of 0.002 per cent unserved energy;
- A system of price mechanisms that are intended to support the attainment of the standard; and
- A fall-back mechanism (reliability safety net) should it arise that the price mechanisms perform poorly.

Accordingly, a comprehensive review of the reliability standard has five identifiable areas of examination:

1. The 0.002 per cent unserved energy standard;
2. The level of the price cap currently used in the NEM spot market, that is, the Value of Lost Load (VoLL) limits, plus an assessment of the current market floor price;
3. The trigger levels and subsequent controlled price level under the Cumulative Price Threshold (CPT);
4. The reliability safety net; and
5. Any interaction between the above components.

Enertrade in this submission has selected to concentrate on the current price mechanisms, the VoLL and the CPT, as it considers that solving these issues will significantly contribute to solving the general issue of reliability that the review is considering.

1.3 Reliability definitions

- The reliability standard was set at 0.002 per cent of unserved energy (USE) at the commencement of the NEM in 1998 and has not been altered since. The standard reflects the agreed minimum acceptable level of bulk electricity supply measured against total energy demand.
- The Value of Lost Load (VoLL) is the market upper price and is currently set at $10,000/MWh. There is also a minimum floor price of -$1,000/MWh.
- The Cumulative Price Threshold (CPT) is currently set at $150,000. Against this is measured the sum of all the trading period spot prices in the previous 7 days. If this threshold is reached then NEMMCO imposes an administered price cap of $100/MWh during peak times and $50/MWh at other times.

- The Reliability Safety Net refers to NEMMCO's ability to intervene directly in the market either by acting as a reserve trader and purchasing ahead of time additional generation (or demand abatement) or by directing generators to generate even in circumstances where the generator may otherwise be unwilling to do so.

1.4 The objectives of this submission

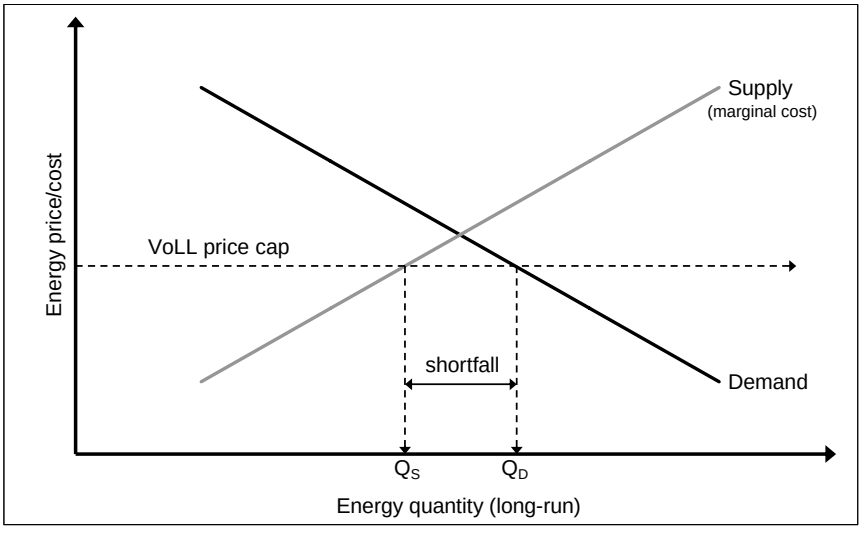
This submission disputes the argument put forward in the Issues Paper (AEMC 2006b) that the price mechanisms (VoLL and CPT) provide the capacity to meet the reliability standard.

Reliability is best satisfied by allowing the market to operate in an unfettered and economically efficient manner. New generation investment will be attracted to entry as a result of returns at levels above long-run marginal cost for new plants. However, VoLL and the CPT represent substantial constraints on the optimum operation of the market. As constraints, they do not contribute to the delivery of the reliability standard but in fact hinder its attainment.

Given the wholesale market price represents the market clearing price for each half hour within the electricity market, a constraint on that price prevents the market clearing at the economically efficient price under conditions of high demand or low supply. By constraining market clearance, VoLL and CPT hinder economical efficiency, in particular in relation to high cost generation plant.

In the long run, a shortfall in investment is inevitable where there are price caps in place in the market. Figure 1 outlines this concept. With a price set at a level below the market clearing price, the quantity supplied will be less than that demanded.

Figure 1: VoLL price cap leading to investment deficit and reliability shortfall



Plant often runs at prices below long-run marginal cost so the revenue from price spikes is critical to achieving returns equal to the long-run marginal cost.

Returns to generators will fluctuate over the investment cycle and sometimes be higher or lower than the cost of capital. Caps impact on the higher than normal periods of revenue but not on the lower than normal periods.

Enertrade is of the view that the restrictions on the natural price mechanism such as VoLL and the CPT should be removed, or, at the very least, substantially raised because of the way in which they impair the efficiency of the market.

It is easily recognisable that the general level of understanding is limited for each of the aspects being covered in the reliability review. And the understanding of the inter-relationship between the various components is especially indistinct. We consider there is a need to clarify the relationship between VOLL and CPT and reliability outcomes.

This submission will also argue that fears are ill-grounded regarding the abuse of market power that may arise from a lack of price caps in the energy market. The Australian Trade Practices Act provides a more than sufficient safeguard against such possible practices. Any increase in regulation in the energy market would merely add unnecessarily to the level of regulatory risk facing market participants. There are already other constraints in the NEM on the market price mechanism, for example, restrictions on generators' rebidding practices.

2 The energy-only market and high price events

2.1 Necessity for high price events

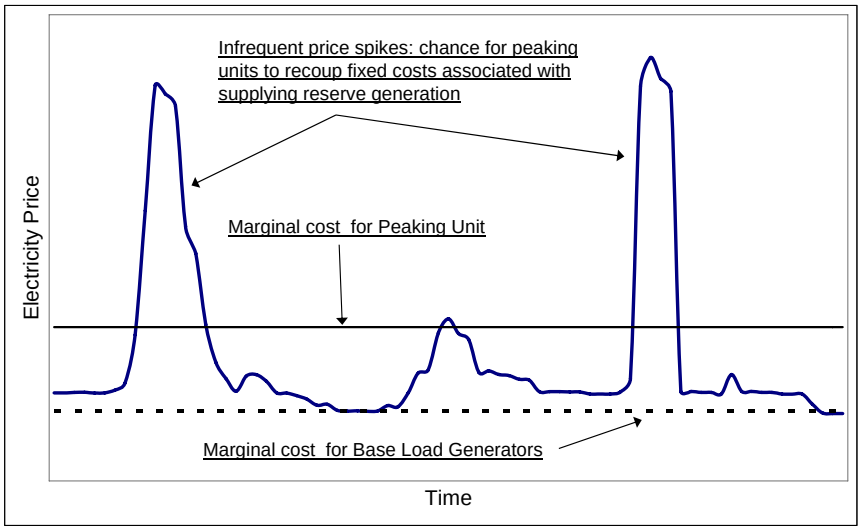
In an energy-only market such as the Australian NEM, the spot market price for energy is the sole source of revenue. There is no separate payment for capacity held in reserve to run at times of high demand.

Generators will only invest where expected time-weighted revenues provide an acceptable risk-weighted return on investment, including covering both capital costs and marginal costs of operation. In an energy-only market, generators obtain the entirety of their returns from spot prices or derivatives of spot prices (i.e. hedges). In derivatives markets, the prices of hedges are fixed based on forward expectations of spot market prices (and risk preferences of market participants). This contrasts with other markets (eg PJM, UK before NETA) which provide generators with capacity payments.

The foundation of the adoption of a spot price energy system for the Australian market is that such markets are the best option for providing efficient short and long term outcomes. Any curtailment of market forces within that system will lead to a less than optimum outcome. Any restrictions on the natural pricing determination process in the NEM are most likely to create a loss in revenue for peaking unit generators to such an extent that there will be insufficient generation investment.

Reserve generation is typically provided for by high-cost peaking generation units. As these units run infrequently, when they do run they require revenue sufficient to cover not merely their variable costs but also to cover their fixed costs. This concept is shown in Figure 2.

Figure 2: Reliance on price spikes to ensure reserve generation



As with any capital intensive industry, there is a substantial difference for generators between their short-run and long-run marginal costs. In relation to new investment and new entrants, the available prices must be seen to at least match their expectations of long-run costs. Estimates of both short and long-run costs in 2005/06 for various generation types are shown in Table 1. For example a Queensland Closed Cycle Gas Turbine (CCGT) faced short-run costs of $28.9 per MWh in 2005/06 and long -run costs of $44.9 per MWh. The much lower costs for coal-fuelled generation is shown in the table as well as the very high costs associated with Open Cycle Gas Turbines.

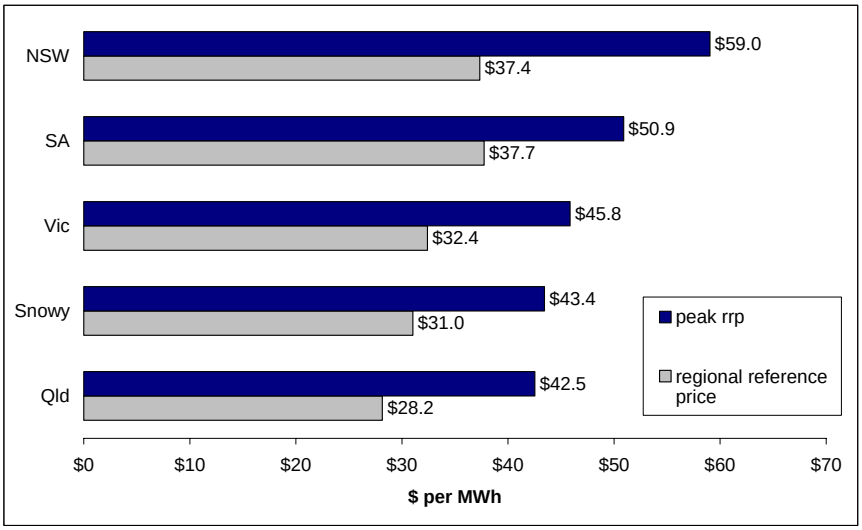
Table 1: Generator cost: short-run and long-run, 2005/06

		Marginal costs	
Generator type and location	Capacity factor per cent	Short-run $/MWh	Long-run $/MWh
NSW CCGT	55	30.4	52.9
Qld CCGT	75	28.9	44.9
SA CCGT	63	29.8	49.5
Vic CCGT	62	27.7	46.5
NSW Coal	91	9.8	34.2
Qld Coal	91	8.4	32.5
Vic Brown Coal	91	7.3	37.0
OCGT	1	72.6	498.7

Source: ACIL Tasman

The prevailing prices available to generators in 2005/06 are shown in Figure 3. Both the overall average prices and those operating in peak times are shown. So Queensland generators received an average price of $28.2 per MWh overall and an average peak price of $42.5 per MWh.

Figure 3: NEM: average annual regional reference price per MWh, 2005/06



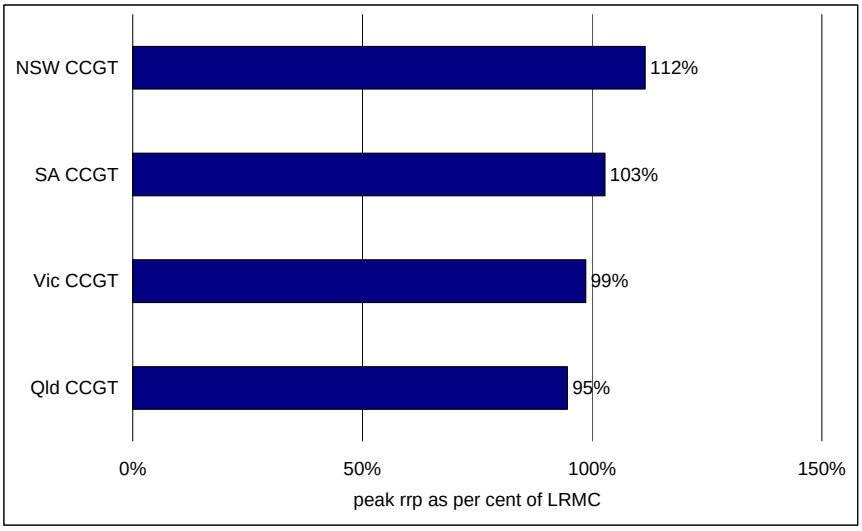
Source: estimated from NEMMCO published data as at 23/06/2006

From Table 1 and Figure 3 it can be seen that, even if the typical fossil-fuelled peaking plants, the CCGTs, were only to receive the higher peak time prices, they would still be only financially marginal. For example, a Queensland-based CCGT seeking to enter the market would need to receive prices in excess of $44.9 per MWh to be viable in the long term. However it would be faced with a peaking price of only $42.5 per MWh in 2005/06. And with the assumption of a 75 per cent capacity factor, as shown in Table 1, the CCGT would have a substantial proportion of its dispatch outside of the peak times and receive substantially lower prices.

This relationship between a CCGT's long-run marginal cost and the peak regional reference price is shown in Figure 4, where the Queensland example used above shows up as the average peak price being only 95 per cent of the long-run marginal cost. The price for a Victorian CCGT was also below its long-run marginal cost while for SA and NSW the prices were slightly above. These percentages would only be representative if the generator operated solely during peak times, and this would certainly not be the case. It is far more likely that any generator entering the market would be facing prices significantly below long-run marginal costs.

Although of a preliminary nature, the above analysis highlights the current lack of financial incentive for additional investment in generation, particularly in peaking units.

Figure 4: NEM: Average peak regional reference price as percentage of the estimated long-run marginal cost, CCGT units, 2005/06



The level of price volatility in the NEM is sometimes criticised and it is argued that this volatility overly contributes to the financial risk facing the participants. But, as shown by the typical pricing patterns in figure 2, this volatility is essential and desirable in an energy-only market in order to encourage new investment, and investment in the most suitable type of generation.

The surplus of supply of generation over load implied by the reliability standard means that a significant portion of capacity (both of baseload and peakers) only gets paid in the rare instances when extreme events occur (transmission outages, extreme weather, unplanned generation outages). In essence, the N-1 requirement means that generation equivalent to at least the largest single generation or transmission element is not expected to receive revenue even at times of peak demand in a very hot or cold year.

This implies that significant portions of capacity only gets paid in very rare and unpredictable circumstances, and in circumstances that the market is explicitly designed to avoid.

As a result, reserve capacity should be rewarded accordingly. For example, if a market has a 20-25 per cent reserve margin (at times of peak demand), then effectively, high priced events when they do occur, are required to cover that 20-25 per cent in potentially just a few hours a year.

Further, the volatility of returns to this reserve capacity is much higher than to plant that is dispatched under normal market returns (given the unpredictability of high priced events and the level of prices during such events, and the impact of the 5/30 price and dispatch model which tends to average such prices), and thus higher rates of return are required by this reserve capacity to compensate for the volatility of returns. Finally, the presence of reserve capacity depresses spot and hedge prices and thus needs to earn a return (in addition to the returns discussed above) to cover that plant which is generally committed during 'normal' market operation. Thus, the returns also have to cover part of the return to the other 75% of plant that is (under the above example) normally running.

NEMMCO intervention in Victoria and SA through the reserve trader arrangements provides support for the view that the market may not deliver sufficient new generation over the investment cycle to maintain the reliability standard. NEMMCO has intervened on a number of occasions to elicit additional generation or user curtailments at times of peak demand during summer. Most recently, NEMMCO paid an amount between $4.4 and $4.9 m to secure control of 375 MW over the two month 2006 summer peak.[2]

Some commentators have characterised the price spikes that arise during times of unexpected transmission constraints or generator outages as instances of the exercise of localised market power by available generators. This characterisation is wrong. Given these price spikes are necessary to provide generators with normal returns, they are appropriately characterised as a implicit reservation charge or insurance policy where the likelihood of a payment is small but the reward is commensurately larger to provide an overall normal return.

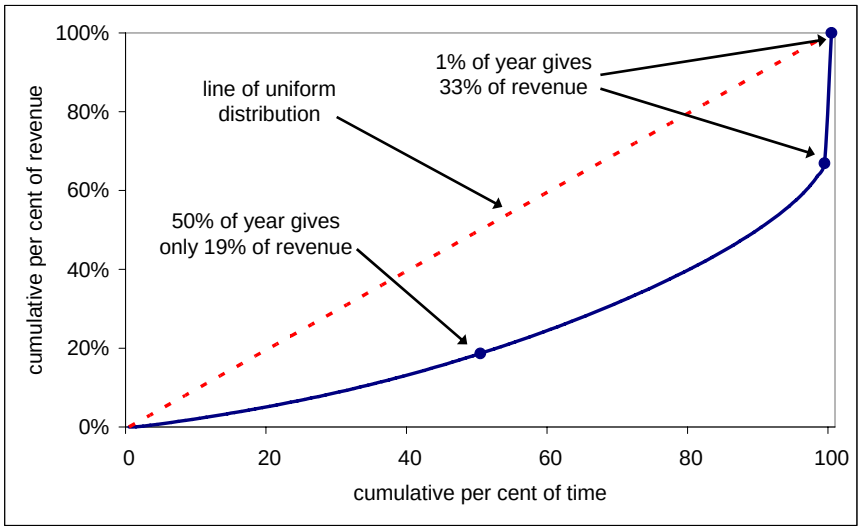
In summary, the reliability standard requires the existence of significant reserve capacity available on the market which under the energy-only market design is only paid in exceptional circumstances. The price spikes that occur when this plant is dispatched reflect the high cost of maintaining this reserve plant. Customers have indicated their willingness to pay such costs through the surveyed results to VoLL and VCR surveys (discussed later in this submission).

2.2 Generator reliance on high price events

An illustration of generators' reliance on high price events can be seen in Figure 5. This shows the revenue distribution for Enertrade in the current financial year from the spot price energy market. The chart is constructed by arranging the revenue received in each half hour period from the smallest to largest. So for example, six months of running (the 50% of trading periods with the lowest revenue) provided only 19 per cent of the total year's revenue. By contrast, the top one per cent of trading periods provided a third of all revenue.

[2] See http://www.nemmco.com.au/powersystemops/190-0011.htm

Figure 5: Enertrade: Inequality of distribution of revenue from spot market activities



Enertrade's generation portfolio has a substantial base and intermediate load component, so that the chart underestimates the reliance for peaking units on high price events. Although a substantial proportion of generation under Enertrade's direction was covered by contracts and hedging arrangements, the revenue obtained from uncovered generation for just a small number of high price events is vitally important. Moreover, hedge pries are driven by expectations as to the maximum price faced by participants.

2.3 The need for new generation

There is a demonstrable and growing need for further investment in generation, including in intermediate and peaking plants. Factors that add to this need include:

- The growing demand for reliability itself. Customers are becoming more sensitive to supply interruptions through the types of equipment they operate, including computers, cash registers, industrial equipment, and other equipment where the costs of even momentary interruption are high; and
- The growing incidence on wind and other intermittent forms of generation in the overall Australian generation portfolio. Comparing new generation against peak demand becomes more problematic as intermittent generation occupies a larger share of total generation. Intermittent generation cannot provide the same security of supply as non-intermittent sources of generation.

It could be argued that there are no overwhelming signs of insufficient investment in generation but it must be remembered that, at commencement, the NEM had a substantial over-capacity of reserve generation. This level of reserve capacity is currently being absorbed rather than maintained. At present, the combination of flat and peak prices provides generators with returns that are well below the cost of capital. This is evident in the reducing margins for generators, and reluctance in South Australia and Victoria to build despite the reserve margin shortfalls. Evidence has yet to emerge conclusively one way or the other that new investment will be forthcoming to maintain reliability at the reliability standard. Clearly, the constraints represented by VoLL and the CPT, which prevent the market reaching the efficient market clearing price at all times, coupled with the importance of revenue from those times, lead to the theoretical conclusion that such investment will not be forthcoming.

There are also forces that tend to distort the efficiency of the wholesale market sector, and may be leading to more investment in the short term in generation, but which may not lead to a continuing pipeline of investment in generation over the longer term.

In particular, there has been an increase in the level of revenue for some generators coming from the various greenhouse abatement programs (e.g. GGAS, GECS, and MRET). This means that some of these plants have able to profitably generate at below spot prices (despite having costs higher than the average of spot prices over the year). This process is bringing forward some new generation investment even though it is significantly decoupled from spot and hedge prices and revenues. This may be obscuring the true extent of generation demand and supply being driven by spot prices by bringing on some generation investment that would otherwise not be economic if the only source of revenue derived from the spot market.

In summary, the NEM needs future investment, and in particular intermediate and peaking unit investment to maintain reliability during short-term demand and supply fluctuations. Such future investment can only be attracted in the long-run by the prospect of normal levels of returns supported by the incidence of some high price events.

3 The Value of Lost Load

3.1 Interpretation of VoLL

In the Australian situation the price cap on the spot price energy market is known as the Value of Lost Load (VoLL). A fundamental problem with the use of the Australian VoLL is the lack of definition of what it is intended to represent and how it is quantified. One area that creates confusion is the relationship between VoLL and another closely related variable, the Value of Customer Reliability (VCR). In the AEMC view the difference is as follows:

> *"VCR differs from VoLL as the latter term is used in the NEM: VCR is purely a customer measure whereas VoLL is the wholesale spot market price cap intended to balance consumer demand preferences with the investment signals provided to market participants." (AEMC, 2006b)*

The above quote suggests a role for VoLL different to the role for VCR. In normal markets, the market clears at the intersection of marginal willingness to pay and to supply. In those terms, VCR represents marginal willingness to pay. The above quote implies that at times of high prices the wholesale market is not about matching demand and supply, in the sense that VoLL has a role to play that is different to providing supply at marginal willingness to pay.

3.2 The purpose of VoLL

It is clear there is an requirement to clarify the purpose that VoLL is meant to play in the market. This review provides an ideal opportunity to examine some of the underlying drivers for particular roles that could be assigned to VoLL, and to set out the role played by VoLL. Clarification of the purpose will assist market participants

to operate with confidence in the market. Without a proper understanding of the purpose of VoLL, it is not possible to set VoLL or to assess on a year by year basis (as currently occurs) whether VoLL should be changed based on market action.

The Issues Paper view that VoLL and the CPT are price mechanisms to deliver the reliability standard is also incorrect. VoLL and the CPT are caps on wholesale market prices that reduce returns to generators by reducing possible revenues. As generators (together with transmission entities) deliver reliability, a cap on their revenues below market clearing prices will reduce availability and thus reliability compared with the reliability delivered with the caps removed.

A number of possible purposes have been assigned to VoLL.

The first is that VoLL assists in decreasing volatility in the market.

Enertrade considers that the wholesale electricity market is inherently volatile due to the:

- instantaneous nature and non-storability of electricity. Non-storable products are risky and costly to supply, but once made must be sold at almost any price offered;
- the rapid changes that can and frequently do occur in supply and demand. It is not atypical for demand or supply to change significantly in a short period of time due to changes in temperatures or bulk supply availability; and
- the very high marginal cost of supply at particular points on the supply curve. This reflects the costs associated with supplementing baseload generators (at perhaps $35/MWh) with high priced generators (eg OCGT at around $500/MWh) once demand reaches a certain point.

This inherent volatility is unavoidable in an efficient wholesale electricity market. Price spikes reflect circumstances where a number of factors come into play at the same time to push prices in the same direction.

Enertrade does not consider that VoLL should stand in the market as a mechanism to smooth this volatility. Hedge market operations perform this purpose. In fact, efforts to smooth wholesale market volatility through mechanisms such as VoLL or the CPT are likely to impair the operation of the hedge market by allowing buyers of hedge products to rely instead on the caps to limit their exposure to volatility and thus reducing demand for hedge products.

A second purpose for VoLL is to restrain the operation of market power by generators.

It is perceived in some quarters that increasing the level of VoLL will permit some generators to abuse their market power. Enertrade contests this view on two accounts.

Firstly, as argued throughout this submission, high price events are necessary to encourage investment in peaking plant and the presence of prices above short-run costs are completely justifiable as long-run costs that have to be met are substantially above these short-run costs. Prices need to go above long-run marginal costs given they typically languish well below this level.

Secondly, there are already effective constraints on the exercise of market power:

- there are low barriers to new entry. New competitors are free to construct generation facilities subject to environmental and planning approvals. While the costs of construction are generally (though not always) sunk, patterns of demand provide some confidence that new generation will be consumed. Further, technological developments enabling new generation to enter at lower cost than existing generation (eg super and ultra super critical plant) provide the opportunity to enter even where demand is not growing strongly. The experience in the market has been that a number of new entrants have come into the market since market start in 1997. These new entrants have come from a variety of backgrounds, including generation specialists, and infrastructure providers, and financial institutions and super funds.
- Competition takes a number of forms, including competition among generation within the same price region, and competition across interconnectors (leading to lower expected forward regional prices and thus lower hedges). This competition has been effective to date in producing average prices within regions that are currently below long-run marginal cost. In particular, competition is apparent when an assessment is made of the medium term trends in prices rather than exclusively focussing on a number of very short term high priced events in reaction to sudden increases in demand or reductions in supply.

  Caps on generator revenue such as VOLL and the CPT are likely to reduce incentives to enter the market and thus reduce competition in the marketplace, leading to more regulatory intervention and a vicious circle of reduced competition and greater intervention.
- the Trade Practices Act is a powerful avenue to pursue any perceived market power misuse.
- the existence of the hedge market makes generators largely indifferent in the short term to wholesale market prices. While higher potential wholesale prices could be expected to deliver higher hedge prices, there is no incentive once fully hedged to engage in an activity designed to increase wholesale prices in the short term. In fact, such short term price rises reflect the interplay of rapid demand and supply changes.
- the rebidding provision in the NER provide for massive company and personal fines for non bona fide rebidding.
- the reliability safety net provisions provide NEMMCO with broad powers to intervene where the market is not bringing on sufficient supply to satisfy future projected demand or in the short-term where particular users would be curtailed unless a generator is directed to turn on.

A third purpose for VoLL is to serve as a proxy for the point at which users would be indifferent between buying and not buying electricity. This is another way of saying the point of marginal customer willingness to pay for electricity.

Enertrade considers that this is the real purpose behind VoLL. As customers are not aware in real time of the price of electricity in the wholesale market, and thus the costs of their decisions to use electricity, their choices about consumption are less informed than in most other markets. As a result, there is a role for VoLL in serving

as a trigger for a demand-side response to very high prices. Conceived in these terms, it is clear that VoLL should reflect customer willingness to pay, i.e. VCR.

Future annual reviews of VoLL should not examine whether prices have reached VoLL and on how many occasions, but whether customer willingness to pay has changed such that VoLL should be adjusted. It can be expected that the value of customer willingness to pay should change over time, reflecting technological developments around electricity-dependent equipment and the costs of interruption to the use of that equipment within households and businesses.

It is clear that the confusion about the purpose of VoLL has been tending to undermine the effectiveness of the market by reducing the depth of the hedge market, and by reducing entry by generators and thus reducing competition among generators.

3.3 Strength of the relationship between VoLL and the reliability standard

The strength of the relationship between VoLL and reliability outcomes have not been explicitly established. In its April 2006 report on reliability the AEMC observed, "In 2005 the dispatch price reached VoLL on a number of occasions, but not for all six dispatch periods within any half hour and hence a price of VoLL was not recorded for any 30-minute period." (AEMC, 2006a) But it is not correct to assume that the infrequency of VoLL or near-VoLL events has no subsequent effect on the market.

The financial market is a very substantial mechanism in relation to energy purchases in Australia. Changes to the level of VoLL will be directly reflected in the contracting levels and contract prices available in these financial markets. This mechanism plays a very large part in delivering the reliability outcomes of the current NEM market.

The role of VoLL and the CPT needs to be judged prospectively rather than retrospectively, especially in relation to their impact on the hedge markets. In other words, VoLL and CPT can reduce generator returns even though no VoLL or CPT events occur, because they reduce the risks faced by retailers and thus the price at which retailers are prepared to enter hedges. So, the presence of VoLL and the CPT reduce generator returns even in the absence of VoLL and CPT events.

3.4 Setting the level of VoLL

The AEMC Issues Paper asks, "Whether the level of the standard should change depends on whether there have been changes in consumer expectations" (AEMC, 2006b, p.24). Certainly if there has been a change in consumer expectations then the levels of the standards need to be re-visited. It would seem certain that consumer expectations have been continually increasing since the commencement of the NEM. But the AEMC statement infers that the levels in place now are the right ones, and this is clearly arguable.

In relation to VoLL, as far back as 1999 the Reliability Panel's Final Report recommended a two stage increase in the level of VoLL: first to $10,000/MWh by September 2001, and then to $20,000/MWh by April 2002 (NECA 1999). It was up to the Australian Competition and Consumer Commission (ACCC) to make a determination on these recommendations. In their draft determination they supported

the NECA proposal but in the subsequent final determination they only agreed to the increase to $10,000/MWh. This decision was made more interesting in that in the period leading up to the commencement of the NEM the ACCC had strongly questioned the need for any cap at all. "The Commission considered that in a competitive market that had efficient market clearing mechanisms, a price cap would be unnecessary."(ACCC 2000)

While it may be difficult to establish an indisputable estimate of the appropriate VoLL (i.e. the price at which customers in aggregate would be indifferent between being supplied or not), it is certain that it should be substantially higher than the current level of $10,000/MWh. As mentioned above, NECA was of the opinion that the level should have been $20,000/MWh in 2002. The most recent estimation of VCR (CRA 2002, commissioned by VENCorp) arrived at a figure of approximately $30,000/MWh. And this level was almost identical to an earlier study conducted by Monash University.

> *The State-level VCR value for Victoria is $29.60/kWh of unserved electricity. This value is very similar to, and only marginally higher, than the VoLL figure of $28.89/kWh estimated in the Monash study." (CRA 2002)*

If it is deemed that a price cap must be maintained, then the price cap should be raised to $30,000/MWh.[3] VoLL should be changed to align with its role as a demand-side response to higher prices.

3.5 The Cumulative Price Threshold

In the same way that VoLL is an inefficient restriction on the market mechanism, the Cumulative Price Threshold (CPT) is an additional excessive limitation. The definition of CPT as outlined by NECA in 2005 stated:

> *The CPT should only be exceeded in the event of a market failure, where supply fails to meet demand, or where due to the unique nature of electricity, supply and/or demand are unable to respond to market signals. (NECA 2005)*

However it cannot be argued on any basis that high prices *per se* are an indication of market failure. In fact, the reverse is true; they are a sign of the market working to come to a stable equilibrium. In the NECA report it was observed that the cumulative price threshold of $150,000 had been approached but never exceeded. But it went on to say, "We concluded that this provides some evidence that the CPT is at the approximately right level."

This is an unsupportable conclusion. The CPT level of $150,000 is a relatively arbitrarily selected number which by little more than coincidence has not yet been breached in the market. Certainly, further research needs to be undertaken to establish

[3] To the extent that the increase in VoLL increases demand-side response activities it will improve the efficiency of the market. At present governments are investigating a variety of ways to encourage greater demand-side participation in the market.

the relationship between VoLL, CPT and reliability outcomes. However it seems assured that the current level of the CPT of $150,000 is too low if the intent of the CPT is for it to only come into operation in times of major market failure.

The role of the CPT has to be seen in the same way as the role of VoLL, that is, as a demand-side response. The CPT trigger level of $150,000 should be raised to $450,000 with subsequent administered prices being $450 per MWh in peak times and $300 per MWh in other times as this would be a closer representation of the demand-side response if users were not as insulated from the wholesale prices as they are currently.

3.6 Impact of increasing the price cap

Modelling work commissioned by the ACCC in 2000 included estimates of the impact that a raise in VoLL would have on the spot prices in the NEM. The modelling by Intelligent Energy Systems (IES) concluded that:

> *Depending on 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. (ACCC, 2000)*

Enertrade has not made a detailed analysis of this modelling exercise but merely provides this example to highlight two important points. Firstly, the increase in VoLL would need to be substantial to have any significant impact on generator's financial incentives. Secondly, that even a substantial increase in VoLL has a relatively minor impact on general prices, so that any fears of a runaway price increase caused by an increased VoLL are unfounded. Enertrade considers that the analysis should be updated to inform the current review about the impact of raising VoLL and the likely resulting price paths and reliability outcomes.

4 Conclusion

Electricity markets are inherently volatile, and prices vary considerably over the course of time as supply and demand change. Price spikes during times of transmission constraint or generator outage do not represent the exercise of localised market power – instead they reflect the high cost of maintaining plant available to meet such supply challenges.

VoLL and the CPT cap wholesale electricity prices during such events and prevent the market clearing at customer marginal willingness to pay.

At current levels, VoLL and the CPT run the risk of compromising the achievement of the reliability standard. They also threaten to undermine competitive conditions in generation and impair the efficiency of hedge markets.

VoLL should not be used as a mechanism for controlling market power or smoothing volatility in the wholesale electricity market. If it is retained, it should be set at customer willingness to pay, viz $30,000. Similarly the CPT threshold should be set around $450,000 with subsequent administered prices being $450 per MWh in peak times and $300 per MWh in other times.

5 References

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