Major Energy Users Inc.

Australian Energy Markets Commission

National Electricity Amendment (Bidding in good faith) Rule 2014

Reference Code ERC0166

Comments on the Consultation Paper

Submission by

The Major Energy Users Inc

May 2014

Assistance in preparing this submission by the Major Energy Users Inc (MEU) was provided by Headberry Partners Pty Ltd

This project was part funded by the Consumer Advocacy Panel (www.advocacypanel.com.au) as part of its grants process for consumer advocacy and research projects for the benefit of consumers of electricity and natural gas.

TABLE OF CONTENTS

Summary

The Major Energy Users Inc (MEU) welcomes the opportunity to provide comments on the AEMC's Consultation Paper issued as part of its assessment of the rule change proposed by the SA government to address the observed use by generators of rebidding as a tool for increasing their revenue when market conditions do not warrant such an increase in revenue. The rule change proposal is strongly supported.

The MEU has seen that generators are using their market power to increase their revenue when they know they are in a position where they must be dispatched at any price in order to maintain system reliability. This was the focus of the 2011 MEU proposed rule change.

The more recent rule change proposal by the AER on ramp rates also highlights that generators use their market power to arbitrarily offer ramp rates which distort market outcomes.

Overall, the issue of generator market power and its abuse has not been properly addressed in the National Electricity Market (NEM) rules, thereby allowing generators myriad opportunities to increase their revenues while delivering a less efficient market outcome. The MEU supports the SA government proposal as it is focused on achieving more efficient market outcomes.

Consumers have been hard hit by rapidly increasing costs for electricity delivered to their points of supply, reflecting structural changes in the market. These increasing costs are a direct result of the unbalanced network investment rules, and massive government social policy interventions. This rule change is in part aimed at reducing the costs of delivered electricity by removing the unwarranted ability of generators to interfere with market based outcomes.

The MEU notes that the Consultation Paper is focused on obtaining evidence that the rule change proposal provides "long term benefits to consumers", as required by the National Electricity Objective. For its part, the MEU considers that the SA Government has established that generators are able to exercise their market power by inappropriate use of rebidding strategies and in doing so lead to unnecessary transfers of wealth from consumers to generators. This appropriation of economic rents is not consistent with the requirements that the National Electricity Market under the National Electricity Law. This means that the AEMC should require opponents of the rule change to provide the evidence that the detriments of the rule change outweigh the benefits that will be generated by establishing a more efficient outcome for the wholesale market.

The MEU notes that this issue of rebidding is one of long standing and was the focus of a NECA rule change proposal in 2001 and on which the ACCC

provided a final determination in 2002. Most telling about the NECA report was its concern that rebidding was being used by generators to exploit transmission constraints and thereby use these as the basis to make inappropriately high priced bids[1].

In its final decision, the ACCC did not allow the NECA proposal that generators should bear the onus of proof that their rebids were made in "good faith" but that the market regulator (now the AER) should have to prove rebids were not made in "good faith". Whilst imposing this change, the ACCC made an important caveat that if the rule change decision did not lead to the efficient outcomes expected, then future intervention to preserve the efficient operation of the NEM would be necessary. Unfortunately for consumers, the difficulties experienced by the AER to prove some rebidding was not made in "good faith" has proven to more difficult than was initially thought by the ACCC. The SA government proposal seeks to address this situation by requiring greater transparency in rebidding strategies.

The Consultation Paper appears to imply that the proposed rule change is a reversal in the onus of proof to generators having to prove their rebid was made in "good faith". This is not the case. The proposal seeks greater information flows that will allow the AER to more adequately assess whether there has been sufficient change in the market to warrant a change in a price bid (a rebid) based on the market conditions at the time of the rebid. To assist in the AER investigation, the proposal also seeks a change to the rules to provide clarity on what would constitute a change in the market sufficient to warrant a rebid.

The proposal is not remarkable and it is important that the AEMC appropriately understands that what is being sought is not to impose a reversal of proof nor does it represent an unreasonable impost on generators although it does require generators to provide more and better information underpinning their decisions to rebid. Accordingly, the MEU strongly supports the rule change proposed by the SA Government.

The SA government proposal is timely. The earlier reviews on the issue highlighted concerns about generators using transmission constraints as a tool for increasing revenues and the ACCC expressed concerns with strategic rebidding and attached very significant caveats in its decision in the event that there is a worsening of the situation and the regulator cannot achieve the expected outcomes. Since that time there have been a number of rule change proposals to limit the abuse of generator market power. That the AEMC has not fully explained the reasons behind the NECA proposed rule change and the caveats of the ACCC is concerning.

[1] This issue was also the focus of the MEU rule change proposal in 2011

The MEU is also concerned with the selective use of material to support the AEMC views on abuse of generator market power. The Consultation Paper highlights the views of the Alberta Market Surveillance Authority (which supports the AEMC views) but neglects to provide views of other overseas authorities which consider that abuse of market power needs to be closely controlled.

The MEU has attached a study that was commissioned by the ACCC in 2001 which shows the necessary analytical work that needs to be undertaken if the current review is to arrive at robust conclusions. In a similar vein, the presentation to the forum on 12 may 2014 by Visy provides more quantitative analysis than the Consultation Paper. There is, surprisingly and curiously, an absence of arguments presented in the Consultation Paper as to the detriments of the status quo. Better qualitative and quantitative analysis is required if the AEMC conclusions are to be deem acceptable.

The MEU considers that a rejection of this rule change proposal, based on the work undertaken so far by the AEMC, would be very concerning as doing so would be inconsistent with the NEO.

1. Introduction

The Major Energy Users Inc (MEU) welcomes the opportunity to provide its comments on the AEMC's consultation paper relating to the AER rule change proposal on generator ramp rates and rebidding.

1.1 About the MEU

The Major Energy Users Inc (MEU) represents some 20 large energy using companies across the NEM and in Western Australia and the Northern Territory. Member companies are drawn from the following industries:

- Iron and steel
- Cement
- Auto industry
- Paper, pulp and cardboard
- Processed minerals
- Fertilizers and mining explosives
- Tourism and accommodation
- Mining

MEU members have a major presence in regional centres throughout Australia, e.g. Western Sydney, Newcastle, Gladstone, Port Kembla, Albury, Mount Gambier, Westernport, Geelong, Port Pirie, Kwinana and Darwin.

The articles of the MEU require it to focus on the cost, quality, reliability and sustainability of energy supplies essential for the continuing operations of the members who have invested $ billions to establish and maintain their facilities.

Because the MEU members in many cases have their major manufacturing operations located in regional centres, the members require the MEU to ensure that its comments also reflect the needs of the many small businesses that depend on the existence of their large manufacturing operations, and the many residential electricity consumers that make up the members' workforces and contractors in those regional centres.

1.2 The MEU view of the energy markets as a whole

The MEU considers that the rule change proposal should be addressed in the context of the electricity market as it is now operating. In this regard, consumers are already being impacted by escalating electricity costs stemming from a range of causes, such as:

- Generator market power itself (the focus of the proposed rule change)
- Steeply rising transmission and distribution network prices
- The electricity market exhibiting reduced competitive pressures from re-aggregation of competitive elements
- Excessive volatility in wholesale electricity prices, and as a result retailers are including in retail price offerings, larger risk and profit maximisation premiums, which are causing significant retail contract price increases
- Introduction of a price on carbon
- Implementation of the renewable electricity target (RET) through its LRET and SRES programs which are currently forecast to provide nearly 30% of electricity from renewable sources.
- In addition to the direct premiums these programs place on electricity costs, there are considerable indirect costs that are being seen through
    - increasing generation prices as thermal generators attempt to recover their fixed costs over lesser production
    - the need to augment networks to meet the RET requirements
- Myriad (and sometimes duplicative) Federal and State Government renewable energy, energy efficiency and climate change programs and 'initiatives', such as feed-in tariff schemes, climate change levies, energy efficiency programs, etc

A trend of reducing demand and consumption across the NEM has been associated with the loss of considerable industrial activity, high electricity prices and increased penetration of residential roof top solar generation. This reducing consumption means that generators have to recover their fixed costs over a smaller consumption base, leading to increased unit prices from dispatchable generation. At the same time, network revenues are still increasing with the revenue recovered from lower demands and less consumption leading to higher prices.

However, one of the more significant factors becoming increasingly evident is the increasing volatility in the regional spot markets for electricity. This volatility is resulting in increased risk to generators and retailers (and therefore to consumers) and this has caused a significant increase in risk margins included in retailer and generator offers and in increased retailer margins.

Overall, there is a general expectation that electricity supply costs will continue to rise in real terms over the next few years as a result of these changes, a significant proportion of which is driven by the many government interventions in a supposedly competitive market. These increasing prices for delivered electricity is having a 'chilling' effect on downstream investments and creating an environment where the ability to pay is becoming a major issue for all consumers, ranging from large industrials facing international competition to small consumers, especially in the lowest income quintiles.

1.3 Generator market power

Generators are able to exercise market power because of constraints in the electricity networks. Once a constraint in the network occurs, it limits the competition between generators that drives efficient pricing by generators.

In 2010, the MEU submitted a rule change proposal that would limit the ability of the dominant generator(s) in a region being able to set the regional spot price when the interconnector(s) to an adjacent region is constrained. This has been referred to as transient market power; the exercise of transient market power is a feature of all competitive electricity markets - both in energy only markets and capacity markets. In most overseas jurisdictions, the exercise of transient market power is seen as inefficient and is prevented. However, this is not the case in the NEM following the recent AEMC decision on the MEU rule change proposal. Allowing generators to rebid when competition reduces (as is the case when generators set artificially low ramp rates - the focus of another rule change request) is another demonstration of where generators use their market knowledge of reduced competition. This thereby accrues a financial benefit at the expense of others - consumers and other generators.

The main source of contention the MEU has with the approach used by the AEMC to assess the MEU rule change proposal on the exercise of generator market power, is that the AEMC used a unique approach to assess the impact of the exercise of this transient market power. To a large extent, this unique approach effectively "averaged away" (or "annualised away") the market inefficiency and cost to consumers the MEU had identified. Despite this, the AEMC still concluded that generator market power was likely to be an issue in the future and that this should be monitored for re-emergence.

Effectively, the AEMC assessed that the amount of damage caused by the inefficiency was not sufficient to warrant a change to the rules but that, in the future, the damage to consumers has to exceed a very high hurdle value before the matter might need to be reassessed. The MEU considers that the AEMC approach does not address the issue of market power as such, but that the amount of damage caused by the exercise of the market power was "within tolerance" of what would be expected of a competitive market[2].

The MEU notes that the AEMC has persisted in using its unique approach on assessing the economic damage of generator market power in this Consultation Paper. That few regulators of competitive electricity markets accept that transient generator market power is acceptable (such as in the UK, Ireland, US (FERC, PJM, NYISO, ERCOT) and Ontario Canada all of which consider a

[2] The MEU is not convinced by the AEMC outcome on its assessment of transient market power and on the MEU rule change proposal due to the unsatisfactory analysis by the AEMC.

much wider assessment is required to assess the impacts on consumers of the exercise of market power) indicates that the AEMC approach is inappropriate[3]. That of all the regulators of competitive markets the AEMC cites the only one - Alberta's Market Surveillance Authority (MSA) - that accepts that a "little exercise of market power" might be acceptable if there is a long term benefit. The use of a single example out of many other examples with a view contrary to that of the AEMC implies the AEMC is being selective in its support of what the AER considers is insufficient analysis[4]. For example, the AER commented in its covering letter of 1 August 2012 to the AEMC with its response to the AEMC draft decision on the MEU proposed rule change (page 1):

> "The AER considers that an average price versus LRMC test [the only test applied by the AEMC] can be a useful threshold indicator of whether or not substantial market power exists. For example, if prices were always below the best estimates of LRMC then one might conclude that there are limited concerns. However, **in the case of the NEM there is a need for further analysis**. For example, in South Australia, average prices stayed well above mid-point LRMC estimates and market modelled LRMC for several years in a row. The AER believes this indicates that there is a problem with substantial market power.
>
> We would suggest that the Commission's work would be enhanced by considering a broader framework such as that which exists under a competition/antitrust law framework. **A useful consideration would be to analyse the actual bidding behaviour of individual participants and how their behaviour influences average prices and the efficiency of dispatch**. Analysis of Lerner Indexes and Pivotal/Residual Supply Indexes would also be beneficial."

There are a number of solutions available to address the observed outcomes of generator market power and these include:

- Increase the size of the network to eliminate any constraints (an expense to consumers)
- Require generators to pay for the certainty of being able to be dispatched (such as through the Optional Firm Access model currently being contemplated)
- Remove the ability of generators being able to garner financial benefit through bidding and rebidding practices (such as proposed by the MEU rule change on market power)

---

[3] The MEU is also critical of the AEMC`s review because of many deficiencies in the analytical assessments.

[4] See the AER response to the AEMC draft decision on the MEU rule change proposal to limit the exercise of market power AEMC reference ERC0123 available at http://www.aemc.gov.au/getattachment/60d0a1c5-1223-4163-919b-23d3896ae19c/Australian-Energy-Regulator-received-1-August-2012.aspx

- Require generators to offer their services to match the physical ability of their plant (as sought by the AER rule change on ramp rates)
- Limit the ability of generators to use unfettered rebidding to exercise their market power (as sought by the SA government rule change on rebidding)
- Do nothing and permit consumers to continue paying for generators use of their market power (such as the AEMC response to the MEU rule change effectively permits)

The MEU recognises that constraints applied to generators under the rules could have the ability to deter future investment of generation and thereby put at risk the long term security of supply. Equally, the MEU notes that the electricity market is intended to be competitive and that where competition is constrained this also has the potential to limit future investment due to the inherent risks.

The NEM is intended to operate in a way that, with sufficient competition, the market would evidence a wholesale price that reflects the marginal cost of generation. At low demand times, the wholesale price should reflect the price at which a generator balances the costs of maintaining output against the costs of stopping and restarting generation[5]. At high demand times, the wholesale price reflects the cost of having fast start generation, which is only occasionally dispatched.

The most efficient dispatch of generation is where the merit order of generation dispatch is set by the relative costs for generation. It is inefficient where any generator is dispatched out of merit order; ie where a higher marginal cost generator is dispatched before a lower marginal cost generator. Where this out of merit order dispatch is caused by a generator using its unique circumstances to vary its bids in order to increase its prices above its marginal cost and be able to do so because competition is limited should be prevented - the MEU sees this as opportunistic and distorts an efficient market.

1.4 Summary

It is recognised that it is probably inefficient to augment the networks to eliminate all congestion. At the same time, it is inefficient to allow just a few generators to increase their financial reward by deliberately rebidding at higher prices by the existence of unique circumstances that reduce competition whilst causing consumers to pay more for the services than is required.

Consumers are facing considerable price impacts for their electricity supplies. A key driver is due to the significant changes in the market structure of the NEM. It is not reasonable that these price rises be exacerbated by generators using

[5] For example by keeping boilers steaming

their market power to further increase electricity prices, and by doing so create a significant transfer of wealth away from consumers.

2. The SA Gov't Rule change proposal, the AEMC approach and the NEO

The Second Reading Speeches for the 2005 and 2007 amendments to the National Electricity Law (NEL) make it clear that competition is the basis for maximising efficiency in generation and retailing. It is by maximising efficiency that will deliver the least cost to consumers.

The MEU agrees that the National Electricity Objective (NEO) should be the basis for rule changes and this is outlined by the SA government in its rule change proposal and by the AEMC in the consultation paper.

2.1 The proposed rule change and the NEO

The consultation paper prepared by the AEMC clarifies the issues behind the SA government decision to seek a rule change to address the damaging effects from the exercise of generator market power through rebidding.

The NEO is drafted in such a way that requires the rule maker (AEMC) to ensure that the supply of electricity to consumers must be delivered to ensure the maximum efficiency is achieved by the market. As Minister Hill (for Minister Conlon) noted[6] when discussing the NEO in the second reading speech for the NEL amendments in 2005

> "The national electricity market objective in the new National Electricity Law is to promote efficient investment in, and efficient use of, electricity services for the long term interests of consumers of electricity with respect to price, quality, reliability and security of supply of electricity, and the safety, reliability and security of the national electricity system.
>
> The market objective is an economic concept and should be interpreted as such. For example, investment in and use of **electricity services will be efficient when services are supplied in the long run at least cost**, resources including infrastructure are used to deliver the greatest possible benefit and there is innovation and investment in response to changes in consumer needs and productive opportunities.
>
> The long term interest of consumers of electricity requires the economic welfare of consumers, over the long term, to be maximised. **If the National Electricity Market is efficient in an economic sense the long term economic**

[6] Hansard, SA House of Assembly 9 February 2005

> **interests of consumers in respect of price, quality, reliability, safety and security of electricity services will be maximised.**
>
> ... **Applying an objective of economic efficiency recognises that, in a general sense, the national electricity market should be competitive,** that any person wishing to enter the market should not be treated more nor less favourably than persons already participating in the market, and that particular energy sources or technologies should not be treated more nor less favourably than other energy sources or technologies." (emphases added)

Efficiency in the market ensures the delivery of electricity at the least cost to consumers over the long term. It is patently inefficient if a generator can exercise market power and as a result cause a transfer of wealth from consumers to generators or a transfer of wealth from one generator to another.

In its analysis of the MEU proposed rule change on generator market power, the AEMC has already accepted that the current rules can allow a generator to exercise its market power to the detriment of consumers and the market in general through inefficient dispatch. As the proposed rule change is clearly focused on increasing efficient dispatch of generation (and therefore a more efficient market), the AEMC should therefore be examining the rule change proposal with the **onus of proof for not implementing the change lying with those who benefit from not changing the rules**.

Put another way the AEMC should be requiring opponents of the rule change proposal to prove that the detriments of the change outweigh the benefits to consumers such that this inefficiency in the market should be accepted by consumers and be retained.

However, the AEMC seems to seek solace in that the modest exercise of market power through rebidding is acceptable as is professed by Alberta's MSA. What is concerning (and rather surprising because of the importance of the AEMC not providing to any misleading or biased advice about the arguments concerned) is that the AEMC appears only to look at the first part of the MSA observation - that (page 18):

> "…the MSA considers that giving too much weight to short-term efficiency concerns can "chill the incentive to innovate or invest" and may harm long-term efficiency. In this respect, the MSA conclude that conduct inconsistent with short-term efficiency can be acceptable so long **as there is a corresponding benefit to long-term efficiency from the forces of competition**." (emphasis added)

The second observation of the MSA is that there has to be a corresponding benefit to long term efficiency from the forces of competition. The thrust of both

the NECA proposal and this proposal from the SA Government is to effectively ensure that the transient loss of competition is not used to cause an unnecessary wealth transfer from consumers to generators. At a macro level, precluding the use of market power delivers a more efficient outcome. The questions regarding the SA government proposal then become ones of assessing whether:

a) There are long term efficiency benefits occurring from **not** making the proposed rule change; and

b) These long term benefits exceed the value of increasing the efficiency of the market that would result from making the proposed rule change.

This means that the long term efficiencies from not making the rule change proposed must exceed those benefits from making the change.

2.2 The SA Government proposed rule change

The SA government rule change proposal is intended to maintain efficient dispatch of generation on a merit order that is based on lowest cost, with the most efficient generation being dispatched in an orderly fashion before higher cost generation is dispatched. This will achieve the NEO in that the NEO seeks to ensure there is efficient operation of the electricity market. What is observed is that inefficient dispatch is occurring under the current rules and this is being caused by generators using their market power to rebid capacity to their advantage when there is no significant change in the market conditions.

Prima facie, the proposed rule change recognises that generators have, at times, the ability to offer their services in a manner which results in less efficient operation of the market with an accompanying financial benefit to the generator by doing so. Because information asymmetry effectively prevents the AER from being able to prove that the generator rebid in "bad faith" in order to maximise their revenue this permits the generators to continue their current practices unconstrained by the requirement of rebidding in "good faith". This is now considered a standard operating procedure, that the MEU argues, creates inefficiencies and distorts market outcomes as identified the SA Government and earlier in this report

The MEU considers this rule change is a sensible and pragmatic outcome from the challenges faced by the AER when imposing the controls that were expected when the "good faith" provision was implemented.

The AEMC has offered the following definition of "good faith" bidding by generators (page i)

> "[T]hat, at the time of making the bid, the generators must have a genuine intention to honour that bid if the material conditions and circumstances upon which the bid is based remain unchanged."

The genesis of the "rebidding in good faith" rule requirement dates back to the National Electricity Code Administrator (NECA) concerns that there was pricing extant in the NEM that NECA (in its report "Generators' bidding and rebidding strategies and their effect on prices" September 2001 Volume 1) observed (page 3)

> "NECA had originally proposed a prohibition on rebidding, subject to appropriate but tightly defined exemptions, three hours ahead of despatch. NECA and the Panel are, however, persuaded of the practical and other disadvantages of such a prohibition. **We are seeking instead to identify and prohibit the specific sorts of bidding and rebidding behaviour that are objectionable. This includes, in particular, exploiting transmission constraints and engineering the calling of inappropriately high-priced bids.** We propose to tackle such behaviour through a prohibition on bids or rebids that have the purpose, or have or are likely to have the effect, of materially prejudicing the efficient, competitive or reliable operation of the market. This will bring the Australian market into line with other major markets worldwide in addressing market behaviour directly within the market rules. The proposed prohibition will be supported by guidelines, on which NECA intends to consult extensively, on how it would enforce that prohibition." (emphasis added)

NECA concluded (page 4):

> "…that some very short-term price spikes often have no basis in the underlying dynamics of the market. They do not represent a genuine price signal to either the supply side, in terms of the need for new investment, or the demand side of the market. Moreover, because by their nature they arise so suddenly and are so very short-term, no competitive response is possible." [7]

These concerns led to NECA recommendations that rebidding must be made in good faith and that the onus of proof that rebid was made in good faith had to rest with generators. The concept behind this was intended to achieve a market where generators could not use rebidding in order to manipulate (ie exercise their market power) wholesale price outcomes.

The NECA proposed rule change was submitted to the ACCC which (at that time) had responsibility for assessing proposed rule changes. As part of its

[7] The MEU agrees with this NECA assessment as do many other regulators throughout the world of competitive electricity market. It is this issue that the MEU raised its rule change on the exercise of market power

review of the NECA proposal, the ACCC commissioned Bardak Ventures P/L[8] to review market practices and identify if rebidding was an issue. This Bardak report identifies that rebidding was a significant issue, supporting the NECA Code Change Panel review, especially highlighting that generators were using constraints in transmission to force increases in prices. Bardak[9] identified that, just had the NECA Code Change Panel, a significant cause of the problem rests with the reduction in regional competition that occurred when interconnectors to adjacent regions were constrained.

What is also of great importance is the Bardak response to three key questions posed by the ACCC, viz (Bardak pages 5 and 6):

> "• *analyse the timing of the rebids and the response from other participants;*
>
> The effect of the timing of the rebids varies, according to the examples studied. Sometimes, capacity is rebid to higher cost bands very close to the despatch period, allowing little time for any competitive response. In any event, generators rebidding to lower prices to counter one rebidding to a higher price is not frequently seen — rebids are generally in the same direction in the instances examined. Generators generally all benefit from instances of high pool prices.
>
> At other times, the initial bidding appears to serve the purpose of alerting other generators that one has seen an opportunity to raise the pool price — for example on the following day. This was seen when Loy Yang changed its approach in the summer of 2001, initially bidding blocks of capacity at high prices the day before, and then rebidding some of that back down to maximise revenue while still achieving the effect desired — usually to keep interconnections running full and to isolate one or two Regions from the remainder of the NEM.
>
> • *comment on whether the timing of the rebids permitted an adequate response from other market participants;*
>
> With the number of rebids being made (NECA have reported an average of 800/day, or one every two minutes), their magnitude (hundreds of MW at times) and their timing (close to despatch on many occasions), **there is little opportunity for a competitive response, even if other generators were inclined to seek to counter the effect that the rebidding generator was**

[8] A copy of the Bardak report is attached

[9] The MEU accepts that the Bardak report relates to the market outcome over a decade ago and before the "good faith" provisions were inserted into the rules, but the issues are still being seen in the market today, which indicates that the "good faith" provision has not resolved the NECA concerns.

seeking. More often than not in the examples studied, the other generators responded by supporting the actions of the lead generator.

For the same reasons, but reinforced by the small capacity reduction available and the dispersed nature of the load, demand side response has little or no chance of countering the effect of generator rebidding.

• *determine whether the price spikes have materially impacted on the average spot price.*

The results arising from the Bardak analysis show that generator bidding and rebidding practices under the existing NEC provisions have had a material effect on the average annual pool price.

Using the year 2000 as an example, eliminating the 20 high priced events identified in this review, reduced the NEM average annual pool price by $912 million dollars or $5.7/MWh, a reduction of 13% (alternatively, the average pool price for that year was 15.3% above the level otherwise applying).

Perhaps more importantly, the incidence of bidding and rebidding to influence the pool price, when conditions are favourable, appears to be on the increase, especially since the summer of 2001, and with a larger number of generators becoming involved as time has progressed and more experience has been gained." (emphasis added)

The ACCC, in its Final Decision, accepted the need for rebidding must be made in good faith but considered that the onus of proof had to rest with the regulator. The ACCC commented in its final decision (page 21) that:

"The Commission also agrees with submissions that reversing the onus of proof would not be consistent with the code objective 'to provide a regime of 'light-handed' regulation of the market'... Whilst supportive of the concept of light-handed regulation, **if the current market framework is failing to produce competitive market outcomes, and evidence is produced to support this view, more heavy handed regulation may be necessary in the absence of structural change.**" (emphasis added)

The ACCC also notes (page 29) that:

"A rule prohibiting economic withholding would change this fact [that all bidding strategies are acceptable if they fall within the rules] and could be the first step in a more interventionist approach to the spot market. The Commission is generally opposed to intervention in markets **but recent**

> **behaviour in the NEM could indicate the need for intervention in the future to preserve the efficient operation of the market**." (emphasis added)

The ACCC clearly states that if the light-handed regulatory approach is effective then there should be no need for generators to bear the onus of proof. However, the ACCC also observes that if the market evidence indicates that this does not work, then some changes to rebidding rules should be applied and implemented. It is also important to note that the ACCC also signals that heavier handed regulation might also be required if the issue of economic capacity withholding were to upset the efficient operation of the market.

The market evidence since the ACCC decision clearly demonstrates that economic withholding is probably more prevalent now than prior to 2002 supporting a view that the effect of the "good faith" provisions when assessed by the regulator have not prevented market price manipulation as intended. However, in recent times there have been a number of attempts to limit the abuse of generator market power through regulatory means but these have been thwarted by the AEMC (see for example the MEU rule change proposal).

The main problem in identifying whether rebids were made in "good faith" lies with the information asymmetry between the market monitor (the AER) and the generators. To impose on the AER the requirement to prove there has been rebidding in "bad faith" is extremely challenging due to this information asymmetry. To overcome this information asymmetry the SA government appears to offer a solution that generators must prove that their rebid was not in "bad faith"[10].

The current rules pose significant challenges to the AER in that the difficulty the AER has in proving "bad faith" is to first identify where a rebid might have not been made in "good faith". To achieve this, the AER must investigate the actions of the generator involved and access sufficient information to support the contention the generator did not comply with the "good faith" provision. This must then be proved in the Federal Court or Competition Tribunal. That there has been no conviction for rebidding in "bad faith" in the 15 years of the NEM operation (notwithstanding several investigations by the AER) implies that either:

- Every generator has always avoided seeking an increase in profitability by never rebidding when there was no significant market change[11], or
- The rule on rebidding is too difficult to apply.

[10] This is the assumption made by the AEMC in its consultation paper although deeper analysis does not support this conclusion

[11] In this regard it is important to recognise that in a 15 year period, there have been 1.6 billion 5 minute dispatch periods for each of the 400+ generation units operating in the NEM and 200+ individual power stations.

The use of Occams Razor as a clarifying tool suggests that the simple answer is more likely to be correct than a more complex one, so the more likely conclusion is that the "good faith" rule on rebidding is too difficult to apply and disprove. The MEU considers that the market evidence shows that the ACCC rule change has not resulted in the expected outcome.

As a result, as the decision of the ACCC has not resulted in the desired outcome, the more interventionist action forewarned by the ACCC must apply.

Specifically the NECA rule change proposal in 2001 was designed

> "…in particular, exploiting transmission constraints and engineering the calling of inappropriately high-priced bids".

The rule implemented to achieve this outcome has not resulted in the desired outcome and therefore must be changed.

2.3 The AEMC process

The MEU notes that the AEMC Consultation Paper has made reference to the earlier NECA proposed rule change on rebidding. The MEU is concerned that the AEMC has not fully represented the case, neither within the NECA proposal nor to the ACCC final decision on that proposal in its Consultation Paper section 2.2.

As the MEU notes in the above section 2.2,

- the NECA proposal specifically highlighted concerns about rebidding when transmission constraints occur, and
- the ACCC final decision recognised that greater intervention might be required if the solution they implement does not work or it there was evidence that non-competitive outcomes continued to occur.

This failure of the AEMC to highlight these significant concerns is disconcerting as it has the potential to lead stakeholders to a view that the work by both NECA and the ACCC were founded on concerns about the market that still apply and that there were important caveats on the decisions made earlier.

The MEU generally supports the AEMC proposed framework to analyse and test the proposal. However, the MEU has considerable concern with four assertions that are detailed in the four steps proposed by the AEMC.

2.3.1 Under the section in the Consultation Paper "define the problem" the AEMC comments

> "The Commission recognises that an inherent level of price volatility exists in the NEM due to the shape of the supply curve and fluctuating demand, and that this volatility is necessary for generators to recover investment costs and to incentivise new investment.

The assertion that volatility is needed to allow generators to recover investment costs and incentivise new investment is not supported by the facts provided to the AEMC by investors in new generation[12].

Firstly, consistency of high prices is what is needed to recover investment costs. Volatility[13], per se, reduces the certainty of what prices might be in the future.

Secondly, as Origin Energy (an investor in new generation) explained to the Reliability Panel at its presentation in February 2010[14], investment decisions are made on the basis that a counterparty will buy the output of the generation being planned. Decisions are not made on the basis that the spot market exhibits volatility or needs to show that volatility. In fact, the higher the volatility of the market price, the greater the risk to generators and retailers which results in greater risk margins they must add to the products they sell.

2.3.2 Under "determining potential solutions" in its Consultation Paper the AEMC comments:

> "…focusing too heavily on short-term rebidding practices might impact on longer run investment incentives in the NEM."

This assertion implies that all rebidding is driven by market efficiency. The MEU accepts that in the majority of cases rebidding reflects market efficiency but in a number of cases (for example those investigated by Bardak for the ACCC in its review on rebidding in 2002 and the examples provided in the MEU's rule change proposal), rebidding is driven by generators seeking to abuse their market power. This highlights the need to assess what rebidding reflects efficiency and what reflects market abuse - this is an essential aspect of what must be undertaken by the AEMC, especially as NECA had highlighted its concerns about exploitation of transmission constraints.

---

[12] For example see Origin Energy presentation to the Reliability Panel in February 2010 http://www.aemc.gov.au/getattachment/6103d235-2c55-4db0-b134-03f7128f4867/Public-Forum-presentation-nbsp;Origin-Energy.aspx

[13] It must be remembered that volatility is driven by both frequency and excessive price movements. Throughout the Consultation Paper the AEMC appears to equate volatility and high price.

[14] See http://www.aemc.gov.au/getattachment/6103d235-2c55-4db0-b134-03f7128f4867/Public-Forum-presentation-nbsp;Origin-Energy.aspx

2.3.3 Under "determining potential solutions" in the Consultation Paper the AEMC comments:

> "Rebidding gives rise to legitimate price signals for investment, such as the benefits of building to alleviate network constraints."

In fact, spot market outcomes are not used to provide a signal for alleviating network constraints. This is an issue that consumers have been raising for many years and the rule makers have only permitted net market benefits to be used to support investment in networks. Whilst high regional prices might imply there is a need for greater interconnection to another region, regulators have consistently concluded that reducing price differentials between regions is not a market benefit as the high priced region reflects there is only a transfer of wealth from consumers to generators with no net market benefit.

The only market signal a high regional price provides is that more generation investment might be required.

2.3.4 Under "determining potential solutions" in the Consultation Paper the AEMC comments:

> "The Commission would be concerned about any solutions that give too much weight to short-term efficiency concerns at the expense of dynamic efficiency by undermining the incentive to innovate and invest over the long-term."

Whilst the principle behind this observation is supported, the MEU considers that there has to be a balance between short term efficiency and dynamic efficiency in that neither should be provided with greater weight than the other. This would require the AEMC to carry out analysis of the causes of the short term inefficiency to assess whether every cause identified would impact dynamic efficiency. In past assessments of rule changes, the AEMC has used a broad brush approach which has not examined specific causes of short term inefficiency, resulting in less than optimal outcomes for consumers.

The MEU is very concerned that the AEMC proposed process has not fully addressed the root issue that the NECA and the SA government proposed rule changes were/are intended to address. By using a process which does not examine the detail of what is actually occurring in the market and causing consumers considerable harm in the short term without providing any long term benefit to consumers (as is required by the National Electricity Objective (NEO)), the AEMC has failed in a fundamental aspect of its obligations. Failure

to undertake the requisite analysis in this review is troubling and does again raise important questions about the AEMC's approach.

2.4 Rebidding in the NEM

On page 15 of the consultation paper the AEMC comments:

> "Spot price volatility is an inherent and necessary feature of a market such as the NEM and prices that occur at times of scarcity must be high enough and occur frequently enough to attract sufficient new investment in supply when needed. Prices that are consistently above variable operating costs and towards the long run marginal cost of new generation capacity indicates to potential new entrants that it is profitable to invest in new capacity. In this manner, bidding promotes efficient price outcomes that reflect conditions of supply and demand and provides a mechanism to signal the need for new investment."

The MEU accepts that prices occurring at times of scarcity must be high to signal the need for new investment. However, the AEMC needs to investigate when high prices occur at times when there is no scarcity as these are more likely to reflect the abuse of market power that NECA was concerned with. For example, the NECA rule change proposal commented (page 2):

> "Many of the very short-term price spikes that have been experienced in the market, however, and aspects of generators' bidding and rebidding strategies, have nonetheless given cause for concern. Those very short-term spikes often do not represent genuine price signals. Nor, by definition, would the effects of inappropriate bidding and rebidding behaviour. **They have no basis in the underlying dynamics of the market**." (emphasis added)

If the AEMC does not carry out thorough investigations of these price spikes that were not caused by scarcity and then fully address them, then it will have failed in its duty under the NEO.

However, in the Consultation Paper (section 5.2.1) the AEMC discusses "price volatility driven by rebidding strategies" and addresses its view on "transient pricing power" as distinct from late strategic bidding. On page 17 the AEMC comments:

> "The Commission considers that transient pricing power is an inherent feature of a workably competitive market such as the NEM and is not synonymous with late strategic rebidding. While both involve a transient ability to increase prices above estimated costs for short periods of time, transient pricing power does not preclude the occurrence of competitive demand and supply side responses.

> Transient pricing power is only a concern if it occurs frequently enough and to a significant magnitude that it leads to wholesale prices that are sustained above the long-run marginal cost of new generation capacity and that barriers to entry exist that prevent or increase the costs of new investment."

The MEU is concerned by the AEMC view that late strategic bidding is not associated with the exercise of transient pricing power. Both are the result of generators having the power in the market to set prices above their short run marginal cost (SRMC), when the market expectation is that generators will bid SRMC as this provides both the expectation and the basis for the most efficient dispatch of different generators and which is the price expectation of the market.

Both the transient pricing power, which the AEMC considers is acceptable providing "it is not used too much", and late strategic bidding, are both abuses of market power and reflect that the generator using this power is operating in a realm of no competition and where it can set the spot price unilaterally. The difference highlighted by the AEMC is that late strategic bidding allows no other stakeholder (supply or demand) adequate time to respond to the market price changes. In both cases, the generator involved in the strategic bidding is doing so in the firm knowledge that, regardless of the price it offers, it must be dispatched.

As discussed earlier in this submission, this leads to a distortion in the market, with generators operating in an opportunistic manner, leading to unjust price hikes which are passed onto the consumer.

The Consultation Paper makes reference to the views of the Alberta Market Surveillance Authority (MSA) and observes the MSA view that (box 5.1)

> "…the transient ability of generators to increase prices above costs, as legitimate individual profit maximising behaviour. Noting that, in a workably competitive market, this is constrained by other generators' responses and "there is no expectation that a market participant can exert significant control over market outcomes"."

Firstly, the MSA observations are at odds with all other overseas regulators (eg in the UK, Ireland, US (FERC, PJM, NYISO, ERCOT) and Ontario Canada) which all consider that the exercise of transient pricing power is of extreme concern and have taken actions to minimise its use.

Secondly, the MSA observation assumes that there is the ability for other stakeholders to respond. Where a generator knows (due to its size in the market) that it must be dispatched regardless of the competition, the implication of the MSA comments is that where there is no competition, action should be taken to prevent the abuse of the market power held.

2.5 Late strategic bidding

In section 5.2.1 the AEMC describes its interpretation of late strategic bidding and the impacts on the market of this activity. The Consultation Paper notes that late strategic bidding leads to inefficient outcomes as:

- Those participants that have the ability to respond have insufficient time to provide a response
- It creates increased (but unnecessary) volatility leading to increased costs for hedging to manage risk
- It reduces the transparency and predictability of the market
- Over the long term, it may lead to less efficient investment.

All of these lead to increased cost outcomes for consumers.

Analysis of when the strategic rebidding is occurring leads to the conclusion that those generators engaging in the practice are utilising the temporal effect of the 5 minute dispatch period and the 30 minute trading interval. This feature is clearly shown in the Visy presentation made at the AEMC rebidding forum on 5 May 2014.

2.6 Options to address the issue

The Consultation Paper implies that the SA government proposal results in a reversal of the onus of proof from AER to the generators. This is not what the proposal is seeking and is a misrepresentation of it.

In fact, the proposal is quite unremarkable: it requires more transparency and requires the generator to provide a better explanation for the reasons behind making a rebid, with specific reference to what changes occurred between making the initial bid and when the rebid is made.

The MEU considers that this is an entirely sensible approach to the issue. In fact, the SA government proposal does little more than require generators to be more explicit in their reasoning behind their decision to make a rebid.

2.7 Summary

What the AEMC Discussion Paper does not address in a climate of increasing costs to consumers for the supply of electricity, is that there is a need to address ever escalating costs for power. This rule change is, in part, driven by a need to reduce the costs of power seen at the consumers' point of supply and

the unconscionable extraction of economic rents by generators abusing their market power.

The AEMC examination of the issue, in general, does support the SA government view that change is needed. This submission identifies that the current rules do cause unnecessary harm to consumers through the ability of some generators to "game" the market through rebidding practices. Specifically, the AEMC analysis implies that the 5/30 difference between dispatch and trading intervals exacerbates the "rebidding in bad faith" issue.

Most telling, is that the SA government proposal does not "reverse the onus of proof" from AER to generators, but requires the generator to provide additional information on what changes have occurred to cause the need for a rebid. The requirement that these market changes must be material is an essential element of any justification for a change.

It is concerning that the AEMC Consultation Paper does not examine the issue in the context that there have been significant and substantial changes in the market structure of the NEM since the ACCC decision was made on rebidding in 2002. Market changes subsequent to that time have seen greater concentration, higher barriers to new entrants, re-aggregation of generation with retail, and increased volatility and risks, all of which have contributed to higher prices for all consumers. In addition, increased market volatility and opportunistic operating practises of generators has had a significant influence on market investment, to the detriment of the NEM

To the MEU's dismay, the AEMC selectively quoted the Alberta example (in the face of overwhelming experience in most other overseas markets) and adduce support for its views that are less then robust.

3. Responses to AEMC questions

The MEU provides the following responses to the specific questions raised in the Consultation Paper. The MEU has endeavoured to keep its answers as concise as possible and refers to the commentary in the preceding sections to amplify its reasoning.

Chapter	#	AEMC question	MEU response
5	1	**Do you consider late strategic rebidding to be the primary issue raised by this rule change request?**	The MEU considers that late strategic bidding is another element of the abuse of generator market power. Abuse of generator market power has been the point of the MEU proposed rule change in 2011, the AER proposed rule change on ramp rates and this SA government proposed rule change on good faith rebidding. The MEU considers that generators have devoted considerable effort to developing ways of increasing their revenues but staying within the rules. The rules are intended to ensure that generators are always exposed to competition yet, due to the market structure and the changes that have occurred since the start of the NEM, competition in the competitive elements of the supply chain has consistently reduced.
5	2	**Do you consider the NEM trading arrangements of five-minute dispatch and 30-minute settlement to be relevant to the issue of late strategic rebidding?** **Do you have any views as to how any issues arising could be addressed?**	Yes. Market evidence demonstrates that generators tend to rebid later in the trading interval and this results in increased prices for that trading interval that other stakeholders are unable to counter through competitive reactions to the price spikes. Analysis undertaken seems to imply that there are often insufficient reasons for the rebid based on the market fundamentals which leads to the conclusion that rebidding is used (at times and with great

			effect) to increase the wholesale price of electricity through the generator causing the increase having market power for that short time. One approach could be to limit the ability to rebid within a trading interval and that prices offered during the preceding trading period become fixed and based on the AEMO forecasts. This would provide greater transparency for participants. However, the MEU notes that the concern lies with the outcome of the abuse of market power and considers that requiring each generator making a rebid should provide better information to AEMO and AER on what market changes had led to the need for a rebid when compared to the basis on which the generator had made earlier bids. Thos would require (as the SA government proposal notes) greater clarity in the rules to what changes are sufficient on which to allow a rebid to be made.
6	**3**	**Do you consider there to be benefits in the proposed rule to reverse the onus of proof onto generators?**	The MEU considers that the proposal does not reverse the onus of proof to generators. What is does do is to require generators to provide better explanations for their rebids and on what bases rebids would be justifiable by comparing the market conditions made for earlier bids with those applying at the time of a rebid. Essentially what the proposal provides is a better information flow and reasons. What the proposal would do is to make generators more careful about exercising their market power.
6	**4(a)**	**Do you consider that all known**	Yes. The MEU is aware that the electricity market is dynamic and

		conditions and circumstances should be taken into account in generator bids and rebids?	changes do occur that warrant rebids. These changes could be one major single event or could be the combination of a number of smaller events. A generator making a rebid would normally look at all changes in the market when making a change to its pricing but when it has market power, there is no constraint as to what price it will offer. Therefore to maximise the efficiency of the market, there needs to be a constraint on a generator making a rebid which is driven primarily on its assessment that it has no competition and that its price must be taken to ensure reliability of supply.
6	**4(b)**	**Do you consider the proposed rule to be practical and sufficiently clear as to when a generator must rebid following a change in material conditions and circumstances?**	Yes. See reasons detailed in earlier sections
6	**4(c)**	**Do you consider that rebids should only be limited to the occurrence of a significant change in conditions and circumstances? If so, how would this be achieved in practice?**	Yes. The proposal requires generators to provide a greater amount of information to support the rebid being made, including what changes have occurred in the market to warrant the rebid. However, it must be recognised that only those rebids which have resulted in an apparent inefficiency or display an apparent abuse of market power will be investigated by the AER. For the AER to carry out its investigations to substantiate the "good faith" of the rebid, the AER must have access to better information from the generator and a clear set of rules which define what constitutes the basis for rebidding in "good faith". Without such clarity, the AER will be

			condemned to be concerned about apparent abuses of market power, without the tools to be able to verify if its concern is well founded and then prosecute the offender.
6	**5**	**Do you consider it reasonable that all bids and rebids should be made with reference to published AEMO data?**	The MEU considers that there are more reasons for a legitimate rebid than what might be available from published AEMO data. However, published AEMO data would be the basis on which market expectations are assessed and therefore published AEMO data is an important source of information needed by the AER to make its assessments.
6	**6(a)**	**What are your views on any of the options discussed above? Do you consider any of these options or any other options around the design of the bidding process to better address the issues raised in the rule change request?**	The MEU considers that each of the options discussed have drawbacks in the delivery of an efficient market - these drawbacks are discussed in the AEMC consultation paper and even in more depth in the ACCC final decision made in 2002. As noted in the sections above, the MEU considers that the rebidding that should be prevented is where the generator is abusing its market power, regardless of the time that it has this market power. The AEMC makes a telling observation on page 22 where the ACCC makes the observation that "the market monitoring process would drive possible reforms in the future". The MEU notes that rebidding has resulted in outcomes that are not efficient and that the process instituted by the ACCC has proven not to result in the outcomes sought by the NECA rule change in 2001. The MEU considers that the NECA outcomes sought have not been resolved by the ACCC rule change when it was considered by NECA that its prime reason

			for the rule change it proposed was to include "…in particular, exploiting transmission constraints and engineering the calling of inappropriately high-priced bids".[15] It is this issue that drove the MEU and AER ramp rate rule changes and therefore there is clear evidence that the ACCC rule change has not overcome the problem identified. The MEU considers that this proposal increases the ability for the AER to investigate and prosecute (if needed) instances where a generator causes the wholesale price to increase because it can rather than for real reasons that warrant a change in a bid. The MEU does not consider that this will resolve all instances where a generator abuses its market power but is a part of a suite of changes that are needed to prevent such abuses continuing.
6	**6(b)**	**Are there any approaches used in electricity markets in jurisdictions overseas that could provide insight into the development of options to address issues raised in the rule change request?**	The abuse of generator market power is addressed by many overseas regulators where there are actions taken to prevent it occurring. As the MEU notes in section 2.4 above regulators in the UK, Ireland, US (FERC, PJM, NYISO, ERCOT) and Ontario Canada all have approaches to limit the abuse of market power. These are commonly based on the regulator (or operator) instituting controls on bidding behavior (an ex ante approach) or ex post assessments examining

[15] NECA report "Generators' bidding and rebidding strategies and their effect on prices" September 2001 Volume 1, page 3

			the detail of a bidding or rebidding practice to identify those practices which resulted from the abuse of market power. The MEU considers that the AEMC should look more closely at what has been implemented overseas rather than just relying on the comments from the MSA in Alberta. For example, ERCOT in the Texas market (also an energy only market[16]) examined the activities of TXU in detail and determined that TXU had (even over a period as short as 3 months[17]) abused its market power and imposed considerable financial penalties as a result. The MEU considers that the AEMC must cast its net much more widely to obtain options for alternatives that might better achieve the outcomes sought in the proposal of the SA government.

[16] The MEU is concerned that the AEMC has consistently limited itself to examining regulatory practices only in energy only markets. The MEU sees that many of the issues faced in the NEM have also been seen in capacity markets. This expansion of examination will result in a much increased breadth of experiences available to the AEMC.

[17] See Public Utility Commission of Texas, "Staff Inquiry into Allegations Made by Texas Commercial Energy regarding ERCOT Market Manipulation," Austin, Texas, January 28, 2004 and the independent market monitor report available at http://www.potomaceconomics.com/uploads/ercot_reports/2005%20ERCOT%20SOM%20REPORT_Final.pdf.

Appendix

Report by Bardak Ventures P/L to ACCC
"A Review of Generators' Bidding and Rebidding Practices in the National Electricity Market" December 2001

BARDAK
ENERGY & MANAGEMENT SERVICES

335 DUKE RD
DOONAN QLD 4562
AUSTRALIA
TEL: +61 7 5449 1244
FAX: +61 7 5449 1550
www.bardak.com.au

Bardak Ventures Pty Ltd

A Report for the
Australian Competition and Consumer Commission

A Review of Generators' Bidding and Rebidding Practices in the National Electricity Market

Rev 1 - December 11th 2001

Bardak Ventures Pty Ltd

A Review of Generators' Bidding and Rebidding Practices in the National Electricity Market

Table of Contents

Bardak Ventures Pty Ltd

A Review of Generators' Bidding and Rebidding Practices in the National Electricity Market

Executive Summary

The Australian Competition and Consumer Commission (ACCC) commissioned Bardak Ventures Pty Ltd (Bardak) to conduct a review of the bidding and rebidding practices of the generator participants in the National Electricity Market since its inception.

The review was to assist the ACCC in evaluating changes to the market rules proposed by the National Electricity Code Administrator (NECA) lodged on 13 September 2001, which were intended to:

- address inefficiencies that have led to the very short term price spikes experienced in the market that have no basis in its underlying dynamics;
- ensure that generator bids and rebids are made in good faith, and
- impose a prohibition on bids and rebids that materially prejudice the efficient, competitive or reliable operation of the market, subject to guidelines to be developed by NECA.

With the agreement of the ACCC, Bardak selected a manageable number of key incidents for examination in the relatively short time available for the Review.

A total of 34 incidents were identified in the NEM Regions where bidding and rebidding appeared to have been a major factor in weeks with abnormally high prices, and where the effect on the average daily and weekly prices was significant in both absolute terms and in relation to the prevailing pool prices around the same dates. A number of tests were used in selecting the set of incidents for detailed examination, including the absolute magnitude of the pool price spike, the relationship to prices at similar times and on similar days around the same period of the year, and the relationship between the price spike and despatch based on Short Run Marginal Costs (SRMC).

Because several of the incidents affected multiple Regions, there were 20 events which requiring detailed analysis.

The conclusions arising from the review of these events may conveniently be summarised in the form of brief answers to the questions posed by the ACCC in the Terms of Reference for the assignment.

- *isolate the trading intervals during which the spot price has been forced to extreme levels;*

Bardak has selected 34 events in the NEM Regions, involving 20 incidents in multiple Regions, where the average weekly price was significantly raised by bidding and rebidding activities and other factors.

- *analyse and report on NEMMCo's demand forecasts for the relevant trading periods;*

  NEMMCo's demand forecasts have only a secondary effect on the generation of price spikes. It is true that the accuracy of the NEMMCo forecasts has been improving and lies in the range which one might expect — given the considerable uncertainties and difficulties involved in making such forecasts on a centralised basis. When a forecast error contributes to a price spike, the major influence is the bidding and rebidding behavior of the generators in constructing a steeply rising price curve for generation to be loaded above the expected demand level. Thus NEMMCo load forecasts are just one of the initiating events which may call upon the high priced bids being selected.

  One wonders why such forecasts are made centrally however. It would surely be better for the retailers/customers to take responsibility for estimating the demand required by their customers and to take responsibility for deviations in their estimates. This would provide much better incentives for the retailers to know their customer loads and to search for demand-side responses, and is one of the desirable features of the UK NETA system.

- *review rebidding data to identify the generators submitting a significant number of rebids, analyse the timing of these rebids, and report on the reasons for the rebids;*

  In each of the 20 incidents selected, Bardak has examined the pattern of bidding behaviour before and during the event and identified the generators adopting bidding and rebidding practices which had a significant effect on the pool price during the period of the incident.

  Physical withholding of capacity still takes place in South Australia, Queensland and New South Wales, but economic withholding of capacity (by bidding part capacity at very high prices) has become the most common form of capacity withholding to create artificial price spikes unrelated to market dynamics or underlying cost structures.

  Generators most active in adopting such bidding and rebidding practices have been Loy Yang Power, Hazelwood Power, and Yallourn Energy in Victoria, Macquarie Generation and Eraring Energy in New South Wales, each of the Queensland generators, NRG-Flinders, Optima Energy and Synergen in South Australia, and Snowy.

  The most aggressive generators in rebidding have been Loy Yang Power, Macquarie Generation and more recently, Eraring Energy. Most generators operating in the NEM have adopted the practice of bidding part of their capacity at very high prices — often above $4,000/MWh, just in case an event occurs which would call upon such high priced blocks of power.

This practice is known overseas as "economic withholding" of capacity and is generally not allowed.

NECA's attempt to get the generators to provide more detailed descriptions of the reasons for the rebids has met with some success, but the overall detail provided remains of concern and could be improved. The most common reasons given still use general terms such as "system conditions", "market conditions", "plant conditions" or "water management" and the like.

- *determine any patterns of behaviour that are evident;*

  The patterns of behaviour observed from the review have been described above.

- *analyse and explain whether the rebids and subsequent prices can be explained solely by reference to external factors;*

  In some of the incidents examined, there is an initiating event present, such as a loss of a generator, interconnection limitations or exceptionally high load forecasts. While these factors certainly have an influence, they cannot explain the major portion of the price spikes occurring during the incidents. The major contributing factor is the bidding and rebidding practices of the generators.

- *analyse the timing of the rebids and the response from other participants;*

  The effect of the timing of the rebids varies, according to the examples studied. Sometimes, capacity is rebid to higher cost bands very close to the despatch period, allowing little time for any competitive response. In any event, generators rebidding to lower prices to counter one rebidding to a higher price is not frequently seen — rebids are generally in the same direction in the instances examined. Generators generally all benefit from instances of high pool prices.

  At other times, the initial bidding appears to serve the purpose of alerting other generators that one has seen an opportunity to raise the pool price — for example on the following day. This was seen when Loy Yang changed its approach in the summer of 2001, initially bidding blocks of capacity at high prices the day before, and then rebidding some of that back down to maximise revenue while still achieving the effect desired — usually to keep interconnections running full and to isolate one or two Regions from the remainder of the NEM.

- *comment on whether the timing of the rebids permitted an adequate response from other market participants;*

  With the number of rebids being made (NECA have reported an average of 800/day, or one every two minutes), their magnitude (hundreds of MW at times) and their timing (close to despatch on many occasions), there is little opportunity for a competitive response, even if other generators were inclined to seek to counter the effect that the rebidding generator was seeking. More often than not in the examples studied, the other generators responded by supporting the actions of the lead generator.

For the same reasons, but reinforced by the small capacity reduction available and the dispersed nature of the load, demand side response has little or no chance of countering the effect of generator rebidding.

- *determine whether the price spikes have materially impacted on the average spot price*.

  The results arising from the Bardak analysis show that generator bidding and rebidding practices under the existing NEC provisions have had a material effect on the average annual pool price.

  Using the year 2000 as an example, eliminating the 20 high priced events identified in this review, reduced the NEM average annual pool price by $912 million dollars or $5.7/MWh, a reduction of 13% (alternatively, the average pool price for that year was 15.3% above the level otherwise applying).

  Perhaps more importantly, the incidence of bidding and rebidding to influence the pool price, when conditions are favourable, appears to be on the increase, especially since the summer of 2001, and with a larger number of generators becoming involved as time has progressed and more experience has been gained.

Given the propensity for this type of market design to produce rapid increases in pool prices, as shown by the experiences the UK in 1994, and more recently in California and New Zealand, placing limitations on the freedom of generators to bid and rebid and achieve prices well above LRMC levels over a year, would seem to be both prudent and necessary.

Bardak has provided a useful example of the provisions being included in one of the latest competitive markets — that in the Philippines. Lessons have been absorbed from other markets and incorporated in a new set of laws and regulations. Some of the provisions might usefully be implemented in Australia's NEM.

Bardak has been pleased to be able to provide this Review for the ACCC on a tight timeline and would be pleased to assist further as may be desired.

>>>><<<<

Bardak Ventures Pty Ltd

A Review of Generators' Bidding and Rebidding Practices in the National Electricity Market

1. Introduction

The Australian Competition and Consumer Commission (ACCC) commissioned Bardak Ventures Pty Ltd (Bardak) to conduct a review of the bidding and rebidding practices of the generator participants in the National Electricity Market since its inception.

The review was to assist the ACCC in evaluating changes to the market rules proposed by the National Electricity Code Administrator (NECA) lodged on 13 September 2001, which were intended to:

- address inefficiencies that have led to the very short term price spikes experienced in the market that have no basis in its underlying dynamics;
- ensure that generator bids and rebids are made in good faith, and
- impose a prohibition on bids and rebids that materially prejudice the efficient, competitive or reliable operation of the market, subject to guidelines to be developed by NECA.

The Review was to:

- isolate the trading intervals during which the spot price has been forced to extreme levels;
- analyse and report on NEMMCo's demand forecasts for the relevant trading periods;
- review rebidding data to identify the generators submitting a significant number of rebids, analyse the timing of these rebids, and report on the reasons for the rebids;
- determine any patterns of behaviour that are evident;
- analyse and explain whether the rebids and subsequent prices can be explained solely by reference to external factors;
- analyse the timing of the rebids and the response from other participants;
- comment on whether the timing of the rebids permitted an adequate response from other market participants;
- determine whether the price spikes have materially impacted on the average spot price.

The report was required to be completed by November 30th.

ACCC arranged for access to non-public bidding data and reasons for rebidding held by the NECA. In the event, the production of data was delayed and initial information was not received by Bardak until November 23rd, and then in a difficult format to read and process. These files are voluminous — over 960 MByte of data was provided by NECA. Apart from the delay in extracting the information, NECA staff were very helpful in resolving the problems of accessing the data and in the provision of information.

This Report has been produced in response to the Terms of Reference and in the time specified.

2. Methodology Followed

It was clearly impossible to analyse every price spike which has occurred in any half hourly period in the almost three years since the NEM commenced operation. With the agreement of the ACCC, Bardak selected a manageable number of key incidents for examination in the time available.

Bardak first downloaded the various data files not already in its possession from NEMMCo and other sources, in order to document the weekly pool prices for the various Regions of the National Electricity Market (NEM), since its inception in December 1998.

A total of 34 incidents were identified in the NEM Regions where bidding and rebidding appeared to have been a major factor in weeks with abnormally high prices, and where the effect on the average daily and weekly prices was significant in both absolute terms and in relation to the prevailing pool prices around the same dates. A number of tests were used in selecting the set of incidents for detailed examination, including the absolute magnitude of the pool price spike, the relationship to prices at similar times and on similar days around the same period of the year, and the relationship between the price spike and despatch based on Short Run Marginal Costs (SRMC).

Because several of the incidents affected multiple Regions, there were 20 events which required detailed analysis. The list of events, with dates and average weekly prices, and the Regions involved, are shown in the Table below.

Incident Number	Year	Week Number	Wk/Ending	Av. Wk Pr $/MWh	Regions involved			
					Qld	NSW	Vic	SA
1	1999	3	17-Jan-99	312.3	1			
2	1999	6	7-Feb-99	108.9			1	1
3	1999	10	7-Mar-99	204.6	1			
4	1999	11	14-Mar-99	120.4	1			
5	1999	16	18-Apr-99	129.4				1
6	1999	32	7-Aug-99	37.7		1		
7	1999	49	4-Dec-99	267.0				1

8	2000	4	22-Jan-00	324.8	1			
9	2000	6	5-Feb-00	282.9		1		1
10	2000	10	4-Mar-00	151.0				1
11	2000	13	25-Mar-00	85.2	1			
12	2000	14	1-Apr-00	99.5	1			
13	2000	23	3-Jun-00	142.6	1	1	1	1
14	2000	36	2-Sep-00	98.2		1	1	1
15	2000	45	4-Nov-00	181.7			1	1
16	2001	3	20-Jan-01	66.0	1	1		
17	2001	4	27-Jan-01	206.9		1	1	1
18	2001	6	10-Feb-01	306.9			1	1
19	2001	8	24-Feb-01	96.0			1	1
20	2001	35	1-Sep-01	49.5		1	1	
Totals					**8**	**7**	**8**	**11**

A reasonable spread of Regional incidents resulted from this set of incidents.

Data pertaining to each of these incidents was collected — directly from the internet to give the actual half-hourly prices, interconnector flows and actual output of each generator in each Region — and from NECA weekly reports or special investigations where these have been published.

NECA weekly reports were only published from October 2000 onward, and thus provide analysis and data for only the past 12 months of NEM operation.

3. Present Code Provisions

The National Electricity Code provisions as they presently apply, provide great freedom for generators to bid their capacity into the market and to rebid that capacity and its price right up to the moment of despatch — much greater freedom than is normally provided in any other competitive electricity market known to Bardak.

NECA described the situation in their primary submission to the ACCC on rebidding as:

> "The market rules currently allow generators effectively unfettered discretion to rebid their available capacity, and the price at which they offer that capacity to the market, right up to despatch."

Bids are made on the basis of individual generating units (with a few notable exceptions), utilising ten blocks of capacity at a fixed price for each unit, and with the magnitude of the block able to be varied by rebidding. No specific allowance is made for startup costs or any other supportive generation costs. Bids and rebids can be made to meet the five minute despatch cycle used by NEMMCo.

There are no limits on the magnitude of prices which can be bid, until the so-called "Value of Lost Load" or VoLL, currently set at $5,000/MWh is reached. VoLL is set to rise to $10,000/MWh in April of 2002. This is the supposed value which customers place on the first increment of demand which is not supplied.

Note that VoLL should only be reached when there is a physical inability to supply the load — a fact often forgotten.

In the NEM, there is no payment made for the provision of capacity, nor are payments made for the specific costs associated with startup and other non-energy related costs. This is unusual in such markets.

In particular,

- there is no obligation on generators to offer capacity to the market when the units are fit to run;
- there is no obligation to start specific units at the request of NEMMCo;
- there are no limits placed on the relationship of the prices applying to the various blocks of capacity (except that they must increase as progressive capacity increases);
- there is no obligation that the prices applying to each block be related to actual marginal costs, even though the origin of the 10 blocks was supposed to allow a close modeling of the actual variation of incremental costs with increasing levels of generation;
- there are no limits on the number and magnitude of rebids which can be made;
- there are no limits on the time before the operating half-hour that rebidding must cease.

Overseas competitive markets typically impose limits on more than one of these factors in order to prevent abuse of the market rules.

It is claimed by supporters of the NEM trading system that this degree of freedom is necessary to allow generators to adjust their positions rapidly to accommodate unexpected changes in demand patterns and in plant availability. Unfortunately, the same freedoms as are required to accommodate these relatively infrequent events (at least those of significant magnitude to be of concern), confer upon the generators great freedom to exercise market power to raise prices when conditions are favourable to this outcome.

Indeed, the Regulator in the UK has commented upon the fact that the multiple price bands, intended by engineers to allow close modeling of the actual incremental cost curve of a generator, have in fact been used to develop sophisticated trading strategies designed to raise pool prices above levels which would otherwise apply.

The NEC provides for the demand side participants to also bid in like manner to generators, and to bid to reduce their demand in periods when the pool price is expected to be high. Experience has shown that this is a vastly unequal contest, however.

This is due to several obvious factors:

- the magnitude of the demand side response is quite small in relation to system peak load levels. NEMMCo stated that they could identify about 135MW of price sensitive demand-side response during peak periods in Victoria last summer, which is less than 2% of the peak summer demand;

- any demand side response of significance is widely dissipated among many customers, and retailers have difficulty in accumulating sufficient response and in sufficient time to make a difference in the pool price;

- any success by retailers in collecting and implementing a demand-side response is easily countered by the generators, who can and do rebid hundreds of MW of capacity at short notice.

- The demand side cannot match either the magnitude or the speed with which the generators can change the plant/load balance.

While demand-side response is always helpful and should be developed and encouraged, it is never likely to provide an effective counter to the ability of the generators to adjust their bidding behaviour to raise prices when they possess market power. Overseas experience shows that control of generator market power must be curbed by using more direct methods.

The only effective restraint on generator bidding and rebidding behaviour in the NEM comes from the competition provided by other generators bidding to be loaded during the same half-hourly period. Customers are ineffective in influencing the pool price. With a relatively small number of generators operating in the NEM and the relatively limited interconnection capacity between the Regions, there are times when the number of active competitors in a Region falls well below that which can provide effective restraint, opening up opportunities for local generators to exploit the market power which they have under such circumstances.

Thus it can be said that the design of the NEM contains several features which, while intended to achieve other purposes in the main, greatly facilitate the exercise of market power by the generators if they wish to make use of it.

4. Expectations Under Perfectly Competitive Market Behaviour

There is a considerable body of economic theory which explains the economic effect of the operation of electricity trading systems.

In the 1960s and 70s, economists in England[1] and France[2] examined the theoretical relationship between short run (SRMC, essentially fuel costs and losses) and long run marginal costs (LRMC, all costs including an adequate return on investment). Arising from their work, it emerged that for the particular case of a perfectly balanced electricity system (not too much nor too little reserve plant), with an optimum mix of plant (such that the lowest cost of electricity could be obtained over a year), and if:-

[1] particularly Ralph Turvey.

[2] particularly Marcel Boiteaux, later to become Chairman of EdF.

- electricity was sold at every hour of the year at the short run marginal cost, plus

- electricity sold at peak times was charged, in addition to the short run marginal cost, a marginal capacity cost corresponding to the cost of providing peaking capacity on the system,

then and only then, the revenue obtained would exactly cover both fixed and variable costs and be equal to the LRMC.

In more recent times, this has been described by Rudnick in South America that, under economically optimum conditions:-

> "Income obtained from selling all energy at the short term marginal cost, plus income obtained from selling capacity at the development cost of peaking units, is equal to the cost of capital plus total generation operation costs"[3] .

Rudnick was explaining at the time that this principle is applied in all competitive markets in South America.

This is the ideal situation which competitive electricity markets of the type used in Australia seek to achieve. The price of electricity would then be sufficient to provide developers of new, efficiently constructed and operated power plants with a full return on their investment, thus maintaining adequate incentives to invest, but would also provide reasonable electricity tariffs to customers and a degree of stability in electricity prices — although fluctuations in prices would still be present.

In the 1970s this theory led to the introduction of electricity tariffs based on marginal costs wherever practical, augmented by an additional charge to cope with the fact that the ideal situation can never be achieved in a practical system[4] . This theory also found application in some of the Australian States, especially NSW[5] .

From the above discussion, it can be seen that certain prerequisites must be achieved for the ideal outcome to be reached. These are:-

- the system must not have over or under capacity, which implies that capacity can be added/subtracted in small increments and with no time delay;

- the system must have the correct balance between high capital cost/low fuel cost and low capital cost/high fuel cost plants, such that their operation over the year results in the lowest possible electricity cost;

- electricity must be charged at marginal cost in all hours of the year;

---

[3] Taken from Rudnik, paper presented in the USA in 1999.

[4] A very good description of this process was contained in the UK White Paper on Nationalised Industries entitled "A Review of Economic and Financial Objectives" HMSO Cmnd 3426, November 1967.

[5] For example, the NSW Bulk Supply Tariff which applied from 1989 was directly based on these principles. Note that the "additional charge" was typically 25% of the total charge to make up for the deviations from the optimal situation.

- a surcharge must be added to peak usage to match the marginal capacity cost.

With the exception of the last point (which is curiously absent in the Australian market design), the proponents of the mandatory pool seek to achieve the objective of pricing at marginal fuel cost for each hour by building in incentives for generators to bid at their marginal cost.

In Bardak's view, this an exceptionally roundabout way of achieving the desired result.

It is rather obvious that such theoretical conditions cannot apply in practice, especially in Australia, where:-

- the number of power stations is limited (less than 6-7 in the larger States and 3-4 in the smaller States);

- a strongly meshed transmission system does not exist, but rather a series of regional grids are connected by relatively weak transmission links[6] ;

- ownership of the power plants in two major States is controlled by the State Governments, and independent action by generators cannot be expected as a matter of course;

- unit sizes are generally large as a proportion of the total system capacity compared to overseas systems;

- lead times for the construction of new plants can be very long (three to six years or more);

- the plant mix may vary quite considerably from the optimum due to all of the above[7], and these conditions can exist for long periods of time.

These imperfections were recognised in the past by the need to have a supplementary charge in centrally established tariffs to make up for the imperfections, which at times could be quite large[8] .

The original English trading system developed in 1989 sought to approach the theoretically ideal outcome by encouraging bidding between generators to be loaded (and thus gain revenue), assuming that this would result in them bidding at their marginal fuel cost, plus adding an additional component related to the probability of the system failing to meet the load at any half hour (the LOLP[9] component of the marginal price). This LOLP component was a proxy for the addition of the marginal capacity cost of peaking plant required in the theoretical formulation, but would equal it only by chance in the English formulation, and was itself capable of being manipulated. The concept was good but the implementation was poor.

---

6 except in the case of South Australia, where the link provides about 33% of installed capacity.

7 For example, there is a clear excess of base load plant in both Victoria and NSW due to past policies of building large coal-fired power plants.

8 For example, the "Supply Charge" in the NSW BST amounted to as much as 25% of the revenue raised.

9 LOLP = Loss of Load Probability.

In practice, this system resulted in "half a market", a phrase used by the English Regulator on many occasions, where generators compete amongst themselves and against the rules, with the retailers/customers unable to directly influence the pool price, since they have little opportunity to vary their demand in the short term. Customers and retailers are effectively "price-takers" under the NEM trading system — unable to influence the pool price directly and forced to seek protection against its excesses by seeking out hedge contracts.

Unfortunately for retailers, the only real source of such hedging contracts is the generators themselves, who may not be particularly interested in offering reasonable contract terms when the customers/retailers really need them.

Recent analyses conducted overseas, especially in California[10] , and also in Australia[11] , have replicated the pool price behaviour in pools of similar design to that of the NEM, assuming that participants were operating under perfectly competitive conditions and were restrained by competitive pressure to bid at their actual marginal costs. These analyses provide a means of measuring the deviation from the results which might be expected were perfect competition to exist and provide a measure of the "excess" returns earned by generators as a result of imperfect competitive conditions. All such studies have concluded that the systems result in prices considerably above those which would be expected under perfectly competitive conditions.

In this assignment, Bardak adjusted the past NEM pool prices by assuming that all generators bid at their SRMC's, as one measure of the performance of the NEM and the effect of generator bidding and rebidding behaviour. A second measure used was to calculate the LRMC for each of the Australian States. The difference between the two indicates the deviation in the NEM from optimum conditions, including the effects of bidding and rebidding by generators.

Ideally, pool prices should fluctuate around the LRMC — being higher in periods when the supply demand balance is tight and lower when period of overcapacity exist.

However, the importance of maintaining fair and reasonably stable electricity prices for the Australian economy is such that large fluctuations — in either direction — are not desirable and will not be politically acceptable nor acceptable to the Australian public.

5. Factors Affecting Generator Bidding and Rebidding Behaviour

Before discussing the results of Bardak's review of the generator bidding and rebidding behaviour, it is useful to analyse the incentives which are placed before a generator in a NEM-style trading system, and how they tend to respond to these incentives.

Note that Bardak does not imply here that the generators act in any way illegally, but always remain within the authorised rules of the NEC.

Given the absence of any specific payment for capacity in the NEM trading system, generators must bid at levels above SRMC to be able to gain contributions towards covering their fixed costs. The issue is — given that they have this freedom under the

[10] By the University of California, Berkeley in particular.

[11] By ABARE and by Bardak.

rules — what prevents them from continuing to raise pool prices well above the levels needed to cover their fixed costs?

The need to bid higher than SRMC is apparent when one considers the position of a peaking generator. As an example, SRMC for an open cycle gas turbine operating on gas in the NEM would typically be of the order of $40/MWh. At a typical capital cost of $500/kW, a 9% real rate of return before tax, and annual operating and maintenance costs of $10/kW/year, its annual fixed expenses would be $55/kW/year or $6/MW/hour.

If the gas turbine was expecting to operate for only 1% of the time (87.6 hours) and obtained no other revenue from other services, it would have to receive $667/MWh generated on average over the year in order to produce sufficient revenue to cover its total costs.

A base load plant is in a very different situation. SRMC costs for a black coal fired power station in the NEM, typically would be of the order of $12/MWh. At a capital cost of $900/kW, a 9% real rate of return before tax and annual operating and maintenance costs of $25/kW/year, its annual fixed expenses would be $106/kW/year or $12/MW/hour.

If this plant expected to operate for 90% of the time (7884 hours) and obtained no other revenue from other services, it would have to receive just $25/MWh on average in order to produce sufficient revenue to cover its total costs.

The essential difficulty is that the same freedom which allows the generators to bid above their SRMC's in order to cover their fixed costs can also be used to "game" the trading system and generate very high prices in favourable circumstances.

In the NEM, bids have no limits until they reach the $5,000/MWh price cap, and thus a legitimate freedom is capable of abuse when the generator in question possesses market power and decides to use it.

The above example shows that if the base load generator can force the peaking generator to be the marginal plant and thus to set the pool price in a given period, he/she stands to gain greatly. For example, if the base load generator rebids (say) 25% of its capacity at prices above $4,000/MWh — effectively removing it from the price setting process — and as a result, makes the peaking generator the marginal plant, then its revenue will be $667/MWh applied to 75% of its output compared to (say) $40/MWh applied to 100% of its output. The revenue for the half hour will be 12.5 times normal.

This is a practice observed many times in Bardak's examination of the operation of the NEM.

The generators play the game of maximising their revenue in terms of the product of output and price, while remaining within the rules of the NEC. A reduction of output by withholding capacity can be extremely profitable if the pool price can be manipulated up by a factor greater than the ratio of the full capacity to the reduced capacity. In the case of withholding one unit out of four, any pool price increase above 4/3 times what

would otherwise apply will be profitable.

Of course a generator would prefer that it is not the only generator cutting back capacity and losing production to gain a higher pool price — otherwise its competitors continue to produce at full output but gain the benefit of the higher price in any event.

This situation is easier to produce if competition from the other NEM Regions is eliminated — such as when interconnections can be forced to be constrained as a result of withholding of capacity. Repeated experience operating in the NEM will readily disclose the normal bidding patterns of the other generators, indicating those who can be relied upon to be bidding at suitably high levels to make capacity withholding profitable.

The favourable circumstances to raise pool prices are also easy to produce for those generators holding a portfolio of plants, since one can be bid at the high level, making it easier to force it to be the marginal plant in favourable circumstances. Alternatively, any rebid partial capacity may be positioned to become the marginal plant in favourable circumstances.

Finally, the ability given to generators in the NEC to bid using up to ten bands of capacity and price — a feature originally designed to allow a generator to sculpt its bids to match the variation in SRMC with level of output — greatly facilitates the playing of the game described above.

Withholding of capacity can be achieved in two ways:

- physical withholding — by shutting down serviceable plants and not starting them up. This can be done in both the short term (i.e. within a day) and in the longer term (seasonally or longer);

- economic withholding — where the plant is operated and capacity is offered to the market, but all or part of that capacity is bid or rebid into price bands so high that the capacity is effectively withdrawn from the market in all reasonable circumstances.

The circumstances are also easier to produce if several generators participate in the game of filling up the interconnections to limit/eliminate interstate competition and force a high bid price plant to set the pool price. This does not need to involve active collusion or any discussion between them, since the circumstances favourable to the creation of a high priced event are readily detected in advance from the predespatch for the day, and the generators can act independently — but all in the similar direction.

However, it is possible for one generator to signal to others that the game is about to be played — for example, by bidding a significant block of capacity at a very high price for several trading periods in the bids lodged on the previous day, forcing the loading of the interconnections to be increased towards their constrained levels, and forcing plants making higher bids to be setting the pool price in the predespatch. The other generators will soon see what is being attempted and, if so motivated, may elect to join in and help the initiating generator.

But no generator wants to see "free riding" taking place i.e. where it withholds capacity to cause a price spike, but sees the other generators maintaining output and also receiving the high price. Thus one should not be surprised to see that the rebidding process allowed under the NEC is frequently used to make minor adjustments to the capacity being withheld, in order to achieve the desired effect, but to maintain output at as high a level as can be achieved. Some of this rebidding will move smaller amounts of capacity back down to a lower price, not to assist the system for altruistic reasons[12], but rather to optimise the capacity / price combination for that generator. Rebidding for this reason is sometimes erroneously described as a generator seeking to reduce the pool price. This is rarely the case.

Also, there is little reason to play the game described above if the generator in question has not first organised its portfolio of hedging contracts to allow it to retain the major portion of the increased revenue without having to give it up to a retailer under a hedging arrangement. Thus when generators believe that they can achieve higher prices by the mechanism described, they will be inclined to cut back on the capacity offered to retailers in the hedging market, or offer hedges at much increased prices.

This has been the experience in the NEM in the last two years, where retailer have complained that they are having difficulty in obtaining hedge cover from some generators, let alone at reasonable prices.

Of course, high pool prices can hurt generators as well. If they suffer a unit outage and their available capacity falls below their contracted level, then they must purchase from the spot market to cover the shortfall. There are examples in the history of the NEM where generators have lost millions of dollars in a day due to this set of circumstances.

Unfortunately, a typical action taken by the generators to protect themselves against this eventuality is to withhold the capacity of at least one of their units from the hedge contract market to effectively act as a "spare" unit — available to allow them to meet contractual commitments while covering the loss of one of their other units. This has the inevitable effect of limiting the availability of hedge contracts and reducing liquidity in the hedging market. It also takes away from the despatch process units which have a low incremental cost and should be able to operate at high load factors. Thus the average fuel cost of the system must increase above desirable and least cost levels.

By way of a simplified example, if each generator in a Region had four units at its disposal, and withdrew the capacity of one of them, only 75% of capacity would be available to the hedge market. Since total capacity would normally be 15% or so greater than the peak load, this means that only 0.75 x 115% of the peak load, or 86% of the peak load could be hedged.

Examination of the history of the NEM shows all of these practices to have been employed at various times, with an increasing number of them experienced since mid-2000.

It must also be remembered that bidding into the NEM systems is a continuous learning experience. As each day passes more information is gathered on system

[12] As NECA often assumes in its commentaries.

conditions, likely demand levels and in particular, the normal bidding patterns of other generators — especially those operating in the same Region. With a small number of generators in each Region, it is relatively easy to deduce the bidding strategies of the other players and to plan your own strategy accordingly.

6. Lessons Learnt from Overseas Experience

The practices described in the previous section of this report have all been encountered in overseas competitive markets and have generally been prevented from occurring by a variety of means. Some examples follow.

- within twelve months from the start of operation of the UK pool in 1990, one of the major generators was found to be deliberately withholding capacity to create artificial shortages and price spikes. The pool rules were changed to require all capacity fit for operation to be offered to the pool;

- a similar provision has now been imposed in California, where capacity withholding became rampant during the extreme price periods in the 2000/2001 years;

- it is normal overseas to require generators to coordinate their maintenance outages to maximise available capacity. This prevents the taking of a maintenance outage at times when the price would be driven higher than normal;

- in South America, capacity payments — equal to the fixed costs of an open cycle gas turbine spread over each hour of the year — are paid to all generators presenting themselves for loading to the system operator. This means that the peaking plants only have to bid at their SRMC's to gain enough revenue to cover all of their costs for the year, and removes the imperative that they have to bid at extremely high prices;

- most overseas systems impose limitations on bidding of one form or another. The PJM system — widely acknowledged to be the best competitive market in North America — constrained generators to bid only audited SRMC's for a long period of time, until sufficient competition was in existence for the rigid limitations to be relaxed. PJM now has over 250 participants, and competitive conditions usually exist;

- general "safety net" caps apply in most areas of the USA, with the figure of $US1,000/MWh typical ($A2,000/MWh);

- in California, FERC recently imposed a "market- based" price cap, where price mitigation applies for all sellers (excluding out-of-state generators) bidding into the market during a reserve deficiency period (defined as a period with a reserve margin of 7.5 percent or less). FERC established a rolling formula based on the product of a suitable spot gas price times the heat rate of the least efficient plant generally operating at peak times (an inefficient open cycle gas turbine). The ISO uses this price to establish the maximum real-time market clearing price when mitigation applies.

This mechanism is attractive as it takes the advocates of a competitive market at their word, in that if effective competition exists, the pool price would never need to rise above the marginal cost of the least efficient plant operating on the highest fuel cost, as set by the formula. The exception is when load is physically not being supplied, when VoLL may be appropriate. The mechanism thus catches and modifies (mitigates) the prices that exceed those which a competitive market would produce;

- in the UK, it is often forgotten that the pool price tended to run away late in the year 1994, and resulted in the Regulator reaching agreement with the generators to "modify their bidding behaviour so as to achieve an annual average pool price of £24.60/MWh" for that year. Not surprisingly, this was almost exactly the result achieved for the year in question and stubbornly remained the result (adjusted by the Retail Price Index) for subsequent years — until the trading system was radically reformed. The price cap level proved to be about 25% higher than the LRMC of an efficient new entrant;

- other new competitive markets (Ontario, Singapore, Korea) are applying maximum annual average prices to be achieved by generators (with rebates to customers if they are exceeded) rather than applying restrictions on the bidding behaviour itself;

- In the UK, generators cannot simply shut down plant and withhold it from the system, unless they can prove to the Regulator that the revenues likely to be gained by offering the plant were so poor that the mothballing was clearly justified. At least one generator has been forced to reopen a mothballed plant after being accused of withdrawing it to force up average pool prices;

- Also in the UK, the Regulator gave serious consideration to compelling the generators make just one bid for the whole of the capacity of a plant — to eliminate the easy means to bid some capacity at a reasonable price and the remainder at an unreasonable price. In the event, the Regulator decided to abolish the pool and replace it with the New Electricity Trading Arrangements (NETA) which accomplish the limitation of generator bidding problems in a better and more fundamental manner;

- most other competitive markets have strong and detailed market monitoring and market power mitigation arrangements, generally designed to identify and correct situations where generator bidding patterns and levels deviate from those which the same generator uses when there is effective competition with others. Changes in bidding behaviour when competition is lowered are themselves considered to be a reason for investigation and possible corrective action;

- in each of the UK, Californian and Australian mandatory pool systems, pool prices initially fell, and price increases were not seen for 3-4 years. It is as if the generators take time to learn how to develop strategies to raise prices and to resist the temptation to chase market share — an understandable initial trading strategy. In the case of UK and California, the price rises which eventually

occurred were unacceptable and led to the imposition of price controls. Bardak notes in passing that Australia is about to begin its fourth year of NEM operation.

By way of a specific example of a consistent set of measures used overseas, in June 2001 FERC agreed a set of measures to apply in the Californian market to avoid the extreme prices seen in late 2000/early 2001. They included:-

- Enhancing the Independent System Operator's ability to coordinate and control planned outages in the real-time market during all hours;

- Requiring sellers to offer all their available power in real time during all hours to the Cal ISO;

- Requiring public utility load serving entities to submit demand bid (identifying the price at which load will be curtailed) in the real-time market;

- Establishing conditions to prevent anticompetitive bidding behavior in the real-time market;

- Establishing a requirement that minimum reserve plant margins be maintained in the State (of the order of 20% above the expected peak load);

- Requiring the ISO to submit weekly reports on schedule, outage, and bid data for all hours so that Commission staff can monitor generating unit outages and real-time prices;

- Establishing a mechanism for price mitigation for all sellers (excluding out-of-state generators) bidding into the ISO's real-time market during a reserve deficiency (defined as reserve margin of 7.5 percent or less). FERC established a formula (based on the maximum marginal cost of gas fired generation) that the ISO can use to establish the real-time market clearing price when mitigation applies.

As this Report was being finalised, FERC announced further measures to curb abuses of market power, mandating cost-based rates where utilities are seen to possess a high level of market power.

Bardak recently attended an APEC Seminar/Workshop on “Lessons learnt from Electricity Industry Restructuring in APEC Economies”, held in the Philippines. Apart from providing an update on the lessons learnt in several countries, Bardak became aware of the detail of the provisions which have been included in the Philippines Act of Congress and the Implementing Rules and Regulations relating to their new competitive market. The Philippines, advised by the Asian Development Bank and the World Bank, have had the chance to incorporate into their system many of the provisions which have been found necessary in other countries.

An extract of the most significant provisions of the Philippines system is provided in the Attachment to this Report, with the suggestion that certain of the provisions could well be incorporated into the NEC or in State legislation and regulations. Bardak draws

particular attention to:

- the provisions preventing excessive concentration of ownership and control in a Region;

- limitations on cross ownership and dealing with subsidiaries;

- trading based primarily on bilateral contracts with the option of using a Government-organised spot market. To promote liquidity, retailers must purchase at least 10% of their requirements from the spot market for the first five years — not an unreasonable requirement;

- both general requirements on participants not to engage in anti-competitive behaviour, and specific prohibitions on particular actions. For example, the provision relating to capacity withholding reads:

  "Physical or Economic Withholding: An Industry Participant shall not use physical operating practices or bidding strategies that limit the market participation of a generation unit under conditions that will result in significant increases in market prices."

  Bardak suggests that this is one provision which could usefully be applied in the NEM.

- Formation of a single Regulator with strong powers to control the exercise of market power and to take actions, including "the imposition of price controls, issuance of injunctions, requirement of divestment or disgorgement of excess profits and imposition of fines and penalties pursuant to this Act".

  Bardak suggests that this is another provision which could very usefully be applied in the NEM.

7. Commentary on Practices Observed in the NEM

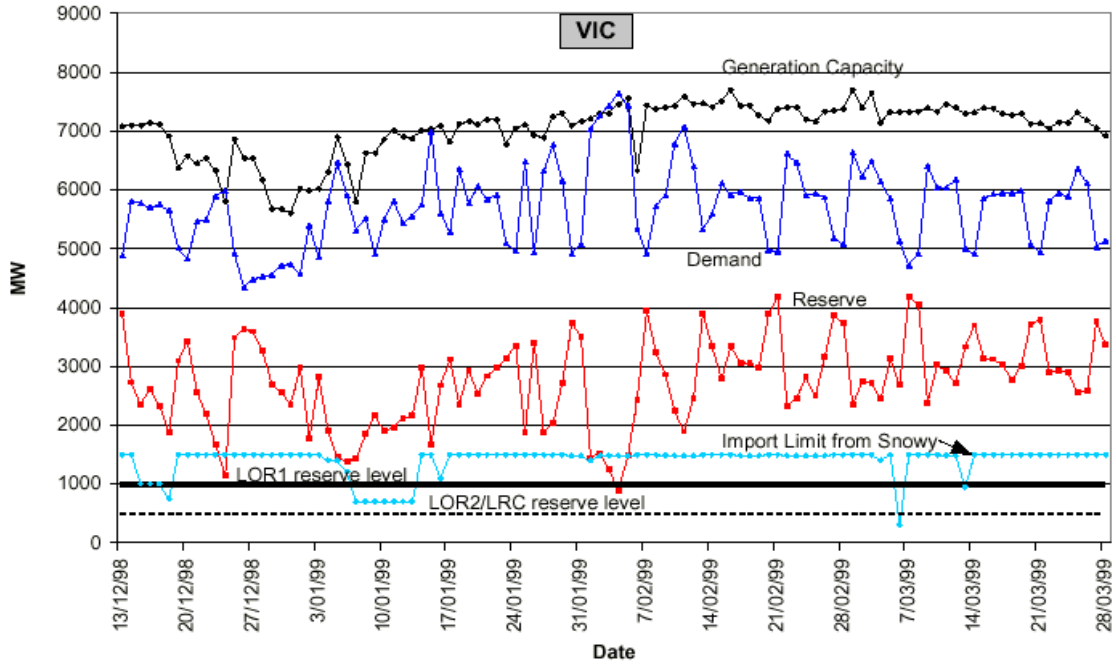
From the examination of the history of trading since the NEM began operation and of the 20 specified incidents, Bardak deduced the following general practices in generator bidding and rebidding behaviour. The various practices are illustrated with examples selected from the 20 incidents.

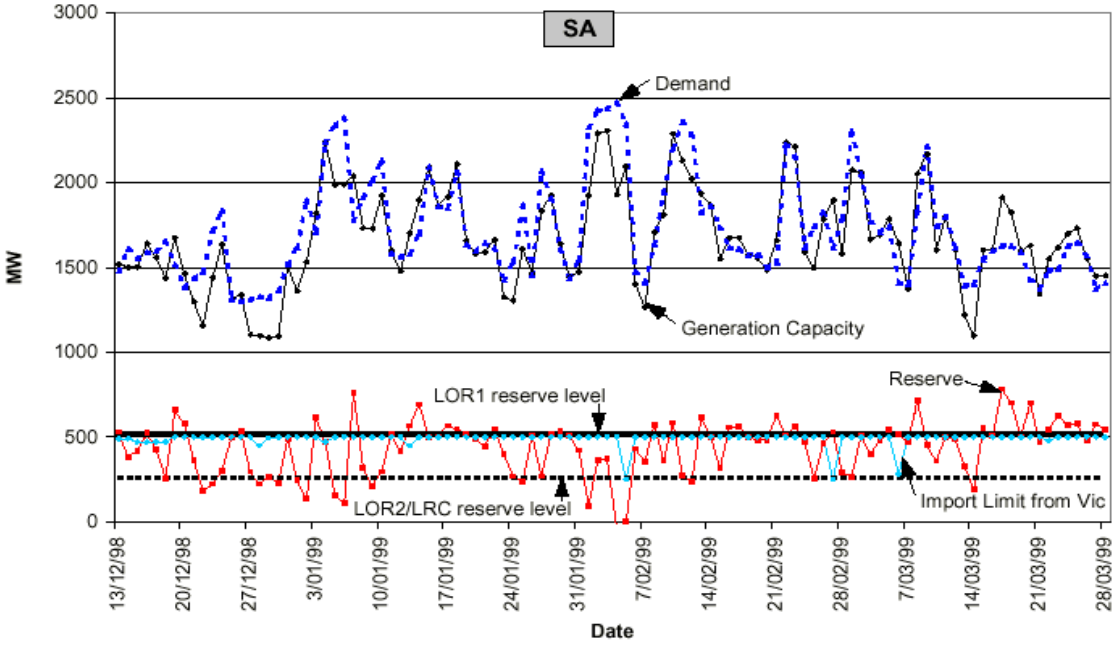
In the very early period of operation of the NEM, capacity was being physically withheld in both South Australia and Queensland. Units were not being started up, and the capacity physically being offered to NEMMCo was generally sculpted to make sure that a tight balance was maintained between supply and demand.

The following graphs, published by NEMMCo in their review of the summer of 2000, illustrate what was happening in South Australia compared to Victoria over that summer.

The close match between supply and demand which was achieved in South Australia is obvious. This was a period with many high priced periods in South Australia, and

with generally high average pool prices. If NEMMCo's load forecasts proved to be on the low side, then the reduced capacity cover would almost inevitably result in a price spike.





In Queensland, gas turbines and the pumped storage plant at Wyvenhoe were typically not started and made available for loading. In all States, peaking gas turbines were typically bid at very high prices indeed as a matter of course — usually in excess of $1,000/MWh and often close to the $5,000/MWh limit. Enertrade and CS Energy in Queensland were clearly following this strategy.

As mentioned above, these practices would not be allowed in other competitive markets.

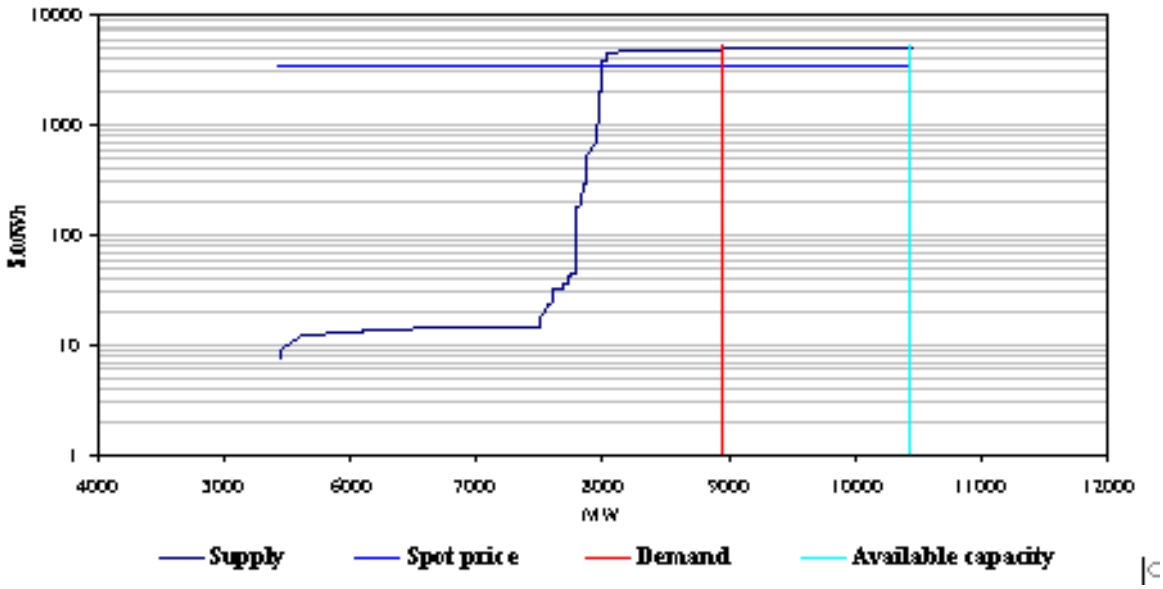
Physical withholding of capacity had previously become evident in mid 1998 in NSW, when both Macquarie Generation and Delta Electric decided not to operate a total of 1600 MW of plant at Liddell and Munmorah in order to eliminate some of the excess capacity in NSW and to raise average pool prices. In fact, these so-called mothballed units subsequently were operated from time to time when conditions were favourable or to cover the outage of another large unit in the portfolio of either company. As mentioned above, in the UK, such actions would be subjected to detailed regulatory review and if the major reason was found to be to raise the pool prices rather than because of reasonable certainty of inadequate revenue being received, action would be taken to force the return of the units to service.

By mid 2000, the practice of bidding large proportions of capacity in each Region at exceptionally high prices — typically $4,000/MWh or above became prevalent, initially in NSW and then in the other States. This is what Bardak understands NECA to mean when they use the term "sleeper bids".

NECA and NEMMCo documented this practice in investigating the event of August 4th 2000, where this bidding practice, together with rebids by Snowy and the NSW generators, isolated NSW from the rest of the NEM and caused a price spike as the high cost capacity blocks were called upon to be loaded.

NECA published the stacked bids in NSW at the time of this event in the form of the following graph. Well over one third of the NSW capacity was being bid at $4,000/MWh and above, and all three of the NSW generators were participating.

Figure 2: NSW regional supply curve for the 7am trading interval on 4 August



When NECA began to publish their weekly Market Analysis reports in October 2000, they adopted the practice of publishing a graph showing the bid stack at the time of despatch for each day of the week. Even a cursory examination of any of these reports will show the extent to which large amounts of capacity are regularly being bid at extremely high levels — well above the maximum SRMC of any generator operating in the NEM — on every day of the week.

All Regions of the NEM now exhibit this behaviour. Any underestimation of the demand by NEMMCo. or any system event which results in a loss of generating capacity, raises the possibility of a fortuitous price spike occurring, but one quite unrelated to market dynamics or the underlying generation cost structure.

This practice is a direct form of economic withholding of capacity, and as noted above, would not be allowed in overseas competitive markets.

An example of this effect in action came when daylight saving was introduced in early September of 2000. It took several days for NEMMCo to adjust their load forecasts to the new load shape in the early morning hours, during which time the bidding practice described above resulted in a series of major price spikes which raised the weekly average pool price considerably.

A new and more aggressive form of economic withholding began in Victoria in early 2000. After first reducing the volume of capacity offered to the contract market — believed to been reduced to about 50% of the capacity available — Loy Yang Power began to rebid large quantities of capacity from their normal price levels (less than $20/MWh) to over $4,000/MWh during the peak periods almost every day during the summer. Up to 1000MW of capacity was being rebid in this manner on some days.

On those days when the flow on the Snowy-Victoria interconnection exceeded about 1000MW, this rebidding was sufficient to constrain the line[13] , separating the pool price in Victoria and South Australia from that of New South Wales, and leading to periods of very high prices, as blocks of capacity which had been bid at high price levels in Victoria and South Australia were called upon to be loaded.

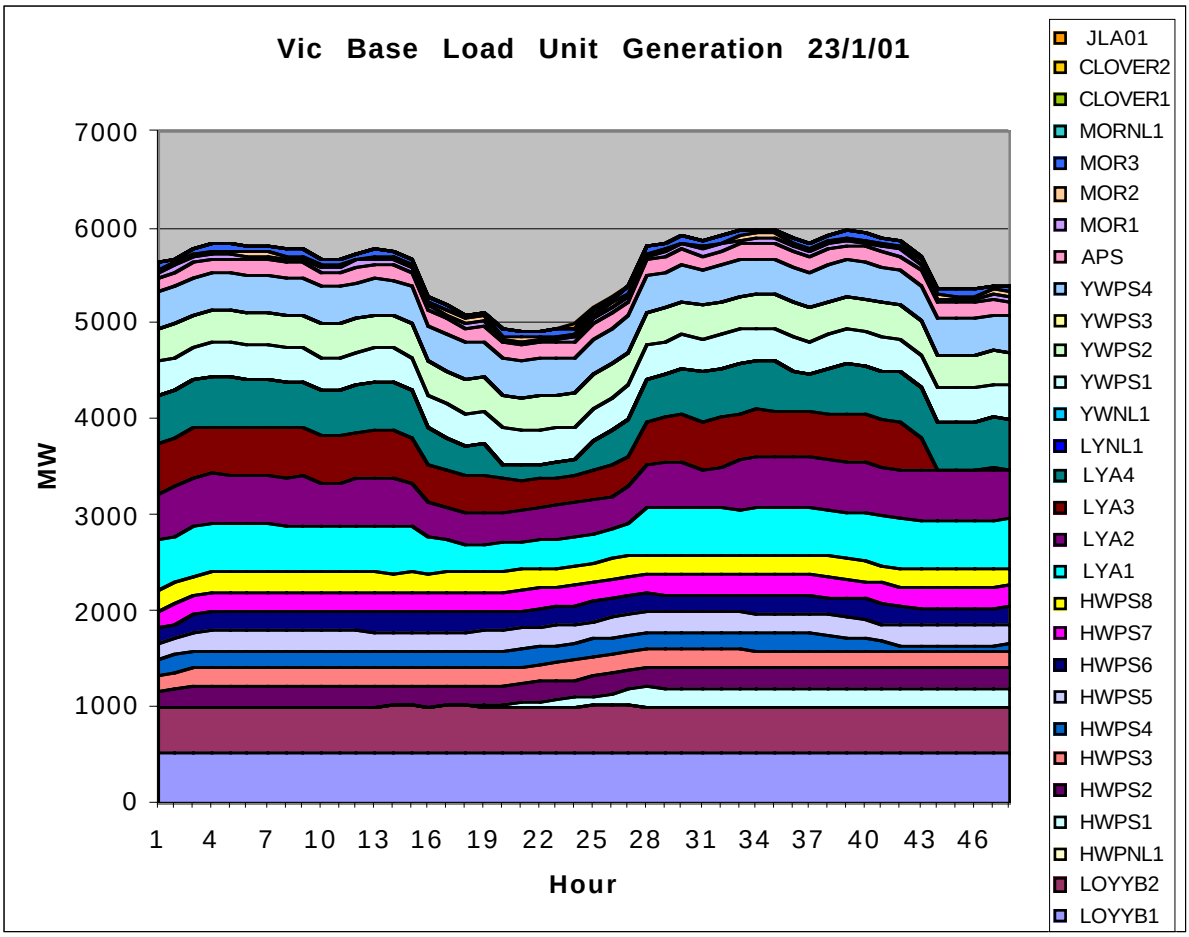
One such event occurred on the 23rd January, where Loy Yang Power reduced the output being bid at "normal" prices by almost 1000MW — including dumping steam direct to the condenser to reduce electrical generation on one unit — loading up the Snowy-Victoria interconnection and causing a major price spike.

The pool price in Victoria averaged $177/MWh on that day — over five times normal — and the price peaked at $1304/MWh.

The pattern of generation of the Victorian base load units for that day is shown below. This was typical of Loy Yang's bidding behaviour all through the summer.

The reasons provided for the rebidding were usually expressed simply as "system conditions", and sometimes "plant limits".

[13] The nominal rating was 1500MW.



In the early part of the summer of 2001, it was only Loy Yang which was aggressively rebidding capacity in this manner. Later in the summer, Loy Yang altered its approach, bidding blocks of capacity at peak hours above $4,000/MWh in the day-before offers and moving smaller blocks back down to normal levels as the day progressed.

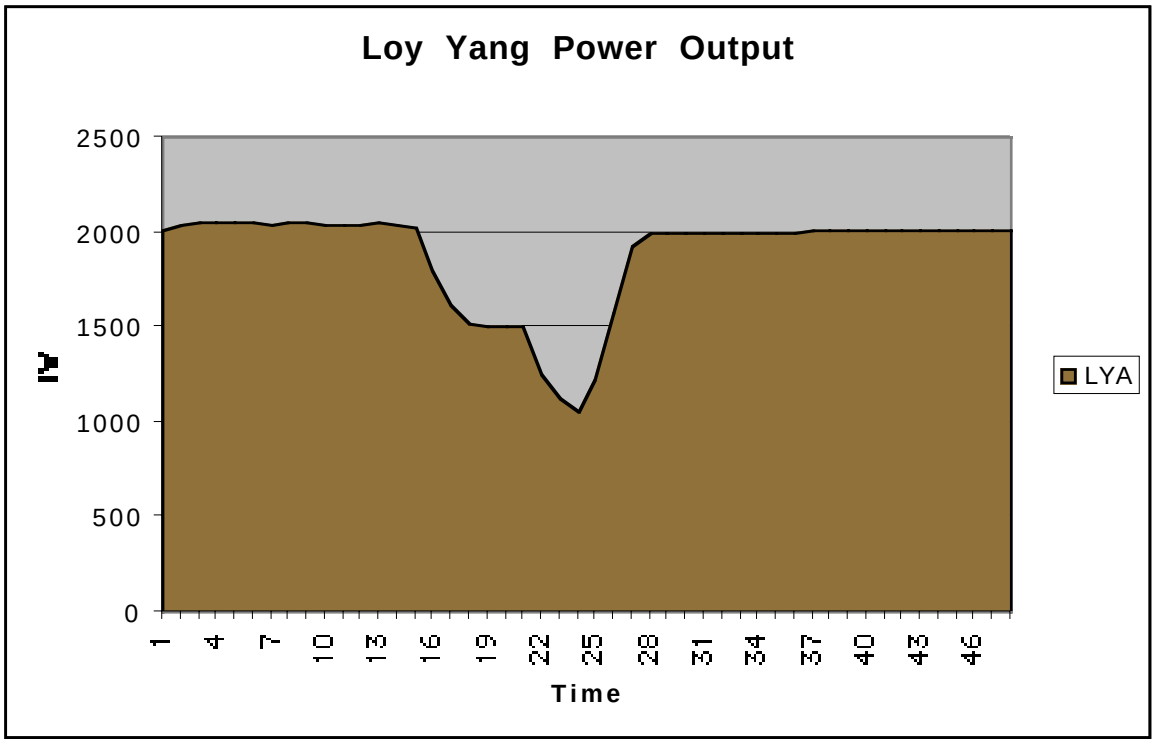
Whether this was done to alert other generators that Loy Yang could see an opportunity to generate high pool prices is impossible to tell from the evidence which Bardak has seen, but nevertheless it appeared to have been very successful in achieving this effect. Loy Yang Power was joined by Hazelwood Power in Victoria, Macquarie Generation in NSW and NRG-Flinders in South Australia at various times — all taking actions to assist Loy Yang to generate higher pool prices than would otherwise have occurred.

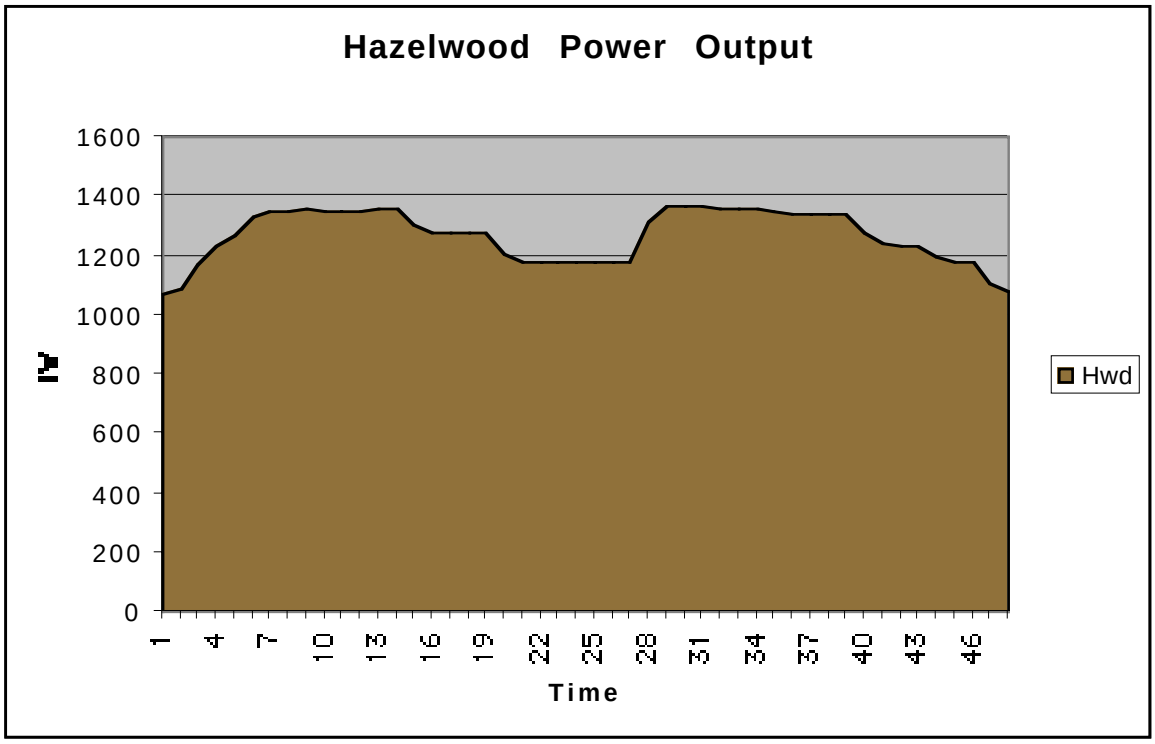
Consistent with the explanation given above of the factors affecting generator behavior, unless these other generators had also wound back the quantity of capacity offered in hedge contracts, they would not have had the same incentive as was available to Loy Yang to reduce capacity.

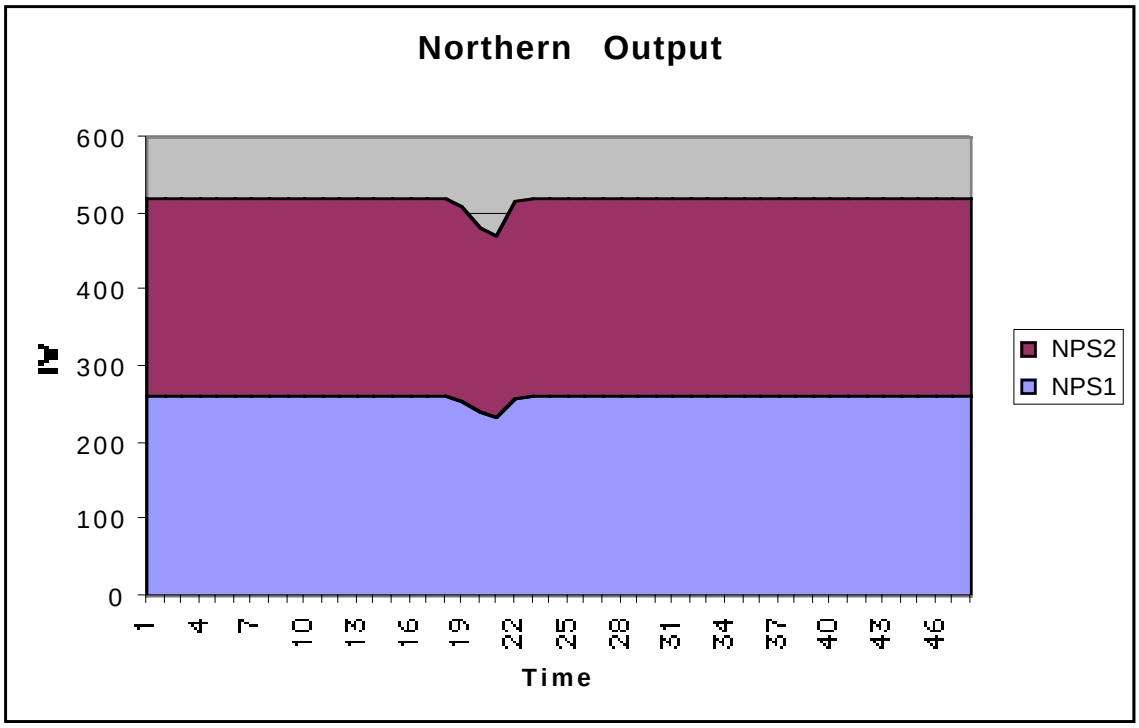
Reasons given at the time were typically “system conditions”, “financial optimisation” but Macquarie often simply said that their rebids were to “improve profitability”.

For example, a similar incident to that described above occurred in February, when the pool price averaged $177/MWh and peaked at $3840/MWh. On that day at least three

generators (Loy Yang, Hazelwood and NRG-Flinders) reduced output at the time of peak price, as shown in the graphs of their total output shown below.







Finally, the event of 27th August 2001, in a period of otherwise moderate pool prices, the NSW pool price spiked to $4729/MWh on unexpectedly high peak load. Bayswater and Eraring rebid up to 1000MW of capacity to high price blocks. The Snowy interconnection was forced to constraint loadings — to effectively separate Vic/SA from NSW and the high priced rebids in NSW set the NSW pool price.

NECA described this incident as follows:

> "Forecast demand for the evening peak increased throughout the morning, with prices rising to between $100 and $300/MWh. At 4pm, forecast prices jumped significantly to more than $4,000/MWh, in part as a result of AES rebidding around 500MW of capacity from prices between $44/MWh and $270/MWh to more than $4,000/MWh at Jeeralang to avoid uneconomic short starts. Some capacity was later restored to lower prices, closer to despatch. Rebids submitted by Yallourn Energy and Callide C, which led to reduced available capacity, also contributed to the higher forecast prices.
>
> At 1.23pm Loy Yang Power rebid 215MW of capacity from prices less than $35/MWh to more than $4,400/MWh for around 2 hours from 5.30pm. Subsequently between 4.48pm and 5.52pm, Macquarie Generation rebid 880MW of capacity from prices less than $40/MWh to more than $4,000/MWh. As a result, Bayswater despatched capacity was reduced by 350MW by 6.30pm and 750MW by 8pm. Bayswater set price in New South Wales for most of the time between 5.30pm and 7pm, including for 30 minutes at prices greater than $4,500/MWh.
>
> Eraring's bids, submitted the previous day, were sculpted so that the capacity presented at less than $50/MWh reduced by 700 MW, with corresponding increases in capacity presented at greater than $4,000/MWh, between 5pm and 6.30pm. As a result, its despatched capacity was reduced by around 500MW. Eraring Energy

committed 240MW of generation at Shoalhaven and rebid 320MW at Eraring to prices less than $40/MWh around 5.30pm. Despite the effects of these rebids, a third of its total capacity was presented at prices greater than $4,000/MWh."

This incident was worrying as several new players were involved in the bidding and rebidding which produced the price spike. Loy Yang Power and Macquarie Generation were joined by AES, Yallourn Energy and Eraring Energy in actions which, taken together, produced the high price spike.

There is a pattern evident in these examples of the progressive development of new techniques and strategies designed to raise the pool prices when conditions allow this to be done, and with the involvement of more generators as time goes on.

8. Results of Bardak Analyses

After processing the voluminous data on the 20 incidents selected for detailed analysis, Bardak compiled several cases to examine the impact of the bidding and rebidding behaviour on pool prices in the NEM region and for the entire NEM. Due to the limited time to complete the assignment, the year 2000 was taken as being typical.

The formulation of these cases, and the results obtained are described in this section of the report.

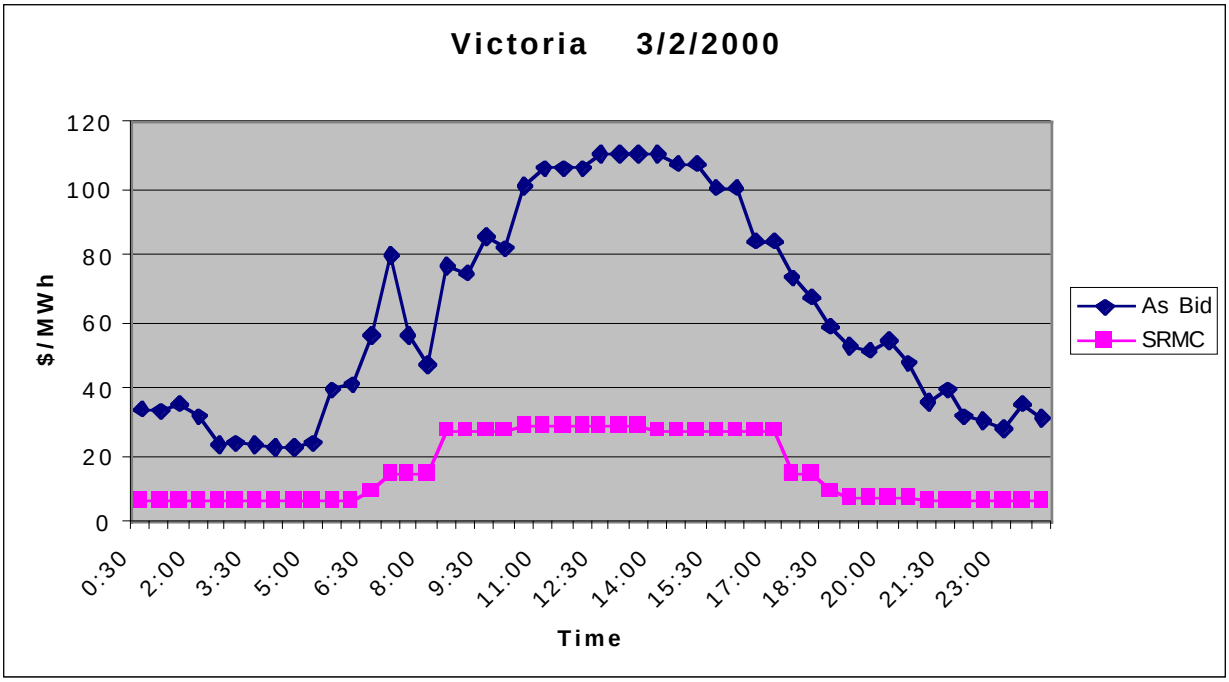
8.1 Bidding at SRMC

NEMMCo has published its estimates of the SRMC of all of the generators operating in the NEM, and Bardak elected to use the NEMMCo figures in this analysis.[14] Using the SRMC data and the capacity of the various power plants, a progressive capacity vs SRMC table can be compiled for each State in the NEM.

No detailed public information is available on plant outages, and to account for the seasonal variation in capacity presented to the market, Bardak wrote down the capacity of each power station by varying factors to approximate the effect of maintenance outages. During summer months, 96% of capacity of each plant was assumed to be available. This reduced to 95% for winter months and 80.5% in the autumn and spring — giving an annual availability of around 88%. This is a reasonable approximation for an analysis of this type.

For each half hourly period, the method used calculated the SRMC of the last plant needed to be loaded to meet the demand for that half hour. This could then be compared with the actual price outcome for the same half hour. For example, the following graph shows the actual price profile for Victoria for the day of the 3rd February 2000, compared to the price which would have resulted had all generators bid their SRMC on that day.

[14] NEMMCo, "SNI Stage 1 Update Report", December 2000, Appendix B.



Consistent with Bardak's view of the need for marginal capacity payments to be added to a SRMC-based simulation, $6.50/MWh has been added to the energy cost obtained from the simulations in each case.

8.2 Estimates of LRMC

The estimation of the LRMC of each region gives an indication of the equilibrium price of electricity and one which would allow an efficient new entrant to obtain a reasonable/normal return on investment in a new power plant in that Region.

Estimates of LRMC produced by generators must be viewed with great caution. It is very much in their interest to "talk up" the LRMC estimates, as it sets the scene for higher pool and contract prices than may otherwise occur. A similar comment, but with less force, can be made about estimates produced by engineering consultants who gain most of their work and income from fees generated by working on new power plants for generation owners.

The best estimates of LRMC come from companies driven to achieve the lowest capital, overhead, operating costs and fuel prices than can be achieved. These are often power plants in intensely competitive regions of Australia and the overseas, often supplying major industrial customers who are very price sensitive. Bardak often associates with the latter type of companies and is accustomed to weeding out the unnecessary margins, fees and contingencies which are often added to estimates of power plant costs.

It should be noted that there can be wide variations between ostensibly similar power plants built at the same time. This has always been the case. A LRMC calculation needs to assume the most efficient modern power plant which can be constructed, minimising capital, operations and maintenance costs, maximising efficiency, and using the most economical source of fuel.

Estimates which have excessive "factors of comfort" are not appropriate for this purpose.

To quote a contemporary example, Callide C in Queensland was constructed with a specific capital cost of around $1000/kW, with low operations and maintenance costs, high steam cycle efficiency and low coal costs. It can produce power with a full commercial return at a long run levelised cost of below $30/MWh. By comparison, Collie power station in Western Australia was constructed with a specific capital cost of $2800/kW, moderately low operations and maintenance costs, normal steam cycle efficiency and high coal costs. It can only produce power with a full commercial return at a long run levelised cost of above $65/MWh.

Bardak used its own estimates of LRMC for this assignment. Based on current best practice capital and operations and maintenance costs, fuel costs and plant efficiencies, and using a reasonable pre-tax return on investment, the Bardak estimates for the LRMC's applicable in the various NEM Regions are as follows:

QLD	$28-30/MWh
NSW	$32-34/MWh
VIC	$32-34/MWh
SA	$37-38/MWh

8.3 Elimination of High Priced Events

Bardak found from the examination of the series of events that bidding and rebidding behaviour was always a factor in generating high prices — even though a physical event was the initiating cause. This is primarily because the practice of bidding a high proportion of system capacity at prices typically above $4,000/MWh "primes" the system, so that a wide range of initiating events, and quite small errors in load forecasts, calls up this capacity and thus a high priced event occurs.

To estimate the effect on average pool prices, Bardak eliminated the effect of each of the 20 incidents which were subjected to detailed analysis, assuming that the average of the pool prices which occurred in the week preceding, and the week following, also applied for the week experiencing the high priced events.

This allows an approximation to be made of the cost incurred by bidding and rebidding behavior which has contributed to the high pool price events. Note that not all high priced events were eliminated by this process and thus the results obtained are conservative.

8.4 Effect of Market-Based Price Caps

For comparison with the foregoing cases, Bardak also added a case which employed the "market-based price caps", of the kind which FERC recently applied to California and the Western Region of the USA.

Such a price cap is set at the maximum SRMC of the peaking units that have a reasonable probability of being called upon to operate. The logic of this is that this is

the maximum price which would emerge from an effectively competitive market — short of physical failure to supply the load.

An examination of the NEM SRMC's discloses that the highest priced units reasonably required to be run are the kerosene-fired open cycle gas turbines in Far North Queensland or the oil-fired open cycle gas turbines in South Australia. Both of these groups have a SRMC in the range $150-250/MWh.

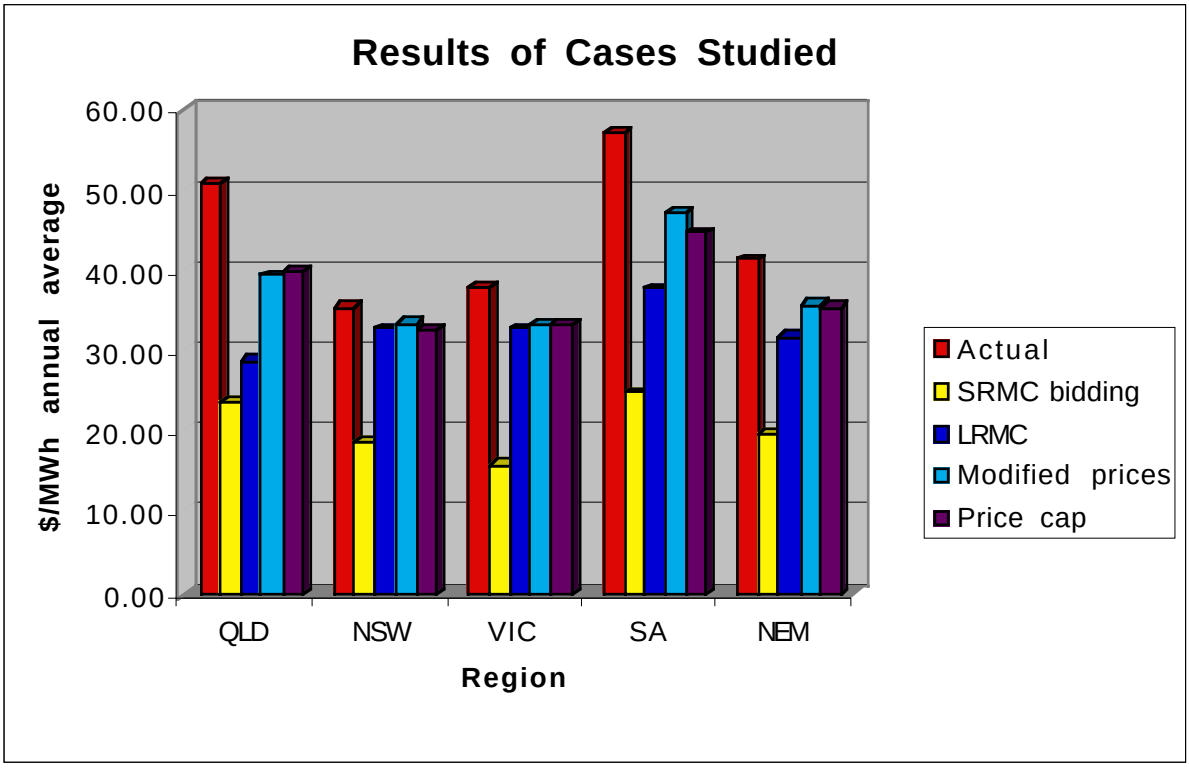
To be conservative, Bardak simulated the operation of the NEM by re-running every past half-hourly period using a price cap of $250/MWh on the pool price for that half hour.

8.5 Summary of Results

The results of the various cases are summarised in tabular and graphical form below for the year 2000 — for each Region of the NEM and for the NEM as a whole.

Year 2000 Results - $/MWh

Case	QLD	NSW	VIC	SA	NEM
Actual	51.0	35.7	38.2	57.4	41.65
SRMC bidding	24.0	19.0	16.0	25.0	19.94
LRMC	29.0	33.0	33.0	38.0	32.06
Modified prices	39.6	33.7	33.5	47.5	35.94
Price cap	40.3	32.7	33.6	44.9	35.63



Discussing these results, certain general conclusions can be drawn:

- bidding at SRMC with the current plant mix in Australia — even with a capacity payment — will not produce enough revenue to cover the cost of a new entrant in any of the Regions. The fact that the prices resulting from this simulation are so far below LRMC estimates is due to the fact that the mix of plants is generally far from optimum in all of the Regions. The disparity is least in Queensland, where there is a better mix of plant types than in the other Regions;

- this means that the design of the NEM trading system forces generators to bid prices higher than SRMC's — raising the problem that the same freedom to do this, allows the generation of extremely high prices when conditions are favourable;

- the actual pool prices in the year 2000 were all above the LRMC estimates for the corresponding Region, indicating that sufficient incentive exists in general for new plant to be constructed. The situation is more complex in the case of peaking plant, where the absence of a capacity payment makes it more problematic that such plants would receive adequate revenue;

- modifying the pool prices by eliminating the 20 specific events investigated in detail, reduced the pool prices considerably in each case. The NEM total figures indicate a reduction of $5.7/MWh, equivalent to a sum of some $912 million overspent in the pool. This is equivalent to raising the average annual pool price which would otherwise have existed by about 16%. Thus with the most obvious (but nor all) high priced events eliminated, average pool prices fall considerably, and generally approach the LRMC values in each Region

- this same analysis was conducted for the years 1999 and 2001. The pool prices were increased by 12.5% and 15.1% respectively for these years. Over the three year period, the average increase in pool prices was 14.6%;

- applying a $250/MWh "market-based cap" as has been applied in California has a generally similar result to eliminating the high priced peaks. In all cases the resulting average annual prices are similar to those obtained by elimination of the most obvious of high priced periods and generally similar to LRMC values in each Region.

9. Conclusions

The conclusions arising from this review may conveniently be summarised as brief answers to the questions posed by the ACCC in the Terms of Reference for the assignment.

- *isolate the trading intervals during which the spot price has been forced to extreme levels;*

  Bardak has selected 34 events in the NEM Regions, involving 20 incidents in multiple Regions, where the average weekly price was significantly raised by bidding and rebidding activities and other factors.

- *analyse and report on NEMMCo's demand forecasts for the relevant trading periods;*

  NEMMCo's demand forecasts have only a secondary effect on the generation of price spikes. It is true that the accuracy of the NEMMCo forecasts has been improving and lies in the range which one might expect — given the considerable uncertainties and difficulties involved in making such forecasts on a centralised basis. When a forecast error contributes to a price spike, the major influence is the bidding and rebidding behavior of the generators in constructing a steeply rising price curve for generation loaded just above the expected demand level. Thus NEMMCo load forecasts are just one of the initiating events which may call upon the high priced bids being selected.

  One wonders why such forecasts are made centrally however. It would surely be better for the retailers/customers to take responsibility for estimating the demand required by their customers and to take responsibility for deviations in their estimates. This would provide much better incentives for the retailers to know their customer loads and to search for demand-side responses, and is one of the desirable features of the UK NETA system.

- *review rebidding data to identify the generators submitting a significant number of rebids, analyse the timing of these rebids, and report on the reasons for the rebids;*

  In each of the 20 incidents selected, Bardak has examined the pattern of bidding behaviour before and during the event and identified the generators adopting bidding and rebidding practices which had a significant effect on the pool price during the period of the incident.

  Physical withholding of capacity still takes place in South Australia, Queensland and New South Wales, but economic withholding of capacity (by bidding part capacity at very high prices) has become the most common form of capacity withholding to create artificial price spikes unrelated to market dynamics or underlying cost structures.

  Generators most active in adopting such bidding and rebidding practices have been Loy Yang Power, Hazelwood Power, and Yallourn Energy in Victoria, Macquarie Generation and Eraring Energy in New South Wales, each of the Queensland generators, NRG-Flinders, Optima Energy and Synergen in South Australia, and Snowy.

  The most aggressive generators in rebidding have been Loy Yang Power, Macquarie Generation and more recently, Eraring Energy. Most generators operating in the NEM have adopted the practice of bidding part of their capacity at very high prices — often above $4,000/MWh, just in case an event occurs which would call upon such high priced blocks of power.

  This practice is known overseas as "economic withholding" of capacity and is generally not allowed.

NECA's attempt to get the generators to provide more detailed descriptions of the reasons for the rebids has met with some success, but the overall detail provided remains of concern and could be improved. The most common reasons given still use general terms such as "system conditions", "market conditions", "plant conditions" or "water management" and the like.

- *determine any patterns of behaviour that are evident;*

  The patterns of behaviour observed from the review have been described above.

- *analyse and explain whether the rebids and subsequent prices can be explained solely by reference to external factors;*

  In some of the incidents examined, there is an initiating event present, such as a loss of a generator, interconnection limitations or exceptionally high load forecasts. While these factors certainly have an influence, they cannot explain the major portion of the price spikes occurring during the incidents. The major contributing factor is the bidding and rebidding practices of the generators.

- *analyse the timing of the rebids and the response from other participants;*

  The effect of the timing of the rebids varies, according to the examples studied. Sometimes, capacity is rebid to higher cost bands very close to the despatch period, allowing very little time for any competitive response. In any event, generators rebidding to lower prices to counter one rebidding to a higher price is not frequently seen — rebids are generally in the same direction in the instances examined. Generators generally all benefit from instances of high pool prices.

  At other times, the initial bidding appears to serve the purpose of alerting other generators that one has seen an opportunity to raise the pool price — for example on the following day. This was seen when Loy Yang changed its approach in the summer of 2001, initially bidding blocks of capacity at high prices the day before, and then rebidding some of that back down to maximise revenue while still achieving the effect desired — usually to keep interconnections running full and to isolate one or two Regions from the remainder of the NEM.

- *comment on whether the timing of the rebids permitted an adequate response from other market participants;*

  With the number of rebids being made (NECA have reported an average of 800/day, or one every two minutes), their magnitude (hundreds of MW at times) and their timing (close to despatch on many occasions), there is little opportunity for a competitive response, even if other generators were inclined to seek to counter the effect that the rebidding generator was seeking. More often than not in the examples studied, the other generators responded by supporting the actions of the lead generator.

  For the same reasons, but reinforced by the small capacity reduction available and the dispersed nature of the load, demand side response has little or no chance of countering the effect of generator rebidding.

- *determine whether the price spikes have materially impacted on the average spot price.*

  The results arising from the Bardak analysis show that generator bidding and rebidding practices under the existing NEC provisions have had a material effect on the average annual pool price.

  Using the year 2000 as an example, eliminating the 20 high priced events identified in this review, reduced the NEM average annual pool price by $912 million dollars or $5.7/MWh, a reduction of 13% (alternatively, the average pool price for that year was 15.3% above the level otherwise applying).

  Perhaps more importantly, the incidence of bidding and rebidding to influence the pool price, when conditions are favourable, appears to be on the increase, especially since the summer of 2001, and with a larger number of generators becoming involved as time has progressed and more experience has been gained.

Given the propensity for this type of market design to produce rapid increases in pool prices, as shown by the experiences the UK in 1994, and more recently in California and New Zealand, placing limitations on the freedom of generators to bid and rebid and achieve prices well above LRMC levels over a year, would seem to be both prudent and necessary.

Bardak has provided a useful example of the provisions being included in one of the latest competitive markets — that in the Philippines. Lessons have been absorbed from other markets and incorporated in a new set of laws and regulations. Some of the provisions might usefully be implemented in Australia's NEM.

Bardak has been pleased to be able to provide this Review for the ACCC on a tight timeline and would be pleased to assist further as may be desired.

>>>><<<<

Attachment 1

Extract from the Implementing Rules and Regulations and the Republic Act 9136 for the Restructured Electricity Industry in the Philippines

Extract from Implementing Rules and Regulations
Document dated 14th Nov. 2001

RULE 12. CROSS OWNERSHIP, MARKET ABUSE AND ANTI-COMPETITIVE BEHAVIOR

Section 1. General Principle.

No Industry Participant or any other person may engage in any anti-competitive behavior including, but not limited to, cross-subsidization, price or market manipulation, or other unfair trade practices detrimental to the encouragement and protection of Contestable Markets or the WESM.

Section 2. Scope of Application.

This Rule 12 shall apply to all persons, including all Industry Participants, including but not limited to Generation Companies, Distribution Utilities, subsidiaries and Affiliates of Generation Companies and Distribution Utilities, stockholders and officials of Generation Companies and Distribution Utilities, Suppliers, NPC, TRANSCO and its successors or concessionaire, and PSALM.

Section 3. Prohibition of Cross Ownership

a. No Generation Company or Distribution Utility, subsidiary, Affiliate, stockholder, officer or director of a Generation Company or Distribution Utility, or other entity engaged in generating and supplying electricity specified by ERC, shall hold any interest, directly or indirectly, in the TRANSCO or its Buyer/Concessionaire, or the Market Operator.

b. TRANSCO, its Buyer/Concessionaire, and any stockholder, officer or director of either or any of their relatives within the fourth civil degree of consanguinity, shall not hold any interest, whether directly or indirectly, in any Generation Company or Distribution Utility.

c. Except for *ex officio* government-appointed representatives, no person who is an officer or director of the TRANSCO or its Buyer/Concessionaire shall be an officer or director of any Generation Company, Distribution Utility or Supplier.

d. This Section shall not apply to PSALM in the course of its privatization of NPC assets pursuant to Sec. 47 of the Act.

Section 4. Limits on Concentration in Ownership of Generating Capacity.

a. A company or Related Group can own, operate or control no more than thirty percent (30 %) of the installed generating capacity of a grid and/or twenty-five percent (25%) of the national installed generating capacity; provided that such restrictions shall not apply to PSALM or NPC during the time that its assets are being privatized pursuant to Section 47 of the Act. For this purpose, a "grid" shall refer to the Luzon grid, Visayas grid or Mindanao grid, or other grid as may be defined by ERC. This limitation shall not apply to a Generation Company that operates a generation facility located in an off-grid area, NPC-SPUG area or in an isolated grid that is not connected to the high voltage transmission system. The ERC shall determine the installed generating capacity in a grid and the national installed generating capacity as well as taking into consideration the interconnection capacity of the different grids, among others.

b. For the purpose of this section, the Agus and Pulangui complexes shall be excluded in calculating the PSALM or NPC share of installed generation in Mindanao until after these plants are privatized pursuant to Section 47 of the Act.

c. In cases where different entities own, operate or control the same generation facility, the capacity of such facility shall be credited to the entity exercising control over the prices or quantities of the output of such capacity sold into the market; and in cases where an entity has more than one owner or shareholder, directly or indirectly, the capacity attributable to such owner or shareholder shall be based on the percentage of ownership that such owner or shareholder have in the entity. These qualifications shall be used for purposes of calculating whether a particular generation portfolio is deemed to comply with the market share caps defined in this Rule 12.

Section 5. Limits on Bilateral Supply Contracts by a Distribution Utility.

a. A Distribution Utility may enter into bilateral power supply contracts subject to the provisions of Rule 28, Section 6 and a review by the ERC, provided that such review shall only be required for a Distribution Utility whose level of open access has not reached household demand level.

b. No Distribution Utility shall be allowed to source from bilateral power supply contracts more than fifty percent (50%) of its total demand from an Affiliate engaged in generation, but such limitation shall not prejudice contracts entered into prior to the effective date of the Act. This limitation shall apply regardless of whether demand is expressed in terms of capacity or energy.

c. The fifty percent (50%) limit for Distribution Utility bilateral contracts with an Affiliate shall refer to the total bilateral contracts portfolio of the Distribution Utility with Affiliates at any point in time.

Section 6. Encouragement of Participation in the WESM.

For the first five (5) years from the establishment of the WESM, no Distribution Utility shall source more than ninety percent (90%) of its total demand from bilateral power supply contracts.

Section 7. ERC Responsibilities.

a. ERC shall enforce the competitive safeguards specified in this Rule in order to promote true market competition and prevent harmful monopoly and market power abuse. However, ERC shall not apply the limitations specified in this Rule to isolated grids that are not connected to the high voltage transmission system.

b. ERC shall have the authority to determine the appropriate grid or grids to use in the application of these Rules when two or more of the three separate grids become sufficiently interconnected to constitute a single grid or as conditions may otherwise permit.

c. ERC shall within one (1) year of the effectivity of the Act promulgate Competition Rules to ensure and promote competition, encourage market development and customer choice and discourage or penalize abuse of market power, cartelization and any anti-competitive or discriminatory behavior, or unfair trade practice that distorts competition or harms consumers. Such Rules shall define relevant markets for the purpose of establishing abuse or misuse of market power, areas of isolated grids, and the reportorial requirements of Industry Participants as may be necessary to enforce the provisions of Section 45 of the Act.

d. ERC shall monitor and penalize any market power abuse or anti-competitive or unduly discriminatory act or behavior, or any unfair trade practice that distorts competition or harms consumers, by any electric power industry participant. Upon finding that an Industry Participant has engaged in such act or behavior, the ERC shall prohibit and redress the same. Such remedies may, without limitation, include the imposition of bid or price controls, issuance of injunctions, divestment or disgorgement of excess profits, and imposition of fines and penalties pursuant to Section 46 of the Act.

e. ERC shall, within one year of the effectivity of the Act, promulgate rules and regulations providing for a complaint procedure that, without limitation, provides the accused party with notice and an opportunity to be heard.

Section 8. Anticompetitive Behavior and Other Unfair Trade Practices.

The ERC shall promulgate Competition Rules prohibiting, and specifying appropriate penalties and other remedies for, any contract, combination or conspiracy that unreasonably restricts competition in any market for electricity, or any conduct that constitutes an abuse of market power in or an attempted monopolization of any market for electricity, including but not limited to the following:

a. Fixing prices of products or services: Industry Participants that are competitors shall not enter into any agreement or understanding, tacit or explicit, to fix, peg or stabilize the price of any product or service. Price fixing shall be deemed to include agreements on bids, price floors, price ceilings, pricing formulas and resale prices, and agreements on credit or any other terms of a transaction between a buyer and a seller.

b. Fixing output of products or services: Industry Participants that are competitors shall not enter into any agreement or understanding, tacit or explicit, to fix, limit or otherwise determine their output of any product or service.

c. Customer, Product, Service or Territorial Divisions: Industry Participants that are competitors shall not enter into any agreement or understanding, tacit or explicit, as to the customers or the geographic territories they will serve, or the products or services they will sell.

d. Tying: A Industry Participant shall not use a position of market power to condition the sale of one product or service on the purchase of another product or service. No Distribution Utility shall make access to its Distribution System contingent upon the purchase of generation, metering, billing or other services.

e. Physical or Economic Withholding: A Industry Participant shall not use physical operating practices or bidding strategies that limit the market participation of a generation unit under conditions that will result in significant increases in market prices.

f. Discriminatory provision of regulated distribution or transmission services: Provision of regulated distribution and transmission services shall be provided on a basis that is not unduly discriminatory. Examples of unduly discriminatory behavior include but are not limited to the following:

   A. A Distribution Utility or transmission operator shall not refuse to interconnect Generation Company or Supplier other than for reasons of system security or reliability pursuant to the Distribution or Grid Codes.

   B. A Distribution Utility or transmission operator shall not give any Generation Company or Supplier, including without limitation any of the Distribution Utility's Affiliates, any preference or advantage over any other Generation Company or Supplier in processing a request for transmission or distribution of electricity.

   C. A Distribution Utility or transmission operator shall not give any Supplier or Generation Company, including without limitation any of the Distribution Utility's Affiliates, any preference or advantage in the dissemination or disclosure of customer or transmission or Distribution System information, and any such information shall be made available to all Industry Participants at the same time and in a nondiscriminatory manner.

   D. A Distribution Utility shall not provide any preference or advantage to

any Supplier in the disclosure of information about operational status and availability of the distribution system.

E. A Distribution Utility shall provide all regulated services, and shall apply Distribution Wheeling Charges to any Supplier that is not an Affiliate in the same manner as it does for itself or its Affiliates.

a. Misrepresentation or false advertising of a Distribution Utility: A Distribution Utility or its Affiliate shall not state or imply that any distribution service provided to an Affiliate is inherently superior, solely on the basis of Affiliate's relationship with the Distribution Utility, to that provided to any other Supplier.

a. Cross-Subsidization: Consistent with Section 26 of the Act, a Distribution Utility shall not use its revenues or resources from regulated distribution services to reduce the cost or price of its competitive services (generation or supply).

Extract from Republic Act A9136

SEC. 45. *Cross Ownership, Market Power Abuse and Anti-Competitive Behavior.* – No participant in the electricity industry or any other person may engage in any anti-competitive behavior including, but not limited to, cross-subsidization, price or market manipulation, or other unfair trade practices detrimental to the encouragement and protection of contestable markets.

No generation company, distribution utility, or its respective subsidiary or affiliate or stockholder or official of a generation company or distribution utility, or other entity engaged in generating and supplying electricity specified by ERC within the fourth civil degree of consanguinity or affinity, shall be allowed to hold any interest, directly or indirectly, in TRANSCO or its concessionaire. Likewise, the TRANSCO, or its concessionaire or any of its stockholders or officials or any of their relatives within the fourth civil degree of consanguinity or affinity, shall not hold any interest, whether directly or indirectly, in any generation company or distribution utility. Except for *ex officio* government-appointed representatives, no person who is an officer or director of the TRANSCO or its concessionaire shall be an officer or director of any generation company, distribution utility or supplier.

An "affiliate" means any person which, alone or together with any other person, directly or indirectly, through one or more intermediaries, controls, is controlled by, or is under common control with another person. As used herein, "control" shall mean the power to direct or cause the direction of the management policies of a person by contract, agency or otherwise.

To promote true market competition and prevent harmful monopoly and market power abuse, the ERC shall enforce the following safeguards:

a. No company or related group can own, operate or control more than thirty percent (30%) of the installed generating capacity of a grid and/or twenty-five percent (25%) of the national installed generating capacity. "Related group" includes a person's business interests, including its

subsidiaries, affiliates, directors or officers or any of their relatives by consanguinity or affinity, legitimate or common law, within the fourth civil degree;

b. Distribution utilities may enter into bilateral power supply contracts subject to review by the ERC: *Provided,* That such review shall only be required for distribution utilities whose markets have not reached household demand level. For the purpose of preventing market power abuse between associated firms engaged in generation and distribution, no distribution utility shall be allowed to source from bilateral power supply contracts more than fifty percent (50%) of its total demand from an associated firm engaged in generation but such limitation, however, shall not prejudice contracts entered into prior to the effectivity of this Act. An associated firm with respect to another entity refers to any person which, alone or together with any other person, directly or indirectly, through one or more intermediaries, controls, is controlled by, or is under common control with, such entity; and

c. For the first five (5) years from the establishment of the wholesale electricity spot market, no distribution utility shall source more than ninety percent (90%) of its total demand from bilateral power supply contracts.

For purposes of this Section, the grid basis shall consist of three (3) separate grids, namely Luzon, Visayas and Mindanao. The ERC shall have the authority to modify or amend this definition of a grid when two or more of the three separate grids become sufficiently interconnected to constitute a single grid or as conditions may otherwise permit.

Exceptions from these limitations shall be allowed for isolated grids that are not connected to the high voltage transmission system. Except as otherwise provided for in this Section, any restriction on ownership and/or control between or within sectors of the electricity industry may be imposed by ERC only insofar as the enforcement of the provisions of this Section is concerned.

The ERC shall, within one (1) year from the effectivity of this Act., promulgate rules and regulations to ensure and promote competition, encourage market development and customer choice and discourage/penalize abuse of market power, cartelization and any anti-competitive or discriminatory behavior, in order to further the intent of this Act and protect the public interest. Such rules and regulations shall define the following:

a. the relevant markets for purposes of establishing abuse or misuse of monopoly or market position;

b. areas of isolated grids; and

c. the periodic reportorial requirements of electric power industry participants as may be necessary to enforce the provisions of this Section.

The ERC shall, *motu proprio*, monitor and penalize any market power abuse or anti-competitive or discriminatory act or behavior by any participant in the electric power industry. Upon finding that a market participant has engaged in such act or behavior, the ERC shall stop and redress the same. Such remedies shall, without limitation, include the imposition of price controls, issuance of injunctions, requirement of divestment or disgorgement of excess profits and imposition of fines and penalties pursuant to this Act.

The ERC shall, within one (1) year from the effectivity of this Act, promulgate rules and regulations providing for a complaint procedure that, without limitation, provides the accused party with notice and an opportunity to be heard.

<<<<>>>>