



30 May 2011

Mr John Pierce
Chairman
Australian Energy Market Commission
PO Box A2449
SOUTH SYDNEY NSW 1235

Dear Mr Pierce

ERC0123: Potential generator market power in the NEM

Origin Energy Limited (Origin) welcomes the opportunity to participate in the Australian Energy Market Commission's (AEMC) consultation into potential generator market power that has been initiated as a result of a Rule change proposal put forward by the Major Energy Users (MEU).

The proposed Rule is premised on the MEU's view that the exercise of generator market power has resulted in a detrimental impact on the National Electricity Market (NEM). Upon examination of the functioning of the NEM and the MEU's proposition, however, Origin finds no evidence to support this assertion.

In our estimation it is the MEU's proposal that poses a serious threat to the NEM's viability and if implemented would:

- Create an inhospitable investment environment which would threaten the market's ability to provide reliable electricity supply - to the detriment of households and industry; and
- Fundamentally change the current market framework, at a time when the NEM has exhibited a high level of performance with respect to reliability and overall efficiency.

Our detailed comments on the AEMC's Consultation Paper and MEU proposal are outlined in the attached submission.

If you wish to discuss any of these issues further please do not hesitate to contact me on (02) 8345 5250 or Steve Reid on (02) 8345 5132.

Yours Sincerely,

A handwritten signature in black ink, appearing to read "Tim O'Grady".

Tim O'Grady
Head of Public Policy



Executive Summary

The NEM by its very nature is volatile due to marked fluctuations in the demand / supply balance brought on by extreme weather events, highly variable load profiles in some regions, and transmission constraints. Whilst the consequent variations in the spot price present a number of risks for market participants, there are a number of mechanisms within the market that allow for the efficient management of these risks - in particular a well-functioning financial contracts market.

Notwithstanding this, the MEU now appears to be seeking to manage its own exposure to the NEM's inherent volatility by proposing the implementation of what can only be described as a pseudo capacity market at times of high demand. There is a significant burden of proof that must be met in order to justify the introduction of an interventionist mechanism that is fundamentally at odds with the basic market design. Whilst the MEU maintains that the exercise of market power by generators has led to a number of deficiencies in the market, they have offered little evidence to support this claim.

Origin has carefully examined the MEU's proposal under the following headings:

Market power in an energy only market

- Market power reflects a supplier's ability to affect the equilibrium price. It should be noted that some degree of market power is present in all market structures except for a perfectly competitive market, which does not exist in reality. Therefore, the existence or even the exercise of market power on occasion does not automatically lend itself to inefficient outcomes.
- An inherent and necessary feature of an efficient energy-only market is the ability of the marginal generator on occasion to bid strategically (i.e. above SRMC) to recover its fixed costs. Markets which combine capacity and energy trading can address this issue through the capacity side of the market. However, an attempt to impose a pseudo capacity component on the energy only market will not work, and will lead to unintended consequences.

Transient market power

- Any perceived exercise of market power in the NEM would be transient in nature. This is supported by the NEM's track record in delivering investment in response to high prices. The regulatory framework as set out by the Competition and Consumer Act reveals that the exercise of market power is only problematic if it is done for a prohibited purpose such as limiting competition—for example by seeking to limit new entry. There is no evidence of this type of behaviour in the NEM, and in fact new entry has, and does occur in response to price signals.

Defining the market

- The MEU has taken a narrow view of the market both in terms of geography and time, where they have focused on high price events in a particular region (e.g. South Australia) at a particular time (periods of high demand). This approach leads to a number of misleading outcomes and implies that high price events are solely as a result of strategic bidding and the exercise of market power. The focus on spot prices also discounts the critical role of the financial contracts market in managing the effects of the NEM's inherent volatility.
- There are sound reasons for considering issues surrounding market power on a broader/NEM-wide basis. Any measure designed to curb the perceived exercise of



market power in a particular region at a particular point in time cannot be confined to that region or timeframe and will have a distortionary impact on the entire market.

The NEM is working well

- If, as the MEU claims, the exercise of market power has had a negative impact on the market, this would be evident in the functioning of the NEM. In a well-functioning market, customers will be required to pay LRMC of generation over the medium term, or investment would not occur. Hence, for the exercise of market power to have the effects claimed by MEU, we would need to observe average spot prices being consistently above system long-run marginal cost (LRMC).
- Our analysis of the NEM reveals that the market is working well and that there is no evidence of any harmful effects as a result of the exercise of transient market power. Our analysis shows that spot prices in the NEM are generally below system LRMC, and there is no direct correlation between market concentration and higher spot prices.
- The NEM has been successful in facilitating generation investment to meet reliability. In addition, the retail markets in Australia are amongst the most competitive in the world and the contracts market has consistently grown since market start and is instrumental in underpinning investment and managing spot price volatility.

Distortionary impact of the proposed Rule

- The implementation of the MEU's proposal would have a number of negative implications for generation investment, which threatens the market's ability to continue the delivery of reliable supply. Specifically:
- The imposition of what is effectively a capacity market, (but without accompanying capacity payments), means that generators would be at significant risk of not being able to recover LRMC.
- By capping the spot price at periods of high demand, the proposal does not provide an incentive for retailers to enter into financial contracts. This is problematic given that it undermines the contracts market vital role in underwriting investment.
- The proposal encourages small scale (less optimal) generation build given that potential investors would want to avoid being categorised as a 'dominant generator'. Incumbent 'non dominant' generators would also put off plans for expansion for fear of breaching the 'dominant' threshold.



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1. Market power in an energy only market

Whilst there are a number of definitions and interpretations of market power, at its core market power reflects a supplier's ability to affect the equilibrium price. It should be noted that some degree of market power is present in all market structures except for the theoretical utopia of a perfectly competitive market, where all suppliers are price takers. Therefore, the existence or even the exercise of market power on occasion does not automatically lend itself to inefficient outcomes. This is made clear through an examination of the concept of market power in the context of an energy-only market such as the NEM.

Market power in an energy-only spot market can theoretically occur whenever a generator is pivotal - i.e. when demand (including reserve margin) is greater than supply from all sources other than that generator. At this point the generator must be dispatched to avoid load shedding and thus can, theoretically, set the price up to the market price cap (MPC).

Under the NEM's energy only design generators predominantly earn revenue from the energy they produce, unlike in a capacity market where they would also receive payment for making their capacity available. For generation projects to be economic, generators must have the ability (over the life of the power station) to recover the full costs associated with their investment. That is, they must be able to recoup their long run marginal cost (LRMC) defined as *the cost of an incremental unit of generation capacity, spread across each unit of electricity produced over the life of the station.*¹ Typically, however, (to ensure dispatch as there is usually excess capacity) generator offers are made on the basis of short run marginal cost (SRMC) which is the incremental cost associated with producing an additional unit of energy. Significantly, the SRMC does not include capital/fixed costs, which means that if generators were only ever able to recover their SRMC it would not allow for a commercially sustainable outcome in the long run.

Given this, the strategy for a generator in the NEM would be to offer its output at SRMC and recover fixed costs when dispatched at higher prices set by higher cost (marginal) generators. For the marginal generator, however, spot prices determined on the basis of the SRMC would result in the under-recovery of fixed costs in the long run. Therefore, an inherent and necessary feature of an efficient energy-only market is the ability of the marginal generator to on occasion bid strategically (i.e. above SRMC) to recover its fixed costs.

The AEMC's Reliability Panel reinforced the above sentiment, in its Comprehensive Reliability Review where it stated that:

*'In considering what is an appropriate price to remunerate investors and deliver efficient incentives, well established theory confirms the need for high prices if all payments are based on dispatched energy... The theory shows that in the event that the marginal 'cost' is set at the operating or short run marginal cost (SRMC) of the marginal plant, the revenue delivered through the spot market will not cover all the costs of all generation. The marginal plant itself must earn more than its SRMC or it would never recover its fixed costs and therefore it would never be economic for an investor to build that plant'*².

¹ ACIL Tasman, 2009: *Fuel resource, new entry and generation costs in the NEM*, April 2009, pg 5

² AEMC Reliability Panel, 2007: *Comprehensive Reliability Review – Final Report*, December 2007,pg 38-39



From a practical standpoint, the Reliability Panel also noted that given peak demand levels only occur on a few hours each year, peaking plant are dispatched infrequently and thus the price must be high enough in those few hours to meet the costs of these generators for the entire year.³

2. Transient Market power

The MEU states that some generators in the NEM have market power and as a result possess the ability and incentive to use this to increase the spot price at periods of high demand. Implicit in the MEU's unease is the notion that high prices are automatically attributed to the exercise of market power and that high spot prices at these times are by default an indicator of market inefficiency.

At periods of extreme demand, high spot prices are not necessarily as a result of strategic bidding but can also be reflective of supply scarcity brought on by extreme weather events such as heat waves, unplanned transmission outages, and network constraints. Thus, observationally, it is hard to distinguish between scarcity pricing and market power.

The higher prices that result during times of scarcity serve both to signal the need for investment and to allow all generators (including the highest-cost generator) to recover fixed costs. The ability of generators to offer and receive these requisite high prices is dependent on its net pivotal position. As we have outlined earlier this is an essential characteristic of a well-functioning energy-only market.

Given this, when is market power an issue? Where market power is of potential concern is when it is proven to be enduring to the extent that it leads to persistent high prices over time, which results in generators consistently recovering revenue in excess of their LRMC, with no new entry. Analysis presented later in this submission indicates that this is not the case in the NEM. This therefore leads us to conclude that any perceived exercise of market power in the NEM would be transient in nature.

The Federal Court's comments in the context of AGL's acquisition of Loy Yang A power station (AGL decision) are quite telling and shed some light on this issue. Justice French said in the AGL decision at [469]:

'To the extent that the bidding regime does permit price spiking and economic withholding of capacity at times of high demand, it provides a mechanism for price signals upon which existing participants can act on to enhance capacity or new participants can enter to relieve the demand/supply imbalance.'

This seems to suggest that examining a generator's pivotal position (ability to exercise market power) over a short span of time is likely to be uninformative. While transient market power may occur, it is the position over time that is relevant for competition analysis. This is supported by the regulatory framework as set out in the Competition and Consumer Act (CCA) which regulates anti-competitive behaviour in the market. As the AEMC explains in its Consultation Paper the CCA does not disallow the mere existence, or

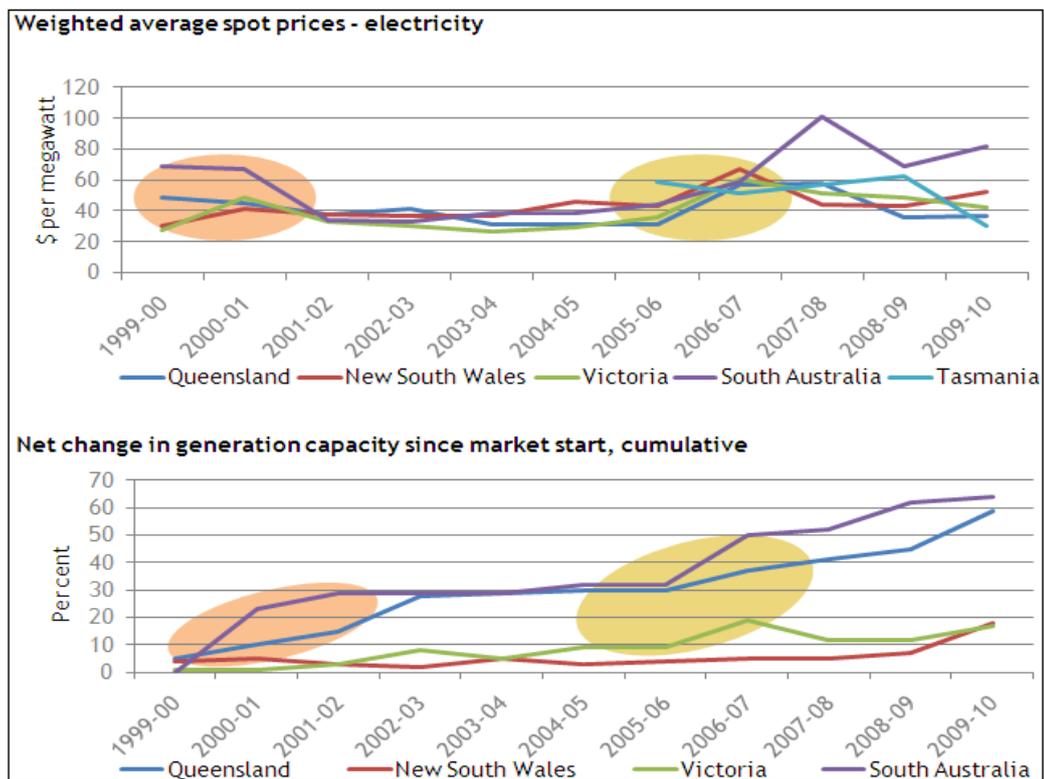
³ AEMC Reliability Panel, 2007: *Comprehensive Reliability Review – Final Report*, December 2007, pg 37

exercise of market power - unless such behaviour is done for a prohibited purpose such as limiting competition.⁴ The AEMC further states that:

'This approach acknowledges that, under workable competition, corporations may experience transitory periods where they are able to influence the market price. However, over time this ability is expected to be competed away by existing or potential competitors, driving the market towards efficient outcomes. In contrast, a sustained ability to influence the market price may drive a wedge between efficient costs and prices, leading to persistent inefficiencies in the market. It is conduct resulting from market power in this latter case that raises concerns'.⁵

The NEM has a history of generation entry following periods of high prices. This is illustrated in the below diagram where tightening supply conditions at the beginning and middle of the last decade led to significant new investment⁶.

Figure 1
Impact of the spot price on generation investment



This further indicates that any perceived exercise of market power in the NEM would be transient, and that the NEM efficiently facilitates new entry to maintain competition, effectively limiting the exercise of market power over time. In deciding whether the

⁴ AEMC, 2011: *Consultation Paper: National Electricity Amendment (Potential Generator Market Power in the NEM) Rule*, April 2011, pg 23

⁵ *Ibid*

⁶ AER: *State of the Energy Market Report, 2009, 2010*, pg 62, 39.

existence of transient market power should be seen as a problem – particularly one requiring direct intervention, it is essential to examine the overall performance of the NEM. This will help to determine if there is any evidence that the exercise of pivotal positions by generators is translating into a systemic exercise of market power which threatens the meeting of the national electricity objective. Our analysis of the NEM in Section 4 of this submission indicates that this is not the case.

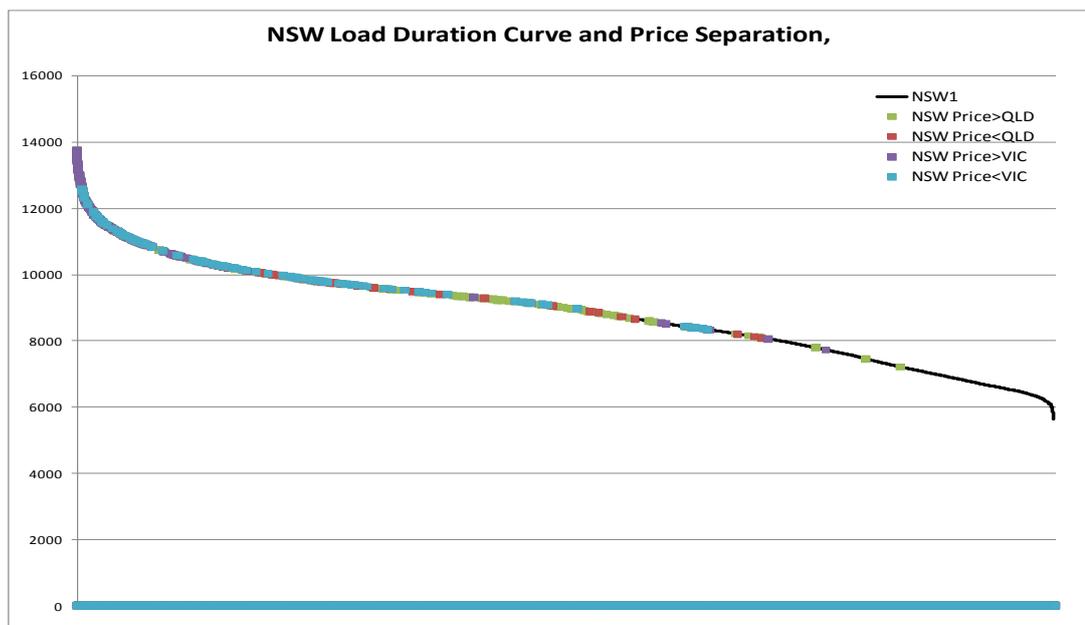
3. Defining the market

3.1 Geographical dimension

Much of the MEU's concern regarding the exercise of market power is focused on South Australia, which indicates that the MEU has taken a regional view of the market. This is mostly likely motivated by the periods of price separation that sometimes occur between regions. Despite occasional price separation, Origin considers that there are a number of reasons why any examination into the exercise of market power must be done on a broader/NEM-wide basis, including that:

- For the majority of times prices are aligned. The mainland regions typically operate as an integrated market with price alignment for 60-80 percent of the time.⁷ It should also be noted that price separation does not only occur at periods of high demand and thus it cannot be concluded that where prices are misaligned generators automatically have the opportunity to exercise market power. The below diagrams illustrate examples of price separations between New South Wales Queensland and Victoria and between South Australia and Victoria. They show that whilst price separation is most prevalent at times of high demand, there is also separation at lower levels.

Figure 2a



⁷ AER 2010: *State of the Energy Market Report, 2010*, pg 28

Figure 2b



- Any measures designed to curb the perceived exercise of market power (such as the MEU's proposed Rule) cannot be confined to a regional market and will have implications for the NEM as a whole. This therefore raises one of the key questions in assessing any Rule change proposal: does the proposed solution fit the magnitude of the perceived problem? That is, even if it could be proven that the exercise of market power is an issue for a particular region such as South Australia, the ensuing impacts of any proposed solution is likely to have a greater negative effect on the entire NEM when compared to the purported exercise of market power. Based on our assessment of the MEU's proposal it is clear that the accompanying distortionary effects will have a significant impact on market efficiency. Section 5 of this submission examines this issue in greater detail.
- The NEM is intended to be a national market. If there are significant periods of price separation due to interconnector constraints, this could be reflective of deficiencies in the transmission planning and investment framework. Therefore, if this price separation resulted in the ability of generators to exercise market power, it would be more appropriate to address the short comings in the transmission framework rather than devise sub-optimal mechanisms to deal with any perceived abuses in the exercise of market power. Origin notes that the AEMC is currently undertaking a comprehensive review into the transmission framework, which is expected to examine the ability of the current framework to facilitate inter-regional transmission build, such as interconnector upgrades.
- Recent market developments indicate that greater interconnection will be the trend going forward. AEMO's proposed NEMLink in this year's National Transmission Network Development Plan and the recent South Australia Interconnector Feasibility study, both outline plans to increase interconnection between the NEM regions. It is anticipated that increased interconnection will facilitate competition, further reducing the potential opportunities for any exercise of market power.



It should also be noted that there is judicial precedence for dealing with issues surrounding market power on a broader NEM-wide basis. Justice French in the AGL decision said at [387] that:

'The geographic market is not to be determined by a view frozen in time or by observations based on short run time scales. The NEM is an evolving market which is intended and designed to operate as a single market for electricity throughout the regions which it covers. Transient price separations between those regions may define temporally limited sub-markets which can be referred to for the purposes of competition analysis. And they may well attract the appellation 'market' in the ordinary parlance of suppliers and retailers operating within them. In my opinion, however, having regard to the structure of the market and the extent to which its major participants operate across regional boundaries, I am satisfied that there is one NEM-wide geographic market for the supply of electricity, and associated with that, entry into electricity derivative contracts.'

3.2 Temporal dimension

The MEU focuses on a very narrow period of time where high demand results in high spot prices. This singular focus lends itself to a number of conclusions that do not reflect overall market reality, including that:

- High prices are the norm, rather than the exception; and
- High prices automatically imply inefficiency

Our analysis of high price events in the NEM (presented in Section 4) indicates that such occurrences are rare and are often attributed to unusual circumstances.

The relatively high MPC in the NEM and the recently approved increase to \$12,500/MWh indicates that high prices are an important in providing incentives for generation investment. This is vital in ensuring dynamic efficiency (optimal mix of plant) and allocative efficiency (optimal level of output) to guarantee the continuing supply of electricity to customers and the meeting of the reliability standard.

Generally, Origin considers that any analysis of spot prices must be kept in perspective. South Australia, for example, has experienced a number of trading intervals where low demand and high wind penetration have led to periods of negative prices. A focus on these periods in isolation could lead to the conclusion that prices are too low and are not sufficient to support investment. This is not to say that there are no issues surrounding high or low prices, but rather that a narrow focus on the periods at which either occurs is not an appropriate means of determining the overall health of the market. Even if it can be proven that there is a separate temporal market at times of high demand, any measures (such as that proposed by the MEU) to deal with any perceived market power at these times cannot be contained to the temporal market and will have a distortional impact on the wider market at other times.

In general, spot prices do not tell the entire story - this point was again reinforced by the Reliability Panel which made the following observation:

'... the spot price alone should not be viewed as an indication of the market's health, although in an energy only market with financial contracts, the spot market is the primary reference for the contract market. The spot price should always be considered in conjunction with contract prices, because, at any point, retailers and



*generators have a choice as to whether they remain exposed to spot prices or whether to hedge with contract cover.*⁸

The MEU's singular focus on high prices at periods of high demand, discounts the importance of the contracts market in safeguarding participants against high price events and limiting the exercise of market power. This is discussed further in following section.

4. The NEM is working well

At the core of the MEU's Rule change proposal is the premise that the exercise of market power has had a detrimental impact on the market. Specifically, some of the issues that the MEU has raised include that the exercise of market power has led to: the creation of barriers to entry in retail and generation; increased electricity prices; major energy users incurring substantial losses; and an increase in the cost of making transactions in the market. Given that the NEM has an exemplary track record in providing reliable electricity supply to customers, there is a significant burden of proof that has to be met if the proposed Rule change (or any like mechanism) is to be introduced into the market.

Origin sees no evidence of the damaging effects of the exercise of market power as outlined by the MEU, and is of the view that a closer examination of the functioning of the NEM reinforces this assertion and essentially dispels the issues the MEU has raised.

4.1 The NEM Facilitates investment

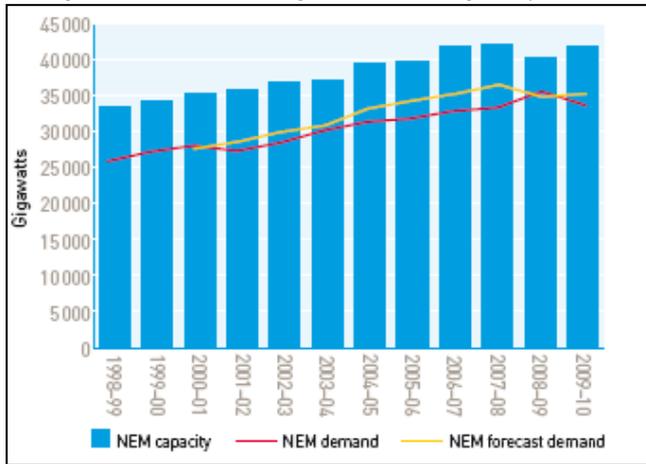
The NEM has a robust track record in delivering the required investment needed to meet reliability objectives. In its 2010 State of the Energy Market Report, the AER reveals that generation investment over the life of the market has generally kept pace with rising demand and has also provided a safety capacity buffer to ensure the reliability of the power system. From the inception of the NEM in 1999 to June 2010, new investment added around 12 100 MW of registered generation capacity⁹. Specifically, all regions have consistently met the reliability standard which is one of the key benchmarks of market efficiency.¹⁰ The below diagram illustrates that generation capacity has kept pace with both forecasted and actual peak demand. If as the MEU claims that the exercise of market power has led to the creation of barriers to entry in the generation sector, it would be expected that this would be evident through a lack of generation investment and a shortage of supply. This, however, has not been the case.

⁸ AEMC Reliability Panel, 2007: *Comprehensive Reliability Review – Final Report, December 2007*, pg

⁹ AER, 2010: *State of the Energy Market Report 2010*, pg 37

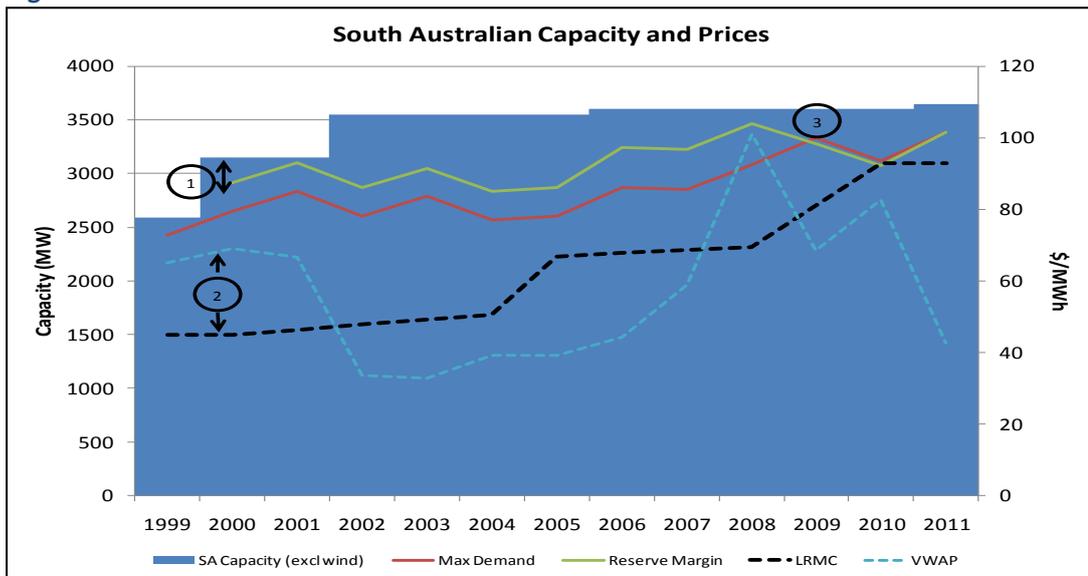
¹⁰ A heatwave in Victoria and South Australia resulted in the breach of the reliability standard in those regions when measured on an annual basis.

Figure 3
NEM peak demand and generation capacity¹¹



Specifically, South Australia provides a good example of how the market works to signal new entrant generation, as seen in Figure 4 below. A tight reserve margin in 1999-2000 (at 1) caused average prices to rise above the new entry cost levels (2). This drove capacity expansion over the following years, restoring the supply demand balance and pushing prices back below new entrant levels. Demand growth since then has again led to a tightening in the reserve margin against available capacity (3), however with only one year where prices have exceeded the required price for a new entrant to satisfy a return on capital, no significant generation has been committed (apart from RET driven wind). The MEU proposal would reduce average prices and further delay the new entrant signal - potentially impacting the meeting of the reliability standard as demand continues to grow.

Figure 4¹²



¹¹ AER: *State of the Energy Market Report 2010*, pg 43

¹² Origin Analysis: LRM up to 2004 based on ACIL Tasman, 2003 - *The definition of SRMC and LRM to be used in IRPC modelling - A Report to the Inter-Regional Planning Committee*. After 2004 LRM taken from ESCOSA

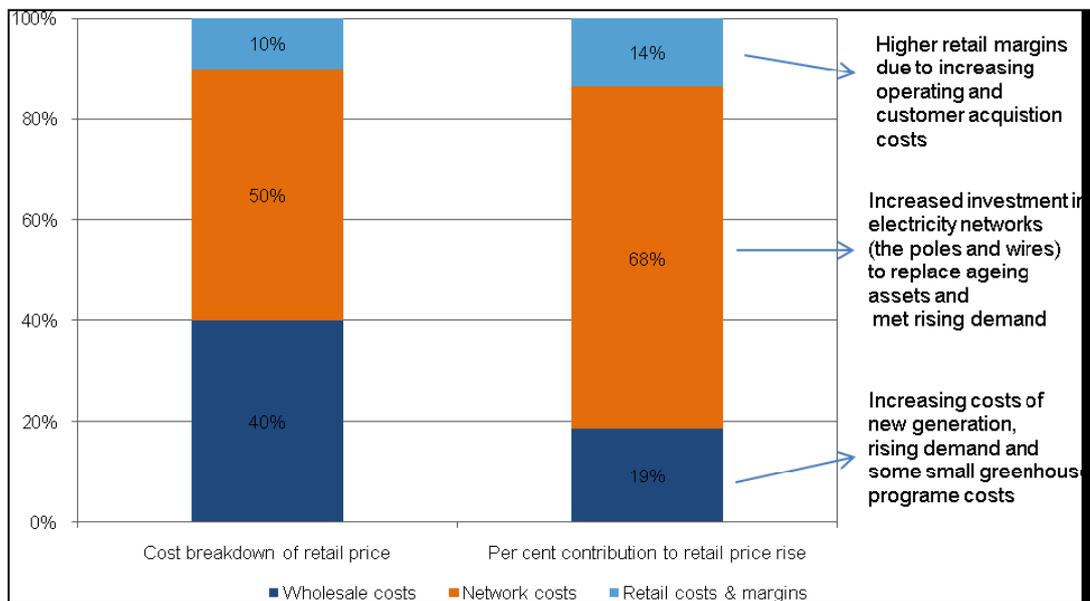
4.2 Retail market

The MEU also maintains that the exercise of market power has weakened competition in the retail market and has resulted in higher retail prices for consumers. An analysis of the retail market proves differently.

4.2.1 Rising retail prices

Though the magnitude differs between states, retail electricity prices have increased by up to 30 percent over the past few years¹³. Interestingly, however, much of this increase has been driven by rising network costs (due to the need for new infrastructure to meet rising demand and replace ageing assets). There is no evidence to suggest that higher spot prices in the wholesale market have led to the retail price shocks currently being experienced in the market. This is aptly illustrated in the below diagram which shows that the wholesale cost of energy has only contributed 19 percent to retail price rises over 2009-10, compared to 69 percent from network charges.

Figure 5
Electricity costs and their contribution to current price rises in 2010¹⁴



4.2.2 Competitiveness of the retail market

Despite the continued regulation of retail prices in some jurisdictions, the retail markets in the mainland states of the NEM have consistently exhibited a high level of competition. An international study recently ranked Victoria as the most competitive retail electricity market in the world, with Queensland, New South Wales and South Australia also ranked in the top ten most competitive retail electricity markets¹⁵. This study estimated that Victoria had seen customer churn of over 25 percent in each of the last three years, with Queensland, New South Wales and South Australia, all exhibiting churn rates of more

¹³ AEMC, 2011; *Strategic Priorities for Energy Market Development: Discussion Paper*, May 2011, pg 5

¹⁴ Garnaut Climate Change Review Update 2011: *Transforming the Electricity Sector – Update Paper 8*, pg 11

¹⁵ AEMC, May 2011; *Strategic Priorities for Energy Market Development: Discussion Paper*, pg 37



than 10 percent. This high level of competitiveness is at odds with the MEU's assertion that the exercise of market power has led to the creation of barriers to entry in the retail market.

4.3 Safeguards that limit the impact of high prices and exercise of market power

The NEM's inherent volatility creates financial risks for market participants. Of particular concern to the MEU are periods of high prices. There are, however, in-built mechanisms within the NEM that help limit the impact of high prices.

4.3.1 Reliability settings

The reliability safety settings - i.e. the cumulative price threshold (CPT), administered price cap (APC) and the MPC all help to limit market participants' exposure to high prices. An administered price period (APP) is triggered in a particular region when the sum of spot prices over a rolling seven day period reaches the CPT of \$187,500. This means that market participants will not bear continued exposure to high price events. Similarly, the MPC ensures that there is some limit to the prices generators can charge for the energy they produce. The reliability settings therefore play a key role in protecting market participants against the potentially damaging effects of high prices and effectively limit the ability of generators to exercise market power. Given that the CPT has only been breached on two occasions both as a result of extreme weather, indicates that there has not been many instances of sustained high prices over a given period.

4.3.2 Contract market

The contract market is instrumental in mitigating the potential negative effects of price volatility, as it allows generators and retailers to lock in firm prices. For a generator the guaranteed revenue stream provided by financial contracts is crucial in underpinning investment. Similarly, contracting insulates retailers and large customers from extreme price events which would otherwise cause financial hardship. It therefore means that any analysis of high price events must take into consideration the functioning of the contracts market.

All players large enough to be potentially classified as 'dominant' will need some form of credit facility. This would allow for the funding of purchase costs and capital spend requirements that accompany the buying of fuel and selling of electricity in large quantities. Lending institutions require that borrowers (generators) maintain a certain credit-quality standard, or risk either significantly higher funding costs, or the possibility of not being able to attain financing. To this end, credit rating agencies will require generators to have a robust risk management policy, and that the cash flows from the business are stable and predictable.

Industry standard risk management for generators is based on an 'N-1' level of contracting level against total capacity. This means for a 4 unit generator, 3 of its units will have contracts sold against them, and in order to avoid potentially large unfunded difference payments against them, these units (representing 75% of capacity) will be bid at (or near) SRMC to ensure that the contracted volume is dispatched. This also locks in a contract premium above SRMC on each MWh generated. Withholding contracted capacity from the market creates uncertainty around cash flows and with relatively few half hours over the year above cap return levels, generators will rarely risk the forgone revenue by shifting significant quantities of their contracted capacity to higher bid bands.



In order to take advantage of its pivotal position, a generator needs to have sufficient uncontracted capacity. A generator selling under contract has no incentive to withhold its capacity from the market, even if it can. As we have explained earlier, generally, generators would need to contract most of its capacity to guarantee revenue certainty and satisfy financiers. The top end of the load duration curve is very sensitive to summer and winter temperatures and a strategy of remaining un-contracted in order to play the strategic withholding game concentrates revenue into these periods and is inherently risky.

A secondary impact of N-1 contracting practice is that as demand grows, new build is required earlier in the contract market than the physical market would have required it to maintain reliability standards. From a portfolio perspective, peaking plant is effectively a physical cap contract. The proposed rule change would act to dampen volatility, reducing the incentive to contract and thus build - which may have adverse impacts on reliability standards during periods of high demand and tight supply.

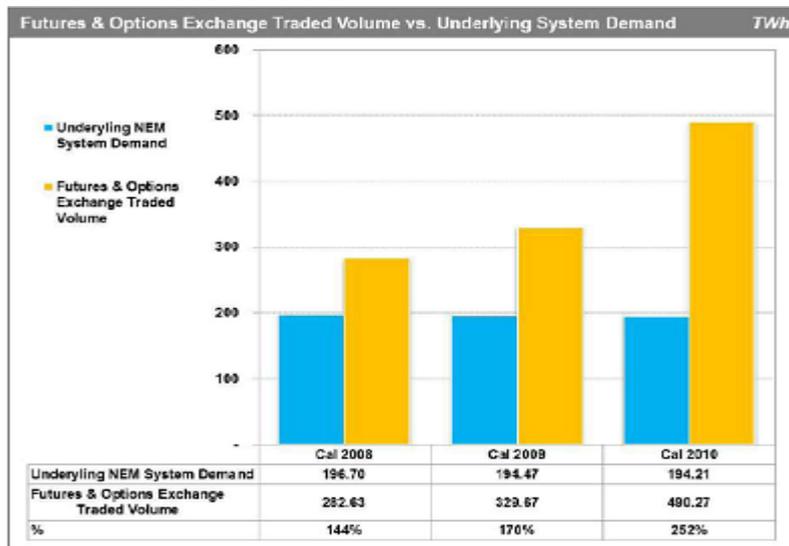
In addition to the supply of contracts by generators, the presence of financial intermediaries is increasingly ensuring the liquidity of the contract market. Financial intermediaries tend to enter the market when they believe there is an imbalance between the pricing of contracts and future spot market outcomes. In other words, the presence of the financial intermediaries would ensure that contract prices efficiently reflect the expected value of future spot prices.

Most swap contracts are negotiated 'over-the-counter' (OTC), via brokers, who publish bid and offers for various contracts, or directly between counterparties. Additionally exchange-traded contracts are becoming increasingly popular, with more standardised contracts readily available via both the Sydney Futures Exchange (SFE) (operated by the Australian Stock Exchange). Various contracts are available from periods covering up to the end of the current month, to several years in the future. Although risk policy would vary across the industry, most companies' policies would require hedge contracts to be in place at least 12 months into the future.

There has been significant growth in exchange traded contracts over the last 3 years with a move from OTC transactions to futures contracts through the SFE. This indicates that market participants have an ever growing means of managing their exposure to the NEM's volatility.



Figure 6
Growth in Traded Contracts¹⁶



The MEU’s proposal effectively seeks to replicate the risk management function that is already provided by contracting. Given the efficient functioning of the contracts market, we see no reason why the MEU’s mechanism should be implemented, particularly given that unlike the contracts market, the MEU’s proposal is likely to deter, not encourage investment.

4.4 Practical test of market power

4.4.1 Market Concentration and Spot Prices

In this section we provide a practical test of market power. If market power was a significant or dominant determinant of spot prices in the NEM then it would be expected that:

- Spot prices in regions with more concentrated markets would be significantly higher than in regions with less concentration
- Spot prices would generally be above LPMC; and
- Spot prices would be stable or closely co-related with large changes in market concentration

The following figures show the Herfindahl- Hirschman index (HHI), average spot price and estimated LPMC of the Queensland, NSW and South Australian regions over the last ten years. The HHI is widely used as a measure of concentration in competition analysis. Despite our contention that considerations around market power should be done on a NEM-wide basis, we have calculated the HHI on a regional basis to show that even if we were to look at individual regions, concentration levels are within acceptable ranges.

The United States Federal Energy Regulatory Commission (FERC) considers that an HHI of less than 1000 is “unconcentrated”, between 1000 and 1800 is “moderately concentrated” and above 1800 is “highly concentrated”. While we do not necessarily

¹⁶ D-cypha Trade



agree that the HHI captures all the dynamics of an electricity spot market it is a useful measure of relative concentration.

Figure 7a

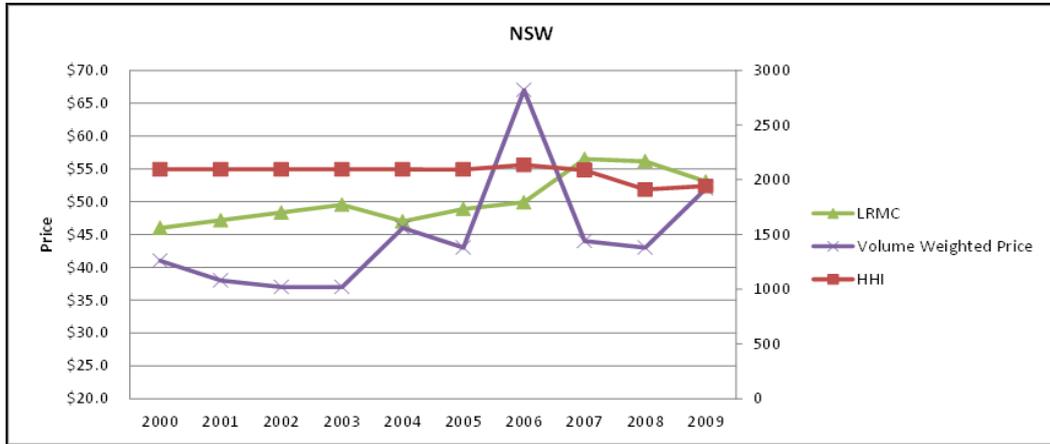


Figure 7b

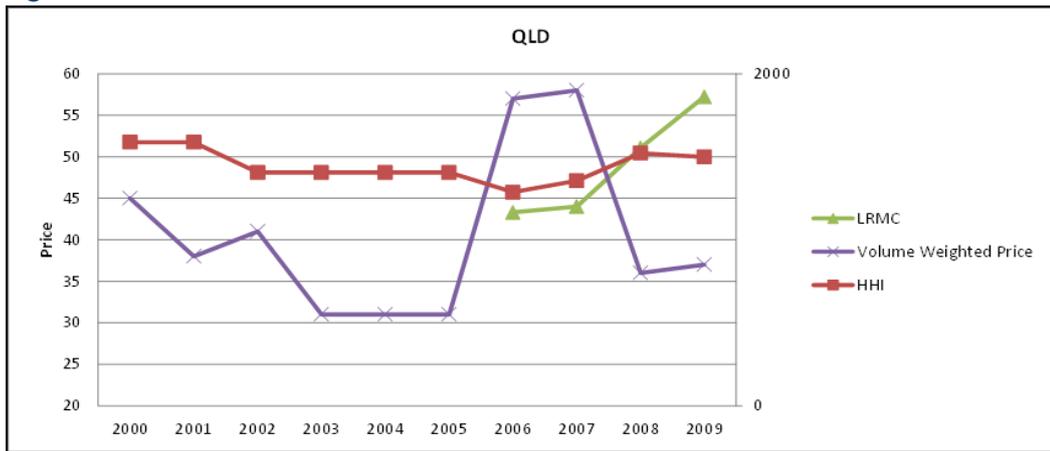
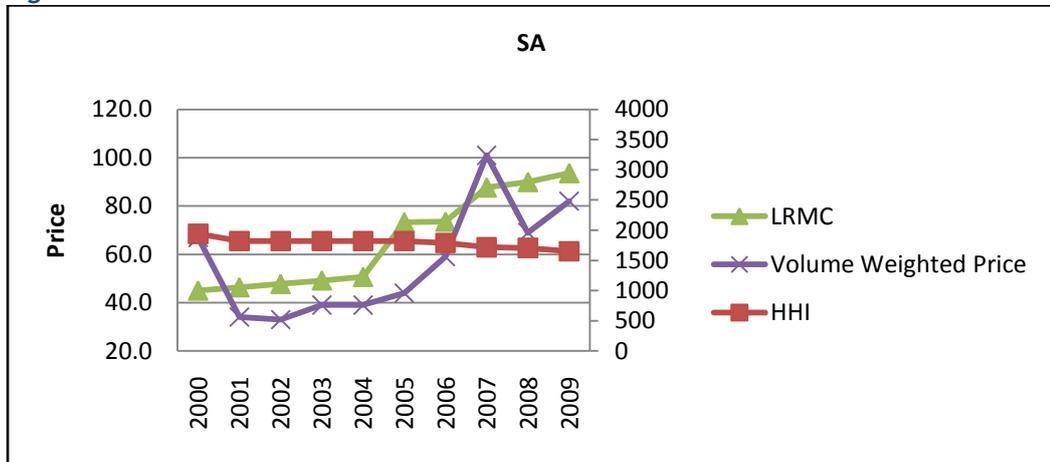


Figure 7c





Our estimate of LPMC is based on determinations from the respective state regulators - QCA¹⁷, IPART and ESCOSA on the efficient wholesale energy cost to be passed through to regulated customers. They are largely based on LPMC estimates. As these costs apply to the supply of energy to the generally more peaky domestic and small business customers a system wide cost would be somewhat lower. The regulators' cost estimates should also be treated with caution, as particularly in Queensland and NSW where Government owned generators and retailers dominated, regulated prices have to some extent been transitioning to fully cost reflective prices.

Taking into account these caveats, the analysis shows that:

- Spot prices have been volatile in all three regions while market concentration has been relatively stable. The movements in spot prices can also be clearly linked to external environmental factors—such as drought in Queensland and NSW and extreme weather conditions in South Australia;
- The estimates of LPMC are generally clearly above spot prices and where that isn't so can be attributed to LPMC prices that are transitioning to cost reflectivity or external events impacting on the spot price; and
- In the similar markets of NSW and Queensland (both dominated by black coal generators), whilst spot prices and LPMC are somewhat similar, concentration levels are not.

Taking the last point further, Queensland's average HHI is 1358 and thus would be regarded as moderately concentrated by FERC. NSW's average HHI is 2033 and would be regarded as highly concentrated by FERC. Yet both markets have quite similar spot price outcomes. It might be expected that prices in Queensland should be slightly lower than NSW as a result of lower cost coal, which is supported by the spot price data.

We also note that South Australia, with an average HHI of 1715 would only be classified as moderately concentrated under the FERC guidelines. The higher prices in South Australia can be attributed to the higher cost fuel—either low quality coal or gas when compared to NSW and Queensland. It is also noteworthy that South Australia is the only market where the HHI has declined steadily—demonstrating that investment is occurring in response to price signals.

Whilst this analysis is high level, it shows that in the NEM there is little correlation between market concentration and spot market outcomes, which is not what would be expected if there was widespread exercise of market power.

4.4.2 Analysis of High price events

In a further test of the efficient functioning of the market we examined the incidences of prices over \$5,000/MWh in NSW and South Australia over the past 5 years.

Again, if market dominance was the primary determinant of spot prices we would expect that in all these high price events, the 'dominant' generators would set the price and that high spot prices would occur whenever a generator was 'dominant'.

This analysis, however, highlights that high price events are relatively uncommon and are far less infrequent than the periods when generators are supposedly 'dominant'. This

¹⁷ QCA prices are only publically available from 2006



reinforces our contention that any theoretical dominance is tempered by commercial and practical considerations such as a generator’s contract position and the need to for thermal generators to maintain minimum generation operating levels, generator ramp rates and the like. The results are shown in the table below:

Table 1
Analysis of NSW Prices over \$5000/MWh

Date	Cause	Half Hours in NSW	NSW Only	Max Price in NSW	Marginal Generators at max price	Generators
31/10/2005	transmission	5	Yes	\$ 6,724	6	Snowy,Tarong,Eraring,Delta,Directlink
9-10/11/2005	high demand	5	Yes	\$ 9,167	2	Eraring, Snowy
7/12/2005	high demand	4	No (Qld)	\$ 8,754	1	Macquarie
2/02/2006	high demand	6	No (Qld)	\$ 9,739	2	Macquarie, Delta
20/07/2006	high demand	1	Yes	\$ 5,120	3	Macquarie, CS, International Power
11/01/2007	high demand	1	Yes	\$ 5,092	4	Enertrade,Snowy, Eraring, TRUenergy
12-28/06/2007	high demand/ low supply	17	No (Qld, Vic)	\$ 9,936	2	Macquarie, Snowy Hydro
22/10/2007	transmission	1	Yes	\$ 7,858	1	Snowy Hydro
23/07/2008	transmission	1	No (Qld,Vic)	\$ 8,455	4	Snowy, Delta,CS,Loy Yang
31/10/2008	high demand/ low supply	7	Yes	\$ 10,000	1	Macquarie
15/01/2009	high demand	1	Yes	\$ 5,210	3	Eraring, Snowy,Tarong
3/11/2009	high demand/ low supply	1	No (Qld)	\$ 6,337	4	Stanwell,Eraring,Tarong,Delta
20/11/2009	high demand	7	No (Qld)	\$ 9,284	4	Delta,Eraring,CS,Macquarie
27/11/2009	high demand	2	No (Qld)	\$ 8,933	3	Delta,Eraring,Macquarie
7/12/2009	demand/ transmission	6	Yes	\$ 9,176	2	Delta,Eraring
17/12/2009	demand	3	Yes	\$ 8,703	2	Eraring,Tarong
4/02/2010	transmission	1	Yes	\$ 5,541	4	Eraring,Macquarie,Delta
22/02/2010	demand/ unit trip	1	Yes	\$ 8,346	4	AGL,Stanwell,Eraring,Macquarie

Source: Castalia from AER reports



Table 2
Analysis of SA Prices over \$5000/MWh

Date	Cause	Half Hours in SA	SA Only	Max Price in SA	Marginal Generators at Max Price	Generators
30/11/2005	transmission	1	Yes	\$ 5,000	1	TIPS
30/01/2006	high demand	1	No (Vic)	\$ 7,758	3	Loy Yang B, Loy Yang A, Snowy Hydro
16/01/2007	high demand	2	No (Vic)	\$ 7,813	3	International Power, Basslink, Southern Hydro
31/12/2007	transmission	1	Yes	\$ 5,057	6	Southern Hydro, Snowy Hydro, Hydro Tasmania, Redbank, Bell Bay Power, Basslink
5-17/03/2008	high demand	26	Yes	\$ 10,000	3	TIPS, Infratil, International Power
23/07/2008	transmission	1	No(Mainland)	\$ 8,033	4	Snowy Hydro, Delta, CS Energy, Stanwell
13/01/2009	high demand	8	Yes	\$ 9,999	1	Infratil
28/29/01/2009	high demand	12	No(Vic)	\$ 10,000	1	TIPS
31/03/2009	generator outage	1	Yes	\$ 5,022	1	Infratil
2/11/2009	high demand	1	Yes	\$ 10,000	1	TIPS
10-13/11/2009	high demand	14	Yes	\$ 10,000	2	TIPS, International Power
19/11/2009	high demand	8	Yes	\$ 10,000	1	TIPS
9/01/2010	high demand	3	Yes	\$ 10,000	1	TIPS
11/01/2010	high demand	6	No(Vic)	\$ 9,115	2	TIPS, Loy Yang B
8-10/02/2010	high demand	9	No(Vic)	\$ 10,000	1	TIPS
31/12/2011	high demand	9	Yes	\$ 12,200	3	International Power, Alinta, Loy Yang B

Source: Castalia from AER reports

From the analysis, we can see that:

- High priced events are rare averaging around 14 hours a year in NSW and 21 hours a year in South Australia. They can generally be attributed to unusual circumstances such as record high demands, unexpected supply shortages and transmission outages or constraints. They are certainly much rarer than the periods in which the MEU considers that generators such as Torrens Island, Macquarie Generation and Delta Electricity are dominant generators. We discuss this point further below; and
- Even at these periods, the dominant generators are not always the marginal generators. This suggests that even when the system is under stress there is still competitive activity. We have carried out a further analysis of the periods in which the MEU consider certain generators to be dominant and the co-relation with high priced events. The results are shown in the table below.



Table 3
Analysis of ‘Dominant’ Generator

Year	No of ‘Dominant’ Periods	No of Corresponding High Price (>\$5,000/MWh) Periods	%	No of Dominant Periods	No of Corresponding High Price Periods	%
	NSW			South Australia		
2005-06	176	10	5.7%	59	0	0.0%
2006-07	222	18	8.1%	157	2	1.3%
2007-08	186	0	0.0%	253	52	20.6%
2008-09	489	2	0.4%	273	25	9.2%
2009-10	242	17	7.0%	332	46	13.9%
Average	263	9	3.6%	215	25	11.8%

In this table we show the number of periods the MEU considers Macquarie Generation and AGL are the ‘dominant’ generators in NSW and South Australia—that is when demand is greater than 12,000MW and 2,500MW respectively. We also show the number of high priced events—that is prices greater than \$5,000/MWh that occurred during these periods only.

The results show that the so called periods of dominance are very infrequent - 1.5 percent for NSW and 1.2 percent for South Australia. Additionally, within these ‘dominant’ periods high price events (above \$5,000/MWh) were also rare, occurring 3.6 and 11.8 percent of the time for NSW and South Australia respectively.

Interestingly, our earlier analysis of high prices also reveals that the ‘dominant’ generators did not always set the price during those limited times.

If market dominance was the key driver of bidding behaviour, it would be expected that the commercial incentives on the generators would be to set the spot price at the MPC whenever possible. The fact that this does not occur, suggests that declaring a generator to be dominant is not as simple as subtracting the generator’s capacity from the capacity of the region.

As we discussed in the previous section, economic withholding and relying on an uncertain and small number of high priced periods for the bulk of a generator’s revenue is not a practical or commercially sustainable business strategy.

4.5 The case of the gentailer

The MEU has also cited that the emergence of gentailers (i.e. vertically integrated retail and generation businesses), has led to a lessening of competition in the market. This is based on a theory that the integrated business will bypass the wholesale market and simply buy and sell energy internally, limiting opportunities for new generators and retailers alike and effectively creating a barrier to entry. Again, the MEU has provided no evidence to validate this claim.

Practically, there are sound financial and commercial incentives that ensure it is not profit maximising behaviour for vertically integrated entities to strive for balance - i.e.



to exactly match their retail load with their generation output both in volume and profile. These reasons include that:

- Gentailers will seek to diversify risks. A retailer's load is continually changing as mass market customers churn, and more significantly as the larger C&I customers (~50 - 60% of load across the NEM) change retailer. Thus, it would not be wise to completely strive for balance given that a few larger customers retendering their load and switching to another retailer might result in a material change in the retail load; and
- There is a first mover advantage in new capacity which means gentailers will tend to build 'market optimum' plant and make the additional output or capacity available to other market participants.

Therefore, for both these reasons vertically integrated entities are motivated to participate in a wholesale hedge market and have an interest in ensuring that an efficient and liquid market exists.

5 Distortionary impacts of the proposed Rule

Origin is of the view that the implementation of the MEU's proposal would have a greater negative effect on market efficiency than the perceived adverse implications of the problem it is intended to solve. In this section, we canvass the raft of distortionary impacts that would arise if the proposed Rule is implemented.

5.1 Disincentive for generation investment

A significant amount of new investment will be required in the electricity market, to meet the challenge of rising electricity consumption brought on by population and economic growth and increasing peak demand. Australia's electricity generation is projected to grow by nearly 50 per cent in the period to 2030, with forecasts indicating that up to \$32 billion of investment in generation could be required by 2020.¹⁸ The mere existence of the MEU's proposal threatens generation investment by adding to the environment of policy uncertainty that has already taken hold due to a lack of clarity surrounding how climate change objectives will be met.

If the proposed Rule is implemented the disincentives for generation investment will be even more pronounced given that it:

- Imposes pseudo capacity market, without a guarantee of recovering LRMC. The requirement that the 'dominant generator' make all its capacity available at \$300/MWh, at times of high demand, is akin to a capacity market, without the assurance of the requisite capacity payments needed to guarantee that the generator is able to recover its LRMC. The MEU would argue that since \$300/MWh is well above the SRMC this implies that LRMC would be recovered. The problem with this approach is that generators would not be assured of earning sufficient revenue to cover LRMC over the entire period it operates (i.e. combination of high and low price periods). Remember that high price events occur only a few hours each year and for the majority of times a generator would be earning close to its SRMC. The MEU's proposal introduces a hybrid framework whereby a capacity market would apply at periods of high demand and the incumbent energy only

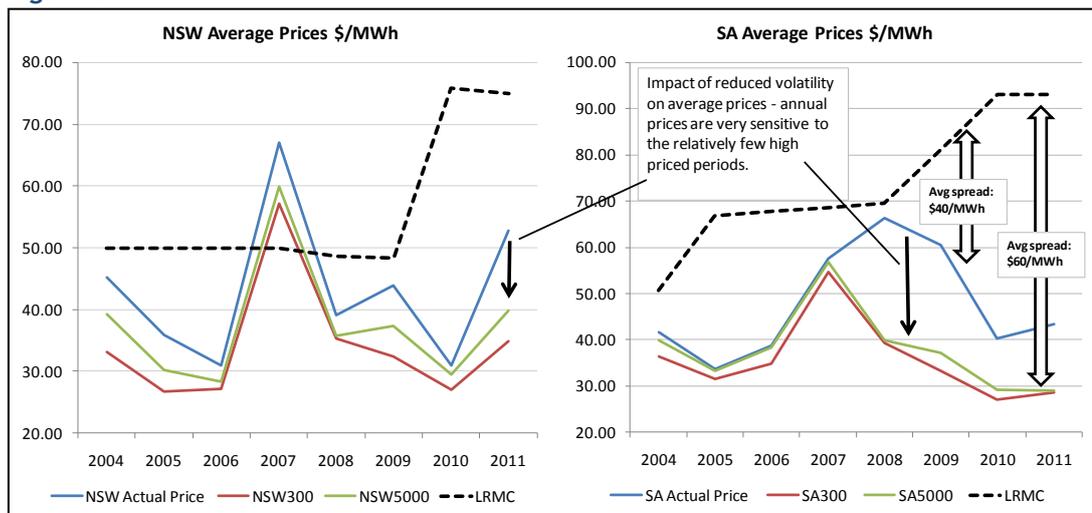
¹⁸ AEMC, 2010: *Transmission Frameworks Review Issues Paper*, August 2010, pg 9

market at other periods. This in our view is unworkable and does not present a clear view of potential future earnings, which is crucial when contemplating investment decisions. If the MEU is as it claims concerned about competition in generation sector, it seems illogical to introduce a mechanism that will disincentivise investment and effectively stifle competition.

Volatility plays an important role in signalling the need for new entrant generation. Analysis was conducted on historical spot prices over two scenarios. The first scenario calculates the impact on average spot prices where all prices above \$300/MWh are capped at \$300/MWh. In the second scenario prices above \$5,000/MWh are capped at \$300/MWh. As evident from the below charts, prices above \$5,000/MWh constitute a significant portion of the average price over the year, despite only occurring a relatively small proportion of the time. Averaging the shortfall between LRMC and average price over 2009-2011 shows that restricting cap returns above \$5,000/MWh to \$300/MWh, would increase the gap between LRMC and the spot price from \$40/MWh to \$60/MWh in SA, and from \$23/MWh to \$30/MWh in NSW.

This indicates that artificially suppressing prices distorts investment signals and works against the provision of reliable supply as demand grows over time.

Figure 8



- Acts as a disincentive for financial contracting. Ultimately it is the contracts market that underpins investment in the NEM. The imposition of the APC at times of high demand would have negative implications for contracting given that it is the presence of prices above \$300/MWh that creates the incentive for retailers to contract (particularly for peaking capacity). This is why the MPC is as high as \$12,500/MWh - without a sufficiently high spot price retailers have little motivation to enter into contracts with generators, which means that generators will not receive the revenue assurance needed to underwrite investment. The MEU's proposal would effectively allow for the provision of cap contracts for free, which would harm investment threatening the meeting of the reliability standard. By capping the price at \$300/MWh the MEU seemingly assumes that this will result in lower pricing outcomes that would be beneficial to the market. The Reliability Panel made the following observation in relation to artificially low prices which we consider to be applicable in this situation:



'It should also be noted that while artificially high prices may have a financial impact on consumers, artificially low prices due to retailer market power or the (inadvertent) effect of policy initiatives will eventually lead to reduced investment and low reliability, also to the detriment of consumers'¹⁹.

Forces the build of smaller generation. The revenue uncertainty that the proposed Rule imposes would result in potential generators seeking to avoid being classified as a 'dominant generator'. The net result of this is that investors (if they do decide to enter the market) would seek to build smaller generation units (below the threshold where they would be classified as dominant). Similarly, existing 'dominant generators,' and those on the cusp of being classified as dominant would be reluctant to undertake any further investment. These outcomes are not ideal given the investment challenge currently facing the market over the next decade; according to the AEMC up to \$1.5b in new generation investment will be required in the next five years alone²⁰.

Additionally, there are negative implications for productive efficiency given that smaller build would not allow for scale benefits that are critical to reducing costs. Again, it is consumers that will ultimately pay the price for this inefficiency.

5.2 Administrative burden

The MEU's proposed rule would introduce a level of administrative complexity if it is to be made operational. Firstly, the classification of 'dominant generators' is likely to change over time in response to a number of factors including: demand; market concentration; network and generator outages; and transmission constraints. The AER would be required to constantly update the classification of dominant generators in response to these variables.

The AER would also have to conduct an ex-post review to ensure that the 'dominant generator' made all its capacity available at the APC, once the demand threshold is triggered. The MEU considers that given this activity is a regular feature of a capacity market, the AER should be able to readily carry out this function. Specifically the MEU anticipates that the AER would need to ascertain:

- The amount of capacity already in use before the introduction of the price control;
- The amount of capacity offered subsequent to the removal of the price control;
- Amounts of capacity offered at other times (particularly in the days before and after the times under investigation) when the price control did not apply;
- The previous demonstrated ability of the generation plant to ramp up and down as demand requirements change; and
- Whether the decision to remove some plant elements from service when there was an expectation of a high demand, was warranted or appropriate.
- Whether any capacity limits imposed during the time of the price control were necessary or typical of limits applied at other times.

All this places a sizeable burden on the AER and reduces the time available to carry out its core functions.

¹⁹ AEMC Reliability Panel: *Comprehensive Reliability Review, Final Report*, pg

²⁰ AEMC, 2011: *Strategic Priorities for Energy Market Development: Discussion Paper*, May 2011, pg 27



5.3 Change of incentives for other bidders

- Essentially if a generator is declared dominant, for e.g. Macquarie Generation in NSW when demand is > 12,000MW, anytime demand exceeds this level, all other generators would have perfect information on Macquarie's bid (i.e. it will bid all of its capacity at \$300/MWh or less). This effectively transfers the 'dominance' to all other generators which can then decide if they want to be dispatched—bid at \$299 or at some higher price. The proposed Rule allows the 'non - dominant generators to be forearmed with perfect information regarding the 'dominant generators' bid and thus increases the prospects of gaming. This in our review represents a significant market distortion.