Australian Energy Markets Commission

Congestion Management Review

Comments on the

Directions Paper

by

The Major Energy Users Inc

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The content and conclusions reached are entirely the work of the Major Energy Users Inc and its consultants.

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Executive Summary

> "The Terms of Reference (ToR) for the Congestion Management Review (CMR or "the Review") require the Commission to:
>
> - identify and develop improved arrangements for managing financial and physical trading risks associated with material network congestion – clause 3.1; and
> - clearly articulate the relationship between a constraint management regime and other matters impacting on congestion, including TNSP incentive arrangements, the Last Resort Planning Power and the Regulatory Test – clause 3.2,"

The MEU notes that the AEMC is required by the MCE to address the matter of congestion in a holistic manner. Unfortunately the AEMC has decided in its Directions paper to assume that the issues affecting the physical aspects of congestion to be assumed as addressed by the implementation of the changes made to the transmission revenue, regulatory test and last resort planning reviews. The Directions Paper almost exclusively addresses only the risks on Market Participants and in financial terms only.

The single market objective of the National Electricity Law is:-

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

This seems to clearly identify that issues in the electricity market are to be addressed in terms of the impact on consumers, yet the issues addressed in the Directions Paper are almost never addressed in terms of consumer needs and impact.

What is essential is that the approach to congestion management must result in the most economically efficient outcome which provides for "the long term interests of consumers". This outcome can only be assessed in light of the costs incurred by consumers resulting from congestion.

The current approach to constraints is that congestion so far has been addressed as a technical and risk problem, rather than a commercial one which has a high impact on consumers. What is being seen is that a major proportion of the average annual regional pool prices is attributable to a very few but excessively severe price spikes caused mostly by price separation between regions resulting from congestion.

The AEMC Directions Paper does move the debate more into the commercial arena but in its very discussion it excludes the costs of the commercial approaches to congestion as they are seen by and applied to consumers. The basic assumption made is that if there is a financial tool available to mitigate the risk of congestion on Market Participants then it is the aim of AEMC to ensure this is developed. In some ways this is not an unreasonable approach, yet the use of these financial tools must be assessed ultimately in terms of the cost on consumers.

The MEU considers that for the AEMC to see that the aim of the Directions Paper is to develop risk management tools for financial protection of Market Participants fails the aim of the Single Market Objective which requires the AEMC to develop an approach which is in the long term interests of consumers with respect to price, quality reliability and security of electricity supplies.

There is no doubt that congestion is the result of the network being undersized for the duty being demanded of it at a particular point in time. If the costs to consumers for managing the outcomes of this congestion are greater than the costs to consumers for relieving the congestion, then the network needs to be augmented.

What the Directions Paper fails to do is to link the assessment of the costs of financial management of congestion to Market Participants (and which are then passed onto consumers) to the costs to consumers of physically relieving the congestion. The AEMC must identify what the costs of congestion are to consumers in order to assess what the costs for financial management of congestion. In its section on measuring the impact of congestion, it only addresses this matter in terms of the pool prices seen, and fails to include the costs passed onto consumers by generators and retailers to manage the risks **if congestion might occur**. The costs for this additional cost are real and paid by consumers so they need to be assessed and included in the costs for financial management of congestion

The assumption throughout the Issues Paper was the need for certainty for the NEM Participants. This trend has continued through the Directions Paper as it seeks to provide financial tools to mitigate the risks to Market Participants of congestion. What is totally absent from the assessment is the need for consumers to have certainty that they are receiving the lowest reasonable pricing for delivered electricity, that pricing will not be increased unnecessarily and that the NEM does not provide excessive and unearned profits for Participants.

The AEMC states (page 47)

> "…the Commission has already undertaken substantial work on the matter of transmission investment and incentives and therefore does not intend to pursue further consideration of these issues as part of the CMR. The Commission is interested in receiving submissions on whether there are specific issues relating to transmission network incentives that should be further pursued in the context of this review."

This implies that in its way forward on assessing the financial risk management tools available, the AEMC will not re-address congestion in terms of the physical network as these are seen to have been addressed in the Transmission revenue and pricing Rules, the revision of the Regulatory Test and the decision on Last Resort Planning.

The MEU considers this approach somewhat bizarre, as it is inadequate physical resources that causes congestion and therefore the need for a financial approach. If the costs for managing the financial approach exceed the costs for augmentation, then it becomes logical that the physical fix should proceed.

As it is consumers that pay the costs of physical augmentation, then this cost must be balanced against the cost to consumers for the financial approaches to congestion management. This point seems to be entirely lost in the Directions Paper.

The MEU has consistently seen interventionist approaches being proposed to address issues which might in reality be fatal flaws in the market design and/or in the regulatory approach, and that these should be addressed rather than consistently applying "patches". Certainly it must be seen that a major issue is there is a lack of incentives for generators to locate where they add the most value and reduce the degree of congestion.

The MEU does accept that there are a number of potentially useful approaches discussed in the Directions Paper. Equally, it sees that many of these approaches have an outcome that will increase risks to Market Participants. As noted in earlier sections, the costs of these risks are passed onto consumers, who are also the parties who pay the costs for augmenting ton the transmission network to reduce congestion. The MEU points out that these costs for managing risks must be incorporated into assessing the benefits and detriments of augmentation, which will actually reduce congestion and the costs that congestion causes.

1. Introduction

The MEU

The Major Energy Users (MEU), which comprises some 20 major energy using companies in NSW, Victoria, SA, Tasmania and Queensland, welcomes the opportunity to provide comments on the Review of Congestion Management. In particular, the submission represents the views of the Energy Markets Reform Forum (NSW), Energy Consumers Coalition of South Australia and the Energy Users Coalition of Victoria.

Analysis of the electricity usage by the members of MEU shows that between them they consume about 5% of the electricity generated in the NEM. Many of the members are located in regional parts of Australia, some distance from the regional nodes. As such they are highly dependent on the transmission network to deliver the electricity so essential to their operations. Being regionally located, those members also have an obligation to represent the views of their local suppliers and of the regionally based workforce on which the companies are dependent. With this in mind, the members require their views to not only represent the views of large energy users but also those of smaller power usage facilities and residences located near to their regional operations.

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

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

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

member companies have become increasingly more dependent on the quality of electricity and gas services supplied.

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

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

The members of MEU have identified that congestion (be it in electricity or gas supplies) leads to lower reliability of supply and resultant increased costs. Members have been both constrained off due to congestion of supply. They have seen higher prices result from inadequacies in the energy delivery systems and have observed and experienced a number of perverse outcomes resulting from the application of the rules and regulations over allocations of limited supplies of energy over the past decade.

One such perverse outcome has been the limitation (and even exclusion) of national wealth creating industries from essential energy supplies, in order to provide energy supplies to those who have created the shortage, but are not required to pay any premium for these limited supplies.

The MEU appreciates the opportunity to review and further comment on the extent of congestion in the NEM and the impact it has on consumers.

2. Views of MEU and members relating to congestion

2.1 Is there a problem with congestion?

It is informative yet perplexing that solutions proposed by the various supply side entities all focus on one of two approaches – the first is that there is no problem but if there is a problem it is only a small problem and doesn't need much attention. The second proposition is that there is a problem, the costs for resolving this should be borne by consumers, as we of the supply side will do the "right thing" to minimise costs to consumers – after all if consumers did the "right thing" there would not be a problem.

This whole approach is addresses the problem from the wrong direction. Without consumers there would be no need for an electricity supply system. We consider that the AEMC is approaching the resolution of a very real problem from the wrong direction as it is the needs of consumers that give rise to the electricity supply system, and therefore solutions must start with consumers.

The national electricity system was developed on a state based approach, with each state determined that it would supply the needs of its state based consumers, and each state determined that it would use its electricity supply arrangements as a tool to encourage downstream investment in its state, and not in another. Whilst this short sighted approach might not have been in the national interests, it certainly was correct in one aspect – that the interests of investing consumers (ie downstream activities) were the focus of the electricity supply industry. What we now see is that the interests of consumers are being put to one side in the interests of the electricity supply side and their needs, **and to encourage investments made by the electricity supply industry.**

2.2 The NEM is not national, and is weakly interconnected

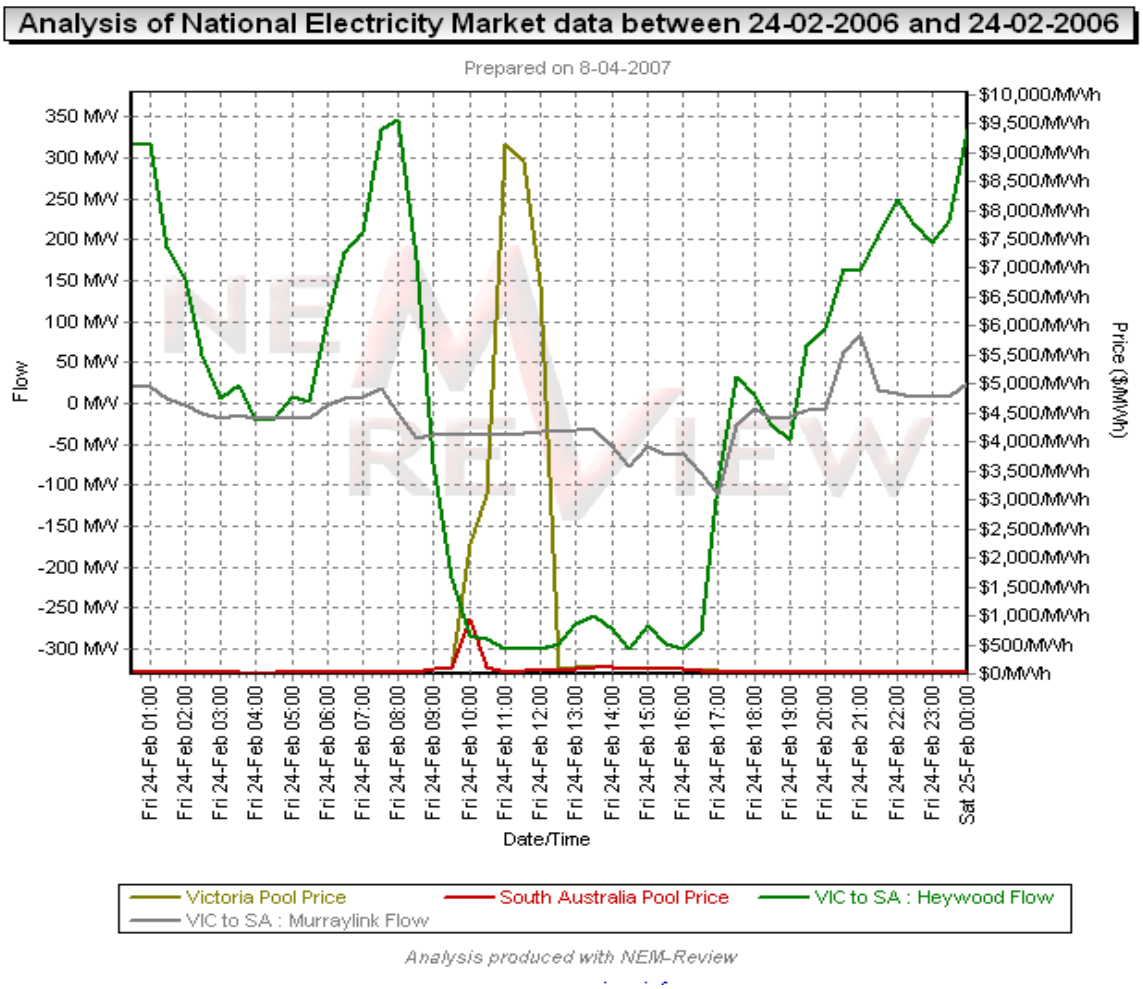
In its earlier submission the MEU pointed out that the NEM is a series of interconnected regions, and not a national system. It is pertinent to recognise how little work has been carried out to develop a national electricity market. The first major interconnection between states was via the Snowy development, which started to provide power to NSW and Victoria in the 1960s. The design of the electricity effectively permitted some transfer between NSW and Victoria, yet its prime purpose was to allow generators in the scheme to direct power to the state most in need – effectively there not so much of an interconnect but an ability to supply power from Snowy's generators to both states. In the late 1980s

an inter-connection was built between Victoria and SA. This was the extent of interconnection prior to the NEM commencing.

Since the commencement of the NEM there has only been one major augmentation of the NEM carried out as part of the transmission network – QNI was built to connect NSW and Queensland, and this was a required precursor to Queensland entering the NEM. Additionally there has been some augmentation of the Victorian network to permit greater flows from Snowy into Victoria.

There have also been three private interconnections built – Directlink (NSW to Queensland), Murraylink (SA to Victoria) and Basslink (Tasmania to Victoria). Of these three only Basslink has added considerably to the national grid – probably because it was a Tasmanian government initiative, effecitively underwritten by Hydro Tasmania. Both Directlink and Murraylink have been financial failures, resulting in the effective sell off of the two to consumers for a discounted price. Even at these discounted prices neither Directlink nor Murraylink provide consumers with full value, as there are many times when neither can transfer supply at maximum capacity when they are needed to do so. This inability is a result of congestion in the networks either supplying to or delivering from these “white elephant” interconnectors.

An example of this is shown in the following chart.



This shows that at a time when the Victorian regional price was high and Heywood flow was at a maximum, the ability of Murraylink to relieve the constraint between SA and Victoria was heavily constrained to about one third of its capacity. This is typical of many occurrences where these poorly located interconnectors have failed to deliver the capacity being paid for.

The import of this explanation is to highlight that there has been little in the way of interconnection between what were developed as quite disparate regions based on state needs, and that little has effectively changed since the advent of the NEM. Despite this lack of inter-regional augmentation, there is a belief amongst the regulators that we have an integrated national market. This is basically a false assumption, and as a direct result consumers see that there are attempts to make these disparate supply regions be seen for what they are not.

The experience of consumers is that the NEM is not a fully integrated network, but is more a series of interconnected regions. When each of the interconnections is constrained from passing power from one region to the adjacent one, the MEU members have seen the regional price spike. Whilst most MEU members are insulated from the direct impact of these price spikes by the retailer management practices, the pricing members are provided with includes for the costs of the premiums for risks faced by retailers (and generators) and which are passed onto each consumer. Thus the cost of the price spiking as each region is constrained is in reality passed onto consumers.

It is in this way that members of MEU have been consistently disadvantaged by the extent of congestion in the NEM.

2.3 Consumers and congestion

Congestion in the NEM is a direct result of the incapacity of the transmission networks to transfer all of the needed energy from one area of the NEM to the next. The direct result of this incapacity is that either consumers are constrained off supply, or that out of merit generation is dispatched to ensure continuity of supply. Being constrained off supply is a major problem for consumers, as the supply of electricity is an essential service, and it is seen by most consumers that the loss of supply comes at a greater cost than the premium required to be paid for constraining on generation. Consumers see that the constraining on of generation to continue supply is not necessarily economically efficient, but certainly results in higher costs to consumers.

Congestion is clearly a deficiency in the infrastructure, and much of it results from the historic approach to jurisdictional management of electricity supplies. When this is compounded with Rules which actively have prevented sensible augmentation of the networks to reduce congestion and has permitted generators to use their undoubted market power, the resultant has been excessively high costs to consumers due to high base prices for electricity and very high retail premiums to address volatility and severe pricing spikes.

The National Electricity Law states that:-

> *"The national electricity market objective is to promote efficient investment in, and efficient use of, electricity services for the long-term interests of consumers of electricity with respect to price, quality,*

reliability and security of supply of electricity and the reliability, safety and security of the national electricity system."

What therefore concerns consumers is that the AEMC has not addressed the issue of congestion in terms of consumers – it proposes to focus on (see page 81):-

- "more refined pricing approaches such as limited generator nodal pricing, CSPs, and constrained-on payments that do not involve funding using an uplift charge on energy transactions;
- improved basis risk management instruments, such as enhancements to the IRSR framework of varying degrees, FTRs, CSCs, and CBRs;
- the provision of additional information, particularly on the current level and implications of congestion; and
- a review of clamping and any intervention alternatives for the management of counter-price flows."

The AEMC goes onto state (page 81) that it:-

"… does not intend to revisit matters that were addressed in the revenue of transmission regulatory arrangements or issues surrounding the delineation and allocation of TNSP and NEMMCO roles and responsibilities."

The MEU pointed out in its response to the Congestion Issues Paper that it was concerned that it is the very shortage of transmission infrastructure combined with a lack of locational signals to generators that is the cause of congestion. The MEU is therefore at a loss to understand the essential disconnect in the AEMC approach to exclude addressing the issue which is essentially a shortage of transmission capacity.

The Electricity Law single market objective requires the AEMC to address issues in the electricity market in terms of consumers and the impacts on them. To implement that, costs to consumers of the alternatives to reducing the impact of congestion on them, requires one of four solutions

1. Do nothing and retain the outcomes as present, addressing the risks of congestion in terms of cost
2. Augment the transmission network to relieve the congestion

3. Increase generator investment to reduce the power flows causing the congestion
4. Encourage consumers to reduce their demand at times of congestion

The alternative which results in the least cost to consumers in the long term of these four is what the Law requires. To fail to address the issue of congestion in terms of these four alternatives is a failure on the part of the AEMC.

It is noted that the AEMC has observed that these outcomes are possible, but it then goes onto comment (on page 7) that

> "… it has already undertaken substantial work on these latter [reducing the trading risks associate with congestion indirectly by tackling the level of congestion itself] types of measures. For example, the Commission recently completed its review of transmission revenue and pricing, which should promote more timely transmission investment and sharper incentives to maximise network availability. These issues are critically important and impact on the overall levels of congestion; however, given their earlier treatment, the Commission does not intend to consider these issues further as part of the CMR."

Whilst this observation has some merit, the outcomes of these other approaches must still be considered within the overall context of congestion management. The AEMC must not exclude such elements, as they are integral within the entire scope of the issue

2.4 Who pays the piper, should call the tune

A key aspect of congestion that is frequently overlooked is that consumers are the parties levied almost all of the costs of transmission as generators are only levied with the costs of "shallow connection" to the NEM. As congestion causes costs to consumers augmenting the networks to reduce the costs of congestion provides a key benefit to consumers. An un-congested NEM results in the lowest cost of power generation to all consumers, but at the highest cost of network provision. On the other hand, by having less network provided (and so reducing its cost) constraints do occur causing out of merit order dispatch of generators (at a cost to consumers) and allowing generators to use congestion in the NEM to increase the price of power as is clearly shown in appendix A.

There is a point at which the overall cost to consumers (of transmission and generation) is at its nadir. This is the task of the AEMC – to identify the point at which the optimum transmission is provided and to minimise the cost of generation. The AEMC can only do this if it takes a holistic approach (ie incorporating all aspects of congestion) rather than just a few elements.

It is also essential that the AEMC address the ways in which consumers see the costs resulting from congestion so that it addresses the costs that consumers actually see. The whole approach taken within the Directions Paper implies that it is only costs to Participants that the AEMC is interested in.

The AEMC sees that the costs of congestion can be managed in a physical way (ie encouraging TNSPs to make their assets available at times of most need, to increase the assets transportation ability by augmentation, etc) or in a financial way. Such financial approaches include:-

- retailers requiring consumers to accept regional price risk
- a retailer seeking a price cap (or cap and collar) from a separate generator
- a Participant (retailer or generator) hedging its exposure with another Market Participant
- different bidding approaches by generators depending on the location of the constraint
- entering into swap arrangements
- purchasing IRSRs

Regardless of the availability of these various financial tools to manage the risk, there is a cost involved and this cost is effectively passed onto consumers by the Market Participant. It is not sufficient for the AEMC to just recognise that these risk management tools are available, it must also assess the cost of these tools so that the costs can be assessed in light of other alternatives (such as augmentation) in order for the lowest cost option is readily available for consumers.

2.5 Regulatory Test and congestion

It is noted in the discussion in the Final Determination on the Regulatory Test that the AEMC decided that the savings made by consumers in the regional price markets by paying for augmentation of the transmission network was to be carefully assessed as there is a concern that the overall efficiency of the

electricity market could be negatively impacted[1] by using a "consumer benefits test" rather than the preferred "market benefits test ". The AEMC approach implies that the assessment of the benefits should be symmetrical between generators and consumers.

The problem arising from this decision is that the costs associated with the provision of the transmission network are not equally symmetrical, with the competitive supply of generation being granted low cost access to the transmission network, completely independent of the generator location. Thus the outcome of this Regulatory Test determination is that signals for generation are effectively independent of the network arrangements when a generator decides on its location. The result of this is that as a generator has reduced locational signaling, there is a greater potential for increased congestion. It is consumers (not generators) that will pay for the costs of relief of the congestion so created.

Further, congestion creates tension between a generator that should be dispatched under the merit order but is prevented from being dispatched by the constraint in the network, and the cost for a generator bidding high in order to get paid a premium price for being effectively constrained on and being dispatched out of merit order. The Regulatory Test does not recognise this cost to consumers or the constrained off generator, and only sees that the premium cost of the constrained on generator is "a transfer of wealth" which needs to be paid by those consumers in the (now) isolated region, and the effectively constrained off generator suffers from not being able to sell its product to willing buyers.

Thus the "transfer of wealth" argument supporting the "market benefit test" excludes the impact on a willing generator wanting to sell to willing buyers but the trade is prevented because of congestion.

2.6 The cost of congestion can impact more then the two regions connected

A constraint between regions can have a major impact elsewhere.

Congestion is where a generator cannot sell its product to a demand centre, and is constrained off even though its power is priced lower than the power from

[1] Eg Page 52, AEMC, Final Rule Determination (Reform of the Regulatory Test Principles),30 November 2006

another generator that can deliver its power to the same demand centre but wants to do so at a higher price. Thus a generator willing to be dispatched at a price lower than one in a remote region but cannot supply due to constraints across the adjacent region and into the remote region, is also constrained off. Thus even though the adjacent region and the remote region might have similar high prices, and generator's region has a low price, the price in the remote region is still indicative of constraints in the system.

Consider that QNI is constrained. As NSW is now a nett importer of electricity, it relies on maximizing power flows from Queensland on QNI and to a lesser extent on DirectLink, backed up consistently with supplies from Snowy. It should be remembered that Snowy was built to provide peaking power to NSW[2].

With both NSW and Victoria seeking power from a reduced output Snowy, prices of supplies from that source will rise. Despite this there is surplus generation in Queensland but which cannot be available to NSW which in turn reduces supplies ex Snowy for Victoria. Implicitly this means that the constraint on QNI has a direct impact on the costs for power in Victoria.

Just because Victoria is not connected to Queensland, does not make its high price not the result of congestion between Queensland and NSW – it is a result of congestion and needs to be recognised as such. Thus, for analysis to only assess the cost of constraints between connected regions,is to exclude a significant element of congestion.

2.7 Inter-regional price uncouplings are the result of congestion

When there is a price uncoupling between regions, (and as noted above where the impact of the price uncoupling is referred to another unconnected region) this is the result of congestion on regional interconnectors. The price differentials are a prima facie indication of the severity of the uncoupling. For the purposes of analysis, it has been assumed that where a regional price exceeds $300/MWh, it is the result of congestion, although it is accepted that congestion can result in

[2] With the drought, Snowy cannot provide as much power and what power it does is primarily from pumped storage using night time generation from NSW and Victoria. Similarly Victoria has been the recipient of power from SA as the drought has reduced power supply from the Victorian hydro schemes.

lower prices, and therefore the base assumption does not include the costs of all congestion.

It might be said that the assumption that using a cut off of $300/MWh is flawed, in that two adjacent regions could both have this high price, and that this indicates there is no congestion. This is true, although the frequency of such occurrences is rare. The two adjacent regions both have elevated prices has been observed, for instance between Victoria and NSW, but this frequently occurs at a time when the Queensland price is lower, implying that there was spare capacity available in Queensland but due to constraints on QNI (and Directlink) this spare capacity was not available for use in NSW. As noted above, this would result in NSW and Victoria both competing for limited Snowy resources, resulting in similar regional prices. Thus the constraint on QNI cause high prices in both NSW and Victoria, implying there is no constraint between NSW and Victoria, despite their similar high prices.

On this basis there is a clear view that regional high prices are the result of congestion and a lack of competition between generators. There is also a clear view that when congestion occurs, generators can and do exercise market power (see appendix A).

Congestion also can lead to prices rising often for just a five minute period, even when demand is low. A rise to VoLL for just a 5 minute period, results in a half hour price of more than $1667/MWh. The frequency of prices about this value was between 20- 25% of all prices over $300/MWh in 2006, indicating that five minute price excursions are frequent causes of elevated regional prices.

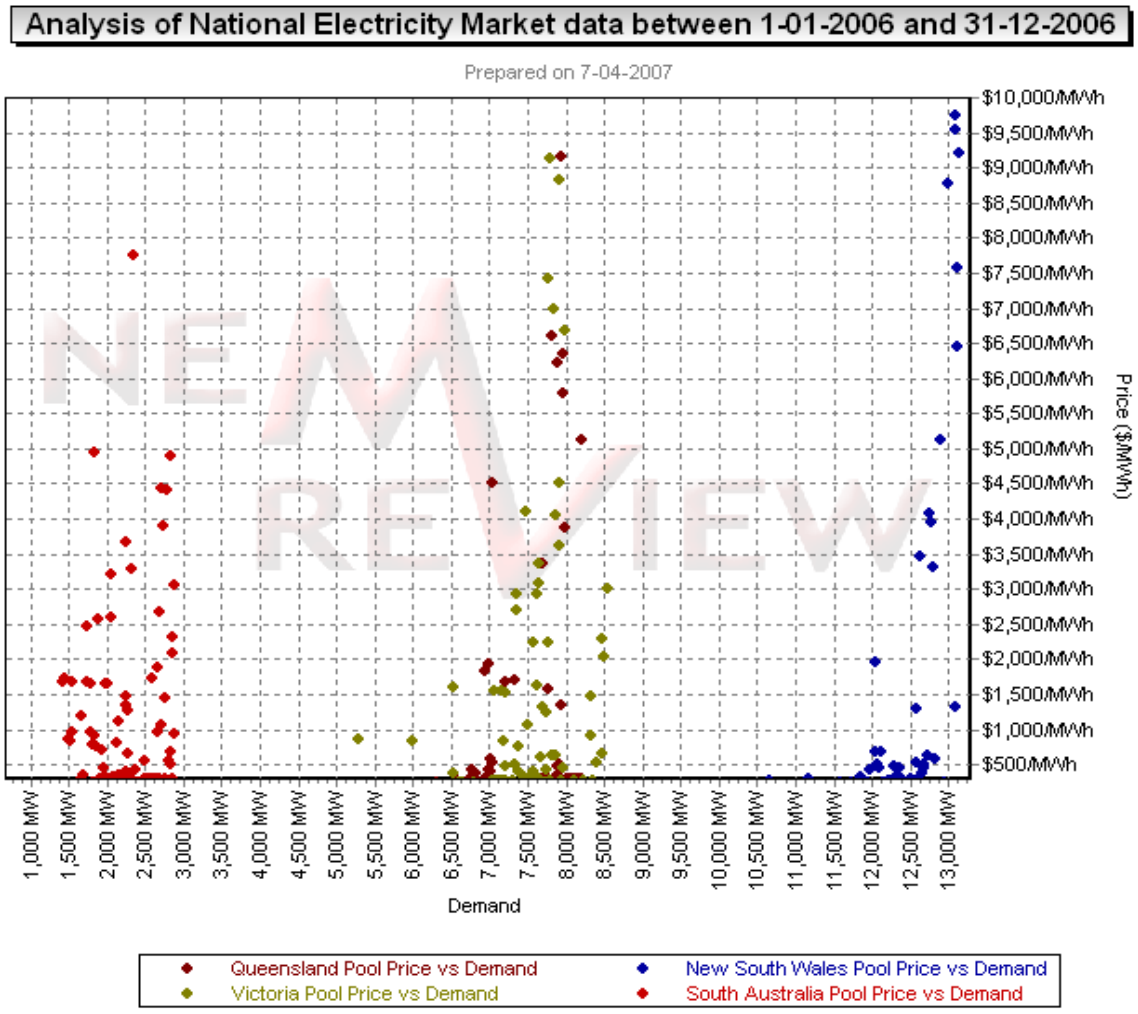
2.8 What is the outcome of congestion?

The outcome of congestion seen by NEMMCo is the out of merit order dispatch of generation. This often results in modest increases in the cost of generation in the region (or sub-region) affected.

What is not so readily recognised is that congestion results in more costs to consumers. The Directions Paper discusses a number of additional cost outcomes to market Participants. As is now the typical approach by the AEMC, the Directions Paper addresses only the impacts on Market Participants, and by failing to address the problem from a consumer's point of view, it misses a significant part of the resultant costs to consumers.

Congestion increases costs and risks. The Directions Paper acknowledges this, but only as far as the impact on market participants, but does not address the impacts on consumers. Retailers must add the costs of the risks resulting from the congestion to the costs they pass onto consumers.

In 2006, the impact of price spikes above $300/MWh (the result of congestion) added nearly $7/MWh[3] to the average annual volume weighted NEM pool price, but there were only some 168 price spikes above $300/MWh across four regions.



Source data: NEMMCo and NEM Review

[3] See section 3.2 below

The above chart shows the number of price spikes above $300/MWh for Queensland, NSW, Victoria and SA. Because of the severity of these relatively few price spikes, retailers must add significant premiums to accommodate the risks they face. Additionally generators add a risk premium to manage the risks they face when contracting with retailers.

These risks and costs are:-

1. Congestion increases the average regional wholesale price which is used as the basis for assessing risk premiums.
2. To these costs, generators add a risk premium to their firm generation costs to manage their exposure to plant failure at times of high prices.
3. Retailers attempt to match demand to their firm contracts, yet there is an inevitable mismatch. The risks associated with this mismatch have to be managed. This mismatch is exposed to the prices occurring when price spikes occur
4. As congestion is not predictable, (a review of the price/demand curves for each region supports this), a retailer's risk mitigation program must apply at all times.
5. The severity of the price spikes occurring as a result of the congestion is enormous (often due to the ability of generators to exercise market power), so much so that a retailer cannot afford **not** to take risk mitigation measures. To overcome these risks, retailers add the cost of securing a $300/MWh price cap which is included in the retailers price to consumers – the average cost of these, regardless of the region, exceeds $10/MWh[4].

There is still the cost of the risk of the price rising above the regional volume averaged price, but remaining under the $300 cap. Different retailers address this risk in different ways, but the outcome is the same for consumers.

The SA regulator (ESCoSA) has estimated these risk premiums[5] for residential consumers. When compared to the average of the preceding financial year pool

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[4] From d-cyphaTrade website 11 April 2007

[5] ESCOSA, *Inquiry Into Electricity Standing Contract Prices Final Report And Determination*, October 2002, page 22.

price of $37/MWh for peak periods these risk premiums add to some $28/MWh[6] to reach the cost consumers see. Of this about $10/MWh (28% of the average peak time pool price) is generator risk margin (ie generator contract premium above peak time pool price), and $18/MWh (49%) was for retailer risk mitigation. To this were retailer costs and margin of $10/MWh (27%).

To put these risk premium costs into perspective, residential electricity demand is about 20% of the total electricity consumed in the NEM. There is an average demand in Queensland, NSW, Victoria and SA of 22 GW. When the premium of $10/MWh[7] just to pay to avoid prices above $300/MWh being carried by retailers is added to the cost of power for residential consumers the cost of this risk mitigation needed because of congestion causing excessive price spikes is some $400 million per year, just paid for by residential consumers. Industrial and commercial users of electricity also incur costs to manage just this one risk extant in the NEM.

Risk mitigation is not a value adding process. The average price in the NEM used by retailers as the basis of their pricing (and used by ESCoSA) already includes for the impact of prices above $300/MWh. In the workings of ESCoSA the price paid by residential consumers uses the average pool price as a starting point (ie it included the impact of price spikes above $300/MWh). Then the risk premium payments were added. Effectively the ESCoSA approach allows for the cost of the price spikes in the base price then adds the cost to mitigate the risk on top. If the cost for risk mitigation is effectively only insurance for the retailer, the cost of this risk mitigation must be additive. Therefore this “insurance” cost must be seen as an actual cost which is the result of congestion.

Whilst this example applies just to residential consumers, the same principle applies to lesser extents for consumers with more predictable demands.

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[6] The peak time period was set at 7 am to 11 pm week days to develop the average pool price

[7] This risk premium is most commonly priced by peaking generation such as Snowy Hydro. Thus it is a contribution made by consumers to generators. As the value of VoLL is related to the cost needs of peaking generators, and there are adequate periods of prices where the price needs of these peaking generators are met, the risk premium paid for a $300/MWh cap **is additional** to the recovery made under the energy only market. Effectively peaking generation is paid twice for high priced events, more than sufficient for them to cover their costs for the occasional dispatch implied by a VoLL of $10,000/MWh.

For the AEMC to assess the cost resulting just to Market Participants allows only for a part of the costs that congestion causes consumers.

Risk management is only part of the story – the AEMC must address all of the costs that result from risk management, as they apply to the consumer

If consumers want to pay for less congestion and the augmentation results in the total delivered costs of electricity falling, then this is the benefit that must be balanced against the cost in reducing congestion.

It is these costs that the AEMC must include in its analysis of the costs of congestion, as well as the other costs that it has identified

2.9 MEU conclusions about congestion in the NEM

There is no doubt that congestion is a problem for consumers.

1. The very design of the transmission system in the NEM inevitably causes times when there will be congestion.
2. Augmentations for the NEM to reduce inter-regional congestion have been very few and those built by private enterprise have resulted in loss to the proponents and consumers paying a premium for inappropriate design and locations
3. Augmenting the transmission system is seen as a logical step to reduce the prevalence and impact of congestion. Unfortunately the AEMC has decided that although consumers pay for more than 90% of the transmission system, any benefit of augmentation to consumers must be balanced against the cost to generators despite them paying little to use the transmission system, and as a result having almost no sensible signal for the optimum location of generation
4. Congestion between two regions can result in increased prices in a third region, but this matter has not been addressed by the AEMC.
5. Congestion causes increased costs, and retailers to have to secure financial products to insulate them from the impacts of congestion.
6. The AEMC has not addressed the costs incurred by consumers as a result of congestion, assessing only the costs and risks faced by Market Participants
7. There is a bland assumption that if there is a risk mitigation strategy available, then this is sufficient. What is totally lacking in the assessment of congestion is the cost that is passed onto consumers of such strategies.

3. The materiality of congestion

There are five elements that impact the materiality of congestion

1. Congestion has two clear aspects. Inter-regional congestion has a cost that can be readily identified by the differences in regional pricing and the volumes of electricity being sold at the regional price. Intra-regional congestion has no clear cost and requires extensive analysis to identify the costs associated with it. Consumers have extreme difficulty is assessing the cost of intra-regional congestion in most cases, but they can readily see (and suffer) the costs of inter-regional congestion.

2. Congestion is a problem because it results in either a consumer not being served with its electricity needs, or that a generator is being dispatched out of merit order (ie constrained on) resulting in higher costs to consumers.

3. Congestion has another face in regard to the generator constrained on. Where a generator is constrained on, it causes another generator which is entitled to be dispatched because of its price and volume offer, not to be dispatched. It is the NEMMCo dispatch engine (NEMDE) which selects the next ranked generator, and in the case of a constraint, NEMDE dispatches the next lowest priced generator on the demand side of the constraint. This is a direct disadvantage to the “rightful” generator, as it was prepared to deliver electricity at a lower price but is excluded from doing so. To exclude a generator in such circumstances is not economically efficient.

4. A constraint in the network provides a direct reduction in competition in the market. Rather than all generators being exposed to all other generators, a constraint dramatically reduces competition in the region where the constraint applies. When generators within the region so isolated identify that competition has reduced, they have the power to increase prices, almost at will. Examples of this generator market power have been provided to the AEMC and AER. Appendix A is attached describing a recent example of such market power.

5. It is inevitable that a constraint in the network will occur – it would probably be economically inefficient if no constraints occurred. Because there is always potential for a constraint to occur, Market Participants must continuously consider an occurrence of congestion as a possibility. The timing, duration and severity of an actual occurrence of a constraint are

unknown. This requires the Market Participant to address constraints as if they might occur at any time. Thus the costs to protect against the financial outcome of constraints are related more to the potential of a constraint occurring than to the actual costs occurring at the time of the constraint.

3.1 The materiality of loss of supply

It must be noted that consumers see that loss of electricity supply is material – for some the degree of materiality might vary with the time the loss of supply occurs, for how long it lasts and the frequency with which it occurs. Regardless of an assessment of the degree with which different consumers assess the impact of loss of supply, there is little doubt that loss of supply is material to all consumers.

The Reliability Panel of AEMC has set the amount of unserved energy to be 0.02% or notionally the loss of supply for less than 2 hours each year for every consumer. The implication of this benchmark is that loss of supply is considered material to all consumers.

As congestion is only one reason for there to be loss of supply, it can be assumed that an expectation of loss of supply due to congestion would be a much lesser amount than 2 hours each year.

Thus from a consumers viewpoint, the loss of supply, regardless of the reason, but especially due to congestion, must be considered to be material.

3.2 Is the cost of congestion material?

It is often pointed out that congestion is not a material issue in the entire scheme of the NEM. Proponents of this view cite that the frequency of price excursions and out of merit dispatch due to congestion is so low as to be negligible. In one way they are correct. Analysis of the frequency of prices above $300/MWh[8] in the NEM shows that the frequency of these price spikes (the result of congestion on inter regional connectors) is less than 0.2% of the time.

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[8] By selecting a benchmark price of $300/MWh as a reasonable expectation of maximum regional pool prices[8], this represents about 10 times the average pool price and a premium at which most buyers would not normally purchase a good. An expectation of price premium is necessary as in the NEM prices are not seen until ex-post.

Analysis of the regional pool prices shows that number of price spikes above $300/MWh is very small. However, the severity of them is enormous.

As noted above, assessing the cost of congestion intra-region is difficult but it is much easier to assess the costs to consumers of congestion between regions as there are prices set for each region. Except for line losses for transport of power between regions, essentially the same price for power will exist in each region where there is no congestion.

In 2002, the impact of price spikes above $300/MWh was to inflate the average pool price in the NEM by 28%[9].

A review of the pool prices for 2005 shows that the price exceeded the amount of $300/MWh for only 152 half hourly periods in the four regions of Queensland, NSW, Victoria and SA. These 152 half hour periods represent less than 0.2% of all half hourly periods in the four regions. The following chart shows the impact of these 152 spikes as a proportion of the average annual price for each region.

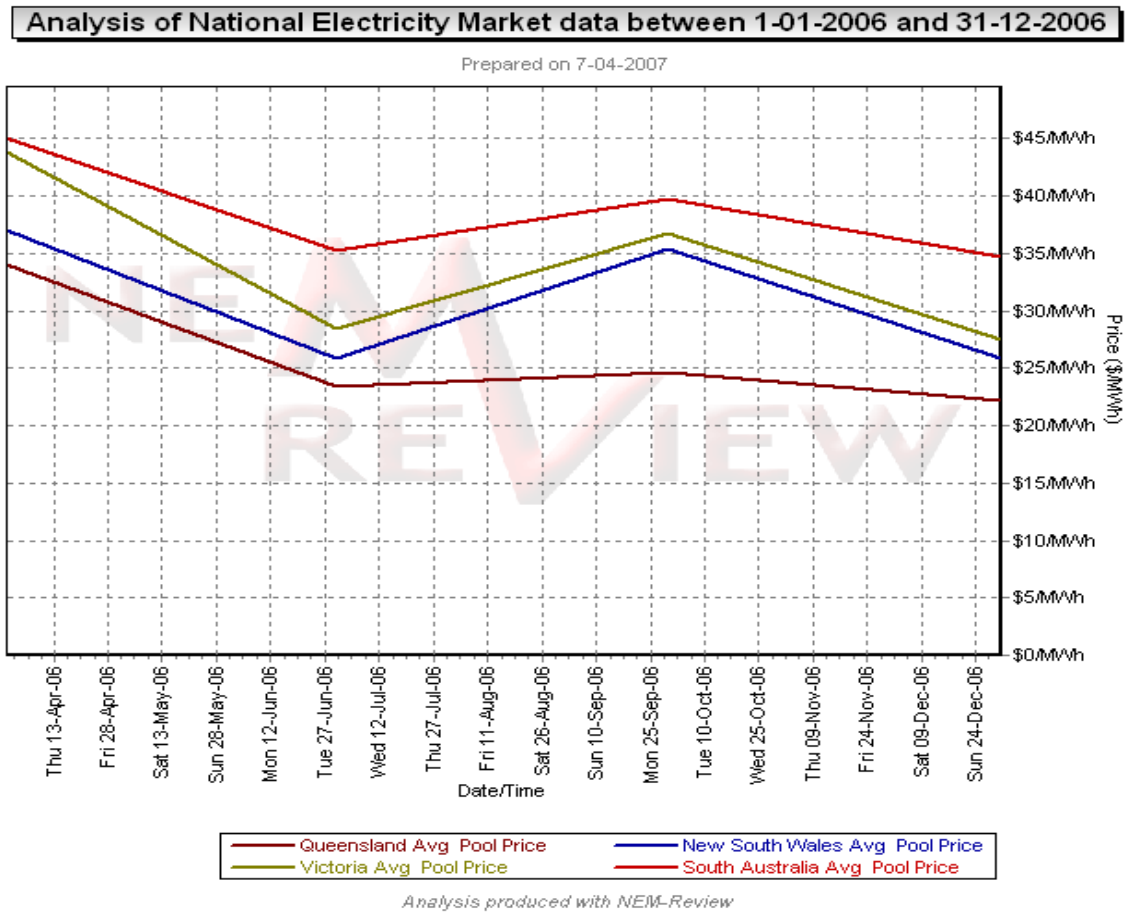
States for 2005	**Qld**	**NSW**	**Vic**	**SA**	**NEM (excl Tas and Snowy)**
% of average annual volume weighted price caused by >$300 price spikes	19.6%	36.6%	7.6%	10.1%	24.6%
Av annual time weighted regional price $/MWh	25.17	35.83	26.29	33.6	30.22
Av annual volume weighted regional price $/MWh	27.12	40.84	27.83	36.76	33.44
# price spikes >$300/MWh in 2005	26	67	24	35	152

Source data: NEMMCo and NEM Review

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

As the total NEM (less Tasmania and Snowy) average demand is some 22 GW the cost to consumers of the 2005 price premium for constraints is over $1500m, or an annual payment of over $400 by every household in the NEM.

A similar exercise has been carried out for year 2006. The following chart shows the average price for supply in the same four regions. It shows that average prices increased in Victoria and SA whereas in NSW they fell. Prices in Queensland remained essentially constant.



The comparable table for 2006 reflects these trends, highlighting that the impact of price spikes in Victoria and SA had a greater impact in 2006 than in 2005, whereas the impact in NSW is the reverse.

States for 2006	Qld	NSW	Vic	SA	NEM (excl Tas and Snowy)
% of average annual volume weighted price caused by >$300 price spikes	18.2%	20.6%	20.9%	19.4%	20.1%
Av annual time weighted regional price $/MWh	25.97	31.01	34.13	38.68	31.02
Av annual volume weighted regional price $/MWh	28.23	34.81	37.65	44.68	34.49
# price spikes >$300/MWh in 2006	27	32	47	62	168

Source data: NEMMCo and NEM Review

The review of the same data for year 2006 shows a similar pattern to the 2002 and 2005 outcomes; although the number of price excursions increase, the severity was less, and the focus moved from NSW to Victoria and SA where most of the price excursions occurred.

With a total NEM (less Tasmania and Snowy) average demand of 22 GW the cost to consumers of the 2006 price premium for constraints is still $1500m, or an annual payment of over $400 by every household in the NEM.

The clear implication is that congestion has caused a significant number of price uncouplings and therefore costs to consumers, and the degree of cost just for pool price excursions is material.

3.3 The RT excludes the consumer benefit, but congestion risk mitigation is allowed to provide a generator benefit

In the calculation above, consumers paying for mitigating the cost of prices above $300/MWh is seen as a risk management tool against the impact of congestion – congestion is the predominant (if not only) cause of prices rising above $300/MWh.

As noted in section 2.8 above, it is peaking generation (such as Snowy Hydro) which provides these $300/MWh price caps. The cost of the price cap is paid by

consumers to retailers so retailers are not exposed to unpredictable price spikes. This cost is then transferred by retailers to peaking generators – so effectively consumers are paying generators for this price cap – but the price is seen as only an "insurance product" rather than a payment in the NEM. Thus there would appear to be a benefit being paid to peaking generators that is not seen by the market but which is a cost to consumers.

Generation is also the beneficiary of a VoLL set at $10,000/MWh (this is the price at which a peaking generator is expected to get its cost recovery from the supposedly infrequent excursions to this price level). This benefit is seen by the market as the regional prices approach this limit regularly. Combining this payment to generators with the "insurance product" payment to peaking generators, demonstrates an effective double benefit, (a high VoLL giving generators a better return and "insurance premiums" in the form of price caps) focused on peaking generators.

As this "insurance product" benefit is a real cost to consumers (and retailers), excluding the cost to consumers of risk mitigation products (especially those paid to other Market Participants) from assessments of congestion significantly understates the total costs of congestion.

Another way of looking at the impact of congestion is to allow that a Market Participant (by passing the costs onto consumers) is not exposed to a pool price above $300/MWh. As noted earlier this cost is greater than $10/MWh. Converting the NEM costs for 2006 to cost all excursions in price >$300/MWh to the price cap of $300/MWh reduces the NEM average price by some $4.64/MWh. Thus for paying a price for a $300/MWh cap for 2006 would reduce the pool price by $4.64/MWh at a cost of more than $10/MWh.

This demonstrates that the cost to source protection from >$300/MWh price spikes in 2006 cost considerably more than the actuality of the risk.

In section 2.8 above the SA regulator (ESCoSA) used the AFMA forward price (the actual pool price increased to accommodate generator risk) as the basis of the calculation for a comparative retailer price. To this base AFMA forward price ESCoSA added the full value of the $300/MWh hedge risk price, plus other risk premiums.

The ESCoSA calculation (which replicates the same calculation made by the Victorian regulator) does not deduct the benefit that will occur to the average pool prices when all prices above $300/MWh are capped at $300/MWh, implying that

the risk premium is the sum of the costs above $300/MWh **plus** the cost of the risk mitigation. Thus the premium paid by consumers to mitigate the risk of the outcome of congestion is greater than $14.64/MWh.

This implies that the money paid to retailers by consumers as a result of congestion was of the order of $2.8 billion in 2006[10]. This amount excludes the risk premiums added by generators on the pool prices to replicate the AFMA forward price used by ESCoSA in its calculations.

It must be stressed that this amount is not the cost implied by the differential between different regional pool prices. This $2.8 billion is the amount that consumers pay to retailers for retailers to take the risks of congestion and pool price spikes.

3.4 Measuring congestion and its impact

Section 3 of the Directions Paper makes reference to a number of studies in an attempt to assess the cost impact of congestion. It refers to

- The AER assessment of the inefficiency of dispatch (out of merit order dispatch) provides one guide. Proponents have noted that this work implies that congestion is not a problem, but the results indicate that congestion is an increasing problem. This is understandable as there is increasing demand (both volume and capacity) but there is insufficient investment in regional generation to match these increases.
- The work by Biggar, which although the AEMC notes some concern at the outcomes, also implies there is an increasing trend in congestion and its costs
- The ability of IRSRs to provide a financial hedge on inter-regional interconnectors. Work by ERIG implies that IRSRs might not be the most effective tool for this purpose as the settlement residues are increasing with time. Market surveys tend to confirm that IRSRs do not provide the protection anticipated
- The work by MMA (commissioned by Macquarie generation) and IES (commissioned by the "Latin" group of generators) as to whether investments by TNSPs were alleviating congestion. Intriguingly this work seems to imply TNSPs are investing wisely in as much as the Regulatory

[10] Based on an average demand of 22 GW for Queensland, NSW, Victoria and SA

Test permits. Consumers view with concern some of the other outcomes from these studies as they imply that costs of congestion might be relived by higher generation costs balanced to a degree by savings in capital costs for generation and transmission.

- Work by NEMMCo on the ANTS which is part of the annual SoO. This work suggests that there is an increasing likelihood of more congestion, with increasing costs resulting from it.

After all of this analysis the AEMC has concluded that there is no clear indication as to whether congestion has been or is a significant problem, but it certainly indicates that it is a problem which is increasing with time. Thus, even if congestion is not currently seen as not being a problem, there is no doubt that if nothing is done then it will become a significant problem.

In particular the AEMC points out that most of the work done has been historically based and therefore is not "forward looking" and that the failure of the studies to date provides an inadequate view of the future. Notwithstanding this, the AEMC will continue to assess historic outcomes to assess whether there is a problem.

3.5 NEMMCo review of the Biggar analysis

NEMMCo was requested by AEMC to identify if the work by Biggar on mis-pricing in the NEM was an increasing phenomenon as deduced by Biggar. NEMMCo considers that there is insufficient evidence to support Biggar's conclusions.

NEMMCo considers[11] that some generic issues might have caused this mis-pricing identified by Biggar, such as increases in system demands and increases in generator pricing have contributed to the increase in congestion in regions and sub-regions, as would have the conversion of constraint formulation.

NEMMCo goes on to state that other issues have contributed to mis-pricing and cited the following (page 2)

- Increase in load in some areas

[11] Impact of intra-regional constraints on pricing: Review of the results of the paper "How significant is the mispricing impact of congestion in the NEM ?" by Dr. Darryl Biggar. NEMMCo 9 March 2007

- Network outages including those to manage system augmentations
- Change in generation output
- Generators switching their output to different networks
- Use of higher short-term ratings for transformers and lines
- Commissioning transmission assets
- Impact of drought on some hydro generators
- Change in constraint formulation
- Directions and Network Support Agreements to manage system conditions
- Change in voltage and transient stability limits due to generator, load and network changes
- Increase in generation from wind-farms

MEU concurs that there are many contributing issues that result in increasing congestion in the NEM. All of these issues are dynamic and are unlikely to ever disappear, so the NEM must be designed to reflect the possibility of each and every one (and others) causing congestion into the future.

It is therefore essential that the approach used to manage (and relieve) congestion must identify not so much the causes of the congestion, as there is no doubt that congestion is caused by the transmission system being undersized for the duty being imposed on it.

What is essential is that the approach to congestion management must result in the most economically efficient outcome which provides for “the long term interests of consumers”. This outcome can only be assessed in light of the costs incurred by consumers resulting from congestion.

3.6 MEU conclusions about materiality of congestion

There is no doubt in the view of MEU and its members that there is a significant problem with congestion in the NEM. Although the frequency of the times there is significant congestion are relatively few, the resultant severity of the outcomes on these few occasions is extreme. To ignore an issue because its frequency is low when its impact is extreme, would be an abrogation of the responsibility vested in AEMC by MCE.

It is of concern that the AEMC has focused exclusively on the impact congestion has on Market Participants, without taking the analysis further to identify the impacts on consumers. Consumers see more of the financial impact of congestion than those just seen by Market Participants. Consumers see the

costs of the market mitigation methods used to manage the risks inherent in the congestion that actually occurs, as well as the costs associated with mitigation measures taken to assess the impact of congestion **if it might** occur.

This issue appears to be the nub of the entire issue from a consumer viewpoint. The AEMC and many other investigators have concentrated on what the actual costs of congestion are when they actually occur. This is not the whole story. Because almost all consumers do not have the skills or the time to manage their direct exposure to the NEM, they have to employ specialists (retailers) to carryout this task for them. Because of this, consumers tend not to directly see the costs of congestion in the NEM, but they do see the costs of mitigating the risk exposure to congestion **if it might occur.**

The design of the NEM does not provide even the reasonable degree of predictability that an alternative NEM structure might provide (eg a capacity based market compared to an energy only market). In the absence of predictability, risk mitigation measures must be in place at all times, greatly increasing costs **to manage the risk from a consumer viewpoint**.

To exclude the cost of these risk management tools from the costs of congestion artificially reduces the costs of congestion.

In the AEMC Issues Paper it provides an indication that risk management from congestion can be managed by retailers either financially or physically. This clearly demonstrates that the AEMC considers that financial (and physical) solutions to managing the risks associated with congestion are legitimate tools and should be used. The MEU agrees but considers that the costs associated with using such tools must be included into the total costs of congestion management.

4. Assessment criteria

On page 7 of the Directions Paper, the AEMC states

> "The Commission interprets clause 3.1 of the ToR to require consideration of a broad range of options for assisting participants to manage trading risks associated with congestion in the NEM. These options could include arrangements to better *manage* congestion, thereby reducing trading risks, as well as arrangements that could reduce the *level* of congestion. The former approach takes the level of congestion as more or less given and focuses on changes that could assist participants to manage the trading risks arising from that given level of congestion. The latter approach focuses on arrangements for reducing the trading risks associate with congestion indirectly by tackling the level of congestion itself.
>
> In this context, the Commission highlights that it has already undertaken substantial work on these latter types of measures. For example, the Commission recently completed its review of transmission revenue and pricing, which should promote more timely transmission investment and sharper incentives to maximise network availability. These issues are critically important and impact on the overall levels of congestion; however, given their earlier treatment, the Commission does not intend to consider these issues further as part of the CMR.
>
> The Commission considers that the distinction between arrangements to better manage congestion and arrangements to reduce the level of congestion is a useful one to maintain in the CMR. Therefore, the distinction is used in describing both the existing Rules for addressing congestion as well as the potential options for change. '

The AEMC also refers in its Directions Paper to the different forms of economic efficiency which it uses as its basis to decide on what its approach might be. The AEMC has previously determined that the "long term interests of consumers" will be best served if it addresses problems in terms of economic efficiency, and develops its solution from its assessed most efficient approach. On pages 9 and 10 of the Directions Paper it states

> "Economic efficiency is commonly defined as having three elements:

- productive efficiency – meaning the electricity system is operated on a "least cost" basis given the existing and likely network and other infrastructure. For example, generators should be dispatched in a manner that minimises the total system costs of meeting consumers' demands;
- allocative efficiency – meaning electricity production and consumption decisions are based on prices that reflect the opportunity cost of the available resources; and
- dynamic efficiency – meaning maximising ongoing productive and allocative efficiency over time, and is commonly linked to the promotion of efficient longer term investment decisions.

The Commission believes that promoting the conditions for competitive conduct in the NEM will often, though not always, spur improvements in all three dimensions of efficiency.

In addition, the Commission has taken the view that the NEM Objective is not solely focussed on a technical approach to the promotion of efficiency. Rather, the NEM Objective has implications for the means by which regulatory arrangements operate as well as their intended ends. This means that the Commission also seeks to promote stability and predictability of the regulatory framework. This, in turn, means that the Commission seeks to:

- minimise operational intervention in the market – intervention in the operation of competitive markets should be limited to circumstances of market failures. Further, the Commission recognises that market failure is only a necessary and not sufficient condition for regulatory intervention;
- promote changes that are likely to be robust over the longer term – other things being equal, the Rules for the dispatch and pricing of the market should be sufficiently stable and predictable to enable participants to plan and make both short- and long-term decisions; and
- promote transparency in the operation of the NEM – to the extent that intervention in the market is required, it should be based on, and applied according to, transparent criteria.

The MEU considers that the AEMC has provided not only a clear indication of tits view on how to address the problem of congestion, but that much of its approach is sound.

Notwithstanding this guarded approbation, the MEU has a concern that the approach does not go far enough, and misses out on some critical elements.

1. The AEMC has stated that it does not see the NEM objective as being solely focused on a technical approach. The MEU strongly agrees, and points out that congestion causes consumers (whose long term interests are the focus of the objective) see significant costs which they incur as a result of congestion.
2. The AEMC has used as its basis the regional pool prices as the financial indicator of congestion, as does many of the other assessments made by parties referred to in the Directions Paper. It is accepted that these provide an indication of the costs of congestion that has actually occurred, but they do not provide a guide to the costs of the financial mitigation tools put in place for when such congestion might occur.
3. The NEM is not predictable, and neither are the incidents causing congestion. With this lack of predictability, the financial tools for congestion management must recognise that that the costs will be greater than needed for the actual constraints occurring.
4. Market Participants recover the costs of the risk management tools used by them from consumers. Thus the AEMC must identify what these tools are and a method for evaluating the costs passed onto consumers.
5. Consumers pay almost all of the costs for transmission, and the augmentations needed to reduce congestion. It is incorrect to balance the costs incurred by consumers for augmentation against the costs incurred by Market Participants as a result of the actual occasions when congestion occurs.

5. The current approach

The effectiveness of the current approach is that congestion has been more addressed as a technical problem, rather than the commercial one which shows a high adverse financial impact on consumers. Further discussions about constraints tend to examine the frequency of constraints. It must be accepted that it is not the frequency of constraints that is the problem but more so it is the severity of the outcomes when constraints occur, and their unpredictability.

The review by the AEMC refers costs back to the regional reference price. Whilst this price shows the spot price, it is not a true representation of the price seen by consumers. The RRP is used by NEMMCo as the basis for dispatch of generation, and can effectively lead to congestion occurring, it does not provide the actual cost resulting from the congestion resulting, nor for the risk mitigation costs needed in case congestion occurs,

A secondary market requires the primary market to operate within certain bounds that can be forecast. As the NEM regional pricing is so random and outcomes can be so severe in magnitude, this essentially closely proscribes a secondary market from operating to assist in management of congestion to its optimum level. What secondary market does exist in relation to the impact of congestion is essentially one established by Market Participants and for the cash benefits to be held by them for providing the service.

The AEMC has identified that IRSRs are not an effective tool for managing congestion, or for encouraging cross regional pricing for consumers. Consumers need long term pricing yet retailers are loath to increase priced periods due to the risks inherent in the NEM. Realistic long term forward pricing is needed by consumers to match the exposure they have to their investments. If long term pricing is too high, consumers have to take short term prices on a more frequent basis.

The current approaches do not recognise the full cost to consumers for congestion risk management, nor are there signals to new generation to locate to relieve congestion.

6. Options for change

6.1 The AEMC proposed options

The AEMC proposes (page 47) that the categorization of options is:-

1. directly improve the ability of participants to manage physical and financial trading risks by
    a. more granular pricing of generation (and potentially load) – to address the problem of mis-pricing;
    b. firmer risk management instruments – to address the problem of hedging for basis risk;
    c. provision of more or better information on likely congestion – to improve the underlying conditions for managing congestion by assisting participants to predict and respond to their physical and financial risks; and
    d. intervention – the imposition or removal of interventions such as clamping and re-orientation may improve the firmness of hedging instruments.
2. indirectly improve the ability of participants to manage trading risks by
    a. reducing the future level of congestion by increasing the actual or effective transfer capability of the existing transmission system in an economically efficient manner; and
    b. provision of more or better information on likely transmission, generation and load developments – to promote efficient locational decisions for new capacity

The MEU agrees with the AEMC that all of these approaches are sound and worthy of investigation. If all of these outcomes could be implemented, then the Market Participants should be able to manage the risks inherent in the NEM with respect to congestion.

What the AEMC then adds is that as it has

> "…already undertaken substantial work on the matter of transmission investment and incentives and therefore does not intend to pursue further consideration of these issues as part of the CMR. The Commission is interested in receiving submissions on whether there are specific issues

relating to transmission network incentives that should be further pursued in the context of this review.**"**

The MEU finds this statement does not recognise the reality that congestion is a physical manifestation of transmission sizing, generator size and location and demand size and location. Thus congestion can only be reduced or relieved by:-

- Reducing the need for electricity flow where the congestion occurs. This will occur only if
  - Existing generation relocating or new generation locating to relieve congestion – this is unlikely as none of the above options will provide a signal for this to occur
  - Existing demand or new demand locating to relive congestion – this is unlikely as none of the above options will provide adequate signals for this to occur, bearing in mind that the cost of electricity is most commonly only less than 10% of the operating costs for most consumers
- Increasing the size of the transmission network to carry the additional electricity flows that will prevent the constraint occurring.

All of the options listed above are about minimising risk to Market Participants incurring costs when and if congestion occurs. The assumption of the AEMC is that retailers will then pass these savings onto consumers as part of the bundled price for sourcing electricity[12] for each consumer.

In fact the retailers and generators use the premium above the pool price and paid by consumers, to pay the risk management costs caused by the risks of the market faced by them.

The AEMC consistently discusses the need for participants to "…manage their trading risk as well as reduce the extent of trading risk …[13]". This is seen as an appropriate approach, yet there is no discussion at all as to what the costs resulting from this management might be, nor how these costs might be recovered from consumers.

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[12] this recognises that costs for transport of electricity and managing the market by NEMMCo are costs that a retailer cannot affect

[13] Directions paper page 47

The MEU is concerned that there appears to be a disconnect between management of risk by Market Participants and the resultant costs of these and the implicit expectation that it will be consumers that will ultimately pay the costs associated.

6.2 An analogy

As noted earlier if there is the risk at any time of a retailer (or generator) being exposed to the risk of congestion and thereby exposed to the possibility of the costs of congestion, then the Market Participant will seek total protection, as the timing of the occurrence of the congestion is unknown.

This can be demonstrated in the following way.

> A householder takes out insurance on its house against fire. A fire may never occur so the costs to the householder are the cumulative premiums for the life of the house.
>
> The options that the AEMC is addressing above represent the potential for the fire at this particular house not to occur (eg replacing wiring, using safety switches, using ducted heating rather than open fires and heaters, etc).
>
> The insurance premium is paid by the householder to replace the house and contents if the fire occurs. Thus if there is even the potential for a fire to occur, regardless of the precautions made, an insurance premium is still required.

The AEMC options address the precautions that are needed to minimise the risk of the house fire. This will result in fewer fires and so the insurance premiums will fall slightly.

The insurers (retailer and generator) include in their pricing the insurance premiums needed if rectification is needed. A larger house costs more to insure than a smaller house, so the insurance premiums will still reflect the cost of rectification.

To extend this analogy, the transmission network can be represented by the fire department. If the fire department is limited in its coverage (ie trying to protect a too large an area or too large a number of houses) then the risk of total damage

to houses on fire increases, resulting in higher insurance premiums. If the fire department is increased in size (augmented) then it can react faster, cover more houses and reduce the costs of rectification, resulting in lesser costs for rectification and therefore lower insurance premiums.

There is a cost to provide the fire department which is part of the insurance premium paid by householders and in their taxes. The approach discussed in section 3.3 above implies that the householder pays to insurance premium (the $10/MWh) but in addition also pays for the provision of the fire department (the $4.64/MWh that the pool price would reduce by if a $300/MWh cap applied).

The issue for householders (consumers) is the total costs for insurance and of the incidental and emotional costs after a total loss.

Thus what the MEU is seeking from the AEMC is an approach which provides options for including the “precautions” but also to recognise that the insurance costs are high even though the risks might be reduced by the implementation of the precautions.

The MEU is firmly of the view that the AEMC has to include the costs of the insurance premium and the saving in the pool price that this premium should result in, into the calculations and to balance this cost against the costs to augment the network, with such augmentation costs incorporating the costs to optimally locate generation to eliminate congestion, or to get consumers to cause the demand causing the congestion to be reduced.

6.3 Aspects proposed by AEMC for further review

In sections 5, 6 and 7 of the Directions Paper, the AEMC proposes a number of further aspects of the NEM warranting review. These are tabulated and MEU comments about each are provided

DirPpr section	AEMC issue	MEU comment
5.1.1	More generator price points	MEU agrees these may assist in better understanding the impact of intra-regional congestion
5.1.2	Firmer risk management instruments	MEU agrees that current IRSRs might not be an effective risk management tool, and raises the point that increased risk adds increased costs to consumers
5.1.3	Information	The MEU accepts that increased information improves

	on likely congestion	overall transparency. Equally MEU has seen (see appendix A) that generators already use the incidence of congestion to increase prices as market power increases when constraints occur.
5.1.4	Interventions	The need for intervention is a direct result of the market failing to meet the objectives of the market. Interventions should only be used occasionally. If interventions are used consistently then the market should be modified, or action taken to prevent the use of intervention. eg if market intervention would be averted by an augmentation, then the reasons for not implementing an augmentation need to be addressed.
5.2.1	Increasing effective transfer	MEU supports the use of "soft constraints" being used by NEMMCo (ie allowing short periods of over rating) and encouraging TNSPs to make full capacity available at times of expected peak usage
5.2.2	Increased information on investments	New generation has to get NEMMCo approval and TNSPs need a degree of approval from regulators. The NEMMCo SoO already provides information on investments. TNSPs also provide information on their plans.
6.1.1	Dispatch Rules	Implicitly this requires NEMMCo to manage the use of short periods of over rating in transmission. This should prevent the short term spikes seen where VoLL is reached for a five minute period only. As noted in section 2.7 MEU identified that perhaps up to 20% of all price spikes above $300/MWh fall into this category and might be eliminated by this approach
6.1.2.1	Regional boundary changes	The MEU is concerned that use of this approach to reduce congestion might cause unintended results. Whilst it might (as in the case of Snowy's Tumut and Murray power stations) provide a solution to generator market power and mis-pricing, it could also have devastating impact on consumers impacted by the regional boundary change. The MEU would counsel extreme care regarding this option
6.1.2.2	Price for being constrained on	The AEMC notes that there are only two options for setting a constrained on price for a generator. In fact there are many more. On that would be a reasonable price could the average price used for dispatch of that generator over the previous (say) 12 months. This

		would be a close approximation of the average cost of supply from that generator and would provide a reasonable recovery for the generator. If this price was used as the constrained on price then it could be used as the regional price, eliminating the need for any uplift or additional payment to the generator. The concern that the MEU has is that if there is a significant payment to a generator for being constrained on, then this will act as an incentive for generators to withhold capacity in the expectation of getting a constrained on premium. The AEMC raises the issue that the constrained off generator is losing money by being constrained off. This is true. It is therefore important that the cost for constraining and of constraining off must be elements permitted to be included as costs in the Regulatory Test. An augmentation of the network would eliminate the constraining on of a generator and allow other generators to operate in a way that meets the merit order of dispatch. This issue is addressed in section 2.5 above. The AEMC observes that paying generators that are constrained off will encourage inefficient behaviour, but regardless the constrained off generator has offered supply at a price lower than the constrained on generator and therefore is being penalized.
6.1.3.1	IRSRs	See comments above in 5.1.2. Additionally it must be recognised that consumers seek supply contracts of longer duration than the four quarterly IRSRs – typically a consumer seeks a contract longer than 3 years. IRSRs to not assist in this regard
6.1.4	Negative residues	The MEU considers that the beneficiaries of the dispatch approach that causes the negative residues should be responsible for the costs they incur.
6.1.5	Information	MUE supports the principle of greater transparency. See comments on 5.1.3
6.2.1	Investment incentive on TNSPs	The AEMC considers that this issue is fully addressed and will not debate the matter further. Decisions made under these other determinations were made with the

		stated exception that further changes might occur arising from the CMR. The AEMC comments imply that this is not the case. Further the decisions made earlier cannot have known of the better understanding the AEMC has acquired under the CMR. Whilst it is accepted that the principles behind the earlier decisions might still stand, it is essential that the actual costs incurred by consumers for risk management are taken into consideration
6.2.2	Information	See comments under 6.1.5. MEU also adds the rider that there may be concern that publishing the information indicated might expose the provider to risks if the information proves later to be incorrect or misleading.
7.1.1	Dispatch Rules	The MEU suggests that introduction of capacity payments made on a locational basis such as is used in the new New England (US) ISO Rules are worthy of investigation[14]
7.1.2.1	Generator nodal pricing	MEU agrees that a transition to even partial nodal pricing is beyond the scope of this study. The MEU supports the investigation of limited generator nodal pricing, but considers that the increased risks to consumers might outweigh the benefits. It would be considered that any increase in cost to consumers would need to be included in the calculations under the RT as augmentation might be a lesser cost than the increased costs to consumers of using the limited generator nodal prices.
7.1.2.2	Constraint support pricing CSP	This approach provides effectively an intervention in the market that has failed to clear under the standard Rules. The MEU sees that such an approach should be used for limited periods only until the fundamental

[14] MEU has made comments on this approach to the Reliability Panel as part of its CRR. MEU submissions are Comprehensive Reliability Review Comments on the RP Issues Paper 11 May 2006 by The Major Energy Users Inc and Major Employers Group Tasmania June 2006 and a Supplementary submission made August 2007

		problem in the market can be rectified. Equally a tool such as this can be used to identify the costs of the failure of the market to clear correctly and include this in the assessment for augmentation.
7.1.2.3	Deep connection costs	The logic opposing the Delta proposal is compelling. Forcing new generation to accept the penalties associated with their locational decisions effectively provides existing generation with greater rights than new generation, but these rights are paid for by a third party (in this case by consumers who pay all TUoS). MEU (and a number of others) raised this point in submissions in the TNSP revenue and pricing review but the AEMC decided to retain the current arrangements. As a result the AEMC has caused this problem itself. By effectively eliminating locational signals on generation only compounds the problem of congestion, yet **the AEMC appears content for consumers to carry the costs of inappropriate generator location decisions**
7.1.3.1	IRSRs	It is agreed that IRSRs have proven to be an ineffectual risk management tool. An alternative approach has to be developed. However the concept of FTRs while accepted in principle might result in higher costs to consumers. For a TNSP to provide a generator with firm access to a load can well cause the TNSP to increase its costs so that the risk of failure to the TNSP is reduced. Under the current arrangements, consumers pay the costs of TUoS, so a TNSP could increase costs to consumers in order to reduce the risk to it for providing firm access to a generator. If TUoS was paid by generators (an option the AEMC has rejected and will not readdress) then the principle of generators paying for varying degrees of firmness of access, makes significantly more sense. In the absence of opening the whole issue of who should pay access and why, introducing FTRs must be treated with extreme care.
7.1.3.2	Constraint support	As noted about CSPs, CSCs are a form of intervention needed because the market design does not allow a

	contracts CSC	patently transparent trade approach. The MEU sees that such an approach should be used for limited periods only until the fundamental problem in the market can be rectified. Equally a tool such as this can be used to identify the costs of the failure of the market to clear correctly and include this in the assessment for augmentation.
7.1.3.3	Constraint based residues	MUE agrees that this approach should be further investigated. It is noted that the AEMC proposes to examine these for limited use. MEU considers that limited use implies that intervention would therefore be needed to identify where CBRs might be used. If this is the case MEU would note that intervention as a standard approach to the market effectively is recognition that the market design is flawed and it is seen that rectification is better then consistent intervention.
7.1.4	Intervention	Intervention in the market is not generally supported. However it is accepted that intervention may be preferable to the alternative of the market not clearing, of increased risks causing increased costs to consumer, or of consumers losing supply. The MEU would point out that there is an increasing use of intervention powers in previous years (eg for the Murray/Tumut connector, reserve trader, etc). The MEU would point out that there may well be a market design or regulatory flaw that should be addressed rather than consistently applying “patches”. In particular the very lack of incentives on generation to locate where they add the most value to the NEM must be accepted as a critical flaw. Equally, the lack of interconnection augmentation (either caused by too little benefit being attributed to the augmentation, or for political, legal or commercial reasons) needs to be addressed to identify if such a approach will reduce the need for intervention.
7.2.1	Transmission investment	The cause of congestion is that there is too much power wanting to go through too small a connection. The NEM is designed to allow generators the right to be dispatched in accordance with their offers. The network being too small prevents this occurring.

		Too much congestion also reduces the reliability of the market, preventing some generators from supplying and as a result giving local generation market power and at the same time reducing the amount of reserve generation capacity being available where there is a need. The AEMC is concerned that allowing the TNSPs free rein to increase the size of connectors (and so reduce congestion) is not necessarily economically efficient. The MEU points out that loss of supply, paying an excessive price for electricity, or preventing lower priced generation supplying in preference for higher priced generation, is also not economically efficient. The AEMC states (page 76) that the new TNSP regulatory "…framework should be given time to operate before any further process of review or reform". Unfortunately consumers will continue to pay a premium for electricity in the interim.
7.2.2	Transmission operation	The AEMC has noted that enhancing the approach to increase transmission availability at times of most need is an element of the new TNSP guidelines to be developed by the AER. At the same time the AEMC notes that incentivising TNSPs to make better use of network support mechanisms (especially when the need has been identified by NEMMCo) is not within the scope of this review. The MEU considers that improving "up time" of transmission at times of greatest needs is important; it also recognises that this tool has limitations in significantly impacting severe congestion.

6.4 Packaging and sequencing issues

The MEU agrees that the various options for managing congestion have the ability to increase risks. Any increase in risk will result in increased costs to manage the resultant increase in risk. The costs of risk management are passed onto consumers. Thus if the AEMC allows any increase in risk in order to manage congestion, then the costs for this risk

management must be identified and included in the permitted costs allowed in the development of the Regulatory Test.

Essentially the Regulatory Test must be permitted to include the costs to consumers of risk management in addressing congestion.

The AEMC notes that there is a concern that addressing regional boundaries might not result in an appropriate solution to some incidents of congestion. The MEU concurs with this view. Equally the AEMC notes that other solutions (eg CSP, CSC, CBR, etc) might provide more acceptable solutions for some congestion. The MEU notes that these more interventionist approaches might be acceptable in the short term, but their prolonged use implies that there is a more pervasive problem that needs to be addressed, and that a significant change in regulatory approach or even market design might be more appropriate.

7. The way ahead

Page 81 of the directions paper states its proposed way forward

> "The Commission has clearly highlighted areas where it intends to maintain or commence work programmes to examine various options. In particular:
>
> - more refined pricing approaches such as limited generator nodal pricing, CSPs, and constrained-on payments that do not involve funding using an uplift charge on energy transactions;
> - improved basis risk management instruments, such as enhancements to the IRSR framework of varying degrees, FTRs, CSCs, and CBRs;
> - the provision of additional information, particularly on the current level and implications of congestion; and
> - a review of clamping and any intervention alternatives for the management of counter-price flows.
>
> In general, the Commission does not intend to revisit matters that were addressed in the revenue of transmission regulatory arrangements or issues surrounding the delineation and allocation of TNSP and NEMMCO roles and responsibilities.
>
> Importantly, the Commission's consideration of options will occur alongside its key work program examining the materiality of the level and implications of congestion.
>
> Information on the materiality of congestion will be compared with the Commission's work on the options to determine which options warrant recommending."

Congestion is a result of inadequate transport facility of electricity. The MEU is of the view that by excluding an ability to readdress matters from the transmission revenue, the Regulatory Test and the last Resort Planning determinations, it is excluding the potential for balancing the benefits and detriments for solutions of congestion between the tools incorporated in these critical regulatory reviews, with the potential solutions that might come from the discussions of the options discussed in the Directions Paper.

The MEU does accept that there are a number of potentially useful approaches discussed in the Directions Paper. Equally, it sees that many of these approaches have an outcome that will increase risks to Market Participants. As noted in earlier sections, the costs of managing these risks are passed onto consumers, who are also the parties who pay the costs for augmenting ton the transmission network to reduce congestion. The MEU points out that these costs

for managing risks must be incorporated into assessing the benefits and detriments of augmentation, which ultimately is the tool for actually reducing congestion and the costs that congestion causes.

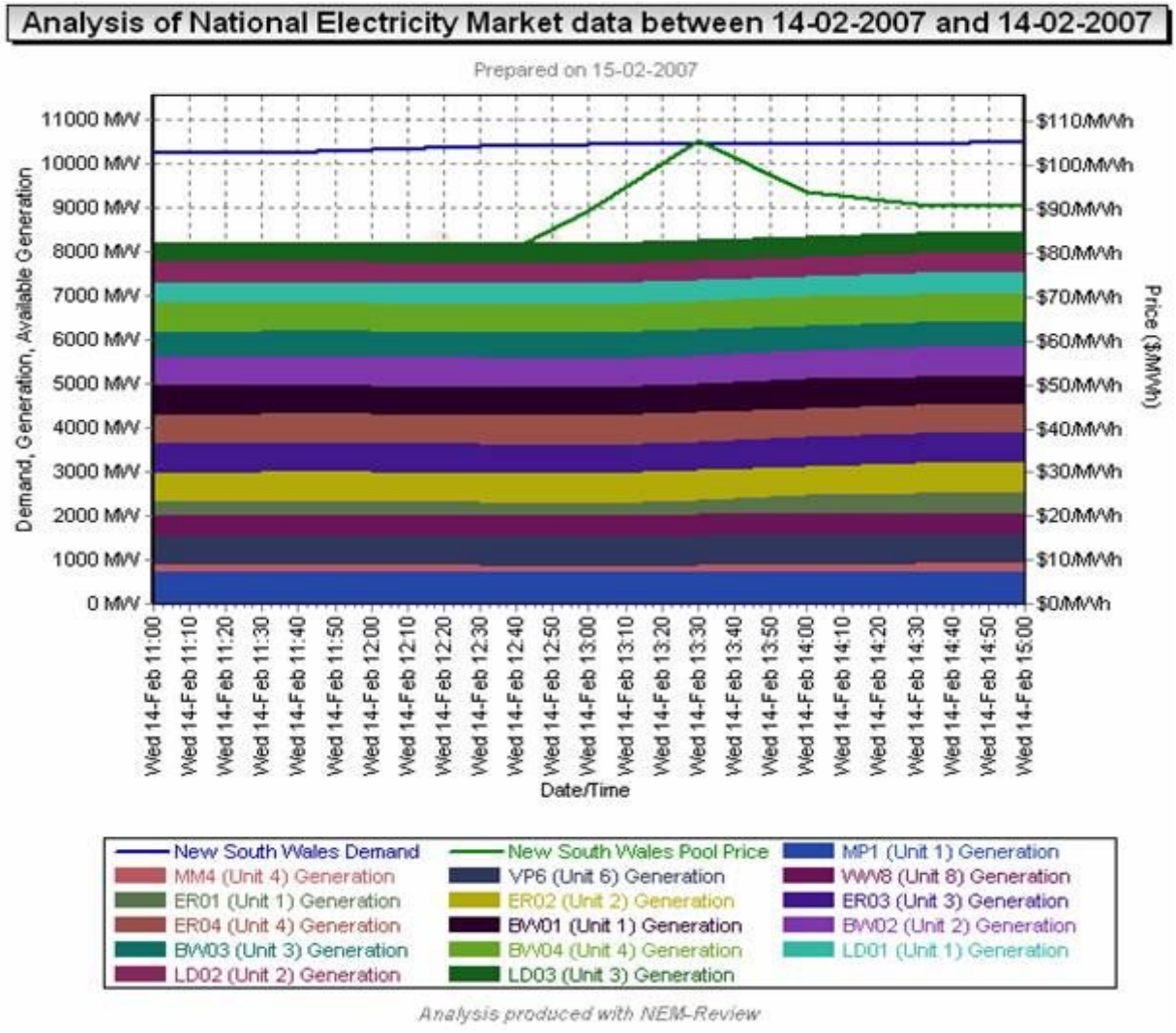
Appendix A

Review of

New South Wales Electricity Market

Weeks 1, 2 and 3 February 2007

The NEM NSW demand, pricing and generation data for 14 February is shown graphically below.



Analysis shows that generators which have not been dispatched are MP2, MM3, VP5, WW7 and LD4. LD4 was last dispatched early January 2007, and WW7 in early February. MP2 was last dispatched on 10 February 2007, MM3 on 12 February and VP5 13 February. These all add to some 2600 MW capacity not in service for some reason on 14 February 2007, although LD4 and WW7 had been down for some time and they contribute ~900 MW and they could have been

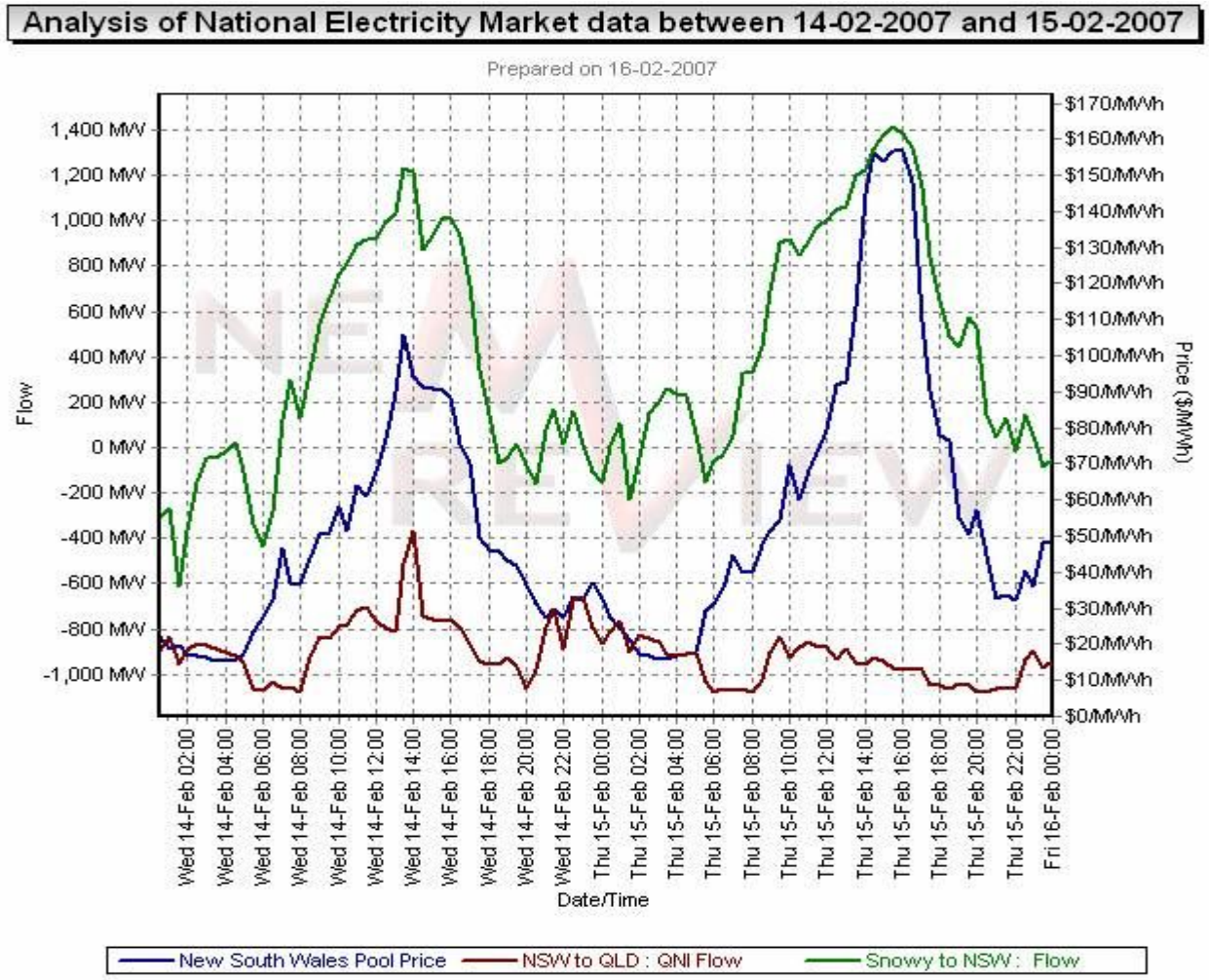
down for maintenance. However, it is not clear yet the reasons for the other three not being available.

Having observed this, there arises the question as to why maintenance is occurring at a peak period of expected Demand. Four of these units are all owned by Delta and it's strange that they would take this plant out voluntarily, as this would expose themselves to the high spot prices for any shortfalls in their contracts. The other unit, LD4, is a McQ plant.

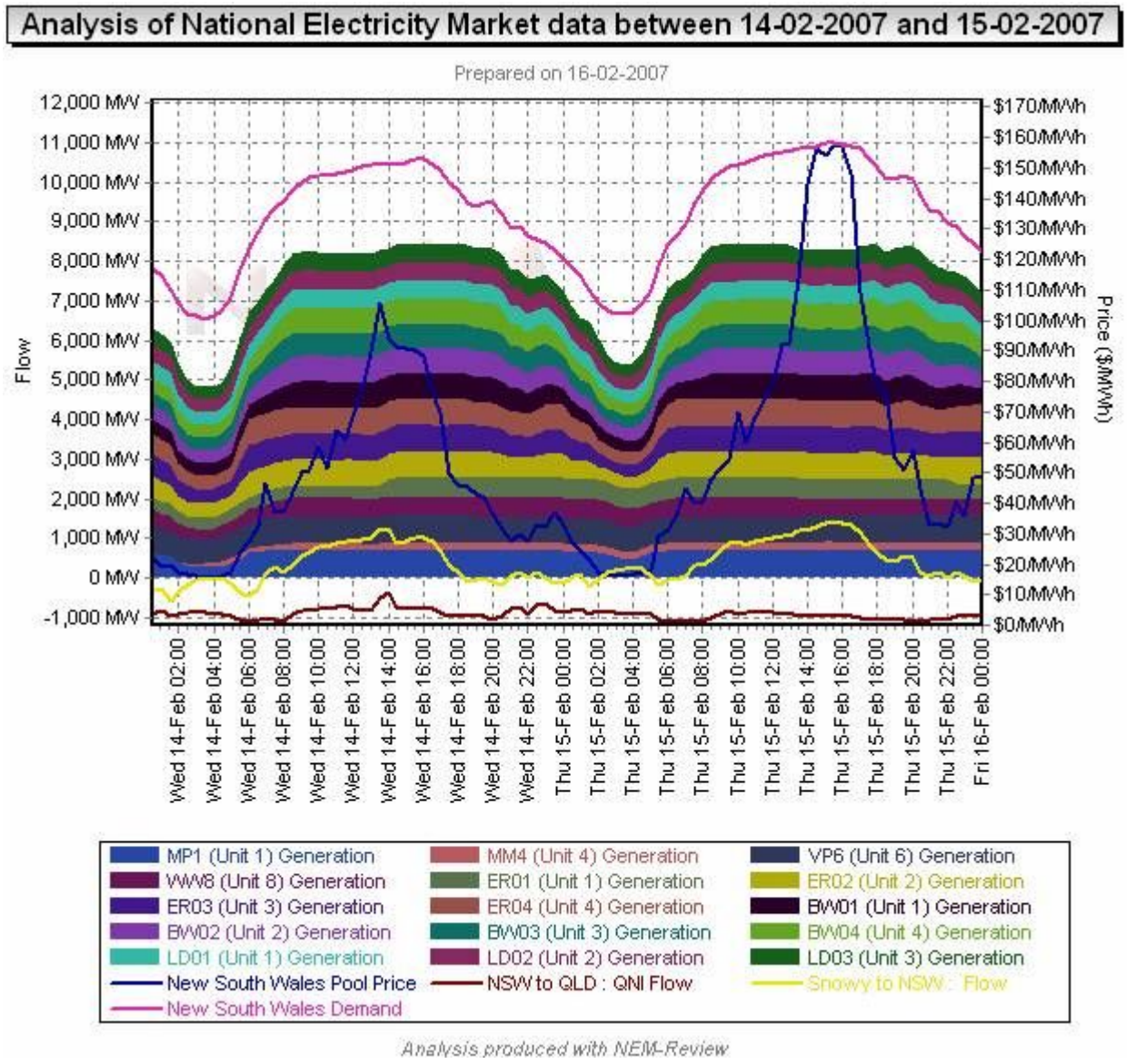
There is no clear indication of gaming by the dispatched units ***but there is a significant amount of plant not being scheduled****. We would need to better understand why these units are down.*

The NEM data for 15 February is also shown graphically below.

*As a first issue, there appears to have been a constraint on QNI flow into NSW about 2 pm on 14 Feb. This spiked the price as shown but there was no apparent withdrawal of supply. The reduction in flow from Qld was balanced by an increase in flow from Snowy. However, there is a question why Delta would have voluntarily had four units out when the price was spiking, as it would have had to balance its contracts from the pool, exposing it to the higher prices****. But the basic question is why are they out on maintenance (if this is the case) at this time of year?***

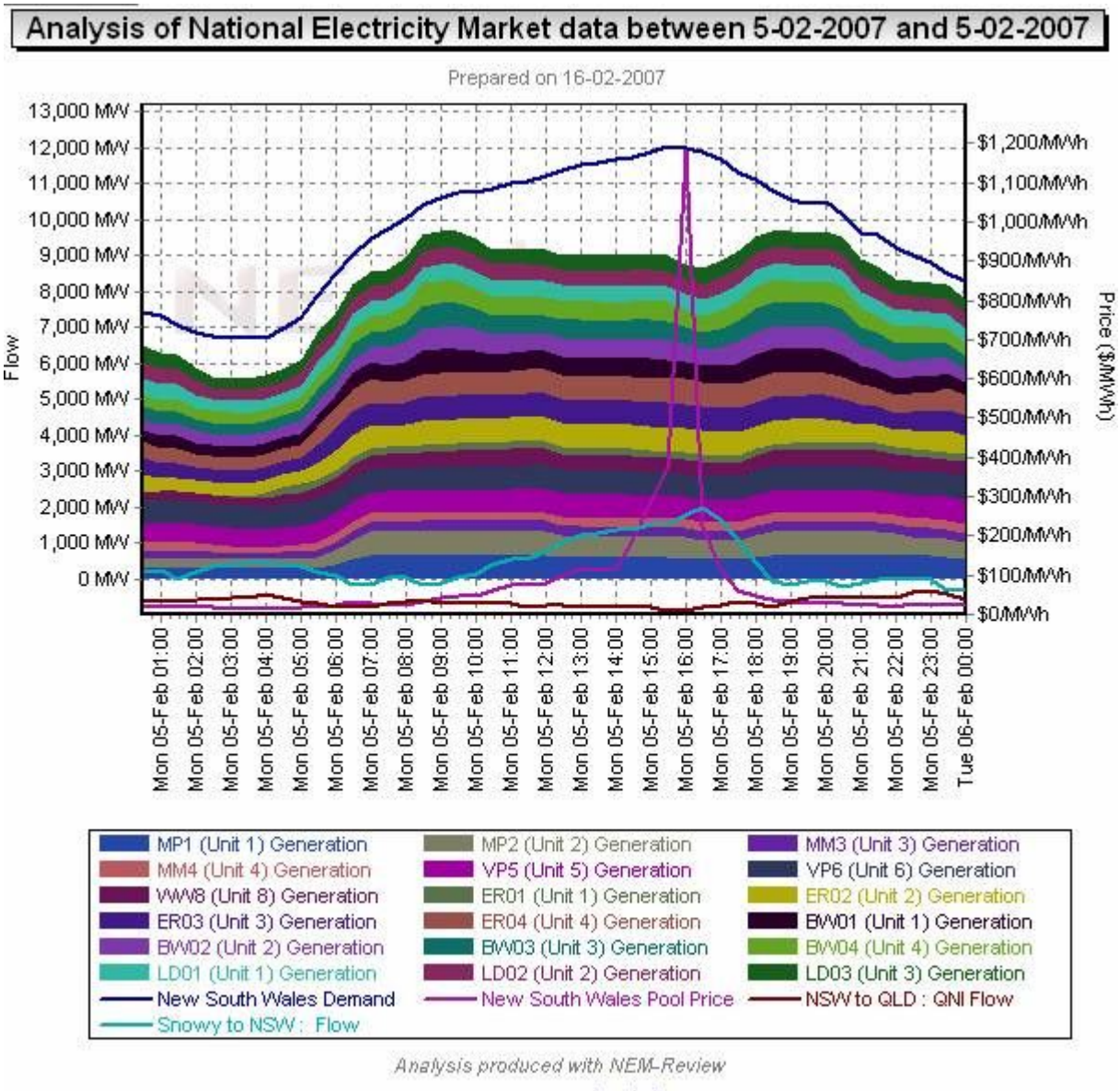


The second issue is the price spike on Thursday 15 February. QNI was working properly but there was a shortfall in generation requiring Snowy to supply more mid afternoon – Snowy always seems to sell its power at higher prices. There seems to have been a bit of market activity by McQ on Thursday by their withdrawing some 200 MW while the demand increased, but again with Delta having so many units down Delta could not have afforded to join in and Eraring didn't either.



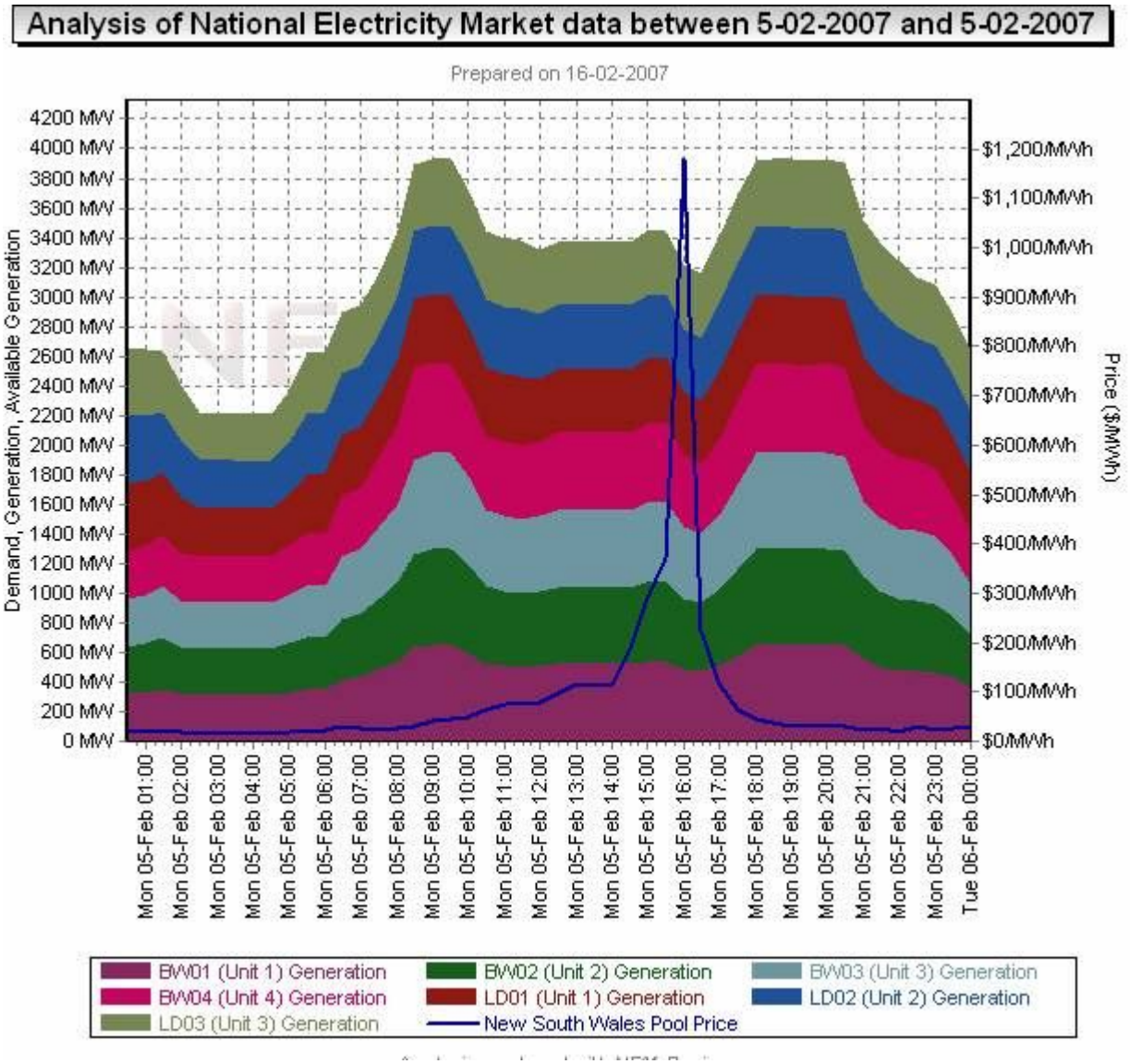
Our assessment is that on Wednesday 14 February there was a short term hiccup on flow from Qld, but this was not long lived. The core of the problem lies with having some 2600 MW not available for service, and most of this capacity was Delta's.

On Monday 5 February it was a different story, as shown pictorially below.



The above graph shows the total dispatch of Delta, Eraring and McQ main generating plants. There is clearly a reduction of supply as the demand increased. QNI was operating properly.

From 9 am onwards McQ reduced supply by 500 MW which drove the price upwards. In mid afternoon they dropped another 200MW and spiked the price even though they had LD4 down at the time. This is more clearly shown in the following chart.

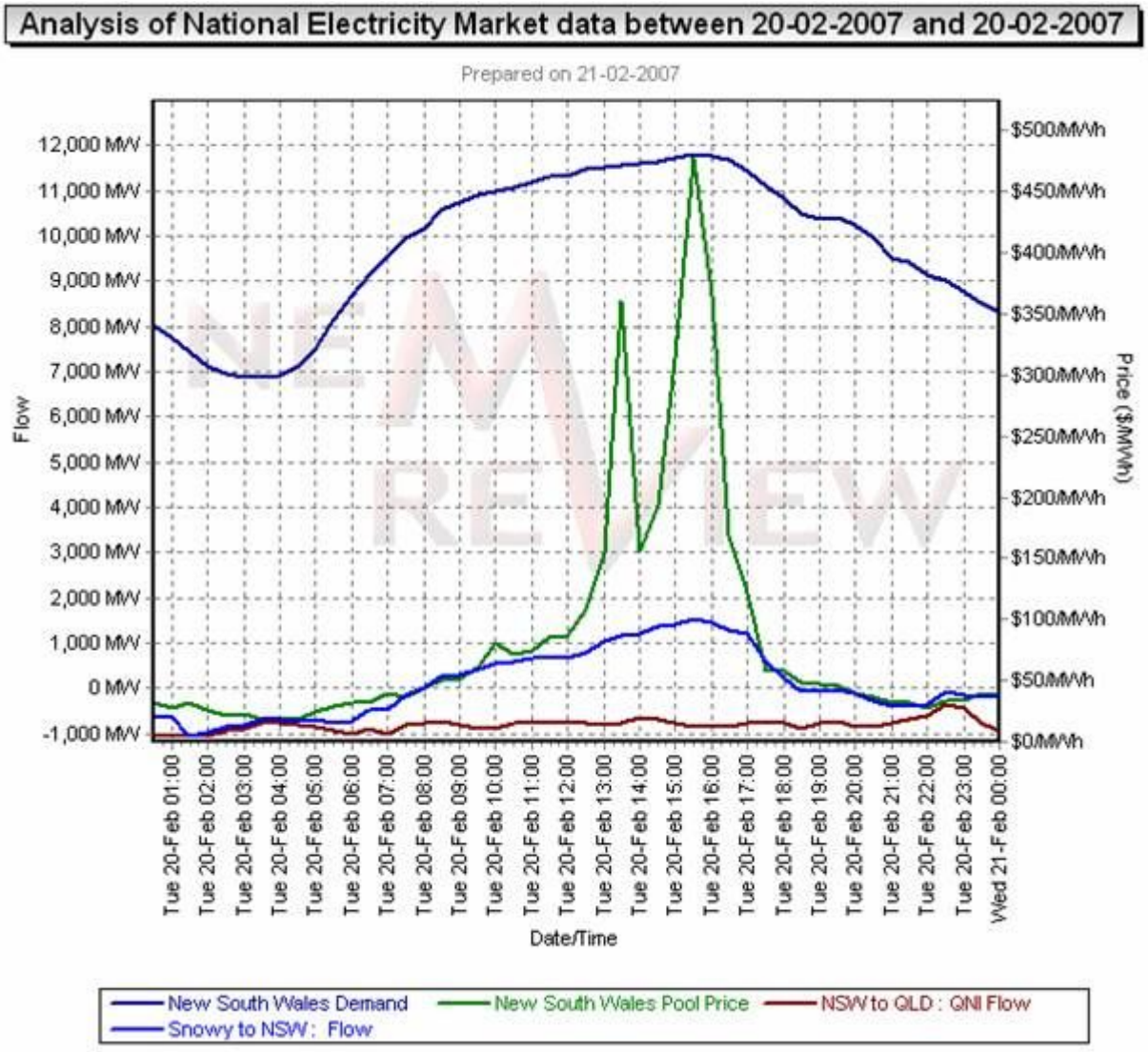


Assessment

We have analysed the situation in weeks 1 and 2 of February and there appears little doubt that McQ generation withdrew capacity when QNI was constrained,

forcing high priced Snowy generation into the NSW mix. However, that is permitted by the Rules.

As can be seen on the next chart, on 20 February Delta withdrew capacity and created the first (smaller) price spike, but McQ created the second and bigger spike. They were assisted by Delta not fully replacing the capacity withdrawn earlier. Delta had some of the plant not available the previous week back in service but it is possible that Delta did not deliberately cause the first spike, but had plant problems.



The bottom line is there is no doubt that McQ has been active in affecting spot prices with Delta being passive by not dispatching units. McQ obviously recognizes that with large amounts of capacity (Delta) not being dispatched, it can and did engage in market activity.

It is now apparent that NSW generators generally wait until QNI is constrained and then back off supply bringing Snowy into the market. Snowy invariably bids high, particularly as it is aware of the actions the coal fired NSW generators will take.

That this activity was instituted at a lower demand benchmark level for the current market activity is a direct result of the large amount of generation Delta had out of service. So McQ withdrew capacity as demand rose knowing when QNI was constrained and that Snowy must make up the shortfall.

Competition is very low in NSW for generation and installed capacity is less than demand (NSW is a net importer of base and intermediate load, much the same as SA). Even adding 400 MW from Tallawarra is not going to help much.

The real problem is with the market which has not provided sufficient confidence to sustain the financial commitment for new base load generation, and made worse by the low level of generation competition in NSW.