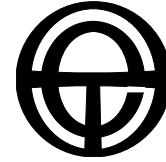


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Sacha Blumen  
Advisor  
Australian Energy Market Commission  
PO Box A2449  
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Cc: Scott Stacey

7 October 2008

Dear Sacha,

Following our phone conversation regarding our proposal for a short-term and long-term price for DM (Rule change proposal 4.12), we have conducted further research and investigations into the particular problem of a lack of DSR bids into the NEM pool.

As a result of that research, we provide the following information on the current situation and alternative options to rectify the problem. We hope that this information is useful and would be happy to discuss it further at your convenience.

Regards,

(signed)

Jane Castle

# Additional Material in Support of TEC Rule Change Proposal on DM Bidding into the NEM

## 1. Summary of current situation

While current NEM bidding arrangements allow for Demand Side Participants (DSPs) to bid against generators, this rarely happens in practice because Demand Side Response (DSR) has very different operating and cost characteristics than generation. The market is currently structured to facilitate generation bidding but is not designed to facilitate DSP. This is borne out by the virtual non-existence of DSR bidding in the market despite its huge, proven and commercially viable potential. Specific barriers are outlined below.

### 1.1 Curtailment used by retailers

There is currently a small amount of load curtailment (as opposed to DSR bidding) in operation in the NEM. Prices paid for the curtailed load will be based on a retailer's avoided cost, usually when the spot price exceeds the trigger price in a hedge contract. This is the only payment mechanism possible for curtailable load in the NEM, and is eclipsed by the superior simplicity of hedge payments because these are instantaneous. There are virtually no other incentives for retailers to seek DSR as an alternative. Instead, the primary driver for retailers is to increase market share, not reduce loads. This is particularly the case where retailers also own generators, which increases the incentive to sell *more* electricity rather than less. There is also little technological capacity for retailers to aggregate multiple loads.

### 1.2 No payment for load curtailment

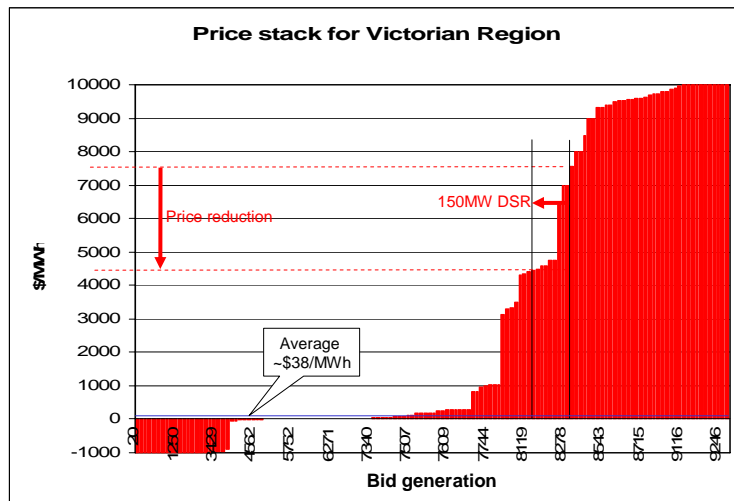
The main reason that end users rarely bid directly into the NEM is because they don't get properly compensated for it. Presently the end user merely avoids consumption at the market price when they curtail their load.

### 1.3 Uncertainty of return – collapsing bid prices

There is currently no certainty that a bid will be accepted or of the actual price that will be paid for it. While this may be acceptable for generators, it is not viable for DSPs. This is a complex area and needs to be followed chronologically (this assumes curtailment bids would be paid for just like generation is paid for):

- NEMMCO forecasts demand for the next 5 mins
- NEMMCO establishes the bid stack in price merit order from all the generator bids
- Curtailment bids are accepted and tallied with demand forecast
  - If there would have been a sharp increase in demand forecast without the curtailment or wind input, then the effects of these two would effectively lower the demand forecast and thereby lower the price.

- Price sensitivities change dramatically with relatively small changes from the forecast demand – up or down. This was demonstrated by the EUAA study (below) which shows that a drop from 8,300MW down to 8,150MW causes the price to drop from \$7,500/MWh to \$4,500/MWh. Another 100MW reduction would result in a price under \$1,000/MWh. While this volatility may not be a problem for generators, it destroys the viability of DSPs.



22 November 2002

EUAA DSR Trial Seminar

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- Once the new demand level is set (net of wind and load curtailment as bid) NEMMCO take the price of the generator whose bid in the merit order covers that demand level and this is set as the price for all the successful generators plus the wind farms plus the load curtailment providers for that 5 minute interval. Therefore a load curtailment provider may bid in at \$6,000/MWh and for this particular 5 min interval gets accepted (to cover 8,300MW will require a generation price at \$7,500). However, once the wind and load curtailment are included, the demand collapses by 100MW therefore the price that will now be paid for that 5 min interval is no longer \$7,500/MWh but \$4,500/MWh.
- Each six 5 minute intervals are then aggregated to achieve a trading interval, and the price for the trading interval is paid to the generator or wind farm or scheduled load. This exacerbates the price issue for the scheduled load because a high price may occur in only a single 5 min interval but for the other five 5 minute intervals in the trading interval may be close to \$0.
- It is important to note that it is the last “scheduled” generator on the merit order that always sets the price.

The particular problem for DSR is that the participant offering the load curtailment would never know in advance what the actual price to be paid would be at the end of the trading interval, and therefore DSPs could not be confident of the value they would get for their curtailment. This is problematic for DSPs because providing DSR is not their primary business and will only do it for a valued return; which (quite understandably) is generally more than the return required by the generators.

## **2. Options for facilitating DSR bidding in the NEM**

### **2.1 Designing a program to target improved security/reliability**

This option would be far simpler to implement in the NEM than any other option because it does not split the energy and reserve aspects of the energy only market. It addresses improved efficiencies in the market and within networks, thereby improving both reliability and security. There is also an existing mechanism in the NEM that provides Network Support and Control Services (NSCS), which targets these aspects.

Thousands of constraints can exist in the NEM on any given day and NEMMCO can and has “directed” generators to supply to overcome any given constraint or emergency situation. However, while demand side options using DSR are eligible under the provisions for scheduled loads, the provisions for scheduled loads (as noted above) are too narrowly defined and onerous to be practical. As a result, the NSCS is generally the exclusive domain of the supply side in the NEM. A rule change to allow improved access in NSCS service provision by DSR providers and aggregators would be relatively simple and a payment mechanism already exists.

### **2.2 Introduce a reserve mechanism adjunct to the NEM's supply side mechanisms**

The Electric Reliability Council of Texas (ERCOT), which is also an energy only market similar to the NEM, has after only 6 years of operation, realised the value of the demand side and implemented several programs that will encourage DSR from various sources.<sup>1</sup> The NEM could adopt any combination of these ERCOT mechanisms such as replacing Reserve Trader with a permanent program.

Reserve Trader is a rarely used, cumbersome mechanism that takes NEMMCO six months to put in place and is widely seen as an indicator that the market has failed – so there is little support for it. Replacing the same mechanism with a permanent program that awards multi-year contracts for DSP reserve capacity could be made to work within the NEM model. The greatest issue to overcome would be how that capacity of DSR would be paid for, and the logical solution would be by a levy on all consumers (since a benefit to all consumers would accrue by its use) collected by the retailers.

### **2.2 Change the market design**

The most logical approach that encourages more DSR is to change the market design. The West Australian Electricity Market has adopted a more (globally) common market model that unbundles the energy component from the capacity or reserve component – effectively separating the variable costs from the initial fixed/capital costs, ie the WA

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<sup>1</sup> Texas ERCOT PUC Substantive Rule #25.507 (EILS)

electricity market is a “Capacity Market”. Here generation and DSR are both equally valued and paid a reserve capacity fee.

The Independent Market Operator’s confidence in DSR is so high that it describes it as a “commercially sound product rather than a mechanism to help out in a crisis”.<sup>2</sup> DSR is integrated into the WA Electricity Market not only as Reserve Capacity but also for emergency use in the Supplementary Reserve Capacity Program.

However, the reality is that the NEM is unlikely to be changed into a capacity market, at least not in the short term.

The table below summarises the characteristics of the three options proposed above.

**Summary Table**

Description	Level of Complexity to Implement	Main Requirements	Dynamics
Reserve Trader Type of Program	Relatively easy to implement	<ul style="list-style-type: none"> <li>• Reserve all the time</li> <li>• Need new/widen education scope; needs to be simpler program to manage; and funded via a levy</li> </ul>	<ul style="list-style-type: none"> <li>• DSR capacity contracted over years</li> <li>• Used to provide reserve as well as other security and reliability-related issues</li> <li>• Releases generation capacity to make market more efficient</li> </ul>
NSCS to Include DSR	Easiest to implement because mechanisms largely exist	Need to include DSR as eligible for NSCS	<ul style="list-style-type: none"> <li>• DSR capacity contracted over years or the life of the constraint</li> <li>• Used to provide reserve as well as other security and reliability related issues</li> <li>• Releases generation capacity to make market more efficient</li> </ul>
Capacity Market	Most complex and costly to Implement	Total change to current market design	Allows greatest possible participation by end users in DSR programs with guaranteed capacity payments but generators will want the same deal

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<sup>2</sup> Presentation by Patrick Peak, Manager System Capacity, titled How the WA Wholesale Electricity Market operates and opportunities for DSM, dated 4 March 2008