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17 December 2012

Dear Ms Yang,

Submission on 2012 Wholesale Electricity Market Report discussion paper

EnerNOC welcomes the opportunity to contribute to the ERA's 2012 Wholesale Electricity Market Report to the Minister for Energy.

EnerNOC is an independent aggregator of demand response, currently managing 8,500 MW of dispatchable demand response sourced from over 13,500 commercial and industrial sites across markets in North America, the UK, Australia, and New Zealand.

Around 300 commercial and industrial customers in Western Australia participate in the Wholesale Electricity Market (WEM) through EnerNOC.

We have several concerns about the discussion paper:

1. There are serious factual errors in the discussion of "costs of excess capacity".
2. The paper largely ignores the significant reforms proposed by the IMO's Reserve Capacity Mechanism Working Group (RCMWG). This is surprising, since the RCMWG's discussion of these issues was largely prompted by the ERA's 2011 WEM Report, and the ERA has been participating in the RCMWG.
3. The paper suggests policies which have already been analysed and rejected as unworkable by the RCMWG and the IMO's consultants.

The attached report addresses the major issues raised in the discussion paper, including correcting the errors, and then responds to the relevant discussion points.

I would be very happy to provide further information or clarification, should you require it.

Yours sincerely,

Dr Paul Troughton
Manager of Regulatory Affairs

Contents

1 Excess capacity

Much of the discussion paper is concerned about the level of capacity in the market. "Excess capacity" is defined as any capacity in the market beyond the minimum required to provide the desired reserve margin.

The primary purpose of a capacity mechanism is to ensure adequate supply – i.e. to avoid the reserve margin falling below the desired level. It should not be surprising that any such mechanism will tend to err on the side of producing a consistent excess, rather than risking a shortage – it is not possible for any market design to ensure that only the exact amount of capacity required is procured.

The Reserve Capacity Mechanism (RCM) has succeeded in avoiding shortages, and hence has produced excesses.

The paper suggests that the current level of excess capacity is a cause for concern, that it has "imposed a significant cost on the market"[1], and that, consequently, radical changes should be made to the operation of the market. We discuss each of these issues in turn below.

[1] Discussion paper, p.17.

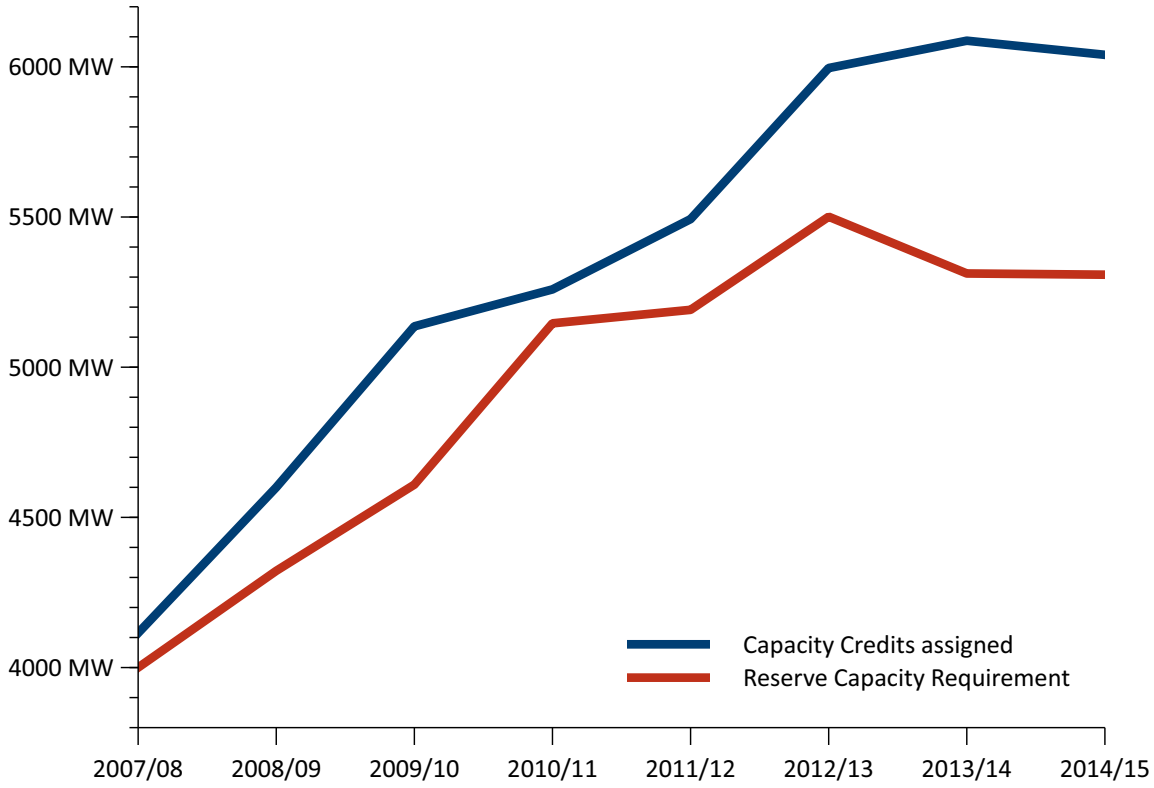

Figure 1: Reserve capacity requirements and capacity credits assigned for each year since market start.

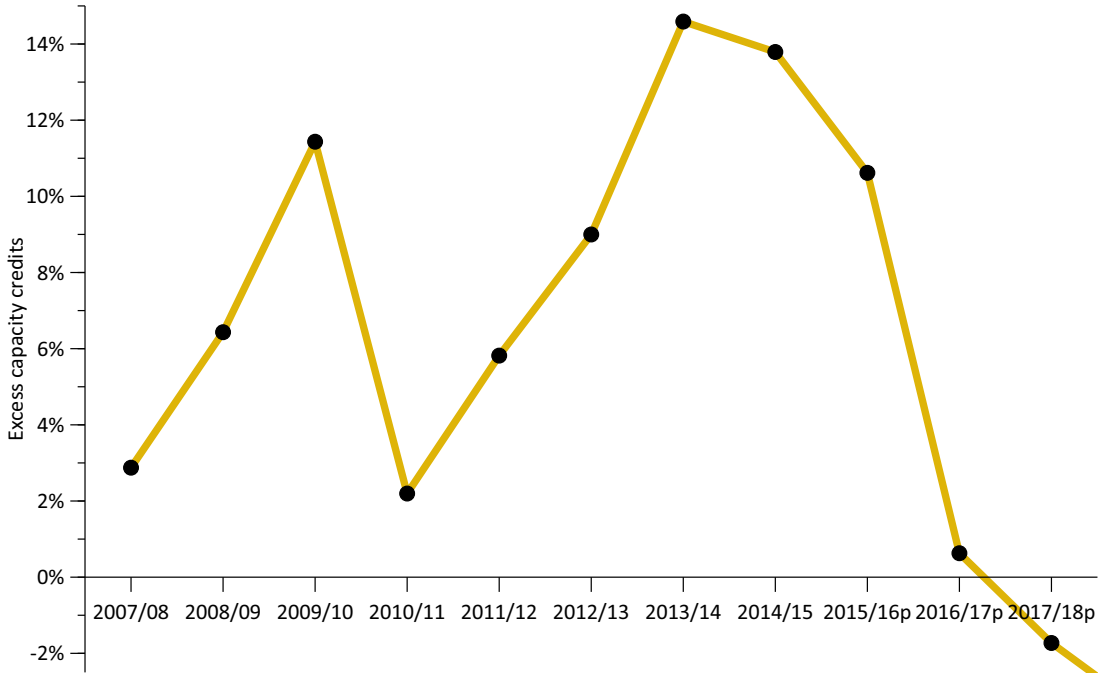

Figure 2: Is there a trend here? Excess capacity credits since market start. Actual results to 2014/15; IMO projections thereafter.

1.1 *Causes of excess capacity*

Figure 1 shows the history of the Reserve Capacity Requirement (RCR) and the capacity credits assigned since market start.[2] Two key features are notable:

1. Most of the recent increase in excess capacity came from the sharp 625 MW reduction in RCR for 2013/14 – due to the peak demand forecast being reduced by more than 10%[3] – rather than from additional capacity entering the market.

2. In 2014/15, for the first time, the level of capacity in the market fell. The 2014/15 reserve capacity cycle had the lowest entry of new capacity since market start, along with some attrition. This seems an appropriate response; it does not suggest that anything is broken.

IMO projections[4] show a return to balance in 2016/17 (i.e. the next-but-one capacity cycle), and shortfalls thereafter, so excess capacity is clearly a temporary issue. Figure 2 shows these projections, along with the historical levels of excess capacity.

The WEM is probably the smallest centrally-organised capacity market in the world. Both generation and load tend to enter and leave the market in relatively large "lumps", relative to the size of the market. We would therefore expect the level of excess capacity to be subject to greater extremes than experienced in other markets. In fact, the WEM appears to be doing better than expected: excesses of 10-13% are common in other capacity markets,[5] and the WEM has only briefly exceeded this range.

The paper is correct to point out, on p.26, that, to the extent that there is a problem with excess capacity at present, state entities are key contributors, in two ways:

- 410 MW of additional capacity (Kwinana HEGT + Muja A & B refurbishments), brought into the market by Verve Energy.

- 664 MW of old unreliable capacity (Muja G7, Kwinana Stage C, and Pinjar GT11[6]) with extremely high planned outage rates (40%+), which has not yet been retired by Verve Energy.

Due to the juxtaposition of the discussion of excess capacity and of DSM, a casual reader could infer that DSM is the cause of, or a major contributor to, the current level of excess capacity. This is not the case; Table 1 puts some of the contributing factors in context.

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2 Data taken from the first three columns of Table 2 on p.22 of the discussion paper.

3 Table 2 on p.40 of the 2011 Statement of Opportunities shows the 10% PoE forecast for 2013/14 being reduced from 5,370 MW to 4,802 MW.

4 See RCMWG Meeting 9 papers, pp.94-99.

5 The NERC *2012 Summer Reliability Assessment*, May 2012, shows on p.21 anticipated reserve margins and reference levels. Transforming these into "excess capacity" proportions gives 10% for MISO and ISO-NE, and 13% for PJM.

6 Pinjar GT11 (105 MW) was mentioned in the ERA's 2011 report, but not in the paper. It is not clear from the discussion paper whether its performance has improved.

Table 1: Contributions towards current level of excess capacity since market start

Total DSM added	394 MW
Gas-dependent capacity additions	1,359 MW
Capacity additions due to government policies[7]	1,000 MW
Downward revision in 2013/14 RCR in 2011 SOO	625 MW
Current oversupply in baseload capacity[8]	1,296 MW
Verve plant with >40% planned outage rate[9]	664 MW

1.2 Cost of excess capacity

On p.22, the paper purports to show the "direct cost of excess capacity to consumers". It contains the following statement:

> *"the direct cost of excess capacity to consumers can be calculated by multiplying the amount of excess capacity by the prevailing capacity price".*

This is fundamentally wrong, as it ignores the significant effect of the Excess Capacity Adjustment. For the same reason, the figures presented in Table 2 and quoted in the text are **double** the correct values.[10] This is entirely misleading, and needs to be corrected.[11]

The Excess Capacity Adjustment is correctly explained on p.19 of the paper. Its effect is to ensure that consumers are not exposed to any costs due to excess capacity: since the Reserve Capacity Price (RCP) falls in proportion to the degree of excess capacity, the costs of any excess capacity are borne by providers of capacity (generators and demand response providers), not by consumers.

On p.23, the paper suggests that it is economically inefficient for capacity suppliers to receive a lower price, and hence make a lower return on investment, when there is excess supply. We do not understand why the ERA takes this view: this is *exactly* the outcome that should be expected from a competitive wholesale market.

The Excess Capacity Adjustment only fails to protect consumers in this way if their retailer chooses to fix the price it pays for capacity by entering into bilateral contracts. However, so long as the retailer only chooses to do this when they can lock in a price that is below the RCP, then they, and their consumers, will come out ahead even in the presence of excess capacity.

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7 Includes impact of Schedule 7, Displacement Mechanism, and refurbishment of Muja A & B.

8 See section 3 of this submission.

9 ERA, *2011 Annual WEM Market Report for the Energy Minister*, p.xiv

10 Since excess capacity causes the Reserve Capacity Price (RCP) to fall, if you want to estimate the "cost of excess capacity", you have to compare the status quo with a scenario in which there is no excess, and hence a higher RCP. In the absence of any better information, we are sharing the ERA's assumption of 50% bilateral contracting.

11 The discussion paper presents a worked example with the correct calculations in footnote 30 on p.23. It is not acceptable to mislead the reader repeatedly in large print, and merely include the truth as a caveat in small print on another page.

If a retailer either misjudges its forecasts of capacity prices, or chooses to pursue some other hedging strategy, and hence ends up contracted for capacity at above the market price, then the excess costs it suffers can be attributed to poor decision-making by the retailer, not to flaws in the market design. In a competitive retail market, the retailer would be unable to pass these excess costs onto its customers – attempting to do so would lead to customers choosing other retailers.

As noted on p.7 of the paper, total capacity costs are already scheduled to drop by more than 30% in 2014/15, with further drops expected beyond that date, due to the change in the Maximum Reserve Capacity Price formula.

Furthermore, the change to the RCP formula proposed by the RCMWG, to replace the current Excess Capacity Adjustment, will lead to total capacity costs *decreasing* as the amount of excess capacity increases. Hence increases in excess capacity will be unequivocally good for consumers and bad for capacity providers, which is again a desirable outcome.

1.3 "Fixing" excess capacity

It is not immediately apparent that there is a problem to solve – the current situation is (a) temporary, and (b) only costs consumers if their retailer has contracted at prices above the RCP.

The paper suggests setting a limit on the amount of capacity allowed into the market. This concept is often referred to as a "spigot control" mechanism, the idea being that the IMO should "turn the tap off" when it judges there to be sufficient capacity, not allowing any more capacity to enter.

This idea has been discussed extensively in the RCMWG.[12] It seems impossible to come up with a such a mechanism while avoiding unfairly advantaging incumbent players (no matter how inefficient) over new entrants.

Adjusting the pricing formula is a much more powerful approach, and avoids this problem. The pricing approach proposed by Lantau achieves a similar cost outcome to the hypothetical "perfect spigot", while being practical to implement. Table 2 shows a worked example for 2014/15.

Table 2: Comparison of hypothetical "spigot" and Lantau price response proposal with the actual outcome for 2014/15.

	Actual outcome	Perfect spigot (hypothetical)	Price response (Lantau proposal)
Reserve Capacity Requirement	5,308	5,308	5,308
Capacity Credits assigned	6,040	5,308	6,040
% of RCR bilaterally contracted	50%	50%	50%
Bilaterally contracted capacity credits	2,654	2,654	2,654
Uncontracted capacity credits	3,386	2,654	3,386
Reserve Capacity Price	$122,428	$139,315	$110,624
Uncontracted capacity cost	$414,541,208	$369,742,010	$374,572,864
Cost savings vs. actual	**—**	**$44,799,198**	**$39,968,344**

[12] See, for example, slide 3 of Lantau's presentation to RCMWG meeting 8, on 11 October 2012.

Generally, the best way to establish the clearing price for capacity is through an auction. This has been discussed at length in the RCMWG.[13] However, implementing an effective auction is difficult.

The Reserve Capacity Auction mechanism specified in the rules is unworkable, as it suffers from the "zero-infinity" problem, in which capacity credits tend towards being either worthless (if there is any excess) or hugely valuable (if there is a shortfall), with no intermediate state.[14]

A more sophisticated and effective auction mechanism could be developed – other markets have them. However, these other markets do not have participants with such extraordinary market power as Verve and Synergy. The market power mitigation mechanisms used elsewhere are unlikely to be sufficient to achieve a workable competitive market outcome from an auction in the WEM. It would therefore probably be necessary to break up both Verve and Synergy into several independent, competing entities before moving to an auction-based approach.

Lantau, the IMO's consultants to the RCMWG, recommend against an auction for the RCM, due to the significant changes that would be required, and the effort and costs associated with developing and implementing a workable auction being disproportionate for this relatively small market.[15] Instead they propose a move to a much more dynamic pricing formula. It provides a very strong incentive to reduce excess capacity, while also increasing the incentive to add capacity as the market nears a shortfall. This is a similar outcome to that which would be achieved in a competitive auction.

The proposed pricing mechanism would result in a lower total cost of capacity if there is significant excess capacity.[16] The assertion on p.29 on the paper that the proposal "will result in a higher cost of excess capacity that will be passed through to electricity consumers" is simply wrong.

2 Market design

The paper asserts, on pp.17-19, that the market is not working as intended. Statements about the intended operation of the market need to be treated with some caution: the rules and operation of the market have clearly evolved over time, and the reasoning behind each element of the design is not clear. For example, as stated on p.19, nobody appears to know the origin of the mysterious 85% RCP adjustment.

Rather than speculating about how the market was intended to work, we would suggest concentrating on observing how the market does work, what reforms are proposed, and whether they will better serve the Market Objectives.[17]

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13 See RCMWG Meeting 9 papers, pp.71-76.

14 See slide 7 of Lantau's presentation to RCMWG meeting 8, on 11 October 2012.

15 See, for example, RCMWG Meeting 9 papers, pp.75-76.

16 See RCMWG Meeting 9 papers, Table 4, p.87. The result holds for any level of bilateral contracting up to 72.5%. See also the spreadsheet model *RCP_projections_and_transitions*, circulated by the IMO to the RCMWG on 7 December 2012.

17 The Market Objectives are defined in clause 1.2 of the Wholesale Electricity Market Rules.

The paper seems to work from an assumption that bilateral contracting is an inherently good thing. As discussed above, ideally, retailers should choose a level of bilateral contracting that suits their view of the future and their risk preferences. Policy imperatives that may have led to non-economic bilateral contracting decisions by Synergy seem to be at the root of the current concern about the costs of excess capacity.

In a competitive retail market, competitive pressure should prevent retailers from passing on the costs of any poor contracting decisions to their customers. However, this competitive pressure is largely absent from the Western Australian market, since around 50% of the market's volume remains uncontestable.

If retailers, on average, are bilaterally contracted at a price 15% above the RCP, and they are 50% bilaterally contracted, it imposes a 7.5% excess cost on consumers. Table 3 shows a worked example for 2014/15.

Table 3: Illustration of bilateral price risk for the 2014/15 capacity year.

	Reference case	**High-priced bilaterals**
Reserve Capacity Requirement	5,308	5,308
% of RCR that is bilaterally contracted	50%	50%
Bilaterally-contracted capacity credits	2,654	2,654
Average bilateral price (% of the RCP)	100%	115%
Bilateral capacity costs	$324,923,912	$373,662,499
Excess cost	**—**	**$48,738,587**

Note that the excess cost in this case is greater than that due to excess capacity, as shown in Table 2.[18]

Under both the current and proposed pricing mechanisms, it seems that bilateral contracting poses more of a risk to consumers than excess capacity.

3 Capacity mix

On pp.21 & 23-27, the paper expresses concern about types of capacity resources participating in the market, in particular that most recently added facilities have been peaking resources – both conventional generators and Demand Side Management (DSM).

Ideally, a power system should have a supply-side mix that is appropriate to its load-duration curve. Hence baseload demand should largely be met by baseload generation, mid-merit demand by mid-merit generation, peak demand by peaking generators, and extreme peaks by DSM.

A system with an extremely peaky load-duration curve should have a relatively high proportion of peaking plant and DSM. Any other outcome would be inefficient.

[18] Under the current pricing mechanism, again assuming 50% bilateral contracting, there would need to be over 17% excess capacity to have the same impact on retailers' capacity costs. Under Lantau's proposed pricing mechanism, having 17% excess capacity would **reduce** the total costs borne by consumers by over 7%. These figures were calculated using the *RCP_projections_and_transitions* spreadsheet, circulated by the IMO to the RCMWG on 7 December 2012.

The most obvious feature of Figure 10 on p.21 of the paper is the large excess of baseload capacity relative to baseload demand. Table 4 shows the values corresponding to the 2011/12 year on that figure.[19]

Table 4: Demand and capacity breakdown for 2011/12.

	Demand MW	Supply MW	Excess MW	Excess %
Baseload	1,684	2,980	1,296	77.0%
Mid-merit	578	509	-69	-11.9%
Peaking & reserve margin	1,982	1,980	-2	-0.1%

In the presence of this excess baseload capacity, it is natural that nobody will seek to build new baseload plant. The other notable feature is that the amount of peaking capacity is appropriate to cover the peaking demand and the reserve margin: *there is no excess of peaking capacity*.

If some of the excess baseload capacity were to exit the market, we would expect to see more mid-merit plant developed – some possibly through conversion of open-cycle peaking plant to combined-cycle operation. While the excess baseload capacity is present, there is no economic incentive to do this.

The business case for developing mid-merit capacity, rather than peaking capacity, depends on the energy market, not the capacity market. If new investment in peaking capacity were to be inhibited somehow, this would still not lead to more mid-merit capacity being developed: only reducing the significant excess of baseload capacity could trigger this.

4 Demand-side management

4.1 Discriminating against DSM

The paper repeatedly mentions the need for "alignment between the payment received by providers of DSM and the value provided by DSM."[20] Clearly, such an alignment must be maintained for all capacity providers, including generators. Generators and DSM both provide Reserve Capacity. Hence they should both be paid the Reserve Capacity Price. Any other treatment would be discriminatory.

Discriminating against DSM is not the answer to any issue. It would be contrary to the Market Objectives, and against the best practices observed in all other capacity markets. We are not aware of any market which allows participation by DSM and has a capacity mechanism, and yet does not allow DSM the opportunity to earn the full capacity price.

On p.30, the report repeats a suggestion made by Synergy (as part of the IMO's RCMWG deliberations) that DSM be paid a lower capacity payment than other resources, and a higher dispatch payment. Similarly, the ERA's 2011 report

[19] This information does not appear to have been published in numerical form, so these values have been measured from the version of the graph that appeared on p.25 of the *2012 Statement of Opportunities*. They should be accurate to within 1%.

[20] Similar phrasing occurs on pages iii, 3, 25, 30, and 31.

suggested considering the merits of the approach to DSM taken in "energy-only" markets, such as the Eastern Australian National Electricity Market.

Put simply, an energy-only approach to DSM, while it can make sense in the context of an energy-only market, generally does not bring about an efficient level of demand-side participation.

As a result, some otherwise energy-only markets have introduced capacity mechanisms specifically to facilitate growth in DSM to somewhere nearer an efficient level. For example, ERCOT in Texas runs a capacity-like programme, the Emergency Response Service, to allow DSM providers to earn predictable revenue. The Ontario Power Authority similarly introduced a capacity-like demand response programme (DR3) when its original energy-only programme (DR1) failed to elicit meaningful levels of participation.

The 8,500 MW of demand response EnerNOC manages is spread across approximately 50 demand response programmes with a variety of designs. None of these megawatts participates on an energy-only basis.

The whole point of a capacity-type mechanism is to procure resources to meet the peak. It addresses the top end of a load-duration curve more predictably and reliably than an energy-only market can.

Towards the baseload end of the load-duration curve, the capacity mechanism is largely irrelevant, as baseload generators recover their costs and make their returns mostly from energy revenues. The purpose of the capacity mechanism is to deal with the peak end of the load-duration curve, where energy revenues are small and unpredictable. The role of peaking generators and DSM is to serve these system peaks. To exclude them from the reserve capacity mechanism would be perverse.

In energy-only markets, providers of peaking capacity rely on derivatives to convert their spot price exposure (the potential for extremely high energy payments) into capacity payments – this is how peaking capacity is funded in the NEM. In the WEM, there is no such derivatives market, as the reserve capacity mechanism fulfils that role. This means that any peaking resource which is excluded from the reserve capacity mechanism simply will not be developed.

The discussion and table on p.24 about the infrequency of DSM dispatches misses the point. Peaking resources are needed to cover extreme peaks in demand. The most extreme peaks only happen occasionally. The planning criterion for the WEM is based on scenarios with a 10% probability of exceedance. Hence, if forecasting were perfectly accurate, and there was no excess capacity, we would expect the last megawatt of capacity to be dispatched on average only one year in ten.[21]

However, if that capacity were not available when an extreme peak in demand occurred, the lights would go out. If you do not pay for the capacity to be

[21] We should not be surprised that no DSM was dispatched in 2011/12. Even if there were no excess capacity, the forecasts in Appendix 2 of the *2009 Statement of Opportunities* suggest there would be only a 50% chance of dispatching the 386th-from-last megawatt (this is the difference between the 10% and 50% POE forecasts). There was only 260 MW of DSM capacity participating that year, so the probability of it being needed was less than 50%. Clearly, as the proportion of capacity provided by DSM rises, and the level of excess capacity drops, the probability of DSM being dispatched in any given year will increase. In EnerNOC's experience in other markets, it is not uncommon for DSM to be dispatched as much as ten times in a year.

available, it will not be available. Treating the top end of the load-duration curve on an energy-only basis would be akin to buying insurance only when you have been burgled. Nobody will provide cover on that basis.

Moreover, while the paper discusses the frequency of DSM dispatches, it does not consider the frequency of dispatch of peaking plants. It seems odd to discriminate between the two: they both receive capacity revenue for providing capacity when needed, and both are rarely dispatched.

4.2 Reforms to DSM

On p.30, the paper mentions that DSM is paid the same as generation "despite their differences in availabilities". At present DSM is available for a limited number of hours per year, but the use of an Availability Curve[22] associated with the RCR ensures that it will be available whenever it is needed, even in a 1-in-10 year.

System Management has expressed concern that it may run out of dispatch hours for DSM facilities in more extreme situations than those contemplated when setting the RCR, and that this risk may impede its dispatch decision-making early in the year.

The RCMWG's harmonisation proposals resolve this concern by removing the limits on the total dispatch hours, so that DSM resources must be available for as long as the system needs it. However, the RCMWG's deliberations and analysis are surprisingly ignored in the ERA's paper in their entirety, despite the paper noting (on p.25) that last year's report asked the RCMWG to consider these issues.

The harmonisation proposals will make the provision of DSM in the WEM considerably more onerous, as indicated in Table 5.

Table 5: Changes in DSM performance requirements from proposed harmonisation.

	Current	**Harmonised**
Dispatch events per year	At least 6	Unlimited
Dispatch hours per year	At least 24	Unlimited
Dispatch on 3 days in a row	No	Yes
Maximum length of dispatch	4 hours	6 hours
Available hours	12:00 – 20:00	10:00 – 20:00
Notification time	4 hours	2 hours
Voluntary dispatch outside mandatory hours	No	Yes
Near-real-time data provided to System Management	No	Yes

The paper notes on p.23 that "growth in DSM is anticipated to slow". This understates the situation. As the IMO has stated when preparing projections:

> *"In discussions with the IMO, DSM providers have suggested that the harmonisation proposal would lead to some reduction in future capacity. For the purpose of this paper, we have assumed a reduction in DSM capacity of 20% for the 2015/16 Capacity Year."*[23]

[22] As set out in WEM Rules clause 4.5.12.
[23] RCMWG Meeting 9 papers p.99.

The ERA's skewed approach with regards to its DSM discussion extends to the degree to which it undertakes its analysis. While it highlights on p.25 EnerNOC's market share of DSM, it fails to provide similar analysis of markets shares for other peaking resources, or for generation resources in general. The current market shares of both Verve and Synergy are the main cause for concern raised by other participants (and the IMO's RCMWG consultants) with regards to the potential for the staging of effective capacity auctions.

It is worth noting that DSM is a contestable service. EnerNOC itself provides no DSM. Rather, it facilitates the provision of DSM by around 300 Western Australian businesses. EnerNOC has had to compete for their business.

4.3 Unique advantages of DSM

The right answer to any cost concerns is to fix the market clearing mechanism, as discussed above. In markets where this has been done successfully, DSM has brought significant competition to the capacity market, driving overall costs down. For example, in PJM's 2013/14 Base Residual Auction, the participation of DSM saved the market $11.8 billion in capacity costs.[24]

Over the long term, the reduction in peakiness from the use of DSM will reduce network augmentation costs. This has also been observed in PJM, where reduced peak demand growth, attributed in part to customer participation in DSM programmes, led to the cancellation of the PATH and MAPP transmission projects, saving $3.5 billion.[25]

To unlock the network benefits of DSM in the nearer term requires coordination with Western Power to defer specific planned network augmentations. The potential benefits from this are substantial. For example, in the NEM, the AEMC found:

> *"Frontier Economics estimated that economic cost savings of peak demand reduction in the NEM is likely to be between $4.3 billion to $11.8 billion over the next ten years (net present value, 2013/14 to 2022/23) which equates to between 3 per cent to 9 per cent of total forecast expenditure on the supply side. The majority of these savings occur in the network sector."*[26]

Recent modelling by Carbon Market Economics found that Western Power's expenditure to address growth in peak demand averages $2.05 million per MW.[27] This suggests that 500 MW of appropriately-deployed demand response capability could avoid around $1 billion in capital expenditure on network augmentations.

Compared to centralised generation, DSM is currently undervalued in the RCM. This is because meeting extreme peaks in demand using centralised generation incurs transmission and distribution losses. Meeting them using DSM does not –

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[24] Monitoring Analytics, *Analysis of the 2013/2014 RPM Base Residual Auction - Revised and Updated*, 20 September 2010, pp.51-52, available from http://www.monitoringanalytics.com/reports/Reports/2010.shtml

[25] PJM, *Letter to Transmission Expansion Advisory Committee*, 28 August 2012, available from http://www.pjm.com/sitecore%20modules/web/~/media/committees-groups/committees/teac/20120913/20120913-srh-letter-to-teac-re-mapp-and-path.ashx

[26] AEMC, *Power of Choice Review*, Final Report, 30 November 2012, p.vi

[27] Carbon Market Economics, *Reducing electricity costs through Demand Response in the South West Interconnected System*, October 2012, p.5

losses are reduced along with the demand. Marginal losses during extreme peaks, when DSM is likely to be dispatched, are higher than average transmission and distribution loss factors suggest. Hence 1 MW of load reduction through DSM may displace up to 1.4 MW of centralised generation, and hence arguably should receive up to 1.4 Capacity Credits. At present, DSM in the WEM is not even compensated for average losses. The Federal Energy Regulatory Commission in the US has acknowledged this issue and is currently investigating how demand response might be compensated for this.[28]

It is worth considering what happens to reserve capacity payments made to DSM. End-use customers – firms spanning the gamut of industry sectors, from resources to health care, data centres, and food production through to agriculture, manufacturing, and heavy industrial operations – receive the bulk of capacity payments delivered to DSM. This revenue assists participating businesses, and the state's economy, significantly more than spending the same money on peaking generators and other supply-side assets which would have extremely low utilisation.

Hence the use of DSM for extreme peaks not only reduces overall costs, but also recycles much of the money that is spent, to the benefit of the economy. This helps participating businesses mitigate rising electricity costs, and pursue more extensive energy management objectives, often resulting in permanent demand reductions.

5 Discussion points raised in the discussion paper

Discussion Point 1: Stakeholders are invited to comment on how the Market Rules may be improved so that the Reserve Capacity Auction provision can be utilised by the IMO for the procurement of any capacity shortfall in meeting the Reserve Capacity Requirement and whether the Bilateral Trade Declaration of capacity should be made as a binding commitment between Market Participants similar to the Bilateral Submission in the energy market of the WEM.

As discussed above, and in the RCMWG,[29] although well-designed auctions are the best way to discover prices, implementing a sufficiently workable auction mechanism for the WEM would be a major undertaking. At a minimum, it would require:

1. Implementing a sloping demand curve, in place of the vertical one defined in the current rules, to avoid excessive price volatility.

2. Moving from a one-shot procurement process for each reserve capacity year to a series of tranches spread over time, so that there is less dependence on uncertain long-range forecasts, and yet long-lead-time resources still have the opportunity to participate.

[28] See, for example, *FERC Chairman Wellinghoff reveals goals, predictions for markets*, Restructuring Today, 13 September 2012: "Wellinghoff's staff is still crunching numbers, but he has some analysis that indicates deploying end-use resources at the distribution level is 20-40% more effective than deploying central station generation. He wants to start having workshops on paying for that superior performance relatively soon..."

[29] See, for example, RCMWG Meeting 9 papers pp.71-76.

3. Implementing a trading platform to allow participants to buy and sell Capacity Credits to match supply with evolving demand forecasts.

4. Limiting the exercise of monopoly or monopsony power by breaking up both Verve and Synergy into multiple, competing organisations, ideally so that no one party controlled more than 20% of the capacity supply or demand.

If it is determined that the implementation costs and ongoing complexity of taking this approach in the WEM are worthwhile, EnerNOC would welcome it.

Due to market power and counterparty risk issues, it is not practicable to introduce binding Bilateral Trade Declarations without a workable auction mechanism.[30]

Discussion Point 2: Stakeholders are invited to comment on whether there should be a limit set for the number of Capacity Credits that the IMO can procure in excess of the Reserve Capacity Requirement and, if so, on what basis this limit should be determined.

This is a bad idea. This idea of "spigot control", in which additional capacity is prevented from entering the market through an administrative barrier, rather than through a price signal, has been discussed at length in the RCMWG.[31]

It would have the effect not only of protecting retailers from any costs of excess capacity, but also of protecting incumbent capacity suppliers from any reductions in capacity prices due to additional capacity being provided by new entrants. This latter effect would deter innovation and remove any signal for the retirement of old, inefficient plant.

In a correctly-functioning market, if an innovative, lower-cost new entrant were to appear, their entry into the market would create a temporary oversupply, driving down prices. If the lower prices persist, it should lead to incumbent, higher-cost resources exiting the market, resolving the oversupply. Any "spigot control" prevents this process, protecting incumbent suppliers from competitive pressure.

Discussion Point 3: Stakeholders are invited to comment on the effectiveness of the Reserve Capacity Price that has been set using the administrative formula with reference to the Maximum Reserve Capacity Price and the Excess Capacity Adjustment and whether an alternative calculation formula should be explored.

The mechanism has worked reasonably well to date. However, it is arguable that it is not sufficiently responsive to changes in the supply:demand balance, and hence may not send strong enough price signals about excesses and incipient shortages in capacity supply. As a result, it also provides little incentive for either retailers or capacity providers to hedge their exposure through bilateral contracting.

Hence it makes sense to explore an alternative calculation formula.

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30 See, for example, discussion of the "Synergy Proposal" on slides 26-27 of Lantau's presentation to the RCMWG workshop on 4 July 2012, and slide 4 of Lantau's presentation to RCMWG meeting 8, on 11 October 2012.

31 See, for example, Lantau's presentation to the RCMWG workshop on 4 July 2012, slides 22-24.

Discussion Point 4: Stakeholders are invited to comment on Lantau's proposal for changing the Reserve Capacity Price calculation formula in the Market Rules.

Lantau's proposal has been considered in exhaustive detail by the RCMWG, and compared to a whole range of potential alternatives, including those alluded to in Discussion Points 1 and 2. It does appear to be the best option for the WEM for the foreseeable future: it brings most of the benefits of a proper competitive auction, while avoiding the extreme complexity. In particular, it renders the whole issue of excess capacity moot, as in all but the most extreme scenarios of unwise bilateral contracting by retailers, the costs of excess capacity are borne by capacity providers, not by retailers, and hence cannot be passed on to consumers.

EnerNOC supports Lantau's proposal.

Discussion Point 5: The Authority invites stakeholders to comment on the value provided by DSM under the current market design and the cost of DSM to the market. The Authority also invites stakeholders to comment on whether alternative treatments of DSM could provide a more cost effective way for the efficient use of DSM.

DSM provides Reserve Capacity, just like a generator, so it should be paid the Reserve Capacity Price. This is what happens in all comparable capacity markets.

Any other treatment would be contrary to Market Objective (c):

> *"to avoid discrimination in that market against particular energy options and technologies, including sustainable energy options and technologies such as those that make use of renewable resources or that reduce overall greenhouse gas emissions"*[32]

As discussed above, because their energy revenues are highly unpredictable, capacity payments are particularly important to peaking resources such as DSM. In energy-only markets, where no capacity payments are available, peaking resources use the derivatives markets to transform their spot price exposure into capacity payments. There is no such derivative market in the WEM, so this option is not available. Hence, barring DSM's access to the capacity price would be tantamount to barring DSM from market participation. This would not be an efficient outcome.[33]

Discussion Point 8: Stakeholders are invited to comment on whether the current market design provides appropriate incentives for retirement of inefficient generating units.

The current market design does not provide sufficient incentive to retire inefficient generating units. Implementing a "spigot control" (Discussion Point 2) would make the situation worse. Implementing Lantau's pricing proposal (Discussion Point 4) would make it better, as capacity prices would drop much further in the presence of excess capacity.

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[32] Clause 1.2.1(c) of the WEM Rules.

[33] It is also likely to be contrary to Market Objectives (a), (b), (d) and (e).

For very old, fully depreciated plant, capacity price signals may not be sufficient to induce retirement. It may be appropriate to strengthen the IMO's role in questioning planned and forced outages, and reducing or withholding the allocation of Capacity Credits where sustained high outage rates indicate that plant may be unreliable.

Discussion Point 11: Stakeholders are invited to comment on how effective the IMO, System Management and the Authority have been in carrying out their respective functions in the WEM.

We consider that the institutions are fulfilling their roles effectively, and the overall governance arrangements are satisfactory.