THE LANTAU GROUP
strategy & economic consulting

Discussion Draft

Prepared For:

WA IMO

Governer Stirling Tower

Perth, Western Australia

Review of RCM: Issues and Recommendations

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Date: September 2011

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1. OVERVIEW

1.1. SCOPE

Following the completion of a comprehensive study of the Reserve Capacity Mechanism, the IMO Board asked The Lantau Group (HK) Limited (TLG) to prepare a note on key areas identified for further review by the Market Advisory Committee. After considering a range of possible directions, and taking into account experience within the WEM and internationally, the IMO Board concluded that the RCM has promoted capacity development and supply reliability in the WEM, but that refinement is needed to improve alignment of the RCM with the Market Objectives.

A number of different capacity remuneration mechanisms, of which the RCM is one example, exist in international electricity markets. Many different markets have features that have merit and can serve as interesting examples, but it is most important that the combined features of any single market work harmoniously. Recommendations for change in the WEM must reflect the design and context of the WEM else they risk being inconsistent or incompatible with the WEM.

As a result, we focus our recommendations on a specific set of issues that arose consistently in our review:

- The formula that establishes the value of the Reserve Capacity Price (RCP), particularly in light of the recent recommendation to reduce the Maximum Reserve Capacity Price (MRCP);
- The inter-relationship between the RCM and the Capacity Refund Regime;
- The extent to which supply- and demand-side resources should be treated similarly;
- The extent to which fuel supply limitations should affect the eligibility of supply-side resources for Capacity Credits;
- The setting of the Individual Reserve Capacity Requirement (IRCR); and
- The extent to which further periodic reviews should be undertaken so as to ensure that the RCM functions as intended to guide appropriate levels of investment in reserve capacity.

The following report explains key forces that influence capacity investment in the WEM and puts the RCM into a broader context. Clearly the global financial crisis has disrupted economic growth, and thus, contributed to excess reserve capacity. We therefore focus on how well the RCM is able to adjust to changing market conditions. If the RCM adjusts too frequently or with too much volatility, that volatility becomes a risk to stakeholders. If the RCM fails to adjust sufficiently, the stakeholders face a different set of risks. A more dynamic but not overly volatile RCM has the potential to improve considerably on the existing arrangement, while being consistent with the managed design that defines the WEM.

1.2. THE CURRENT RESERVE CAPACITY CUSHION

Capacity investment in the WEM is the product of many factors, including demand growth, which can be lumpy as well as volatile. Currently, the WEM has an approximately 15 percent reserve capacity cushion. However, this cushion cannot be attributed entirely to the RCM. Several past programmes, no longer in force, influenced capacity investment, including the Displacement Mechanism in the original Vesting Contract and the earlier Schedule 7 requirements that forced Western Power Corporation to tender for new capacity. The lingering impact of the global financial crisis and subsequent global slowdown are also key contributors, as the impact of the slowdown has become apparent in the most recent load projections.

As a result of this increased cushion, or excess reserve capacity, a number of areas of the RCM merit particular review, as set out below.

1.2.1. Refine elements of the RCM

Though there is excess reserve capacity, our analysis indicates that the existing capacity mix is broadly reasonable given the economics of different power generation technologies and the extent to which the existing mix reflects pre-WEM investment decisions. We therefore focus on the overall quantum of excess reserve capacity in the WEM, and on whether the RCM can and should be refined. We conclude that refinements to the setting of the Reserve Capacity Price (RCP) would better achieve the Market Objectives.

1.2.2. Improve alignment of the Capacity Refunds Regime and RCM

Linked to the RCM is the issue of how the Capacity Refund regime operates and what the economic impact would be of making changes to the Capacity Refund regime. The Capacity Refund regime is linked sufficiently tightly to the overall workings and parameters of the RCM as to compel joint consideration. A change in the Capacity Refund regime changes the expected value of a Capacity Credit, and vice versa. Given this linkage, a dynamic refund regime—one that links the refund value to system conditions—is best matched to a more dynamic RCP regime in which the RCP also better reflects system conditions.

1.2.3. Harmonise treatment of restricted capacity resources

We then consider the implications for harmonising the treatment of demand-side resources with the treatment of supply-side resources in the RCM. Most demand-side resources have chosen under the Market Rules to be classified into a category that imposes lesser performance obligations on them than are imposed on supply-side resources. We consider the implications of differential treatment from the perspective of the workings of the RCM.

Similarly we consider the fuel supply requirements imposed on supply-side resources. These are currently that a supply-side resource qualifying for a Capacity Credit must demonstrate fuel supplies to support operation for 14 hours a day. The issue arising is how fuel supply, which is crucial to the ability of a resource to generate if called, interacts with the RCM.

1.2.4. Adjust the Individual Reserve Capacity Requirement

We consider refinements to the Individual Reserve Capacity Requirement (IRCR). The current IRCR settings have some aspects that potentially incentivise rent-seeking rather than value-creating behaviours. We recommend minor changes to mitigate these adverse incentives.

1.2.5. Establish a periodic RCM review cycle

Where capacity mechanisms are employed in electricity markets globally, they have evolved steadily. As an administrative mechanism, the RCM naturally requires periodic calibration and review to ensure it is delivering reasonable outcomes. In particular, a number of key parameters should be reviewed every few years so that they best reflect market conditions.

1.3. STRUCTURE OF REPORT

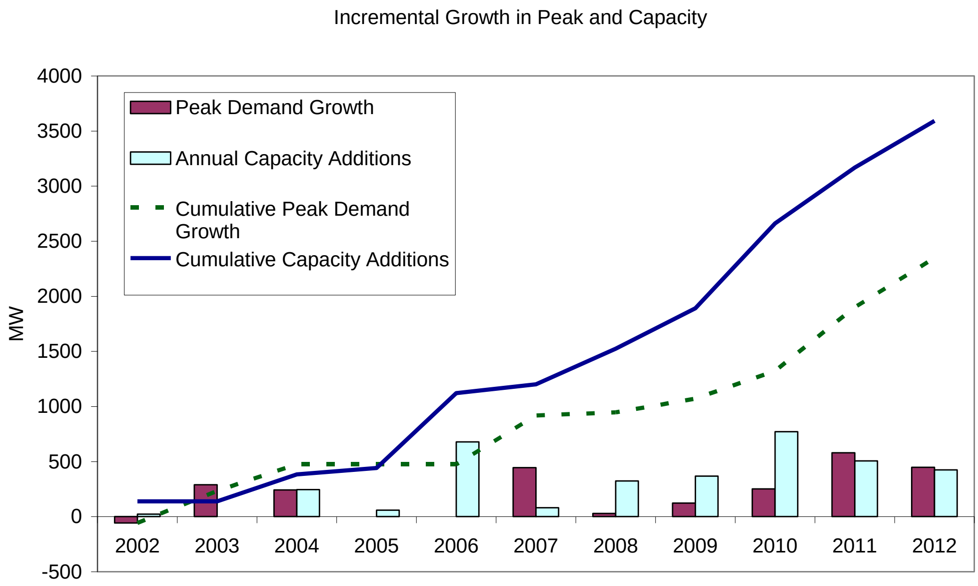
We review key aspects of these recommendations in the next sections of this report, focussing first on the current supply of reserve capacity and its economic value.

2. THE CURRENT SUPPLY OF RESERVE CAPACITY

2.1. OVERVIEW

In evaluating the RCM, we bear in mind that the WEM was in a shortfall situation not long ago. The RCM is now the only mechanism specifically intended to assure capacity adequacy in the WEM. To be clear, the mere existence of excess capacity at a point in time is not sufficient reason to change the RCM. Excess capacity can be the result of a good decision, even though subsequent events (such as the Global Financial Crisis) might make it seem otherwise (necessitating delay or mothballing of mining capacity, for example). Excess capacity can arise when unexpected economic disruptions occur or when growth is naturally lumpy and unpredictable in the shorter-term.

Figure 1: Peak demand and capacity additions since before market start



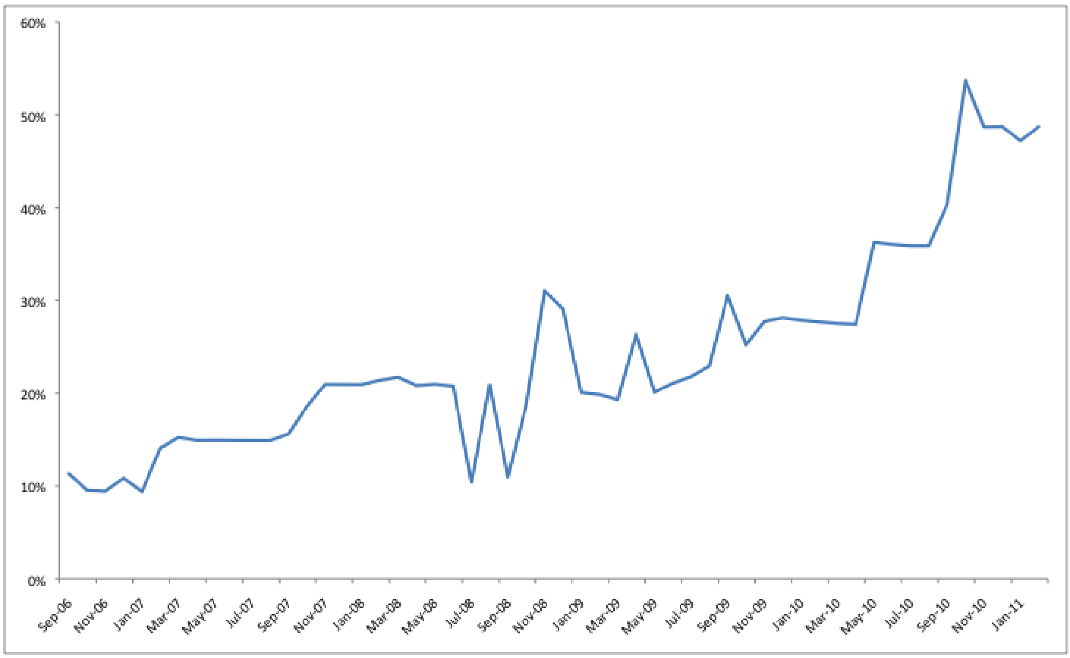
The particularly challenging economic period from 2008 to 2010 accounts for the bulk of the excess capacity additions relative to peak demand growth. This period aligns with the onset of, through gradual recovery from, the global financial crisis. Our concern is not so much with the impact of unexpected (or unexpectedly severe) external forces, however. Our concern is whether the RCM *adjusts* sufficiently to an increase or decrease in the amount of excess capacity so as to mitigate any reasonable risk of compounding the problem.

Additionally, given the proposed material reduction in the MRCP as recommended in the on-going MRCP review, it is important to consider how the level of the MRCP interacts with other elements of the RCM. If the MRCP is too high or low for an extended period, then other aspects of the RCM are unlikely to function as intended. In particular, changing too many aspects of a complex administrative mechanism simultaneously increases risk—underscoring the importance of prudence, as well as reliance on periodic recalibration reviews, to ensure the RCM continues to meet expectations.

2.2. The Rapid Increase in Uncontracted Capacity Credits

It is concerning that there has been a recent and dramatic surge in capacity credits paid for by the IMO directly, rather than being transacted between market participants.

Figure 2: Uncontracted Reserve Capacity Requirement[1]



This surge strongly indicates that the IMO's capacity credit buy price—a price that is determined by an administrative adjustment formulae within the RCM—is higher than the market value of those same capacity credits. This movement away from bilaterally contracted capacity (with a commercially negotiated price) to the regulated price (RCP) is a reason to look more closely at the economic signals transmitted by the RCM and whether those signals might be improved.

1 Source: IMO data, compilation of confidential data

2.3. The cost of excess reserve capacity

The perceived cost of excess reserve capacity depends on one's perspective. The RCM incorporates adjustment formulae to adjust the RCP downward when there is excess reserve capacity. In theory, the adjustment is sufficient to shelter consumers from the cost of excess capacity because an increase in excess reserve capacity is offset by a reduction in the RCP. The reduction in the RCP only applies, however, to Capacity Credits that must be procured by the IMO. Another way to consider the costs of excess reserve capacity is that it drives a wedge between the market value that would be encapsulated in a bilateral contract and the administrative value paid by the IMO. The greater this wedge, the greater the risk of unintended consequences, either in the form of inefficient investment, non-productive rent-seeking behaviour or a reduction in confidence that the WEM delivers value.

The reality is that the economic value of excess reserve capacity approaches zero the greater the amount of excess reserve capacity exists. At present, the WEM has approximately 15% more reserve capacity than is required. The following calculations illustrate how the incremental value of an additional MW of reserve capacity at this point in time (i.e. in addition to what excess already exists) is essentially zero, implying a quite substantial "wedge" between the economic value of a Capacity Credit and the currently applicable RCP. As discussed below, a rigorous market-based value for incremental Capacity Credits would be zero, or nearly so, today, far, far lower than the current regulated price. On the other hand, a rigorous pricing system would also have the characteristic of introducing substantial volatility to the pricing of Capacity Credits. This latter point is important because in other respects, the WEM design has generally avoided reliance on volatility, given the small size of the WA market and the increased difficulty of accommodating, managing or properly assessing the meaning of highly volatile prices.

2.3.1. Economic Value of a Capacity Credit

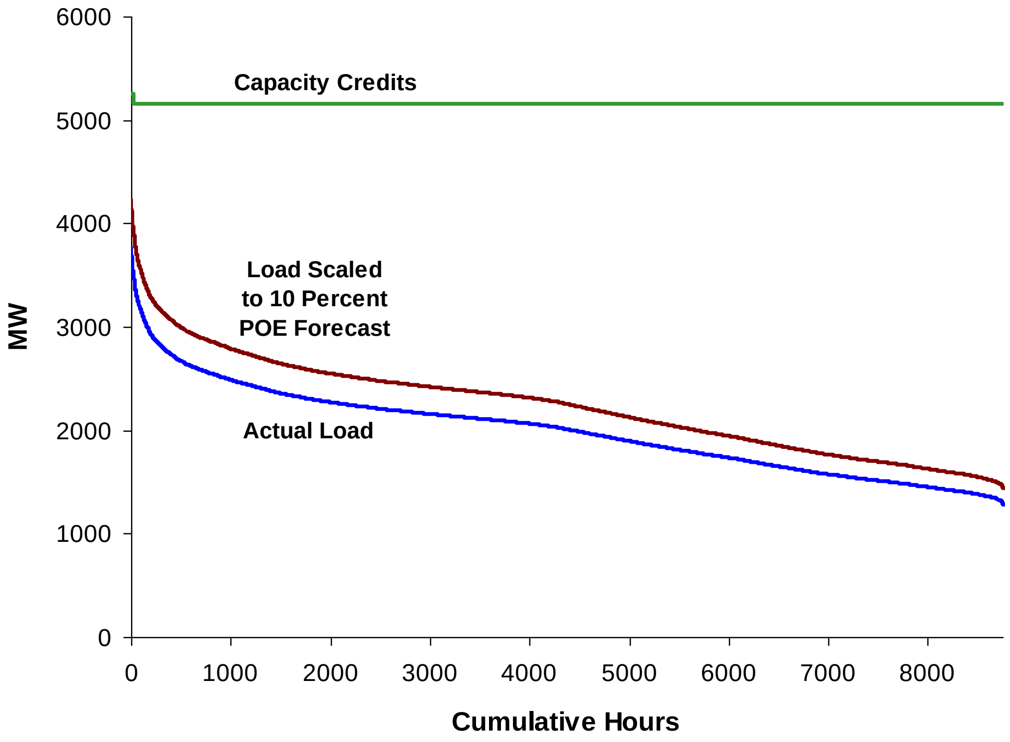
A useful way to estimate the economic value of incremental reserve capacity is to focus on the extent to which additional reserve capacity lowers the probability of lost load.

The reliability standard in WA is based on the 10 percent POE forecast peak demand supplied through the SWIS plus a reserve margin equal to the greater of 8.2 percent of the forecast peak demand and the maximum capacity of the largest unit on the system. Expected energy shortfalls are to be limited to 0.002 percent of annual energy consumption.

The quantity of capacity is mainly relevant during the peak hours in which the load duration curve hits high loads. Figure 3 presents two different load duration curves – one depicting the actual loads and a second scaled to match the 10 percent POE forecast as of the 2007 forecast. The value of the RCM is clearly concentrated in the approximately top 200 peak hours in which the difference between the load and capacity available is the smallest.

Figure 3 also shows the approximate capacity duration curve and the load duration curve for the 2009/10 capacity year. The capacities are based on the allocated capacity credits. The small peak in the capacity duration curve represents available DSM resources, in each of the classes. We implicitly assume that DSM resources can be dispatched perfectly into each of the very top 24 hours that most DSM resources have obligations to be available. Because of planned maintenance needs, the quantity of capacity credits somewhat overstates the actual availability during off-peak periods.

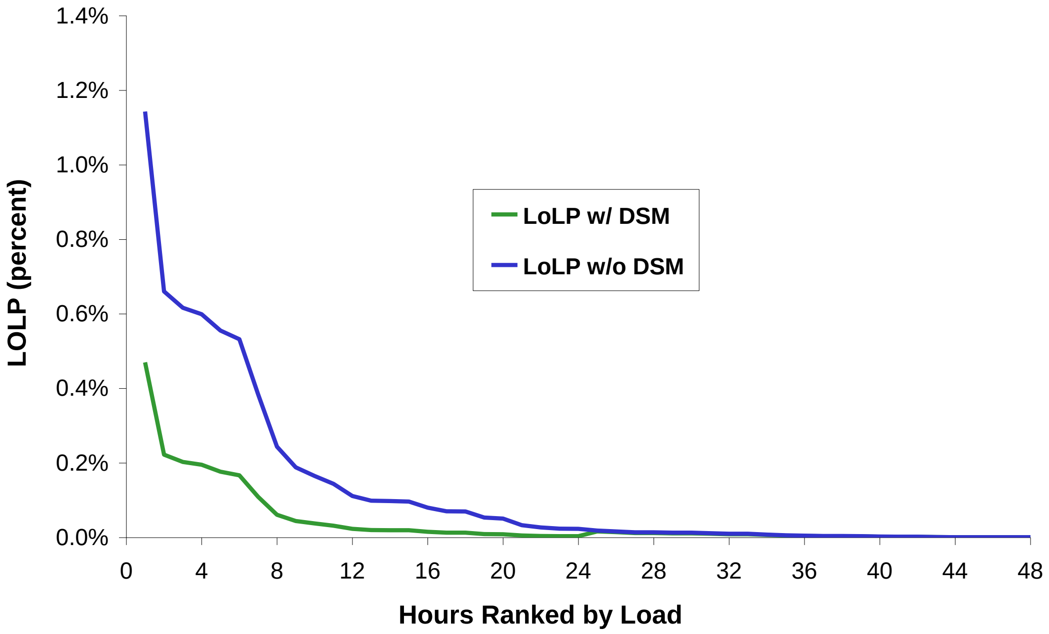
Figure 3: Load and capacity duration curves for 2009/10



We can calculate the loss of load probability (LOLP) associated with the supply and demand situation at each point in time. For example, the available capacity of each unit in a given hour (C_i) is an uncertain variable, due to the possibility of forced outage. Similarly, the load in that hour (*L)* is subject to forecasting error. The LOLP is the likelihood that L exceeds the sum of C_i across all units in the system. A number of different algorithms exist to form this required distribution of load less total capacity and solve for the likelihood that this quantity is positive.

We base the analysis on the 10 percent POE forecast2 of demand in the WEM from 2007 (the year in which the Reserve Capacity Requirement (RCR) for the 2009/10 Capacity Year was forecast). We have used the value of Value of Lost Load (VOLL) (AUD 12,500 / MWh) as adopted in the National Electricity Market (NEM). We therefore estimate capacity values using the derived LOLP values from the WEM and the VOLL from the NEM, noting that the NEM VOLL may exceed the actual value of lost load for some customer groups. The estimated LOLP is shown in Figure 4.

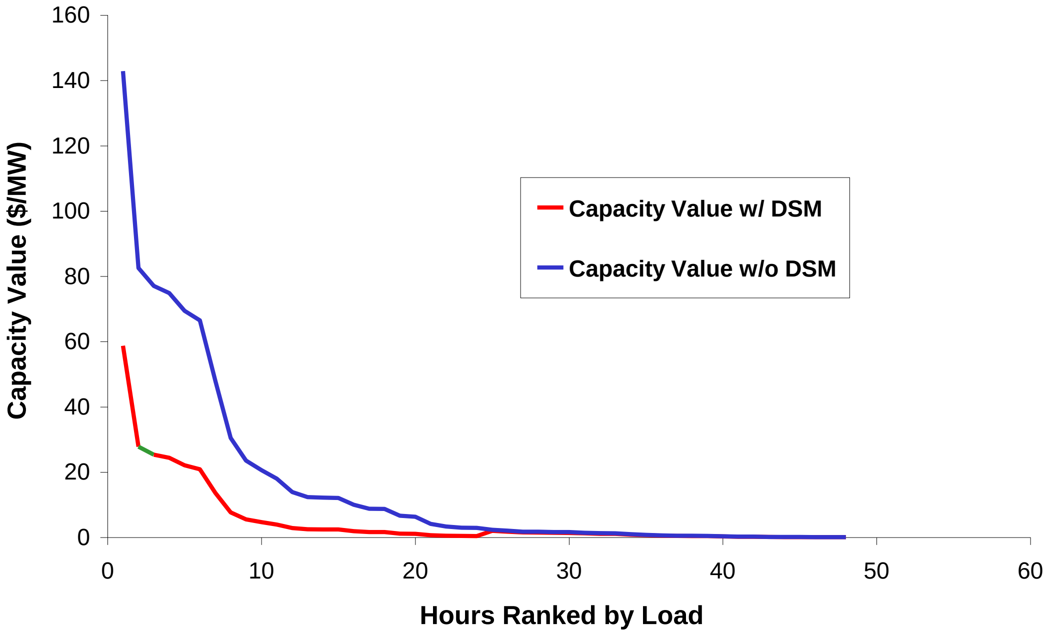
Figure 4: LOLP based on 10 percent POE forecast for 2009/10



Based on these LOLP values, the value of *incremental* reserve capacity over the year is AUD 253/MW with DSM or AUD 780/MW without it. These values are implicit in Figure 5. These values are much lower than the payment that was available through the RCM, which in 2009/10 was AUD 108,459/MW.

2 This has been done simplistically by scaling the top 48 hours of the demand hours in the year by the ratio between the 10 percent POE peak demand and the actual peak demand in 2010 and scaling the rest of the hours in the year so that the total energy matches the high energy demand forecast for the year. As such it almost certainly over-estimates the energy in the year; however, it gives a feel for what the difference of a 10 percent POE versus actual peaks might be.

Figure 5: Value of capacity based on 10 percent POE forecast



The values estimated in this way correspond to the economic value of adding *one more MW of* reserve capacity to what already exists. Once the WEM is in an excess reserve capacity situation, the value of adding additional supply- or demand-side capacity to the system falls towards zero. This incremental ("marginal") value is essentially the spot market value of capacity, taking into account demand conditions and how much reserve capacity exists at that point in time.

2.3.2. Implications for limited availability demand and supply resources

The peak demand in WA is concentrated in relatively few hours. The value of reserve capacity is therefore similarly concentrated in a few peak hours. In the example calculation above, virtually all of the value of reserve capacity is concentrated in fewer than 30 hours. This is an overstatement, of course, because it reflects a single actual out-turn rather than the risk of an unknown out-turn, which is what reserve capacity is intended to mitigate. It also assumes that reserve capacity resources are always available.

Even a resource that is available just 24 to 48 hours could theoretically provide a material proportion of the value provided by a resource available much more than that. This feature of peak load in the WEM has implications for the treatment of resources with limited availabilities. As the availability of various resources increases, their value as a source of reserve capacity quickly converges.

Importantly, we assume that each resource is similar enough in all other respects that it can be treated as equivalent by System Management. However, based on stakeholder feedback, dispatch limitations on DSM resources can be sufficiently constraining that the DSM resource is not equivalent in application to a supply-side resource. Clearly, System Management must be able to call available resources on an effectively equivalent basis if they are to qualify for the same value of Capacity Credit. To be clear, however, "effective equivalence" need not mean that all resources must be available 24x365 hours each year. Effective equivalence means that a common, reasonable, minimum performance standard should be developed and applied (and refined if or as conditions change) so as to be consistent with a standard Capacity Credit price.

2.4. KEY LINKAGES AFFECTING THE RCM

2.4.1. The MRCP

A separate industry workstream reviewed the setting of the Maximum Reserve Capacity Price (MRCP), a key parameter that feeds into the RCM. The MRCP is based on a 160 MW open cycle gas turbine—a standard peaking generation technology.

The review concluded that the current MRCP is not necessarily reflective of actual costs. Proposed amendments to the MRCP methodology would reduce the MRCP. A reduction in the MRCP, through its linkage to the reserve capacity price (RCP) paid by the IMO for capacity credits that are not traded bilaterally, will, all else equal, also reduce the incentive to build new capacity.

After considering the expected material change to the MRCP but also that the WEM is a comparatively small, lumpy, administratively structured market with close government oversight, we recommend fine-tuning of the RCM's administrative price setting mechanism rather than designing, agreeing and implementing a more extensive overhaul and redesign of the RCM along the lines of more dynamic, complex and volatile open-market mechanisms.

2.4.2. The Capacity Refund Regime

In addition to refinement of the RCM, we also recommend changes to the Capacity Refund regime. Possible refinements to the Capacity Refund regime need to be considered in conjunction with the RCM itself, however, as a change to one alters the economic impact of the other.

The value of the refund payments is currently unrelated to system conditions at the time of the event that triggers the refund payment. Consequently, it is possible for refund payments to be high (or low) relative to the economic consequences associated with the event that triggers the refund—introducing a source of potential distortion or inequity.

For example, if the value refunded were to be modified to reflect system conditions, then, compared to the present Capacity Refund regime, refunds could be reduced during periods of excess reserve capacity. This outcome might be economically correct if the Capacity Refund regime were analysed on a stand-alone basis. But the actual economic impact on the workings of the RCM would be to *increase* the expected value of reserve capacity (by reducing the amount that might have to be refunded). In effect, "fixing" the economics of the Capacity Refund regime has a potentially adverse impact on the outcomes of the RCM unless both are considered together.

To address the economic issues that underpin concerns about the Capacity Refund regime, it makes sense to first refine the RCM so that the RCP is more dynamic with respect to the amount of excess reserve capacity that exists. The RCP is an annual value, however. The Capacity Refund is based on a much shorter interval, and is intended, in part at least, to assist System Management in achieving an orderly scheduling of maintenance outages during off-peak or shoulder periods. Introducing appropriate dynamism into the Capacity Refund regime is complicated by the fact that the economic value of capacity is such an explosive function of the amount of reserve available at each point in time. Given that we have seen that the value of a Capacity Credit can be substantially linked to even as few as 30 hours in a year, any Capacity Refund scheme risks distorting incentives if it does not likewise concentrate refund exposure into those periods which really matter. This is not easily done in an administrative setting because the underlying hourly economic value at stake in the Capacity Refund regime is quite a bit more volatile than the annual Capacity Credit value.

As a consequence, the Capacity Refund scheme cannot, in any practical sense, be expected to be a perfect measure of the economic consequence of a refund-triggering event. Inspection and verification of availability and performance will continue to be crucial to ensure that seldom-used capacity remains eligible for Capacity Credits.

2.5. Evaluation framework: the Market Objectives

The Market Objectives provide guidance for evaluating whether the RCM works effectively. The Market Objectives are to:

(a) promote the economically efficient, safe and reliable production and supply of electricity and electricity related services in the South West interconnected system;

(b) encourage competition among generators and retailers in the South West interconnected system, including by facilitating efficient entry of new competitors;

(c) 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;

(d) minimise the long-term cost of electricity supplied to customers from the South West interconnected system; and

(e) encourage the taking of measures to manage the amount of electricity used and when it is used.

If the RCM attracts or supports more capacity than is required, then it would get lower marks for meeting Market Objective (d). On the other hand, more capacity may be argued, in some instances, to assist the achievement of Market Objective (b) by supporting greater competition. Similarly, a failure of the RCM to attract sufficient capacity would also result in a costly failure of the WEM, compromising virtually all of the Market Objectives, except perhaps (e). Clearly, evaluating a specific change to the RCM (or even its current performance) against the Market Objectives involves balancing a number of countervailing forces.

This inherent tension matters when evaluating potential refinements to the RCM. Risk in power markets is generally asymmetric with respect to the capacity investment. A capacity shortage, resulting in involuntary load shedding, can be much more costly than a similar amount of excess capacity, perhaps only resulting in higher tariffs. Consequently, greater tolerance is advised when considering RCM settings that may be biased towards supporting slightly too much capacity as compared to settings that are more parsimonious, raising the risk of a capacity shortfall. We consider Market Objectives (a) and (d) to be supportive of this view.

2.6. THE ESSENTIAL PROBLEM THAT MUST BE ADDRESSED

Currently, any supply or demand resource that can establish itself as "committed" and declares itself as intending to trade bilaterally (whether or not it ever actually enters into a bilateral agreement) can secure Capacity Credits, whether or not the underlying capacity is actually needed in the WEM. In short, there are no "supply side" limiting mechanisms that kick in if there is excess reserve capacity. The certification process and the eligibility of an investor to be paid for Capacity Credits are not affected by the quantum of excess reserve capacity.

One possible approach therefore is to develop a clear, equitable, timely and effective way to turn off the "spigot" when the quantum of excess capacity reaches some threshold. Conceptually, the idea of a spigot control has a lot of merit. Unfortunately it would be very difficult to implement equitably. The impact on project sponsors who expect to gain credits and then are unable to gain them due to an unexpected demand reduction could be extreme. Ultimately, if the RCP remains much higher than the economic value of a Capacity Credit, then the process of turning off the capacity certification "spigot" puts the mouse on one side and the cheese on the other—a situation that is inherently unstable.

The other approach is to refine the way the RCM calculates the RCP when excess reserve capacity exists. Currently, the RCP is adjusted downward in proportion to the amount of excess reserve capacity that exists. The price adjustment could be more strongly linked to the amount of excess reserve capacity. Doing so would reduce the discrepancy between the RCP and the economic value of a capacity credit. By reducing the gap, the risk of unintended consequences, rent-seeking behaviour and other generally value-destroying outcomes is diminished.

3. RECOMMENDED REFINEMENTS

In this section we put forward a set of specific recommendations for consideration by the Market Advisory Committee, regarding the setting of the RCP, the Capacity Refunds regime, the treatment of DSM resources, and the requirement for supply side resources to have access to fuel resources. In each instance, additional work will be needed to establish specific details, though the general direction and scope for improvement should be clear.

3.1. REFINEMENTS TO THE RCP

3.1.1. Conceptual recommendation

With respect to the administrative pricing formula that establishes the RCP, our principal recommendation is to increase the slope factor by which the RCP reduces as the amount of excess capacity increases. To understand our recommendation, two things must be kept in mind.

- First, as previously noted, the economic value of excess reserve capacity falls very quickly to zero when there is a surplus and can rise very quickly to the market price cap if there is a shortage. It has required a significant evolutionary effort in other (international) markets with auction-based capacity mechanisms that can either accommodate or mitigate the volatility inherent in the valuation of reserve capacity.
- Second, the WEM has been designed quite specifically in ways intended to manage volatility while still producing acceptably efficient investment outcomes. Some, pure market-based approaches used in much larger international markets, however meritorious in those contexts, conflict with what can reasonably be called the WEM's underlying architecture and contextual "DNA".

We therefore recommend a simple adjustment to the administered pricing formula to cause the administered price to fall faster when there is more excess capacity, compared to the present arrangement. By increasing the *rate* of "fall off" we increase the certainty that the RCM works as intended and does not inadvertently incentivise unneeded excess reserve capacity. Consistent with mitigating more volatile value incursions, we recommend that a floor be imposed to limit the extent to which the administered capacity price can be adjusted downward.

One additional area of caution is noted, however. An investor must be able to look at the prospect of a Capacity Credit and be able to *expect* to earn the cost of capital on a capacity investment that is, in fact, needed in the WEM. If an investor would otherwise choose to enter the WEM based on the prevailing RCP but is exposed to the risk that the RCP can be *reduced* due to excess capacity but never increased above the MRCP due to scarcity, then the investor may perceive the RCP as being biased downward. This risk is inconsequential if the MRCP is inadvertently "too high". In light of the recent proposed MRCP revision (downward), however, there is greater risk that the long-term RCP could be biased below its proper (investment supporting) level due to the prospect of downward adjustments for excess capacity that are not symmetrically offset by any upward adjustments for shortage. The design and application of the steeper slope coefficient can take these concerns into account.

The bilateral market for Capacity Credits could be an offset to this, provided there is no buyer power in that market, but given the size of Synergy relative to the overall WEM, that is a significant assumption.

3.1.2. Recommended options for consideration

Given the desire to provide stable, long-term support to essential infrastructure investment in WA and the desire to ensure that the RCM does not exacerbate a situation of excess reserve capacity, we propose that the current slope factor be decreased to "minus 3" from its current value of "minus 1". Currently, the slope is inversely proportional to the amount excess capacity that exists. The recommended change would render the slope much steeper.

The specific level of the floor is perhaps best left to broader consultation, but a level of about 50% of the MRCP would appear, qualitatively, to balance the objective of ensuring a low enough price to ensure there is no residual investment signal while recognising the importance of a stable and predictable long-term investment environment.

Thus, under the revised RCM administered price adjustment formula, if there is 10% excess reserve capacity, the RCM administered capacity credit "buy" price would be reduced by a further 30% rather than the current approximately 9%. If there is 15% excess reserve capacity, the RCP would be reduced by a further 45%, rather than by the current approximately 13%.

Any reduction that would otherwise be greater than the floor value, would be limited by the floor value. Thus if there were 20% excess reserve capacity, and the floor on the administrative price were set at 50% of the MRCP, then the reduction would be limited to 50%, rather than 60%.

Finally, with a steeper slope introduced, it would be possible, as well, for the RCP to be directly linked to the MRCP, rather than continue with the definition of the base RCP as being 85% of the MRCP. This change would offset some of the immediate sting of the steeper slope, assisting with the transition, while still leaving a strong signal.

3.1.3. Transitioning

The immediate impact of the refined RCP formulae would be a reduction in the value of Capacity Credits paid for by the IMO. Three potential phase-in options are suggested for consideration:

- Initiate the steeper slope immediately, but transition via a “floor” price that starts at just 5% below what the current RCP methodology would produce and then reduce the floor price by 5% each year until it hits 50% of the MRCP; or
- Introducing the steeper slope in a stepwise manner, with the slope moving from -1 to -1.5 in year one; to -2.0 in year two, and to -2.5 in year three and -3.0 in year four; or
- Introduce the refinements as of a projected date such that participants have time to make changes, if appropriate, in anticipation of the future implementation.

Each approach mitigates the risk that unneeded additional capacity is added to the WEM. Each also provides time for participants to adjust (and for the market to potentially absorb existing excess reserve capacity).

3.2. HARMONISING DEMAND-SIDE AND SUPPLY-SIDE RESOURCES

3.2.1. Demand Side Resources

The current treatment of demand-side resources is not consistent with the treatment of supply-side resources. The underlying economic causes and implications of this lack of harmony are complex. The value of a capacity credit, however, attaches to a particular set of attributes. Among those attributes is the fact that any qualifying resource should be able to provide an equivalent service, whether it is a supply side resource or a demand-side resource. In effect, “reserve capacity” is “reserve capacity” is “reserve capacity”. If the same price is paid for it, then the same service needs to be derived from it. Inefficient resource use and perceptions of inequity arise when differential treatment has no apparent justification.

Consequently, we recommend harmonising the treatment of demand-side and supply-side resources by imposing the same minimum requirement to any resource that qualifies for a Capacity Credit. This may mean that some demand-side resources will no longer desire to provide capacity services.

One extreme approach is to require all resources to be available in all hours to qualify for a Capacity Credit. This approach would push the burden to the DSM resource owner of taking the risk that the DSM resource could be called at a time when it either cannot perform or can perform only at an uncompensated cost. Given that reserve capacity resources are likely to be called in a relatively few hours in a year, this could be seen as a commercial risk that a DSM provider could reasonably evaluate.

A less extreme approach would involve making a change to the resource classifications. The existing classifications can be better calibrated to the value reserve capacity delivers. By eliminating, for example, the 24 to 48 hour availability class, DSM resources would be forced to join a higher availability class or cease to be eligible for Capacity Credits. From the analysis performed to date, such an adjustment would greatly improve alignment between the economic value of demand- and supply-side resources.

Other operational impediments also exist with respect to DSM resources, ranging from notice period differences, limitations on consecutive trading periods and so forth. We understand these differences affect the dispatch of DSM resources by System Management. To that extent, such impediments drive a wedge between the definition of Capacity applicable to a demand-resource and that applicable to a supply resource. Such operating limitations and constraints should be eliminated to the extent possible so that the economic value of demand- and supply-resources is made workably equivalent.

The specific number of hours attributable to minimum eligibility can then be reviewed periodically to ensure that the availability classes are designed to delivery essentially equivalent value from a Capacity Credit perspective. This latter approach would not achieve perfect technical equivalence—some small value gap would remain—but it would make it easier for options with some availability constraints to quantify the value to them of being a certified capacity resource, widening the pool of resources available to the WEM over time.

3.2.2. Refining the treatment of the Fuel Supply Requirement

To be certified as eligible for a Capacity Credit, a generation resource is required under the current Market Rules/Market Procedures to demonstrate fuel supplies to support operation for 14 hours a day for 10 months of the year. This operational standard greatly exceeds the number of hours that a reserve capacity resource would normally be required to support in order to justify the value of a Capacity Credit. Notwithstanding that concern, there are two primary issues that we see:

- The first is that a resource seeking to qualify for a Capacity Credit clearly needs to have sufficient access to fuel to actually deliver value as a source of reserve capacity;
- The second is that the requirement to have access to fuel should be economically efficient—it should be structured so as to promote least-cost solutions.

Thus, a firm fuel access requirement is simply that, a requirement to have *access* to fuel. That fuel can be gas or liquid, and the quality of “access” needs to be such that generation can be expected should the unit be called to run. But it need not necessarily mean that the fuel must be stored on site or that the contract with the fuel supplier needs to have a minimum annual quantity. Option contracts or other more flexible arrangements that impose clear financial commitments can be valid structures in such instances.

Of courses, if such robust but flexible fuel supply arrangements are not available, then that would call into question whether a unit would be able to provide reserve capacity when called. A gas supply limitation naturally results in a generation capacity limitation, and this should, if it arises, flow through to the number of Capacity Credits that gas supply can support. If a unit cannot demonstrate access to gas, then it could demonstrate an alternate backup fuel, or it could simply not qualify for Capacity Credits.

Given the concentration of reserve capacity value into a relatively small number of hours, an alternative approach may be possible in which a generation resource without a clear and firm fuel supply access arrangement can qualify for Capacity Credits by submitting and maintaining, on a rolling basis, an approved fuel management or access plan sufficient to support the relevant portion (for that part of the rolling horizon) of the minimum eligibility hours required for a Capacity Credit. Operational testing would also continue to be part of the certification process.

In other respects, if a unit is then not able to perform dutifully when called, the Capacity Refund regime would be the applicable penalizing mechanism. A dynamic Capacity Refund regime in which the refund exposure depends on system conditions assists by promoting appropriate incentives.

3.2.3. Refining the Individual Reserve Capacity Requirement

In reviewing the RCM we found the idea of decomposing loads into temperature-dependent and non-temperature-dependent loads and the associated determination of the Individual Reserve Capacity Requirement (IRCR) generally reasonable. Some implementation issues arise, however, that merit refinement:

- The use and application of 12 Trading Intervals to determine the IRCR.
    - The more trading intervals are combined to set the IRCR the further away the IRCR moves from its economic intent: to represent the reasonable peak demand expectation of a given load. Considering the use of fewer trading intervals is sensible. The top three trading intervals, for example, have been used for analogous purposes in the UK and New Zealand.
    - The calculation of the IRCR is based, approximately, on an approach based on the median value of 12 top Trading Intervals[3]. The use of the median value approach rather than the mean value means that the highest values are ignored, which makes no sense.
- Alignment with DSM resource offering

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3 Not necessarily the very top 12 intervals, but the three highest demand trading intervals on the four trading days with the highest demand.

- A load with an IRCR of “X” MW should not be able to offer more than “X” MW of DSM. No load should be able to offer a DSM capacity value greater capacity than its IRCR, as a matter of logic. For this to be possible implies a problem in the setting of the IRCR itself. As noted, the use of 12 Trading Intervals in combination with the median value approach means that it is possible currently for a load to have a DSM value that exceeds its IRCR, an illogical outcome.

3.3. REVIEW CYCLE

Stakeholders need to see past the specific settings of the RCM at any point in time and appreciate that, as an administrative (non-market) mechanism, the RCM is likely to produce an imperfect signal, one that is, from time to time, too high or too low.

Long-term investors do not depend on short-term prices, but on longer-term expectations. More than any temporary outcome, long-term expectations depend on being able to understand what will guide adjustment to the RCM over time, and how often the need for adjustments will be reviewed. Annually is too short a time, given the resource costs to undertake a serious review. However, five years is too long given the development time of new capacity. A two- or three-year review cycle is therefore recommended for consideration.

Elements requiring periodic review are as follows:

- The RCP and MRCP;
- The “slope” factor;
- The “floor” factor;
- The number of hours of minimum availability for eligibility for a Capacity Credit, and accordingly, the resource classes;
- The requirements of a fuel management and access plan.

Periodic review of these factors would need to take into account market conditions (supply and demand). Modelling of loss of load probabilities would be required to confirm or establish the minimum eligibility levels and the fuel management and access plan requirements.