



## **Independent Market Operator**

### **Final Rule Change Report Title: Calculation of the Capacity Value of Intermittent Generation - Methodology 1 (IMO) and Methodology 2 (Griffin Energy)**

**RC\_2010\_25 and RC\_2010\_37**

**Standard Rule Change Process**

**Date: 15 December 2011**

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## 1. INTRODUCTION

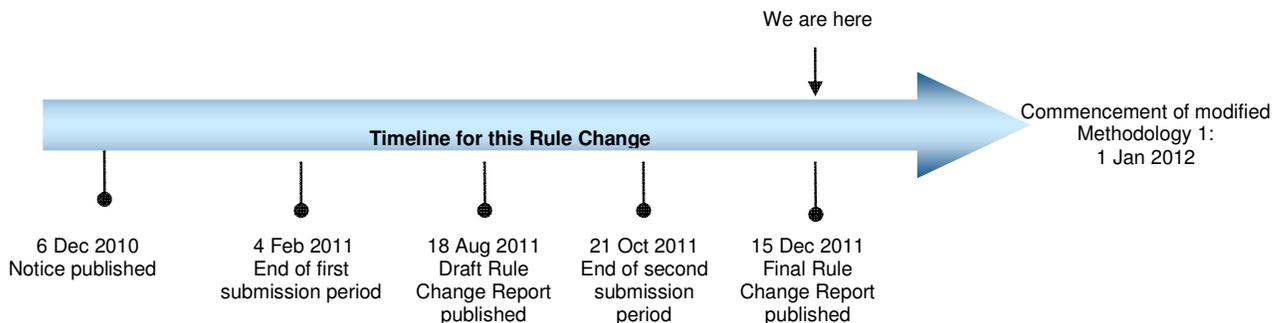
The IMO is currently progressing two Rule Change Proposals to amend the existing methodology for valuing the capacity of Intermittent Generation in the Wholesale Electricity Market (WEM):

- Calculation of the Capacity Value of Intermittent Generation – Methodology 1 (IMO) (RC\_2010\_25)<sup>1</sup>; and
- Calculation of the Capacity Value of Intermittent Generation – Methodology 2 (Griffin Energy) (RC\_2010\_37)<sup>2</sup>.

These two proposals are being processed using the Standard Rule Change Process, described in clause 2.7 of the Market Rules.

In accordance with clause 2.5.10 of the Market Rules, the IMO decided to extend the end date for both the first and second submission periods and the timeframes for preparing the Draft Rule Change Report and Final Rule Change Report for each proposal. The IMO also decided to undertake a further consultation process on three issues that arose from second round submissions prior to the publication of the Final Rule Change Reports for the two proposals<sup>3</sup>. Further details of the extensions are available on the IMO website.

To ensure that the two alternative methodologies could be considered in unison throughout the formal Rule Change Process, the IMO has ensured that the key dates for the two proposals were aligned. This allowed for interested stakeholders to comment on the two methodologies at the same time. The key dates in processing these Rule Change Proposals, as amended in the extension notices, are:



The IMO Board's final decision is to:

- accept the IMO's Rule Change Proposal (RC\_2010\_25), as modified following the consultation processes; and

<sup>1</sup> RC\_2010\_25 was formally submitted by the IMO on 29 November 2010 and proposed amendments to clauses 4.11.3A, 7.7.5A, 7.7.5B, 7.7.5C, 10.5.1 and new clause 4.11.3B and Appendix 9 of the Wholesale Electricity Market Rules (Market Rules).

<sup>2</sup> RC\_2010\_37 was formally submitted by Griffin Energy on 30 November 2010 and proposed amendments to clauses 4.11.3A, 7.7.5B, 7.7.5C, 7.7.5E, 7.13.1, 10.5.1 and the Glossary of the Market Rules.

<sup>3</sup> Note that following the further consultation period the IMO Board determined to make a slight change to the proposed Methodology 1 that was presented in the Draft Rule Change Report.

- reject Griffin Energy’s Rule Change Proposal (RC\_2010\_37).

In making its decision on these Rule Change Proposals, the IMO Board has taken into account:

- the Wholesale Market Objectives;
- the alignment of each of the methodologies with the reliability criterion;
- the views of the Sapere Research Group, the independent expert appointed to undertake a technical study of the two methodologies and provide independent advice to the IMO Board;
- the practicality and cost of implementing the proposals;
- the views of the Market Advisory Committee (MAC) on the proposals;
- the views expressed at the public workshop; and
- the views expressed in the submissions received for the proposals (during the formal consultation process outlined in the Market Rules and, where appropriate, during the further consultation process undertaken by the IMO).

All documents relating to each of the Rule Change Proposals can be found on the following IMO websites:

- RC\_2010\_25: [http://www.imowa.com.au/RC\\_2010\\_25](http://www.imowa.com.au/RC_2010_25)
- RC\_2010\_37: [http://www.imowa.com.au/RC\\_2010\\_37](http://www.imowa.com.au/RC_2010_37)

## 2. THE ORIGINAL RULE CHANGE PROPOSALS

### 2.1 Submission Details

The submission details for the Rule Change Proposal: Calculation of the Capacity Value of Intermittent Generation – Methodology 1 (IMO) (RC\_2010\_25) are as follows:

Name:	Troy Forward
Phone:	9254 4300
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Organisation:	IMO
Address:	Level 3, Governor Stirling Tower, 197 St Georges Terrace
Date submitted:	29 November 2010
Urgency:	Standard Rule Change Process
Change Proposal title:	Calculation of the Capacity Value of Intermittent Generation – Methodology 1
Market Rule affected:	Clause 4.11.3A, 7.7.5A, 7.7.5B, 7.7.5C, 10.5.1 and new clause 4.11.3B and Appendix 9.

The submission details for the Rule Change Proposal: Calculation of the Capacity Value of Intermittent Generation – Methodology 2 (Griffin Energy) (RC\_2010\_37) are as follows:

Name:	Shane Cremin
Phone:	9261 2908
Fax:	9486 7330

Email:	shane.cremin@thegriffingroup.com.au
Organisation:	Griffin Energy
Address:	L15, 28 The Esplanade, Perth, 6000
Date submitted:	30 November 2010
Urgency:	Standard Rule Change Process
Change Proposal title:	Calculation of the Capacity Value of Intermittent Generation – Methodology 2
Market Rule affected:	Clauses 4.11.3A, 7.7.5B, 7.7.5C, 7.7.5E, 7.13.1,10.5.1 and the Glossary.

## 2.2 Summary Details of the Proposals

Given the momentum driving the growth in renewable energy providers on the South West interconnected system (SWIS) concerns have been raised by a number of stakeholders about the current Capacity Credit valuation methodology for Intermittent Generators. Specifically:

- doubts have been expressed as to whether the current 3 year average methodology for determining Capacity Credits for these facilities accurately reflects the capacity they can reliably deliver; and
- it is widely acknowledged that the current valuation methodology is unsuitable for solar generation and undervalues this capacity.

Given these concerns, the appropriateness of the current Capacity Credit valuation methodology was reviewed by the Renewable Energy Generation Working Group (REGWG). While failing to reach a consensus position on the matter of valuing Capacity Credits for Intermittent Generation, the REGWG supported the proposal that the IMO would nominate the valuation methodology that it felt best served the Wholesale Market Objectives (Market Objectives).

### 2.2.1 Summary of Methodology 1 (IMO)

***Please note that Methodology 1 as proposed by the IMO in RC\_2010\_25 was proposed to be modified in the Draft Rule Change Report following the advice of the independent expert, Dr Richard Tooth of Sapere Research Group, appointed by the IMO to provide advice on the two methodologies. For further details please refer to the Draft Rule Change Report.***

The IMO proposed the implementation of the following methodology for valuing the capacity of Intermittent Generators:

1. Identify in each of the 8 previous years the 12 Trading Intervals which experienced the highest Load for Scheduled Generation (LSG). For this purpose, the LSG is calculated for each Trading Interval by subtracting the output from Intermittent Generators (IGs) (measured output from existing facilities and modelled output where the facility had not yet entered service) from the total sent-out generation during that Trading Interval.
2. For each of the 8 years, determine the average output of the Intermittent Generator fleet during the 12 Trading Intervals with the highest LSG.
3. Determine the 95 percent Probability of Exceedance (PoE) level of the 8 annual averages. This is the Fleet Capacity Value.

4. Identify in each of the 3 previous years the 250 Trading Intervals which experienced the highest LSG.
5. Determine the average output of each individual Intermittent Generator facility for the 750 intervals determined in Step 4. This is denoted below as the Facility Performance Level.
6. Determine the sum of the facility performance levels determined in Step 5. This is denoted below as the Fleet Performance Level.
7. Apportion the fleet capacity value to each Intermittent Generator facility according to its performance over the 750 intervals.
8. Relevant Level = (Facility Performance Level) / (Fleet Performance Level) × Fleet Capacity Value

The IMO also proposed to include a requirement for the IMO to conduct a 5 year review of the methodology for determining the Relevant Level for a Facility to ensure it is effective in its application.

Full details of the IMO's Rule Change Proposal are available on the IMO website: [http://www.imowa.com.au/RC\\_2010\\_25](http://www.imowa.com.au/RC_2010_25)

### **2.2.2 Summary of Methodology 2 (Griffin Energy)**

Griffin Energy proposed the implementation of the following methodology for valuing the capacity of Intermittent Generators:

1. Identify the top 750 Trading intervals associated with the highest LSG output in each of the 3 previous years.
2. For each of the 2,250 intervals identified in Step 1, determine the metered output of the Intermittent Generator facility (or the estimated output if the facility is experiencing a Planned or Consequential Outage or where its output was curtailed following a request from System Management).
3. Double the value determined in Step 2 and divide this number by 2,250. The result is the Relevant Level for that Facility (or is the quantity of Capacity Credits allocated to that facility).

Full details of the Griffin Energy's Rule Change Proposal are available on the IMO website: [http://www.imowa.com.au/RC\\_2010\\_37](http://www.imowa.com.au/RC_2010_37)

## **2.3 The Original Proposals and the Wholesale Market Objectives**

The assessment of each of the proposals against the Market Objectives as presented in the Rule Change Proposals is provided below.

### **2.3.1 Assessment of Methodology 1 (IMO)**

In its proposal, the IMO contended that the proposed amendments are consistent with the Market Objectives and better address Market Objectives (a) and (c). In particular, the IMO considered that the proposed changes will apply a methodology to the calculation of Capacity

Credits for Intermittent Generators that more appropriately reflects the contribution of a renewable generator at times of high system demand. This will:

- Promote greater system security and reliability by providing certainty to System Management that the capacity available in the market can meet peak demand requirements (Market Objective (a)); and
- Remove a current source of discrimination between Scheduled Generators and Intermittent Generators by determining the level of certification of Intermittent Generators during peak demand periods (Market Objective (c))

The IMO considered that the proposed changes are consistent with the other Market Objectives.

### 2.3.2 Assessment of Methodology 2 (Griffin Energy)

In its proposal, Griffin Energy considered that the proposed amendments would have the following effect on the Market Objectives:

Objective	Impact
a)	<p>The proposed changes will promote greater reliability as the quantity of Capacity Credits received by an Intermittent Generator is closely aligned with the peak summer demand periods, when system reliability is most at risk.</p> <p>The changes will also promote economic efficiency by rewarding Intermittent Generator facilities with a suitable quantity of Capacity Credits relative to other generation facilities, ensuring investment in generation technologies is optimised in the WEM.</p>
b)	<p>The proposed changes will promote competition among new entrant generators (including those with advanced intermittent projects under development) as it is relatively consistent with the current Capacity Credit allocation methodology and does not distort the market for new generation investment.</p>
c)	<p>The proposed changes lessen the discrimination between Scheduled Generators and Intermittent Generators in that Intermittent Generators are now also awarded Capacity Credits based on output during higher (summer) demand periods.</p> <p>The proposed changes also lessen the discrimination between Intermittent Generator technologies by ensuring all technologies have their capacity allocation assessed by their contribution during peak (summer) demand periods.</p>
d)	<p>The proposed changes will <i>prima facie</i> increase the long term cost of electricity in the WEM as any expected reduction in Capacity Credits from Intermittent Generator facilities (compared with the current allocation methodology) will mean that further generation facilities (or Demand Side Management (DSM)) will need to be constructed (or contracted) to meet the same IMO forecast demand, hence, raising the cost to end users.</p> <p>The proposed changes may also assist in reducing the cost of electricity in that, assuming renewable energy facilities are to be constructed to meet federal MRET targets, intermittent facilities that are incentivised to produce energy during high demand periods will likely offset expensive peaking scheduled generation, bringing down wholesale energy prices in the STEM and balancing markets during the summer period.</p>
e)	<p>The proposed changes may lead to benefits in that energy storage options will be incentivised and implemented more quickly as storage technologies become economically</p>

viable.

Further details of Griffin Energy's assessment of its proposal against the Market Objectives are provided in its Rule Change Proposal.

## 2.4 Proposed Amending Rules

The amendments to the Market Rules originally proposed by the IMO and Griffin Energy are available in the respective Rule Change Proposals available on the IMO website at [http://www.imowa.com.au/RC\\_2010\\_25](http://www.imowa.com.au/RC_2010_25) and [http://www.imowa.com.au/RC\\_2010\\_37](http://www.imowa.com.au/RC_2010_37).

## 2.5 The IMO's Initial Assessment of the Proposals

The IMO decided to proceed with both of the proposals on the basis that Market Participants should be given an opportunity to provide submissions on each proposal as part of the rule change process.

## 3. FIRST SUBMISSION PERIOD

The first submission period for the original IMO and Griffin Rule Change Proposals was between 7 December 2010 and 4 February 2011. The timeframes for the first submission period were extended in accordance with the IMO's extension notice published on 6 December 2010.

### 3.1 Submissions received

The IMO received submissions for RC\_2010\_25 and RC\_2010\_37 from the following interested parties:

Submitter	Rule Change Proposals
AGL	RC_2010_25 and RC_2010_37
Alinta	RC_2010_25
Collgar Wind Farm	RC_2010_25 and RC_2010_37
Griffin Energy	RC_2010_25 and RC_2010_37
Infigen Energy	RC_2010_25
Landfill Gas & Power (LGP)	RC_2010_25 and RC_2010_37
Moonies Hill Energy (MHE)	RC_2010_25 and RC_2010_37
Office of Energy	RC_2010_25 and RC_2010_37
Pacific Hydro	RC_2010_25 and RC_2010_37

Submitter	Rule Change Proposals
Perth Energy	RC_2010_25 and RC_2010_37
Sustainable Energy Association of Australia (SEA)	RC_2010_25
System Management	RC_2010_25 and RC_2010_37
Synergy	RC_2010_25 and RC_2010_37
Verve Energy	RC_2010_25
Vestas Wind Systems	RC_2010_25 and RC_2010_37

The main points raised in the submissions received for both proposals are summarised below, with a more detailed summary of the main points raised by each submitting party provided in Appendix 3 of the Draft Rule Change Report. A copy of the full text of all submissions is available on the IMO website. Additional detail along with the IMO's response to issues raised in submissions is contained in Appendix 4 of the Draft Rule Change Report. The submissions and the Draft Rule Change Report can be found on the IMO's website at [http://www.imowa.com.au/RC\\_2010\\_25](http://www.imowa.com.au/RC_2010_25) and [http://www.imowa.com.au/RC\\_2010\\_37](http://www.imowa.com.au/RC_2010_37).

In summary, the views of submitting parties on the proposed changes under both RC\_2010\_25 and RC\_2010\_37 were polarised. The majority of submissions received did not support the IMO's proposed methodology noting the following general issues:

- it does not reflect the advice of McLennan Magasanik Associates (MMA), the expert appointed to derive an appropriate methodology;
- it will reduce investment in Intermittent Generators (barrier to entry);
- it is complicated and neither statistically sound or transparent;
- it introduces regulatory risk to the market; and
- it unfairly penalises existing Market Participants with Intermittent Generator assets (no grandfathering provisions included).

Submissions received on Griffin Energy's proposed methodology (Methodology 2) noted the following general points in comparison to Methodology 1:

- it has a lower associated regulatory risk to the market;
- it represents the most simple, transparent and logical option; and
- it more closely aligns with the advice of MMA.

The submissions received from the Office of Energy, Perth Energy and System Management, however, supported the IMO's proposed changes, noting:

- the risks to system security and reliability associated with over allocation of Capacity Credit to wind farms;
- to date the SWIS has not experienced a 1 in 10 year load since the development of the major existing wind farms, therefore the wind contribution for this extreme event is not known and the IMO should err on the side of caution in evaluating the two proposals;
- the merits in reviewing the valuation methodology at a later date (consistent with the proposed 5 year review); and
- that providing cross subsidies via market mechanisms will in general lead to inefficient economic outcomes.

A summary of the assessment by the submitting parties as to whether each proposal would better achieve the Wholesale Market Objectives and an overview of participant submissions on the costs associated with implementing each of the proposed changes and the timeframe for implementation was presented in the Draft Rule Change Report for the two proposals available on the IMO website.

### 3.2 The IMO’s response to submissions received during the First Submission Period

There were a number of common issues raised by respondents on the two proposals. These have been categorised as shown in the Table 1 below.

The IMO’s response to each of the issues identified during the first submission period is presented in Appendix 4 of the Draft Rule Change Report.

**Table 1: Common Issues raised in submission during the first submission period**

Issues	Sub-issues
Investment impacts	<ul style="list-style-type: none"> <li>• Investment Incentives</li> <li>• ... and Impacts</li> <li>• ... and Government Policy</li> <li>• Efficient investment</li> <li>• Viability of investment in the WEM</li> <li>• External drivers of investment in Intermittent Generators</li> <li>• Broader Impacts of investment in Intermittent Generators</li> <li>• Incentives for Intermittent Generators performance</li> </ul>
The REGWG process	<ul style="list-style-type: none"> <li>• Scope of the process</li> <li>• The MMA review</li> <li>• Need for Holistic Review</li> </ul>
Regulatory risk	<ul style="list-style-type: none"> <li>• Regulatory risk &amp; grandfathering</li> </ul>
Market objectives	<ul style="list-style-type: none"> <li>• Balance of objectives</li> <li>• Market objective assessment</li> <li>• Reliability criteria</li> <li>• Energy shortfalls reliability criterion</li> <li>• Efficiency</li> <li>• Discrimination for/ against Intermittent Generators</li> <li>• Long term costs</li> <li>• Price impacts</li> <li>• Incentives for Intermittent generators performance</li> <li>• Appropriate capacity allocation level</li> </ul>

	<ul style="list-style-type: none"> <li>• Planning Criteria</li> </ul>
Security and reliability impacts	<ul style="list-style-type: none"> <li>• Changing reserve margin</li> <li>• Security and reliability impacts</li> <li>• Availability of data</li> <li>• System Management analysis</li> <li>• Reserve Margin</li> <li>• Comparison with Scheduled Generation</li> </ul>
Methodology issues	<ul style="list-style-type: none"> <li>• LSG methodology</li> <li>• The adjustment for fleet performance</li> <li>• Accuracy of methodology</li> <li>• Simplicity</li> <li>• Volatility</li> <li>• Time period</li> <li>• PoE Factor</li> </ul>
General comments	<ul style="list-style-type: none"> <li>• Simplicity of proposal</li> <li>• Calculation of Non-scheduled Generator Data used to calculate Curtailment Energy</li> <li>• Further suggestions</li> <li>• 5 year review of methodology</li> <li>• Further suggestions</li> <li>• General position</li> <li>• Progression of rule change</li> <li>• Balancing and Ancillary Services</li> <li>• Definition of Intermittent Generator</li> </ul>

### 3.3 Public Forums and Workshops

No public forums or workshops were held in relation to either of the Rule Change Proposals during the first submission period.

## 4. THE IMO'S ANALYSIS OF THE PROPOSALS FOLLOWING THE FIRST SUBMISSION PERIOD AND DRAFT ASSESSMENT

### 4.1 The IMO's analysis of the proposals and the Technical Study by the Sapere Research Group

The IMO's analysis of the two proposals, including some background to the capacity requirements in the WEM that are of relevance to the proposals, is presented in the Draft Rule Change Report. Following feedback on the initial proposals, the IMO Board commissioned the Sapere Research Group (Sapere) to undertake an examination of the two proposals and identify whether adjustments would be made to make them simpler in application and more accurate (acknowledging that a balance between the two objectives would be required). The IMO Board also asked Sapere to consider any options for the implementation of a glide path transition. Details of the technical study by Sapere are summarised in section 5.2 of the Draft Rule Change Report. Details of the IMO Board's considerations in light of this study are provided in section 5.3 of the Draft Rule Change Report. A copy of the Sapere report is available on the IMO website at [http://www.imowa.com.au/RC\\_2010\\_25](http://www.imowa.com.au/RC_2010_25) and [http://www.imowa.com.au/RC\\_2010\\_37](http://www.imowa.com.au/RC_2010_37).

### 4.2 Additional Amendments to the Amending Rules

As a result of the IMO Board's conclusions in light of the Sapere report and following the closure of the first submission period, the IMO made additional changes to the proposed Amending Rules for Methodology 1 to:

- Modify the methodology in accordance with the recommendations presented in the Sapere report;
- Outline the requirements for a periodic review of the methodology to be conducted by the IMO prior to the start 2017/18 Capacity Year;
- Incorporate details of the glide path for implementation to apply to new and existing facilities during the 2014/15 – 2016/17 Capacity Years;
- Reflect the suggestions received in submissions during the first consultation period, where appropriate; and
- Improve the integrity and clarity of the proposed Amending Rules.

The IMO also noted it had reflected in the proposed Amending Rules the approved amendments presented in the Final Rule Change Reports for:

- Adjustment of Relevant Level for Intermittent Generation (RC\_2010\_24)<sup>4</sup>;
- Curtailable Loads and Demand Side Programmes (RC\_2010\_29)<sup>5</sup>; and
- Demand Side Programmes – Operational Issues (RC\_2008\_20)<sup>6</sup>

These additional amendments are presented in Appendix 5 of the Draft Rule Change Report.

#### **4.3 The IMO's Draft Assessment**

The IMO's draft assessment of the two Rule Change Proposals can be viewed in the Draft Rule Change Report (available from the IMO's website).

### **5. THE IMO BOARD'S PROPOSED DECISIONS**

In accordance with clause 2.7.7 (f), the IMO Board's proposed decision on:

- RC\_2010\_25 was to accept the proposed amendments presented in RC\_2010\_25, as modified by the amendments outlined in section 5.4 and specified in Appendix 6 of the Draft Rule Change Report (modified Methodology 1); and
- RC\_2010\_37 was to reject the proposed amendments in RC\_2010\_37 (Methodology 2).

#### **5.1 Reasons for the IMO Board's proposed decision**

The IMO's detailed assessment set out in the Draft Rule Change Report indicated that both methodologies could be expected to result in the Market Rules better achieving Wholesale Market Objectives (a), (b), (c) and (d). Both proposals would also more fairly reflect the contribution of solar generation facilities to power system reliability at times of peak output than the current Capacity Credit valuation methodology for Intermittent Generators which undervalues their contribution.

However the two methodologies are mutually exclusive. In making its proposed decisions on each of the proposals, the IMO Board gave substantial weight to the area where the two methodologies are clearly distinguishable, that is, in the area of alignment with the reliability

<sup>4</sup> For further details refer to the following Web Page: [http://www.imowa.com.au/RC\\_2010\\_24](http://www.imowa.com.au/RC_2010_24)

<sup>5</sup> For further details refer to the following Web Page: [http://www.imowa.com.au/RC\\_2010\\_29](http://www.imowa.com.au/RC_2010_29)

<sup>6</sup> For further details refer to the following Web Page: [http://www.imowa.com.au/RC\\_2008\\_20](http://www.imowa.com.au/RC_2008_20)

criterion. On the weight of current information and analysis, the IMO Board considered it most appropriate to select modified Methodology 1.

After taking into account all of the submissions made on the proposals during the first submission period and the advice and recommendations presented in the Sapere report, the IMO Board proposed to accept Methodology 1 in a modified form and reject Methodology 2 on the basis that:

- Modified Methodology 1 is more accurate at reflecting the actual performance of Intermittent Generators during peak periods and thereby better achieves the Market Objectives than Methodology 2.
- Given the lack of available data on the performance of Intermittent Generators during peak periods and the complexity of the matter at hand, a more conservative approach is required.
- Notwithstanding the conclusions reached by MMA in its review, lack of performance data during extreme peak conditions is a significant concern for the IMO and a reassessment should be conducted following any extreme peak event (as per the IMO's Rule Change Proposal).
- The adoption of a lesser number of intervals on which the performance of an Intermittent Generator is assessed appears to be better aligned with the intent of the Planning Criterion, in conditions where there is sufficient energy-producing plant available on the SWIS.

The IMO Board also proposed to implement a three year glide path (to apply for the 2012 – 2014 Reserve Capacity Cycles) during the initial implementation of modified Methodology 1 and to require a three year review of the methodology to be undertaken by the IMO prior to 1 January 2015. The IMO Board considered a three year review period would be appropriate as over this period further performance information will be available to the IMO which will enable analysis to be undertaken on the performance of Facilities during extreme peaks. The IMO Board also noted that any changes in international practice in this field during the three year period will be considered during such a review. Further, a three year review is appropriate given the likely increase in the penetration of Intermittent Generation over the next few years.

In making its proposed decisions, the IMO Board relied on a number of findings and conclusions it has reached with regard to the relevance and weight of the material before it, as set out in detail in the Draft Rule Change Report. For further details refer to section 7 of the Draft Rule Change Report.

## **6. SECOND SUBMISSION PERIOD**

Following the publication of the Draft Rule Change Report on the IMO website, the second submission period was between 19 August 2011 and 21 October 2011. The timeframes for the second submission period were extended in accordance with the IMO's extension notices published on 1 September and 13 October 2011.

Given the clearly polarised views expressed during the first submission period, the IMO invited interested stakeholders to provide submissions supported by further analysis/fact on the material presented in the Draft Rule Change Report.

## 6.1 Submissions received

The IMO received submissions for RC\_2010\_25 and RC\_2010\_37 from the following interested parties:

Submitter	Rule Change Proposals
Alinta Energy	RC_2010_25
APA Group	RC_2010_25 and RC_2010_37
Collgar Wind Farm	RC_2010_25 and RC_2010_37
Infigen Energy	RC_2010_25 and RC_2010_37
Landfill Gas & Power Pty Ltd (LGP)	RC_2010_25 and RC_2010_37
Mid West Energy	RC_2010_25 and RC_2010_37
Perth Energy	RC_2010_25 and RC_2010_37
PacificHydro	RC_2010_25
Sustainable Energy Association (SEA)	RC_2010_25 and RC_2010_37
SkyFarming Ptd Ltd	RC_2010_25 and RC_2010_37
Synergy	RC_2010_25 and RC_2010_37
System Management	RC_2010_25 and RC_2010_37
Vesta Wind Systems	RC_2010_25 and RC_2010_37
Verve Energy	RC_2010_25

The main points raised in the submissions received are summarised below, with a more detailed summary of the main points raised by each submitting party provided in Appendix 1 of this report. A copy of the full text of all submissions is available on the IMO website at [http://www.imowa.com.au/RC\\_2010\\_25](http://www.imowa.com.au/RC_2010_25) and [http://www.imowa.com.au/RC\\_2010\\_37](http://www.imowa.com.au/RC_2010_37). Additional detail along with the IMO's response to issues raised in submissions is contained in Appendix 2 of this report.

In summary, the views of the submitting parties on the material presented in the Draft Rule Change Report, including the IMO Board's proposal to accept modified Methodology 1 and reject Methodology 2, continued to be polarised.

Verve Energy and Perth Energy both supported modified Methodology 1, albeit with Perth Energy noting that the glide path required further consideration.

Alinta noted that it supports the principle that the number of Capacity Credits be determined on both an equitable basis, and reflect a Facility's ability to support the secure and reliable operation of the WEM. System Management supported the concept that the capacity value of Intermittent Generators be based on an average value less a variability adjustment.

A number of parties (APA Group, Infigen Energy, LGP, Mid West Energy, Pacific Hydro and SEA) provided support for modified Methodology 1 contingent on the removal of LSG to select peak Trading Intervals and the U factor adjustment, amongst other suggestions.

Collgar Wind Farm, Synergy and Vestas did not support modified Methodology 1.

A summary of the assessment by the submitting parties as to whether each proposal would better achieve the Market Objectives (Table 2) and an overview of participant submissions on the costs associated with implementing each of the proposed changes and the timeframe for implementation (Table 3) is presented below:

**Table 2: Submitting parties' Wholesale Market Objective assessment**

Submitter	RC_2010_25 (modified)	RC_2010_37
Alinta	Alinta supports the continued evolution of the WEM in a manner consistent with the Market Objectives. No specific assessment provided.	<i>Not applicable</i>
APA Group	Marginal impact of using top 12 intervals in promoting reliability (objective (a)). Otherwise APA notes that the removal of LSG would promote Market Objective (b) by reducing volatility. The U factor would be inconsistent with Market Objective (c) as it is a manifest discrimination against solar. The modified methodology would have differing impacts for wind (against) and solar (for) with regard to Market Objective (d) and would be generally inconsistent with Market Objective (e).	<i>None provided</i>
Collgar Wind Farm	Inconsistent with Market Objective (c).	<i>None provided</i>
Perth Energy	Promotes Market Objective (a) but inconsistent with Market Objective (d)	Promotes Market Objective (a) but inconsistent with Market Objective (d)
Pacific Hydro	Inconsistent with Market Objective (c).	<i>Not applicable</i>
Infigen Energy	<i>None provided</i>	<i>None provided</i>
LGP	<i>None provided</i>	<i>None provided</i>
Mid West Energy	Incorporation of LSG and U factor inconsistent with Market Objectives (a) and (c). Removal of the LSG and U factor will promote Market Objective (b) and (d). Market Objective (e) will be promoted by increasing the level of solar generation.	<i>None provided</i>

Submitter	RC_2010_25 (modified)	RC_2010_37
SEA	<i>None provided</i>	<i>None provided</i>
SkyFarming	Notes that the result of the amended modelling (to include Collgar) will be a better result simply because it better reflects what is in the ground. No specific assessment provided.	Notes that the result of the amended modelling (to include Collgar) will be a better result simply because it better reflects what is in the ground. No specific assessment provided.
Synergy	Inconsistent with Market Objectives (a) and (d) <sup>7</sup> .	Inconsistent with Market Objectives (a) and (d).
System Management	The proposed changes, including System Management's recommended revisions will better facilitate the achievement of the Market Objectives.	<i>None provided</i>
Vestas Wind Systems	Inconsistent with Market Objectives (a), (b), (c) and (d). Unlikely to be impacted on by the modified Methodology 1.	Previously provided, noting that Methodology 2 far better achieves the Market Objectives than Methodology 1
Verve Energy	<i>None provided</i>	<i>Not applicable</i>

<sup>7</sup> Note that the IMO has clarified with Synergy that its comments relate to both the original RC\_2010\_25 and RC\_2010\_37 proposals and the modified RC\_2010\_25 proposal.

**Table 3: Submitting parties' identified costs and implementation timeframes**

Submitter	Identified Costs		Implementation Timeframe	
	RC_2010_25 (modified)	RC_2010_37	RC_2010_25 (modified)	RC_2010_37
Alinta	<p>Modified Methodology 1 would not require Alinta to change its IT or business systems, and hence there are no associated IT or business costs.</p> <p>While future developers of intermittent generation projects would be able to account for any reduction in revenue from Capacity Credits by increasing contract and/or energy prices in power purchase agreements, Alinta estimates that the modified IMO proposal outlined in the Draft Rule Change report would materially reduce its EBITDA.</p>	<i>Not applicable</i>	<p>The changes to the Market Rules contemplated by the IMO in its Draft Rule Change Report would not require Alinta to change its IT or business systems, and hence there is no specific period of time that would be required to implement the changes arising from the Rule Change Proposal.</p>	<i>Not applicable</i>
APA Group	<p>Expectation that the introduction of modified Methodology 1 will result in a large decrease in the value of the Emu Downs Wind Farm and would also present a small increase in the risk profile of the Badgingarra Wind Farm development project.</p> <p>With the further amendments that have been proposed a modest decrease in the value of the Emu Downs Wind Farm</p>	<p>It is expected that the introduction of Methodology 2, while increasing revenue risk, would have little impact on the value of the Emu Downs Wind Farm or the development of the Badgingarra Wind Farm project.</p>	<i>None provided</i>	<i>None provided</i>

Submitter	Identified Costs		Implementation Timeframe	
	RC_2010_25 (modified)	RC_2010_37	RC_2010_25 (modified)	RC_2010_37
	will occur along with a small increase in the risk profile of the Badgingarra Wind Farm development project.			
Collgar Wind Farm	For the 2011-12 year, Collgar has been issued 90 Capacity Credits – the largest of any of the renewable energy participants in the market today. This represents a significant revenue stream for the Collgar stakeholders. Implementation of this Rule Change will materially reduce the number of Capacity Credits which in turn reduces the available revenue stream.	<i>None provided</i>	<i>None provided</i>	<i>None provided</i>
Infigen Energy	<i>None provided</i>	<i>None provided</i>	<i>None provided</i>	<i>None provided</i>
LGP	<i>None provided</i>	<i>None provided</i>	<i>None provided</i>	<i>None provided</i>
Mid West Energy	The adoption of modified methodology 1, subject to the stated further amendments, will remove a large portion of the discrimination against solar generators found in the current market rules. This will be positive for MWE's business.	<i>None provided</i>	Immaterial	<i>None provided</i>
PacificHydro	<i>None provided</i>	<i>Not applicable</i>	<i>None provided</i>	<i>Not applicable</i>

Submitter	Identified Costs		Implementation Timeframe	
	RC_2010_25 (modified)	RC_2010_37	RC_2010_25 (modified)	RC_2010_37
Perth Energy	See no problems in this regard	Sees no problems in this regard	Does not require any lead time to implement either of the changes.	Does not require any lead time to implement either of the changes.
SEA	<i>None provided</i>	<i>None provided</i>	<i>None provided</i>	<i>None provided</i>
SkyFarming	<i>None provided</i>	<i>None provided</i>	<i>None provided</i>	<i>None provided</i>
System Management	No changes required	No changes required <sup>8</sup>	Could be implemented on the proposed commencement date	Could be implemented on the proposed commencement date
Synergy	Would not require any changes to IT or business systems, but would incur a cost as a result of a reduction in capacity crediting to intermittent generation facilities if this proposed rule change is adopted <sup>9</sup> .	Would not require any changes to IT or business systems, but would incur a cost as a result of a reduction in capacity crediting to intermittent generation facilities if this proposed rule change is adopted.	Synergy is uncertain about the time required in making adjustments or whether it can make adjustments given it will involve contractual negotiations.	Would not require any changes to IT or business systems, but would incur a cost as a result of a reduction in capacity crediting to intermittent generation facilities if this proposed rule change is adopted.
Vestas Wind Systems	<i>None provided</i>	<i>None provided</i>	<i>None provided</i>	<i>None provided</i>
Verve Energy	<i>None provided</i>	<i>Not applicable</i>	<i>None provided</i>	<i>Not applicable</i>

<sup>8</sup> The IMO clarified with System Management the change in its cost assessment between its first (potentially significant changes to System Management's IT systems) and second submission (no changes required) period responses. System Management notes that as the requirement to provide information on wind farm output under clause 7.7.5B is now on request (rather than daily) the changes identified originally to the interface specification are no longer applicable

<sup>9</sup> The IMO clarified with Synergy that its comments relate to both the original RC\_2010\_25 and RC\_2010\_37 proposals and the modified RC\_2010\_25 proposal.

## 6.2 Public Workshop

During the second submission period the IMO held a public workshop to present the analysis and recommendations outlined in the Sapere report and allow interested parties an opportunity to ask the IMO and Dr Richard Tooth (Sapere) any questions regarding the modified Methodology 1.

The workshop was attended by the following entities:

- Alinta
- Blairfox
- Collgar
- Future Effect
- Jackson McDonald
- Office of Energy
- Skyfarming
- System Management
- Vestas
- Western Power
- APA Group
- Clifford Chance
- Economic Regulation Authority
- Infigen Energy
- LGP
- Pacific Hydro
- Synergy
- TransAlta
- Verve Energy

A copy of the minutes from the workshop is available on the IMO website, along with the presentations made by the IMO and Dr Tooth, at [http://www.imowa.com.au/RC\\_2010\\_25](http://www.imowa.com.au/RC_2010_25) and [http://www.imowa.com.au/RC\\_2010\\_37](http://www.imowa.com.au/RC_2010_37).

## 6.3 The IMO's response to submissions received during the second submission period

There were a number of common issues raised by respondents during the second submission period, including the use of LSG, the U-factor adjustment, the unavailability of a complete Collgar dataset for the analysis, regulatory risk and the process undertaken by the IMO in its progression of the two Rule Change Proposals. The IMO's response and supporting analysis to a number of these common issues is presented in the sections below. The IMO's response to each of the issues raised during the second submission period is presented in the table in Appendix 2.

### 6.3.1 Selection of peak periods

A number of submissions received during the second submission period included recommendations relating to the selection of peak periods for the purposes of determining the performance of Intermittent Generators. Further details of the analysis conducted by the IMO with respect to the continued use of the LSG concept, impact of new Facilities on existing Facilities and modification of the LSG concept to incorporate load reduction services are presented below.

#### 6.3.1.1 Use of Load for Scheduled Generation (LSG)

A number of submissions commented on issues associated with using LSG to determine peak Trading Intervals and requested the LSG measure be replaced with operational load.

While LSG was adopted as part of both the original RC\_2010\_25 and the RC\_2010\_37 proposals, the IMO acknowledges that the implications of using LSG may not have been fully appreciated by all stakeholders. There is, however, a strong rationale for using LSG to select peak Trading Intervals. As noted in the Draft Rule Change Report, peak LSG identifies the periods when additional capacity is most valuable. Thus by aligning Capacity Credits to peak LSG, an incentive is given for production of additional capacity when it is most needed (has the highest marginal value to the WEM).

This effect reflects that the value of an Intermittent Generator in adding to capacity is greater if the Intermittent Generators are less correlated with each other (or even negatively correlated with each other). Alternatively stated, there is value in diversification of Intermittent Generators. By using LSG to identify peaks, an adjustment is automatically made for the correlation (covariance) between Facilities.

The true capacity value of an Intermittent Generator depends on the covariance of its output with other Facilities. If LSG were not used to identify peak periods, an alternative method would be needed to adjust for covariance between the Facilities. For example, an alternative identified (which is adopted by PacificCorp in the United States) that uses the z-method) involves making an explicit adjustment for the covariance between Facilities. Under this approach the Capacity Credits formula would be something like:

$$\begin{aligned} \text{Capacity Credits} = & \text{Average at peak} \\ & \text{/less a factor x } \mathbf{\text{covariance with other Facilities at peak}} \\ & \text{/less other adjustments} \end{aligned}$$

The IMO expects that the results would be broadly similar regardless of which method was used. For example, there would be no adjustment expected if a Facility's output is not correlated with the output of other Facilities and a positive adjustment if a Facility's output is negatively correlated with that of other Facilities.

To date no alternative options to adjust for the covariance between Facilities have been proposed and suggestions received in second round submissions failed to identify that an alternative approach would be required to ensure the true capacity value of Intermittent Generators is identified.

The use of LSG is not expected to materially affect the total value of Capacity Credits allocated to Intermittent Generators as the use of the LSG concept (as opposed to a separate adjustment for covariance) was a consideration taken into account by Dr Richard Tooth when determining the adjustment parameters used in modified Methodology 1. Further it is expected that the relative merits of LSG and other alternative approaches for addressing the issue of covariance will be considered as part of the three year review process. For further details of the IMO's assessment of the merits of using LSG refer to section 6.4.3 of the Draft Rule Change Report.

### **6.3.1.2 Impact of existing Facilities on new Facilities through use of LSG**

A number of submissions raised concerns with the impact that new Facilities would potentially have on the measurement of LSG, which in turn impacts on existing Facilities. In particular, submitting parties were concerned that estimated data provided by the accredited expert report and used for the purposes of determining the level of

certification for a new Facility would affect the Capacity Credit valuations of existing Facilities.

The IMO agrees that it is inappropriate that estimated data, being used for Facilities that are yet to enter service or re-enter service after significant maintenance or having been upgraded<sup>10</sup>, should impact the historical calculation of LSG for existing Facilities.

An alternative approach to remove this impact, which is to calculate LSG for existing facilities using only actual metered output, was identified by the IMO and further consultation was sought on the proposal (refer to section 6.4 of this report). Further details of the identified methodology are outlined below:

- LSG would be calculated for existing Facilities using actual metered output. As a result, historical calculations of LSG would not change when new or upgraded Intermittent Generators are certified. Furthermore, as a five year period is used to determine output used in the LSG formula, any future impact of a new Facility on the LSG of existing Facilities will occur gradually as a full five years worth of meter data is recorded.
- For new and upgraded Facilities (new Facilities), the process would remain whereby the estimated output would be used to calculate the peak LSG Trading Intervals for only that Facility. In particular, the LSG used for new Facilities would be determined using the total output of the existing Intermittent Generator fleet, adjusted to reflect the Facility's estimated output. The LSG for an upgraded Facility would be determined using the total existing Intermittent Generator fleet, adjusted to reflect the estimated output for the Facility under its new component configuration wherever the actual metered data for the Facility is either missing or else pre-dates the fully operational date for the Facility<sup>11</sup> (for the new configuration). Where multiple new Facilities are entering the market, separate LSG values would be determined for each Facility, thereby ensuring the impact of estimated data for any one Facility does not affect the certification level of another new, upgraded or existing Facility. The estimated data would be replaced by the metered results over a five year period once the Facility becomes fully operational in the market.

As noted in the IMO's extension notice (published 21 November 2011) this proposed approach to treating new Facilities was considered to be appropriate to provide the right incentives for investment in Facilities that provide output at the times when capacity is most valuable.

Given LSG for existing Facilities would be based entirely on Meter Data Submissions<sup>12</sup> the IMO would be able to publish this information on 1 June rather than 1 August of the relevant Reserve Capacity Cycle. This would allow existing Facilities to consider this information prior to the closure of the window for certification applications on 1 July. New Facility LSG values will not be published due to potential confidentiality issues. The confidentiality status of information document maintained by the IMO will be updated to reflect this classification.

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<sup>10</sup> The IMO notes it would not also be appropriate to use metered output for facilities that have changed their configuration during the five years as this would not reflect their ability to contribute during peak periods.

<sup>11</sup> The IMO notes that this treatment of an upgraded facility as a whole for the purposes of the calculation (rather than simply considering the upgrade separately) is consistent with the approach taken for the return of Reserve Capacity Security.

<sup>12</sup> Excepting any estimates required to adjust for Dispatch Instructions or Consequential Outages.

Note that Facilities that are currently fully operational but do not have metered results (relevant to the current component configuration of the Facility) for the five year assessment period would be required to provide the IMO with an expert report containing estimated output for those missing Trading Intervals. The IMO notes that this would also be the case under the original modified Methodology 1.

### **6.3.1.3 Modification to LSG to reflect load curtailment**

In response to an issue raised by LGP during the second submission period, the exclusion of the impact of DSM (and Interruptible Loads and involuntary load shedding) on the signals provided by LSG has been further considered by the IMO. Consistent with the original intention of the LSG concept, to reflect the peak when additional capacity is most needed, curtailment of demand on either a voluntary or involuntary basis is likely to be aligned with peak Trading Intervals. For example, a contingency event such as restricted gas supply on a hot day would potentially reduce the output of the Scheduled Generator fleet, making it highly likely that DSM will be dispatched by System Management, Interruptible Loads will be automatically tripped off and that involuntary load shedding will occur<sup>13</sup>.

Not incorporating load reduction events into the overall determination of the peak (previously indicated by just total sent out generation of all Facilities – which in the abovementioned situation would be restricted to a lower level), means that the LSG determination would fail to consider similar types of contingency events when determining the peak 12 Trading Intervals.

The IMO has investigated the impacts of amending the definition of LSG to include load reductions (voluntary and involuntary) on the 12 peak LSG Trading Intervals. An overview of the outcomes is presented below.

- The inclusion of DSM curtailment data changes the timing of the peak loads. This change has a small but materially positive impact on the Capacity Credit value for existing wind farm Facilities (for other Facilities, such as landfill gas, the impact appears negligible). This appears to have been because curtailment during the 2011 DSM curtailment events occurred during the peak afternoon period on 24, 25, 26 and 28 February, which pushed peak LSG to earlier periods when wind output was lower. The 2008 curtailment event only impacted on one peak LSG Trading Interval and had a negligible overall impact.
- The inclusion of involuntary load shedding data has no impact on the peak LSG periods.

Note that the impacts of Interruptible Loads tripping off the system in response to system frequency changes have not been assessed, as the reductions in MWh energy output caused by these events are not currently determined by either the IMO or System Management.

Given the importance of this issue the IMO undertook further consultation on the problem and the IMO's proposed solution. For further details refer to section 6.4 of this report.

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<sup>13</sup> The IMO notes that Dispatchable Loads would also likely be dispatched either upwards or downwards during such an event. However due to acknowledged issues relating to Dispatchable Loads throughout the Market Rules the IMO does not propose to incorporate these loads into the determination of the peaks but rather to consider their inclusion at a later date when the issues relating to Dispatchable Loads are specifically addressed in the Market Rules.

A copy of the revised LSG periods to reflect the proposed amended determination of peak periods was provided in the extension notice published on 21 November 2011 and available on the IMO website.

#### ***6.3.1.4 Concerns that LSG biases against Intermittent Generators because it is not applied to Scheduled Generators***

A number of submissions raised concerns that the use of LSG is biased against Intermittent Generators and that such a concept is not applied to Scheduled Generators. The IMO considers these views misrepresent the LSG concept which explicitly recognises the different characteristics of capacity providers.

The use of LSG has an effect only because Intermittent Generators' output at peak periods is intermittent. A Facility with stable output during peak periods is not affected by whether these peak periods are measured using LSG or operational load. Furthermore if, as is expected of Scheduled Generators, Intermittent Generator output was stable during peak periods, then the peak LSG periods would be identical to the peak operational load periods.

Similarly some submissions argued that the concept of highest marginal value is not applied to Scheduled Generators. The IMO considers this not to be the case as Scheduled Generators are required to be available when the marginal value of additional capacity is greatest. With respect to DSM and peaking generators the IMO also notes that capacity payments to these facilities are not linked to the frequency that System Management calls on these generation types but rather represents an availability payment.

#### ***6.3.1.5 On the volatility of using LSG and the number of Trading Intervals selected***

A number of parties stated in submissions that they would prefer to see a larger number of Trading Intervals used in determining peak output. The IMO agrees that a larger number of observations would be likely to reduce variability in the capacity valuation, however the more observations that are used the greater the risk that the observations being determined do not align with the peak periods. A balanced number of Trading Intervals is therefore required.

Relative to the other methodologies originally put forward in RC\_2010\_25 and RC\_2010\_37, modified Methodology 1 uses fewer Trading Intervals; however the 60 Trading Intervals are drawn from separate Trading Days. This reduces the risk that the average output measure will be significantly influenced by an unusual period.<sup>14</sup>

Some submissions argued that the certification results would be less volatile if operational load was used to select peak Trading Intervals. In general, this is unlikely to be the case; for the five years to April 2011, the average variance of output of Intermittent Generators was less when peaks were measured using LSG rather than Operational Load.

Over time there can be some additional movement in capacity valuations from using peak LSG as new Intermittent Generators are accredited, thereby impacting on the

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<sup>14</sup> In contrast, in calculating the Facility level amount, the original Methodology 1 used 750 Trading Intervals. These were drawn from largely adjacent periods on similar days with the result that the results from around 60 to 70 days were used.

calculation of LSG in future years.<sup>15</sup> However, this impact will be gradual (following the amendment to only use metered data in calculating LSG for existing Facilities), and will be limited if the new Facility or upgraded Facility is small or its output is uncorrelated with the output of existing Facilities.

In the absence of significant changes in the Intermittent Generator fleet (and to an extent demand), the volatility of the Capacity Credit valuation can be reasonably well estimated using the historical variance of the Facility's output across peak Trading Intervals. Similarly the IMO expects that the Capacity Credit valuation of a new Facility or upgraded Facility will be able to be estimated using estimates of the average, the variance and the correlation of output with the fleet of Intermittent Generators during peak periods.

### **6.3.2 The adjustments**

#### **6.3.2.1 The inclusion of the U-factor adjustment factor**

A number of submissions requested that the U-factor adjustment be removed. The IMO however considers that there is compelling evidence that there is a significant risk that the output of Intermittent Generators is materially less during conditions when demand is likely to be at its peak and, as such, does not consider it would be appropriate to remove the U-factor adjustment.

None of the submissions received provided any evidence or arguments that might reduce the IMO's view of the risk associated with Intermittent Generators failing to perform during a peak event. Likewise, none of the submissions provided alternative options as to how the risk might be addressed in the valuation methodology in the absence of sufficient performance data.

A number of submissions argued that, given the uncertainty associated with the adjustment, it should be removed. In the IMO's view the Wholesale Market Objectives are not best served by assigning a conservatively high number of Capacity Credits (or conversely conservatively low). The IMO considers that the U-factor adjustment is appropriate as it attempts to provide an accurate assessment that is presently achievable.

Some submissions suggested that the U-factor adjustment would be biased against solar Facilities and wave technology. The IMO notes that the U-factor adjustment has been designed to target Facilities with high variance of output during peak times. The IMO has no reason to believe that the impact of the U-factor on solar Facilities would be significant and notes that while the potential impact on wave technology is uncertain at this time it is unlikely that this technology will be introduced into the WEM prior to the first review. (The IMO notes that should significant issues associated with the entry of wave technology into the market arise, the IMO is not precluded from undertaking the review of the methodology earlier, if required.)

Some submissions questioned whether a technology-specific adjustment should have been made. While this is a possibility and may be considered in the future, the IMO considers that, at this stage, there is insufficient information<sup>16</sup> as to how this might be

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<sup>15</sup> Potentially there will also be some additional movement from using LSG as result of changes in the variance of peak demand. In general, the capacity valuations will slightly increase as demand expands.

<sup>16</sup> The IMO notes that it was not provided with any appropriate data for solar facilities.

achieved, and that for the present an adjustment proportional to the variance of each Facility's output during peak is an appropriate alternative.

### **6.3.2.2 Transparency as to how the adjustment estimates were made**

Some submissions requested greater transparency as to how the U-factor adjustment was calculated. As has been acknowledged in both the IMO's Draft Rule Change Report and the Sapere report, the structure and the size of the adjustment have involved a combination of analysis and judgement. Given the continued concerns relating to this issue, Dr Tooth from Sapere has provided further detail on how the size of the U-factor adjustment was determined. This was presented as Appendix 1 to the IMO's extension notice published on 21 November 2011 and is available on the IMO website.

While recognising that the process has involved some judgement, the IMO has chosen to adopt the recommended parameter values, given that:

- the recommendation is an independent assessment;
- there is a transition period which mitigates the impact of the valuation; and
- the IMO has signalled that the size and structure of the adjustment will be reconsidered in the future.

### **6.3.2.3 Uncertainty over the size of the U-factor adjustment**

A number of submissions raised concerns that the U-factor adjustment would add to uncertainty about the Capacity Credits that applicants would receive. The IMO acknowledges that this could be the case; however even without the U-factor adjustment there would still be uncertainty and concern as to the performance of Intermittent Generators during peak times and therefore the actual capacity value of Intermittent Generators. The U-factor adjustment responds to this uncertainty, on the basis of current information. The IMO also notes that the size of the U-factor adjustment can be estimated by applying the formula using estimates of the variance and average of Facility output during peaks.

However, the IMO recognises that under the current structure there is no limit to the adjustment that may be applied, which leads to the risk that the U-factor adjustment could be excessive for a Facility. The IMO also recognises that there is value in removing unnecessary uncertainty.

In response to this issue the IMO identified that a cap on the U-factor adjustment of one-third of the Facility's average output at peak times could be applied to mitigate concerns that the U-factor adjustment will be excessive. This is a level that would not affect the current Capacity Credit valuations of any existing Market Participant. Given the importance of this issue the IMO undertook further consultation on the problem and the IMO's proposed solution. For further details refer to section 6.4 of this report.

### **6.3.2.4 Future values of the adjustments**

A number of submissions requested greater transparency as to how the values of the adjustment parameters will be determined in the future.

The IMO has flagged that the size of the adjustments will be reassessed as part of the next review. The IMO can only provide limited guidance as to the method and the size of the adjustment parameters. However the IMO agrees that there is merit in better

outlining how the values have been set in the initial determination by Dr Tooth. This should ensure that consistency can be achieved when determining the values to apply during the first three year review.

The IMO notes that the K-parameter adjustment is to reflect the additional variability in the peak load to be met by Scheduled Generators as a result of Intermittent Generation. The Sapere report notes that there are methods to calculate the K-parameter based on observed results and that the K-parameter is likely to be in the order of 0.002 to 0.005 per MW<sup>-1</sup>. The IMO also notes the impact of the K parameter adjustment is small.

The size of the U-factor adjustment (and indeed how it will be applied) is more variable. The principle for determining the U-factor adjustment is however clear — its purpose is to account for the concern that Intermittent Generator output is likely to be lower during absolute peaks than has been observed to date.

The IMO has previously noted that the U-factor adjustment will need to be reviewed in the future. The IMO considers the risk that low Intermittent Generator output coincides with high demand due to environmental factors to be a real risk that warrants greater investigation. Consideration as to how this risk might be better understood and reflected in the Capacity Credit valuation methodology will be required in preparation for the first three year review.

In preparation for the next review, the IMO requests that stakeholders also give consideration to how a more refined approach could be developed to deal with the issue of the lack of data that occurs on absolute peaks. There are a number of possible alternatives. For example:

- One approach is to use existing data on environmental factors that might affect both demand and Intermittent Generator output to forecast the output of Intermittent Generators during peak times.
- Another mitigating measure is to weight the Trading Intervals according to their significance. Thus, for example, the output of Intermittent Generators during periods which are more likely to be peaks (e.g. with higher load) would receive greater weight.

The IMO notes that the views of the MAC and any other interested stakeholders will be sought on any alternatives as part of the first three year review.

### **6.3.3 Collgar data**

A number of submissions suggested that data from the Collgar wind farm should have been used in conducting the analysis.

Collgar was first requested to provide data during the REGWG process and had failed to provide relevant data. Following the public workshop for this Rule Change Proposal, Collgar approached the IMO and offered to provide its data. At this point the IMO declined the offer given its intention to not revise either the Sapere report or the Draft Rule Change Report for RC\_2010\_25 and RC\_2010\_37. However after further consideration the IMO determined there would be merit in obtaining the data and calculating the 12 peak LSG periods including Collgar's estimated output, so as to allow impacted parties to undertake their own assessments of the impacts of modified Methodology 1 on their individual Capacity Credit allocations.

The IMO acknowledges that its request to Collgar to provide the data was only 10 Business Days prior to the close of the public consultation period. However the IMO assumed Collgar held a refined data set with fewer caveats given its offer to provide this information after the public workshop.

The data provided by Collgar for the purposes of determining the impacts on the peak LSG periods omitted a number of important data points during the Hot Season. These are summarised below and outlined in further detail in the extension notice for both proposals published by the IMO on 13 October 2011:

- 2006/7 hot season: entire data series missing
- 2007/8 hot season: 20 days with missing data, including 3 of the days currently identified in the top 12 Trading Interval's
- 2008/09 hot season: 32 days with missing data, including 4 of the days currently identified in the top 12 Trading Interval's
- 2009/10 hot season: 27 days with missing data, including 2 of the days currently identified in the top 12 Trading Interval's
- 2010/11 hot season (up to 7<sup>th</sup> March only): 13 days with missing data, including 2 of the days currently identified in the top 12 Trading Interval's

There is also significant uncertainty with regards to the results and Collgar advised the IMO that they would be useful for indicative purposes only.

To ensure that incorrect signals were not provided to the market regarding the potential impacts of Collgar in shifting the peak LSG intervals the IMO did not consider it appropriate to re-run the analysis to include Collgar. The IMO maintains this position in the absence of any improved data. The IMO however notes its open offer to publish the Existing Facility LSG peak periods including Collgar Wind Farm if a completed data set that meets the requirements of new clause 4.10.3 is provided to the IMO.

#### **6.3.4 Rule Change Process**

Some submissions argued that the modified Methodology 1 represented a major change from what had been originally proposed by the IMO in Methodology 1 and that the appropriate process would have been to reject both RC\_2010\_25 and RC\_2010\_37 in the Draft Rule Change Report and submit modified Methodology 1 as a new Rule Change Proposal. This would have allowed two further rounds of consultation to be undertaken on modified Methodology 1.

The IMO considers that the modifications to Methodology 1 do not represent a major change. In particular:

- the structure of Methodology 1 (average at peak less an adjustment due to concerns of increased variability and underperformance at peak) and key elements (use of 12 Trading Intervals selected on the basis of LSG) were retained;
- these and other key concepts in modified Methodology 1 are consistent with issues discussed by the REGWG; this includes the concern that Intermittent Generators did not perform at peak extremes;
- Sapere was asked to only consider modifications (and, in particular, simple changes) to the two originally proposed methodologies.

Additionally, the IMO notes that it held a public workshop during the second submission period to allow interested parties an opportunity to gain an understanding from Dr Tooth of how modified Methodology 1 would operate. Two extensions to the timeframes for the second submission period were also granted to allow interested parties sufficient time to understand Modified Methodology 1 and prepare their submissions.

The IMO also undertook a further round of consultation on its proposed solutions to three important issues that arose from submissions received during the second submission period that resulted in a slight modification of the proposed Amending Rules. Refer to section 6.4 for further details.

The submissions received during the further round of consultation largely reiterated or expanded on previously stated positions. The IMO has considered the submissions and is of the view the submissions did not identify any concerns arising from the proposed refinements that were not previously raised.

### **6.3.5 Regulatory Risk and transitional arrangements**

In preparing the Draft Rule Change Report the IMO undertook a number of steps to address concerns regarding regulatory risk.

- First, it has sought to adopt a methodology that most closely reflects the reliability value of Intermittent Generators both in terms of structure and overall level.
- Second, the IMO established a more comprehensive three year review period of the methodology. Among a number of other considerations (outlined in the Draft Rule Change Report and section 6.3.6.2 ), the three year review will determine the value of the parameters K and U used in the methodology to be applied during each of the three Reserve Capacity Cycles commencing during the three year period.
- Third, the IMO put forward a three year glide path from the current methodology (for the 2012-14 Reserve Capacity Cycles).

In their second round submissions a number of parties raised concerns with the transitional arrangements proposed in the Draft Rule Change Report. The IMO continues to consider that the proposed transitional arrangements provide an appropriate length of transition given they strike an appropriate balance between mitigating financial impacts to existing Intermittent Generators and removing an inefficient market signal.

In addition to this, calculating LSG separately for new Facilities which do not have five years worth of meter data (for the component configuration of the Facility for which certification is being sought) provides an additional transitional mechanism to existing Facilities from the potential impact of new Facilities. Under the revised approach, LSG for existing Facilities will only be based on metered data and thus, given the use of five years of historical data for calculating Capacity Credits, the potential for new Facilities to impact on the Capacity Credits of existing Facilities through the selection of peak LSG periods will transition over five years.

### **6.3.6 Other issues**

The following additional general issues were raised in submissions received during the second submission period.

### **6.3.6.1 Reliability criterion and summer peak**

Some submissions questioned whether additional focus should be given to other aspects of reliability, notably:

- the second element of the reliability criteria, the requirement to maintain less than 0.002 percent expected unserved energy; and
- the performance in shoulder periods during which there is lower scheduled generation capacity due to scheduled outages.

As was discussed in the Draft Rule Change Report and as reflected in section 7.2, the IMO views that for the foreseeable future the most stringent criterion will be the “defined event scenario” that focuses on system peak.

The IMO notes the concern that, due to Planned Outages, available capacity may be lower at non-peak times. However, such reductions in capacity are controllable by System Management. Outages are unlikely to be approved unless there is sufficient capacity on the system and so the risk posed by outages at such times should be no more than that during times of peak LSG.

### **6.3.6.2 Other issues for consideration in future reviews**

The IMO anticipates that a number of issues will be considered in the next review. Some of these issues reflect points raised in a number of submissions received during the second submission period. These include:

- The structure and size of the U-factor adjustment, including:
  - how greater certainty over the performance of Intermittent Generators during extreme peaks can be obtained; and
  - whether technology-specific adjustments should be made.
- Whether a weighting should be applied to the Trading Intervals. Potentially a more accurate result can be achieved by applying a greater weight to Trading Intervals when the risk of a shortfall in capacity is greater. For example, greater weight may be given to Trading Intervals where the surplus capacity was lower, or where conditions reflect higher demand.
- Greater consideration of the covariance between Intermittent Generators.

The IMO notes that many of these issues are interrelated. For example, the weighting of Trading Intervals has implications for the U-factor adjustment.

The IMO notes that any future modifications would need to be consistent with the principle of bettering the Wholesale Market Objectives, primarily to improve the accuracy and certainty of the methodology.

## **6.4 Further consultation**

Three important issues relating to the application of modified Methodology 1 (as presented in the Draft Rule Change Report) were raised in, or arose, from second-round submissions on RC\_2010\_25 and RC\_2010\_37. These were:

- uncertainty over the size of the U-factor adjustment (refer to section 6.3.2.1

- the impact of load curtailment on peak periods (refer to section 6.3.1.3 ); and
- the impact of existing Facilities on new Facilities through LSG (refer to section 6.3.1.2 ).

Following further consideration of these issues the IMO identified proposed solutions to address each, as alluded to in the relevant sections above. While acknowledging that clause 2.7 of the Market Rules does not contemplate a further consultation period after second-round submissions on the Draft Rule Change Report, the IMO considered that the issues and proposed solutions warranted further consideration by interested parties. This was due to the importance of the issues raised and their potential impact on the IMO's assessment of the Rule Change Proposals. A further consultation period was undertaken between 21 November and 30 November 2011. During this time submissions were received from:

- APA Group
- Collgar Wind Farm
- LGP
- Mid West Energy
- Synergy
- Vestas Wind Systems
- Wind Prospect

The IMO notes that a number of submitting parties, including APA Group and Vestas did not comment directly on the IMO's proposed solutions but rather reiterated their positions presented during the second round of consultation. Likewise, the IMO notes that Wind Prospect provided comments on the introduction of RC\_2010\_25 rather than comments on the requested issues and proposed solutions.

Several submitting parties provided comment on the IMO's approach of holding a further consultation period. In particular:

- Collgar Wind Farm, LGP and Mid West Energy supported the IMO's decision to seek submissions on the proposed additional changes. Collgar noted in its submission that the IMO's decision to seek further consultation however raised the question of whether the modified version of RC\_2010\_25 should be treated as a new rule change entirely, as suggested by System Management in its second round submission.
- Synergy noted its lack of surprise that the IMO has, for the first time, requested a third round of public comment on what has turned out to be a complex Rule Change Proposal. Synergy considered that RC\_2010\_25 and RC\_2010\_37 have been ground breaking Rule Change Proposals in every way.
- APA Group expressed confusion regarding the course of action undertaken by the IMO in releasing a third (unofficial) submission period and requesting feedback on the proposed solution to issues raised in the second submission period. APA suggested that the IMO appears to be seeking to negotiate its preferred outcome with the market.
- Vestas noted that the further consultation period seemingly ignores comments of many submitters during the second submission period that the changes to RC\_2010\_25 have been so substantial that the process should be terminated

and recommended that revised RC\_2010\_25 be submitted as a new Rule Change Proposal so it can be properly considered. Vestas noted System Management advocated this approach in its second round submission.

The IMO notes the views of submitting parties on the rule change process undertaken for these two Rule Change Proposals to date. Refer to section 6.3.4 of this report for further details of the IMO's response to concerns raised that modified methodology 1 represents a significant change from that originally put forward in RC\_2010\_25.

An overview of the general comments received along with specific details of the submissions on the three issues and the IMO's proposed solutions for them are provided in Table 4. The IMO has responded directly only to additional points note specifically raised in previous submissions, and to comments provided on the three issues and their proposed solutions. The IMO has already provided formal responses to the views of submitting parties that were previously raised during the first and second submission periods.

**Table 4: The IMO’s responses to submissions received during the further consultation period**

	Clause/Issue	Submitter	Comment/Change Requested	IMO’s response
1.	General comments	Mid West Energy	Considered the proposed solutions to be flawed as they add further complexity to concepts that have already been discredited. MWE expressed disappointment that “the IMO has chosen to introduce a new ‘fleet’ concept at this late stage of the process.”	<p>The IMO disagrees that the concepts have been discredited. The concepts (use of LSG and the “U” factor adjustment) to which MWE objects address important issues associated with the correlation of output between Facilities and the concern the available evidence raises that Intermittent Generator perform poorly at extreme times. These issues have not been directly debated by participants and the IMO does not consider any practical alternative solutions have been proposed.</p> <p>The IMO disagrees that a “new ‘fleet’ concept” is being introduced in the proposed Amending Rules presented for further consultation.</p>
2.	General comments	APA Group and Vestas	Both parties supported a further assessment of System Management’s proposed alternative option, as presented in their second round submission, of pre-determining the minimum quantities of various types of generation and demand side resources that must be sourced.	The IMO notes that System Management’s proposal (which focuses directly on security of supply not Capacity Credit valuation for Intermittent Generators) is outside the scope of RC_2010_25 and RC_2010_37.
3.	General comments	Vestas	The comments System Management provided in its second round submission support what Vestas and many other investors in Western Australian have been saying all along. It doesn’t matter what level of Capacity Credits are paid to generators if your major concern is security of supply at peak times. There is nothing in RC_2010_25 that will have a material impact in addressing such issues.	<p>The IMO notes that the intention of neither RC_2010_25 nor RC_2010_37 was to address security of supply issues associated with Intermittent Generators but rather to more accurately reflect the actual contribution of these facilities at peak times when assigning Capacity Credits.</p> <p>Refer to the IMO’s response to Issue 2.</p>
4.	General comments	LGP	Supports an assessment of the alternative methodology based on peak periods proposed by System Management in its second round	While the IMO appreciates System Management’s suggestion, it considers that such a time based approach will result in the selection of Trading Intervals (e.g. 11:00am or 6:00pm) which

	Clause/Issue	Submitter	Comment/Change Requested	IMO's response
			submission.	are extremely unlikely to be peaks. Furthermore such an approach does not take into account the correlation of output between Facilities. For further details of the IMO's response to System Management's alternative methodology refer to the response provided to Issue 95 in Appendix 2.
5.	General comments	Collgar	Considered that System Management's proposed alternative methodology using peak demand periods between set times of days above 40 degrees Celsius would be highly discriminatory to wind farm generators if indeed these high temperature days coincide with low wind days. Collgar recommended that this be taken into consideration and investigated further before a ruling is passed.	Refer to the IMO's response to Issue 4.
6.	Uncertainty over size of the U-factor adjustment	Collgar	Irrespective of the modification proposed by the IMO, Collgar does not support the use of the U-factor. Collgar considers that it still appears to be an arbitrary value used to cater for a one in ten year event on the SWIS. The fact that the U-factor increases by 100% from the 2012-13 Reserve Capacity Cycle and then again by 50% for the 2013-2014 cycle appears to highlight the high degree of potential uncertainty in determining this factor.	<p>The IMO notes Collgar's views (and those of other submitting parties during the further consultation period) on the use of the U-factor adjustment. Refer to section 6.3.2.1 for the IMO's response to this issue, which was raised during the second submission period.</p> <p>The IMO notes that the increase in the U-factor presented in the proposed Amending Rules allows for the agreed transition period to take effect over the next three years. Refer to section 8.1.2 for further details of the IMO Board decision.</p>
7.	Uncertainty over size of the U-factor adjustment	LGP	Nothing in the proposed changes to the U-factor provisions mitigates LGP's concern that this appears to only be a subjective fudge factor designed to guarantee a more conservative outcome. If a fudge factor is to be used for this purpose, LGP suggests that it should be simple and not shrouded in pseudo-	Refer to the IMO's response to Issue 6.

	Clause/Issue	Submitter	Comment/Change Requested	IMO's response
			science. LGP perceives no merit in adding the complexity of a subjective cap, especially given that the level of the cap is chosen to not affect any existing facility.	
8.	Uncertainty over size of the U-factor adjustment	Synergy	The extra explanation of how the U-factor adjustment was determined is of help but, that given the general market view, does not justify its continuance. Synergy's second round submission suggested that the IMO should "seek a more rigorous assessment of the relationship between Intermittent Generator output and temperature, possibly by engaging a suitable qualified consultant with local experience in this field." Undertaking this step is still Synergy's preferred approach given it is too large a change to accept based on a single source.	Refer to the IMO's response to Issue 6.
9.	Uncertainty over size of the U-factor adjustment	Synergy	On reading the consultant's extra explanation it still appears to be a brave conclusion that a negative relationship between temperature and Intermittent Generator output is confirmed given the few data points at 41 degrees and an understanding that based on too few data points, averages are speculative and not conclusive. The chosen approach to determine a "U-factor" was a "best-effort estimate". The IMO may therefore consider it is addressing participants' concerns and so is trying to reach a reasonable outcome by providing more details of the analysis. There is no doubt that this is the IMO's intention but from participants' perspective the inclusion of the U-factor adds	Refer to the IMO's response to Issue 6.

	Clause/Issue	Submitter	Comment/Change Requested	IMO's response
			complexity and removes certainty.	
10.	Impact of load curtailment on peak periods	LGP	Supports the proposed adjustments for Demand Side Management.	The IMO notes LGP's support.
11.	The impact of existing Facilities on new Facilities through LSG	LGP and Synergy	LGP supports the proposed adjustments to treat new Facilities separately when calculating LSG. LGP retained its concern about the use of the LSG concept instead of peak periods. Similarly, Synergy notes that while the factoring over five years for new Facilities is a reassuring step, existing Facilities (through the use of LSG) will impact on each other immediately and new Facilities progressively in the future.	The IMO notes LGP and Synergy's continued views on the use of the LSG (refer to section 6.3.1.1 for the IMO's response to this issue that was raised during the second submission period) and support for the treatment of new and existing facilities separately.
12.	The impact of existing Facilities on new Facilities through LSG	Synergy	Synergy also reiterates its previous position that it is appropriate that Market Participants be advised of the impact of the Collgar wind farm on their respective capacity positions before considering this approach further. It is, though, noted that the arrangement to separate the calculations for existing and new Facilities will not result in an immediate impact on existing Facilities but will be factored in over a five year period. It needs to be remembered that new arrivals will ultimately impact existing Facilities after year four and that the full impact of Collgar, given it is already here, is likely to be experienced in a shorter timeframe.	<p>The IMO notes Synergy's views regarding the inclusion of Collgar data. The IMO notes that nothing raised in the further consultation period has changed its view on the inclusion of Collgar data. The IMO also notes that it has not to date been provided with updated, more appropriate data for Collgar. Refer to section 6.3.3 for the IMO's response to this issue that was raised during the second submission period.</p> <p>The IMO notes its open offer to publish the Existing Facility LSG peak periods including Collgar Wind Farm if a completed data set that meets the requirements of new clause 4.10.3 is provided to the IMO.</p>
13.	The impact of existing	Collgar	Collgar does not support the use of LSG even with the differentiation between new and	Prior to publishing the request for further consultation the IMO had identified this issue of meter data not necessarily reflecting

	Clause/Issue	Submitter	Comment/Change Requested	IMO's response
	Facilities on new Facilities through LSG		existing Facilities proposed by the IMO. The use of LSG could potentially create a situation where actual meter data for a facility would be used to calculate LSG intervals, however this actual meter data may only be representative of an Intermittent Generator during their commissioning phase. Therefore the LSG intervals would not accurately reflect full operations of an Intermittent Generator at that point in time. LSG would need to be differentiated between actual meter data and actual meter data during commissioning and hence would be open to further interpretation and complexity.	the full output ability of a new or upgraded Facility (particularly during commissioning). The IMO notes that in the Amending Rules presented for further consultation the IMO included a requirement for a Facility to nominate its fully operational date. After this date Meter Data Submissions, relevant to the current configuration of the Facility, will be used. Prior to this date estimates will be used. The IMO does not consider any further amendments are necessary.
14.	Permanency of the U-Factor	APA	Stated that "By introducing the U-factor, we are locking in a permanent discount..."	The IMO notes that the U factor adjustment will be reviewed as part of the 3 year review and will also be reviewed should a 1 in 10 year event occur
15.	More rigorous assessment of output and temperature	Synergy	Considers that the IMO board should either 'seek a more rigorous assessment of the relationship between IGF output and temperature' or remove the U factor adjustment at this juncture.	The IMO expects that a more rigorous assessment of the relationship between Intermittent Generator facility output and temperature will be conducted as part of the three year review. The IMO does not consider it necessary or practical to conduct this review at this time.

## 6.5 Additional amendments to the Amending Rules

Following the closure of the second submission period and the further consultation period, the IMO made some additional changes to the proposed Amending Rules. The additional amendments are contained in Appendix 3 of this report.

These amendments include:

- changes to the LSG methodology as outlined in section 6.3.1.2 of this report, to prevent estimated output values for a new or upgraded Facility from affecting the LSG calculations of another Facility;
- a cap on the U-factor adjustment equivalent to one-third of the average output measured at peak LSG (the Facility level average);
- incorporating a defined “full operation date” for a Facility under a given configuration, which will allow the IMO to distinguish between existing Facilities (with five years of actual meter data for their proposed configuration) and new Facilities;
- an adjustment to the LSG calculation to include demand that was reduced as a result of the:
  - dispatch of a Demand Side Programme;
  - tripping of a Interruptible Load in accordance with an Ancillary Services Contract; and
  - involuntary load shedding (manual and automatic);
- a requirement for System Management to provide the IMO with estimates of consumption reductions as a result of Interruptible Loads tripping and load shedding;
- the use of estimated output data in the calculation of the Relevant Level where a Dispatch Instruction or instruction to Verve Energy to deviate from its Dispatch Plan or change its commitment or output has been issued by System Management;
- amendment of the heads of power outlined in clause 7.7.5D for the Power System Operation Procedure: Dispatch to cover additional amendments to the provision of wind farm information and System Management’s requirements originally proposed by the IMO; and
- a number of minor and typographical amendments to improve the integrity of the Amending Rules.

## 7. THE IMO'S FINAL ASSESSMENT OF THE PROPOSALS

This section conducts an assessment of the modified IMO (modified Methodology 1) and Griffin (Methodology 2) proposals.

This is an unusual situation for the IMO. The IMO has not previously had to contemplate two Rule Change Proposals that seek to change the same provisions of the Market Rules at the same time.

In deciding whether or not to make Amending Rules, the IMO is required by clause 2.4.2 to take into account the Market Objectives, and also to have regard to the matters listed in clause 2.4.3. Given the mutually exclusive nature of these two Rule Change Proposals, the IMO considers it must take into account the relative merits of each proposal when deciding which (if any) of the Rule Change Proposals to accept and whether in the forms originally proposed or in a modified form.

Clause 2.4.2 outlines that the IMO “must not make Amending Rules unless it is satisfied that the Market Rules, as proposed to be amended or replaced, are consistent with the Wholesale Market Objectives”. Additionally, clause 2.4.3 states, when deciding whether to make Amending Rules, the IMO must have regard to the following:

- any applicable policy direction from the Minister regarding the development of the market;
- the practicality and cost of implementing the proposals;
- the views expressed in submissions on the proposals and by the MAC; and
- any technical studies that the IMO considers necessary to assist in assessing the proposals.

The IMO notes that there has not been any applicable policy direction from the Minister.

The two methodologies (modified Methodology 1 and Methodology 2) before the IMO for consideration are similar in that they both seek to determine a valuation methodology for assigning Capacity Credits to Intermittent Generators in a practical and accurate way. As a result the primary difference in the extent to which the methodologies meet the Wholesale Market Objectives is in how they perform in meeting the objective of accurately valuing Capacity Credits.

Given the similarity of the two proposals, the IMO has chosen to prepare a joint Final Rule Change Report in respect of the proposals (as was the case for the Draft Rule Change Report). The main benefit of this approach is that it enables a comparison of the relative merits of the proposals and avoids duplication of work where issues are common to both proposals. The IMO's detailed assessment is outlined in the following sections.

To simplify the IMO's assessment, the following approach is taken:

- Section 7.2 compares the two methodologies directly against the Wholesale Market Objectives.
- Section 7.3 assesses the two methodologies in terms of their relative accuracy in valuing Capacity Credits and subsequently in meeting the reliability criteria.
- Section 7.4 examines the practicality and cost of implementing the proposed changes.

A number of submissions received during the first submission period commented on the relative merits of the 2 methodologies including the extent to which the 2 proposals aligned with the Wholesale Market Objectives. The IMO notes that during the second submission period the majority of submissions commented on modified methodology 1 as proposed in the Draft Rule Change Report and its relative alignment with the Wholesale Market Objectives. These comments received during both submission periods have been considered by the IMO in conducting its assessment.

The IMO notes that it has taken into account the technical study completed by Sapere in conducting its assessment as to whether to make the Amending Rules. In particular, the IMO has chosen to modify Methodology 1 based on the Sapere report's recommendation and submissions received during the second submission period and further consultation period (refer to section 6.5 of this report for further details of these). The assessment presented in this section is therefore related to the modified Methodology 1 (as opposed to that originally proposed by the IMO) and Methodology 2.

### **7.1 Wholesale Market Objectives**

In considering the two proposals the IMO has:

- undertaken an assessment of each of the proposals against the Wholesale Market Objectives; and
- directly compared the two proposals to assess which would better achieve the Wholesale Market Objectives.

The IMO notes that the modified Methodology 1 (RC\_2010\_25), as amended following the first and second submission periods, and Methodology 2 (RC\_2010\_37) are similar in that they each put forward a new method for valuing the capacity of Intermittent Generators based on historical performance data. As such, the impact of each depends on the extent to which they accurately represent the capacity value of Intermittent Generators.

The IMO's assessment is presented below:

#### ***Market Objective (a): promote economically efficient, safe and reliable production and supply***

*Assessment of each methodology against the Wholesale Market Objectives:* Both methodologies would improve the reliability of the SWIS by more accurately valuing the capacity of Intermittent Generators than under the current valuation methodology. This is achieved by more closely aligning the Capacity Credits of Intermittent Generators with the peak system demands, thereby better reflecting their capacity contribution during these times. System Management will therefore have greater certainty that the capacity available in the market can meet peak demand requirements.

Under both methodologies greater security and reliability will be achieved than under the current valuation methodology through the RCM providing incentives for generators to meet reliability requirements at lowest cost.

Both methodologies appear to improve efficiency in that they correct for a current distortion in the valuation of Capacity Credits for Intermittent Generators, though to differing extents. Through the workings of the Reserve Capacity Mechanism, this distortion also affects the value of Capacity Credits for Scheduled Generation. An overvaluation of Capacity Credits (all else being equal) for Intermittent Generators will

result in greater levels of Intermittent Generators entering the market and consequently reduced levels of capacity being provided by Scheduled Generators. By correcting for this distortion, the proposals would improve the economic incentives for efficient investment in both Intermittent and Scheduled Generators relative to the current valuation methodology.

Comparison of the methodologies: Based on the information available to date, the IMO considers that Methodology 2 would over allocate Capacity Credits to Intermittent Generators. This would mean that Capacity Credits allocated to these facilities would not be reflective of their actual deliverable capacity to System Management during peak periods, thereby creating a potential system security risk when compared to the outcomes of modified Methodology 1. This security risk would however be reduced in comparison to the current valuation methodology. Further, as Intermittent Generators would continue to be paid for an amount of capacity that is not actually available during peak periods, a current market distortion would continue (though to a reduced extent).

Modified Methodology 1 would more accurately align Capacity Credits with the actual performance of Intermittent Generators during peak periods. It would encourage the entry of Intermittent Generators that have the greatest contribution to the peak demands on Scheduled Generation more so than Methodology 2. This encourages diversification to the benefit of system security. Further, modified Methodology 1 would remove the current distortion in Capacity Credits assigned to Intermittent Generators. This would improve economic incentives for efficient investment in all generation types.

The IMO considers that modified Methodology 1 would improve economic efficiency, safety and reliability in the WEM to a greater extent than the application of Methodology 2. The relative extent to which the two methodologies meet the reliability criteria is a **key issue** that is considered in section 7.2.

***Market Objective (b): encourage competition among generators and retailers, including by facilitating efficient entry of new competitors***

Assessment of each methodology against the Wholesale Market Objectives: The IMO is of the view that both methodologies would have no material impact on the level of competition among existing generators and retailers.

Both methodologies are expected to have a net positive impact on facilitating efficient entry of new competitors when compared to the current valuation methodology, specifically:

- Under the current rules there is a distortion in the valuation of Capacity Credits for Intermittent Generators. By correcting for this distortion in the valuation of Capacity Credits, though to varying extents, both methodologies would have a positive impact on facilitating *efficient* entry;
- Furthermore, by addressing a long-standing issue (i.e. how to value the capacity of Intermittent Generators) both proposals would remove an existing area of uncertainty that is a potential deterrent for new entrants of both Intermittent and Scheduled Generation capacity; and
- The methodologies are similar in concept to the existing capacity valuation methodology and are not overly complex. As such, neither methodology would materially increase the costs of investigating investment opportunities in the market for potential new entrants.

Comparison of the methodologies: The IMO considers that through its better alignment with actual Intermittent Generator performance during peak periods, modified Methodology 1 will provide a better signal for entry of new Intermittent Generator types (i.e. Solar PV) than under Methodology 2. This is because modified Methodology 1 will provide more accurate signalling of the true benefits to the market of the different types of Intermittent Generators in comparison with each other and in comparison with Scheduled Generators.

***Market Objective (c): to avoid discrimination against particular energy options and technologies***

Assessment of each methodology against the Wholesale Market Objectives: Under current arrangements, compared with Scheduled Generators which are allocated Capacity Credits to reflect the actual value of peak generation of these facilities, Capacity Credits for Intermittent Generators are allocated based on long-term averages and do not reflect the level of generation during peak demand. These arrangements may distort the value of investment in Intermittent Generators. Both methodologies seek to correct this potential distortion.

Both methodologies would also lessen the discrimination between alternative Intermittent Generator technologies. In particular, the methodologies are expected to provide greater value to solar power generation which provides a greater contribution to peak demand times than is reflected in current Market Rules.

Comparison of the methodologies: The IMO considers that Methodology 2 will tend to over allocate Capacity Credits to Intermittent Generators. Further by not making an adjustment based on variability of output, Methodology 2 will be relatively favourable (relative to their actual value) to facilities which are larger and have greater variability in output. Due to the clustering problem Methodology 2 may also discriminate against technologies with energy production profiles that are closely correlated with peak times during the day.

The IMO considers that modified Methodology 1 will more accurately allocate Capacity Credits to Intermittent Generators based on their contribution to reliability and thus will better avoid discriminating against particular energy options and technologies than Methodology 2.

***Market Objective (d): to minimise the long-term cost of electricity supplied to customers from the South West interconnected system***

Assessment of each methodology against the Wholesale Market Objectives: By more accurately valuing the capacity of Intermittent Generators, a capacity valuation methodology for Intermittent Generators will be consistent with the objective of reducing the long term cost of electricity. The IMO considers that both methodologies provide incentives to meet the reliability requirements in a lower cost manner than currently through incentivising a more appropriate allocation of resources, though to differing extents. The IMO considers that both modified Methodology 1 and Methodology 2 are an improvement over the current valuation methodology in terms of minimising the long term cost of electricity.

The application of either methodology will result in increased costs being incurred by the market in the short term as a result of a reduction in the number of Capacity Credits being assigned to existing Intermittent Generators. This will increase the need for the IMO to secure the shortfall in available capacity from other generators. The IMO

however notes that these costs are likely to be negated by the current oversupply of capacity. If neither methodology was implemented, in the long-term either reliability may be compromised or a more expensive method of generation (i.e. Demand Side Management or liquid fuelled generation) may be required to meet the reliability requirements.

Comparison of the methodologies: The IMO considers that the application of modified Methodology 1 will result in a more accurate reflection of the actual costs to the market associated with the provision of Intermittent Generator capacity than Methodology 2. This is because the IMO considers that modified Methodology 1 will more accurately allocate Capacity Credits to Intermittent Generators based on their contribution to reliability than Methodology 2.

***Market Objective (e): to encourage the taking of measures to manage the amount of electricity used and when it is used***

Assessment of each methodology against the Wholesale Market Objectives: The proposed changes do not directly impact on the amount of electricity used and/or when it is used. However, both proposals may have a long-term indirect impact. By aligning Capacity Credits more closely to the output at peak times, the proposals may increase the financial incentives for firms to investigate and invest in storage technologies as they become economically viable.<sup>17</sup>

***The IMO's overall assessment:***

The IMO considers that the Market Rules as a whole, if amended by either RC\_2010\_25 (as modified based on the advice of the technical study conducted by Sapere and following the second submission period and further consultation period) or RC\_2010\_37 would be consistent with the Wholesale Market Objectives and would better achieve Wholesale Market Objectives (a), (b), (c) and (d).

Further, the IMO considers that modified Methodology 1 will better achieve the Market Objectives to a greater extent than Methodology 2. This is due to the methodology's greater accuracy in measuring Intermittent Generators' contribution to reliability. For further details refer to section 7.2.

## **7.2 Reliability Criteria**

The core objective of both of the proposals is to provide an improved method for valuing the Capacity Credits of Intermittent Generators. The focus of this section is on the relative merits of each of the methodologies in meeting the peak demand criterion of the energy reliability criteria.

The second element of the reliability criteria, the requirement to maintain less than 0.002 percent expected unserved energy, should also be taken into account. This manifests itself in the requirement for Scheduled Generators to maintain fuel stocks and to be available at all times. All energy-producing facilities will contribute to this element of the Planning Criterion. While the peak demand continues to grow at a faster rate than average demand, this element of the Planning Criterion is unlikely to be the dominant factor in determining requirements for the SWIS. In the future increased solar PC penetration, (small-scale) storage technology and changes to consumer behaviour at

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<sup>17</sup> This point is noted in Griffin Energy's submission.

peak times could alter the selection of the Planning Criterion used to set the Reserve Capacity Requirements.

### 7.2.1 Comparison of the Methodologies

To assess which methodology more closely reflects the reliability criteria it is useful to more closely examine the differences between the 2 methodologies. A useful framework in which to consider the alternative methodologies is to consider that both proposals can be expressed as:

$$\text{Capacity credits} = 1. \text{ Average facility output during peak periods} \text{ Less } 2. \text{ An adjustment for the variability in output}$$

A summary of the proposals against this structure is provided in Table 5 below.

**Table 5: Summary comparison of proposals**

	1. Average facility output	2. Adjustment for variability in output
<b>Methodology 1 (Original IMO proposal)</b>	Based on fleet average from top 12 Trading Intervals (over 8 years) allocated to facilities based on relative output in top 250 Trading Intervals (over 3 years)	Adjustment based on the 95% PoE of the fleet annual averages allocated to facilities based on relative output in top 250 Trading Intervals (over 3 years)
<b>Modified Methodology 1 (Modified IMO proposal)</b>	Average of facility output from top 12 Trading Intervals (over 5 years) chosen from separate days	Based on a multiple of facility variance during same Trading Intervals
<b>Methodology 2 (Griffin proposal)</b>	Average of facility output over top 750 Trading Intervals (over 3 years)	No adjustment

Notes: All proposals identify the top Trading Intervals using LSG. Note that following the second consultation period the IMO determined to amend the definition of LSG to include both load curtailment. Refer to section 6.3.1.3 for further details.

Table 6 provides an estimate of the Capacity Credits for the Intermittent Generator fleet for each of the proposals. The total Capacity Credits allocated under the modified Methodology 1 is between that determined by Methodology 2 and the original IMO proposal. As summarised in the table, while there are some differences in the calculation of the ‘average’ component, the core differences in the results stem from the adjustment for variability in output.

**Table 6: Estimate of Capacity Credits assigned to fleet by proposal (MW output)**

	<b>1. Average facility output</b>	<b>2. Adjustment for variability in output</b>	<b>Capacity Credits (equal to 1. – 2.)</b>
<b>Methodology 1</b>	74.8	38.5	36.3
<b>Modified Methodology 1</b>	80.3	17.3	63.0
<b>Modified Methodology 1 modified for DSM<sup>18</sup></b>	81.3	16.4	64.9
<b>Methodology 2</b>	82.2	<i>Nil</i>	82.2

Source: Adapted from Sapere Report.

Note: Amounts reflect estimates of the output of the fleet of Intermittent Generators for which information was available. Amounts are purely for indicative purposes only and should be considered draft.

### **7.2.2 Assessment of the average**

As shown in Table 6 there is a small but material difference between the average facility values that are generated by modified Methodology 1 and Methodology 2. A core difference between the modified Methodology 1 and Methodology 2 (and original Methodology 1) in determining the average is that modified Methodology 1 uses top Trading Intervals selected from separate Trading Days.

This modification was introduced by the IMO (in the Draft Rule Change Report) to address a ‘clustering’ problem with Methodology 2 (and the original Methodology 1) whereby Trading Intervals may be selected from periods that are unlikely ever to be the peak periods.

As the primary reliability criterion of interest is concerned with meeting the required load at the peak it is important that the Trading Intervals selected are those that may be the peak Trading Intervals. Because in any one year there is only one peak, an average of top Trading Intervals is selected so as to attempt to reduce the volatility of results. However the top Trading Intervals tend to be ‘clustered’ on a small number of days — in most years the top 12 Trading Intervals came from only two Trading Days. This results in Trading Intervals being selected outside of the very peak time (most likely to be between 15:30 and 17:00). The clustering problem is described in further detail in the Draft Rule Change Report.

In the IMO’s view, by selecting only the top 12 Trading Intervals, the average facility output captured in modified Methodology 1 more accurately reflects the output at the periods that are likely to be peak times.

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<sup>18</sup> Also includes involuntary load shedding but not reductions in consumption from Interruptible Loads given the current unavailability of this information to the IMO. A requirement for System Management to provide estimated reductions in consumption for Interruptible Loads has been included into the Amending Rules.

### 7.2.2.1 Adjustment from the average

A major difference in the methodologies being considered is that modified Methodology 1 (and the original IMO proposed methodology) makes an adjustment from the average facility output whereas Methodology 2 does not.

There are two justifications for an adjustment to the average facility output. First, the Intermittent Generators output will typically add to the variability in the peak load that needs to be met from Scheduled Generators. That is, typically, at peak times:

Variability in total sent out generation	<b>Less than</b>	Variability in LSG (i.e. total sent out generation less Intermittent Generation)
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This is important as, the greater the variability in the load to be met by Scheduled Generators, the greater the risk that the peak demand target will not be met. To meet this additional risk, additional capacity is required, thus in part reducing the benefit of the Intermittent Generators.

To account for this factor, modified Methodology 1 makes an adjustment proportional to the variance of the facility output during peak periods. As noted in the Sapere report, this approach is consistent with theory and follows an internationally recognised and used method for Capacity Credit valuation that is appropriate when penetration of Intermittent Generation is relatively small (as is the case).

The size of the adjustment depends on a number of factors, including — as noted in the report — the extent of correlation of output between facilities and the effect of using LSG to select peak Trading Intervals. The Sapere report indicates that the appropriate adjustment factor is likely to be in the order of 0.002 to 0.005 per MW<sup>-1</sup>.

The second justification is more significant. A key concern is that future extreme peaks in demand will coincide with low Intermittent Generation output. The Sapere report provides evidence that justifies this concern. The report found that on very hot days, Intermittent Generator output has tended to be lower. The report examined the contribution of Intermittent Generators in reducing the peak load to be met by Scheduled Generation on very hot days and found this to be less than the average Intermittent Generator output during the top 12 Trading Intervals. For example, the report (page 18) notes that this average contribution of the fleet was '67 MW for days with temperature  $\geq 40$ ' and lower still for higher temperatures, compared with the fleet average in the top 12 Trading Intervals (as measured by LSG on separate days) of 80 MW.

The Sapere report notes that these results are based on a small number of Trading Intervals and should not be considered as strong evidence of Intermittent Generator output during extreme demand/temperature scenarios. However, the Sapere report argues that it provides enough evidence to warrant a further adjustment based on the uncertainty in Intermittent Generator output (second justification).

To account for this second justification the modified Methodology 1 makes a further adjustment. This adjustment is also made in proportion to the variance of output during peak periods, which ensures that facilities whose output does not vary during the peaks are not impacted. A cap is placed on this adjustment to address the risk that the adjustment is excessive for an individual Facility. Methodology 2 makes no adjustment for this second justification.

By making these adjustments, in the IMO's view, modified Methodology 1 more accurately reflects the capacity value of Intermittent Generators.

### **7.3 Discussion and Issues**

#### **7.3.1 Market Advisory Committee**

The MAC discussed the proposals at the 10 November 2010 (RC\_2010\_25) and 15 December 2010 (RC\_2010\_25 and RC\_2010\_37) MAC meetings. An overview of the MAC discussions is presented in Appendix 4. Further details are available in the MAC meeting minutes available on the IMO website: <http://www.imowa.com.au/market-advisory-committee>

In summary, the views expressed at the MAC were polarised on the two proposals and it was acknowledged that a number of issues would likely be raised during the consultation process. No consensus on the two proposals was reached by the MAC and as such no specific advice on RC\_2010\_25 and RC\_2010\_37 was provided to the IMO.

The IMO notes that the views of the MAC have not been sought on modified Methodology 1.

#### **7.3.2 Views Expressed in Submissions**

##### **First Submission period**

The IMO received 15 submissions on RC\_2010\_25 and 11 submissions on RC\_2010\_37 during the first submission period. In summary, the views of submitting parties on the proposed changes under both proposals were polarised. A summary of the common issues raised in submissions is provided in section 6.4 of the Draft Rule Change Report, including:

- Investment impacts
- The REGWG process
- Regulatory risk
- Wholesale Market Objectives
- Security and reliability impacts
- Methodology issues
- General comments

A summary of the IMO's response to each of the issues raised in submissions is presented in Appendix 4 of the Draft Rule Change Report and is supported by the analysis presented in Sections 6.2 and 6.3 of the Draft Rule Change Report.

##### **Second submission period**

The IMO received 14 submissions on RC\_2010\_25 and 12 submissions on RC\_2010\_37 during the second submission period. In summary, the views of submitting parties on the material presented in the Draft Rule Change Report (including the IMO's proposed decision to accept modified Methodology 1) were polarised. A summary of the common issues raised in submissions is provided in Appendix 1 of this report, including:

- Use of LSG, including the treatment of new and existing facilities
- Inclusion of the adjustment factors (U-factor)
- Collgar Data
- Transition period
- Rule Change Process

A summary of the IMO's response to each of the issues raised in submissions is presented in Appendix 2 of this report.

During the second submission period the IMO also held a public workshop to present the analysis and recommendations outlined in the Sapere report. For further details refer to section 6.2 of this report.

### **Further consultation period**

The IMO received 7 submissions on the three issues (and the IMO's proposed solutions) outlined in the extension notice published 21 November 2011. In summary, a number of parties did not provide comment on the issues and associated proposed solutions but rather reiterated their views expressed in the second consultation period. The views of submitting parties were generally supportive of the further refinements to the concepts, albeit maintaining their opposition to the introduction of the LSG concept and U-factor adjustment.

A summary of the IMO's response to each of the issues (relating to the proposed solutions and that had not been previously raised) is provided in section 6.4 of this report.

## **7.4 Practicality and Cost of Implementation**

### **Cost**

#### Identified costs of implementation

The IMO notes that it has determined to implement a spreadsheet solution rather than amending the Wholesale Electricity Market Systems operated by the IMO. To develop a spreadsheet to implement either modified Methodology 1 or Methodology 2 is expected to cost between \$5,000 and \$10,000 AUD. Additionally, completing an audit of the spreadsheet is expected to cost between \$5,000 and \$10,000 AUD. There will be some annual costs in capturing and processing the data and using the spreadsheet, however these are not expected to be significant.

The IMO notes that no other submitting parties identified any IT costs associated with the proposed changes.

#### Updates to Market Procedures:

The IMO also notes that there will be updates required to the following IMO and System Management Market Procedures as a result of either RC\_2010\_25 or RC\_2010\_37:

- Certification of Reserve Capacity (IMO);
- Information Confidentiality (IMO);
- Data Cleansing (System Management);and

- Operational Data Points for Generating Plant (System Management)

The IMO considers that these costs fall within the day to day operation of the IMO and System Management and therefore will not incur additional personnel costs.

#### Other identified costs

The IMO notes that there will be costs to some existing Facilities to obtain reports from accredited experts where they do not have 5 years worth of metered output for the current component configuration of the Facility. These are not anticipated to be substantive.

There will also be costs to new and upgraded Facilities associated with obtaining independent expert reports to cover five years rather than 3 years as required under the current certification methodology.

There will be costs associated with undertaking the prescribed 3 year reviews of the methodology. The IMO however considers that the costs of undertaking this review are likely to be outweighed by the benefits to the market associated with any further refinements to the methodology to further improve its accuracy in valuing the capacity of Intermittent Generators (particularly if a one-in-ten year event occurs during this period).

There will also be minor costs associated with the IMO updating the list of confidential information to ensure that New Facility LSG is to be confidential. Likewise there will be costs associated with updating the IMO's list of accredited experts. These costs are expected to fall within the normal operating costs of the IMO.

#### **Practicality**

The IMO notes that a number of Market Participants identified costs to their current asset values for Intermittent Generator assets. To reduce the impacts the IMO Board proposed the implementation of a 3 year glide path (for the 2012 – 2014 Reserve Capacity Cycles) in the Draft Rule Change Report. For further details refer to section 6.3.5 of this report.

The IMO has not identified any other issues with the practicality of implementing either of the proposed changes.

## **8. THE IMO BOARD'S FINAL DECISION**

In accordance with clause 2.7.7 (f), the IMO Board's decision on:

- RC\_2010\_25 is to accept the proposed amendments presented in RC\_2010\_25, as modified following the submission periods and further consultation period (modified Methodology 1); and
- RC\_2010\_37 is to reject the proposed amendments in RC\_2010\_37 (Methodology 2).

### **8.1 Reasons for the IMO Board's decision**

Given the lack of evidence surrounding the performance of large scale Intermittent Generator facilities in the SWIS during extreme peak demand events, it is difficult to accurately assess the real contribution that these facilities make to the RCM. This will

remain an issue for some time and the IMO Board must choose an appropriate course of action based on the balance of information and submissions it has before it.

The IMO's detailed assessment set out at section 7.1 above indicates that both methodologies could be expected to result in the Market Rules better achieving Wholesale Market Objectives (a), (b), (c) and (d). Both proposals would also more fairly reflect the contribution of solar generation facilities to power system reliability at times of peak output than the current Capacity Credit valuation methodology for Intermittent Generators which undervalues their contribution.

However the 2 methodologies are mutually exclusive. In making its decisions on each of the proposals, the IMO Board has given substantial weight to the area where the 2 methodologies are clearly distinguishable, that is, in the area of alignment with the reliability criterion. On the weight of current information and analysis, the IMO Board considers it most appropriate to select modified Methodology 1, as updated following the submission periods and further consultation period.

After taking into account all of the submissions made on the proposals during both the formal and informal consultation processes and the advice and recommendations presented in the Sapere report, the IMO Board has determined to accept Methodology 1 in a modified form and reject Methodology 2 on the basis that:

- Modified Methodology 1 is more accurate at reflecting the actual performance of Intermittent Generators during peak periods and thereby better achieves the Market Objectives than Methodology 2.
- Given the lack of available data on the performance of Intermittent Generators during peak periods and the complexity of the matter at hand, a more conservative approach is warranted.
- Notwithstanding the conclusions reached by MMA in its review, the lack of performance data during extreme peak conditions is a significant concern for the IMO and a reassessment should be conducted following any extreme peak event (as per the IMO's Rule Change Proposal).
- The adoption of a lesser number of intervals on which the performance of an Intermittent Generator is assessed appears to be better aligned with the intent of the Planning Criterion, in conditions where there is sufficient energy-producing plant available on the SWIS.

The IMO Board has also determined to implement a 3 year glide path (to apply for the 2012 – 2014 Reserve Capacity Cycles) during the initial implementation of modified Methodology 1 and to require a 3 year review of the methodology to be undertaken by the IMO prior to 1 January 2015. The IMO Board considers a 3 year review period is appropriate as over this period further performance information will be available to the IMO which will enable analysis to be undertaken on the performance of facilities during extreme peaks. The IMO Board also notes that any changes in international practice in this field during the 3 year period will be considered during such a review. Further, a 3 year review is appropriate given the likely increase in the penetration of Intermittent Generation over the next few years.

In making these decisions, the IMO Board has relied on a number of findings and conclusions it has reached during the rule change process with regard to the relevance and weight of the material before it, as set out in detail in section 6 of the Draft Rule Change Report, section 6.3 of this Final Rule Change Report and as summarised below.

Note that the IMO Board has taken into account the views expressed during the informal consultation period in making its decision regarding whether to separately calculate LSG for new and upgraded facilities, to incorporate voluntary and involuntary load shedding in the determination of LSG and to cap the U-factor adjustment.

### **8.1.1 Overvaluation versus undervaluation of capacity**

The IMO Board considers that the lack of evidence surrounding the performance of large-scale Intermittent Generators in the SWIS during extreme peak demand events is expected to remain an issue for some time. The IMO Board does not consider it appropriate to continue to apply a methodology that distorts the valuation of Capacity Credits for Intermittent Generators. The IMO Board notes that it must choose an appropriate course of action based on the balance of information and submissions it has before it.

### **8.1.2 Regulatory risk and transitional arrangements**

The IMO Board notes that several proponents have claimed that modified Methodology 1 (and likewise Methodology 2) will directly result in negative impacts to the asset values of some Intermittent Generators.

However, with regard to regulatory risk and the need for transitional arrangements, the IMO Board notes the following:

- Most existing Intermittent Generators were in development prior to the start of the market;
- The WEM has a rule development process which implicitly allows the market to evolve over time consistent with the Market Objectives;
- Concerns over the capacity valuations of Intermittent Generators have been raised by participants for some time. More formally, a review of, and potential changes to the level of CRC and Capacity Credits for Intermittent Generators, were identified in the 2008 - 2011 Statement of Opportunities reports, with the intention of notifying existing and potential investors of possible changes;
- The market is designed on the premise that capacity will be largely bilaterally contracted and the capital cost recovery will be a matter between bilateral counterparties; and
- Capacity prices in the market have risen steadily over the past 5 years so, to the extent that owners of Intermittent Generators are not bilaterally covered, their financial exposure is likely to have been less than if capacity prices had not grown as they have over previous years.

Further, the IMO Board continues to be of the view that the overvaluation of Capacity Credits of Intermittent Generator facilities potentially propagates inefficient signals to other sectors of the market in the long term.

Overall the IMO Board considers that the implementation of a 3 year glide path (to apply for the 2012 – 2014 Reserve Capacity Cycles) to the new modified Methodology 1<sup>19</sup> will strike an appropriate balance between reducing the financial impact on Market

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<sup>19</sup> The IMO Board also notes that capacity is certified two and a half years before it is required to be provided to the market, i.e. capacity certified during the 2012 capacity year will not be provided to the market until the 2014/2015 Capacity Year).

Participants and not continuing to generate market inefficiencies. The IMO Board also notes the requirement to undertake a review of the methodology in three years time.

### ***8.1.3 The view of the consultant engaged by the REGWG***

Given the factors outlined in section 6.2 of the Draft Rule Change Report, the IMO Board has determined that MMA's assessment does not sufficiently reflect the risks to reliability and, for this reason, the IMO Board does not accept MMA's recommendation. The IMO Board considers that modified Methodology 1, including the further adjustments made following the second submission period, better reflects the risks to reliability in the SWIS than Methodology 2.

### ***8.1.4 The use of the LSG methodology***

Given the demonstrable merits associated with the use of the LSG concept as presented in section 6.3.1.1, the IMO Board has determined that it is appropriate that the LSG methodology is used to identify the Trading Intervals to be analysed in determining the capacity valuation for Intermittent Generators. This is because the LSG concept is reflective of the Trading Intervals when additional capacity has the highest value. The LSG concept is also relatively attractive both in terms of its simplicity and accuracy.

The IMO Board has also determined that load reduction events should be incorporated into the overall determination of the peak to ensure that the LSG concept will account for contingency events when determining the peak 12 Trading Intervals. The IMO considers that incorporating these events will better reflect times where additional capacity from Intermittent Generators is most needed and are likely to be aligned with a 1 in 10 year event.

### ***8.1.5 Impact of new facilities on existing facilities***

The IMO Board has determined to amend modified Methodology 1 such that the value of LSG will be calculated for the fleet of existing Intermittent Generators only on the basis of actual metered data. Each new and upgraded Facility will have a separate LSG value calculated until such time as five years worth of actual metered data is available (relevant to the current configuration of the Facility). The IMO Board considers that this approach will provide the right incentives for investment at the time when capacity is most valuable.

### ***8.1.6 Adjustment Parameters***

The IMO Board has determined to set a cap on the U-factor adjustment at one-third of the facility's average output at peak times. The IMO Board considers that the introduction of a cap at this level may help to mitigate concerns that the U-factor adjustment will be excessive while not impacting the purpose of the adjustment.

### ***8.1.7 The use of a fleet adjustment***

The original Methodology 1 included a fleet adjustment to the average facility output and an adjustment for the variability in the fleet output based on the standard deviation of annual average fleet peak output. The fleet adjustment for the average facility output was removed under the modified Methodology 1 because as set out in the Sapere report it was no longer necessary. In making its proposed decision (presented in the Draft Rule Change Report) the IMO Board considered it more appropriate to assign Capacity Credits based on an individual facility's performance than the fleet performance, thereby

ensuring consistency with the approach adopted for Scheduled Generators. The IMO Board maintains this decision.

The IMO Board notes that a key justification for the original fleet adjustment was to allow for averaging over a small number of peak Trading Intervals without introducing significant volatility. By selecting Trading Intervals from separate Trading Days this can be achieved at a facility level without introducing excessive volatility.

Modified Methodology 1 replaces the adjustment for standard deviation in the annual average fleet peak output (as was originally proposed by the IMO) with an adjustment for variance in individual facility performance during the peaks. This adjustment better reflects theory and international practice and the nature of causes of the adjustments. The modified approach also ensures that facilities with stable output during peaks are not penalised by variable output of other facilities.

However the IMO Board notes that fleet considerations will still be relevant:

- The true capacity value of an Intermittent Generator in part depends on how it performs relative to the Intermittent Generator fleet due to the value of diversity.
- Under the modified Methodology 1 (and Methodology 2) a facility's Capacity Credit valuation is potentially impacted by other Intermittent Generators through the use of LSG for selecting the top Trading Intervals. However any potential impact is mitigated because 5 years of historical data is used in calculating Capacity Credits and new facilities will not impact on historical LSG calculations (refer to section 8.1.5).

#### **8.1.8 Avoidance of discrimination**

While the IMO Board agreed in the Draft Rule Change Report that there is a need to ensure that the right amount of investment in generation in the SWIS is encouraged, the Market Rules must avoid discrimination against particular energy options and technologies. The IMO Board continues to consider that adoption of modified Methodology 1 will ensure that correct signals for investment decisions in the SWIS are provided and thereby remove a potential discrimination in favour of Intermittent Generators.

The IMO Board notes the modified Methodology 1 benefits those facilities with output that is greatest and most stable during the very peak times.

#### **8.1.9 The views of the MAC**

The IMO Board notes that, due to the fact that the MAC did not reach a view on the preferred proposal, the MAC's advice was not determinative in the IMO Board's proposed decisions on each of the proposals (refer to section 7.3.1 and Appendix 3 for further details).

## **9. AMENDING RULES**

### **9.1 Commencement**

The amendments to the Market Rules will commence at **8.00 am** on 1 January 2012.

The IMO notes that capacity certified during 2012 will be made available to the market during the 2014/2015 Capacity Year.

## 9.2 Amending Rules

The IMO Board's final decision is to amend the Market Rules. The following clauses are amended (added text, ~~deleted text~~):

- 4.10.1. Each Market Participant must ensure that information submitted to the IMO with an application for certification of Reserve Capacity pertains to the Reserve Capacity Cycle to which the certification relates, is supported by documented evidence and includes, where applicable, the following information:
- ...
- (dA) a description and a configuration of the main components of the Facility;
- ...
- (i) whether the applicant wishes to nominate the use of the methodology described in clause 4.11.2(b), in place of the methodology ~~that~~ described in clause 4.11.1(a), in assigning the Certified Reserve Capacity or Conditional Certified Reserve Capacity to apply to a Scheduled Generator or a Non-Scheduled Generator; ~~and~~
- (j) whether the Facility will be subject to a Network Control Service contract; and
- (k) where an applicant nominates to use the methodology described in clause 4.11.2(b) and the Facility is already in full operation under the configuration for which certification is being sought (as outlined in clause 4.10.1(dA)), the date on which the Facility became fully operational under this configuration, unless this date has already been provided to the IMO in a previous application for certification of Reserve Capacity.
- 4.10.3. An application for certification of Reserve Capacity that includes a nomination to use the methodology described in clause 4.11.2(b) for a Facility that:
- (a) is yet to enter service;
- (b) is to re-enter service after significant maintenance;
- (c) is to re-enter service after having been upgraded; or
- (d) has not operated with the configuration outlined in clause 4.10.1(dA) for the full period of performance assessment identified in step 1(a) of the Relevant Level Methodology under 4.11.2(b),
- must include a report prepared by an expert accredited by the IMO in accordance with clause 4.11.6. The IMO will use the report to assign Certified

Reserve Capacity for the Facility and to determine the Required Level for that Facility. The report must include:

- ~~(a) — an estimate of what the expert considers the Certified Reserve Capacity of the Facility would have been for the purposes of clause 4.11.2(b) had the history of performance been available;~~
- ~~(b) — a value, expressed in MW as a sent out value, which equals the 5 percent probability of exceedance of expected generation output for the Facility for all the Trading Intervals that occurred within the last three years up to, and including, the last Hot Season, where this value is to be used in the calculation of the Required Level in clause 4.11.3B;~~
- ~~(c) — a proposed alternative value to that specified in clause 4.10.3(b), expressed in MW as a sent out value, to apply for the purposes of the Required Level, if in the opinion of the expert the value provided under clause 4.10.3(b) would not be a reasonable representation of the Facility's 5 percent probability of exceedance of expected generation output during its first year of operation; and~~
- ~~(d) — the reasons for any proposed alternative value provided under clause 4.10.3(c); and~~
- ~~(e) — an estimate of the expected electricity sent out by the Facility that would have been sent out for the full period of performance assessment under clause 4.11.2(b).~~

~~The applicant may provide the same report until the Facility has been in operation for the full period of performance assessment under clause 4.11.2(b).~~

4.10.3A. A report provided under clause 4.10.3 must include:

- (a) for each Trading Interval during the period identified in step 1(a) of the Relevant Level Methodology, a reasonable estimate of the expected energy that would have been sent out by the Facility had it been in operation with the configuration proposed under clause 4.10.1(dA) in the relevant application for certification of Reserve Capacity;
- (b) a value, expressed in MW as a sent out value, which equals the 5 percent probability of exceedance of expected generation output for the Facility for all the Trading Intervals that occurred within the last three years up to, and including, the last Hot Season, where this value is to be used in the calculation of the Required Level in clause 4.11.3B;
- (c) a proposed alternative value to that specified in clause 4.10.3A(b), expressed in MW as a sent out value, to apply for the purposes of the Required Level, if in the opinion of the expert the value provided under clause 4.10.3A(b) would not be a reasonable representation of the

Facility's 5 percent probability of exceedance of expected generation output during its first year of operation; and

(d) the reasons for any proposed alternative value provided under clause 4.10.3A(c).

4.11.2. Where an applicant submits an application for Certified Reserve Capacity, in accordance with ~~section clause~~ 4.10, and nominates under clause 4.10.1(i) to have the IMO use the methodology described in clause 4.11.2(b) to apply to a Scheduled Generator or a Non-Scheduled Generator, the IMO:

(a) may reject the nomination if the IMO reasonably believes that the capacity of the Facility has permanently declined, or is anticipated to permanently decline prior to or during the Reserve Capacity Cycle to which the Certified Reserve Capacity relates;

(aA) if it the IMO rejects such a nomination under clause 4.11.2(a), the IMO must process the application as it would if the application had nominated to use the methodology described in clause 4.11.1(a) ~~no nomination to use rather than the methodology described in clause 4.11.2(b) had been made; and~~

(b) if it has not rejected the nomination under ~~paragraph clause~~ 4.11.2(a), must assign a quantity of Certified Reserve Capacity to the relevant Facility for the Reserve Capacity Cycle equal to the Relevant Level as determined in accordance with the Relevant Level Methodology ~~determined in accordance with clause 4.11.3A~~, but subject to clauses 4.11.1(b), 4.11.1(c), 4.11.1(f), 4.11.1(g), 4.11.1(h) and 4.11.1(i).

4.11.2A. Where an applicant nominates under clause 4.10.3A(c) to have the IMO use an alternative value to that specified in clause 4.10.3A(b) the IMO:

(a) may reject the proposed alternative value if it does not consider the reasons provided in accordance with clause 4.10.3A(d) provide sufficient evidence that an alternative value is required; and

(b) must use the alternative value in the calculation of the Required Level if it does not reject the proposed alternative value under clause 4.11.2A(a).

4.11.3A. [Blank]

~~The Relevant Level in respect of a Facility at a point in time is determined by the IMO following these steps:~~

~~(a) take all the Trading Intervals that fell within the last three years up to, and including, the last Hot Season, excluding any Trading Intervals where the Facility either:~~

- ~~i. was owned, controlled or operated by a Market Participant other than the Electricity Generation Corporation and:
 
  - ~~1. was affected by a Planned Outage or Consequential Outage as notified under clause 7.13.1A; or~~
  - ~~2. was issued a Dispatch Instruction from System Management as notified under clause 7.13.1(c); or~~~~
- ~~ii. was owned, controlled or operated by the Electricity Generation Corporation and:
 
  - ~~1. was affected by a Planned Outage or Consequential Outage as notified under clause 7.13.1A; or~~
  - ~~2. was issued an instruction from System Management to deviate from the Dispatch Plan or change its commitment or output as notified under clause 7.13.1C;~~~~
- ~~(b) determine the amount of electricity (in MWh) sent out by the Facility in accordance with Meter Data Submissions received by the IMO in accordance with clause 8.4 for all Trading Intervals occurring during the period referred to in step (a);~~
- ~~(c) if the Facility has not entered service, or if it entered service during or after the period referred to in step (a), estimate in accordance with the Reserve Capacity Procedure the amount of electricity (in MWh) that would have been sent out by the Facility, had it been in service, for all Trading Intervals occurring during the period referred to in step (a) which are prior to it entering service;~~
- ~~(cA) if, during the period described in step (a), the Facility's output was reduced in order to comply with a Dispatch Instruction from System Management, issued in accordance with clause 7.7, use:
 
  - ~~(a) the estimated decrease (in MWh) in the output of each Facility, by Trading Interval, as a result of System Management Dispatch Instructions, provided by System Management in accordance with clause 7.13.1(eB); and~~
  - ~~(b) the amount of electricity (in MWh) sent out for the Facility determined from Metered Data Submissions received by the IMO in accordance with clause 8.4 for all the Trading Intervals that were excluded under step (a)(i)(2);~~~~
- ~~to estimate the amount of electricity (in MWh) that would have been sent out by the Facility, had it not complied with the Dispatch Instruction for all the Trading Intervals that were excluded under step (a)(i)(2);~~

~~(cB) if, during the period described in step (a), the Facility's output was reduced in order to comply with an instruction from System Management under clause 7.6A.3(a) to deviate from the Dispatch Plan or change its commitment or output, use:~~

~~i. the estimated decrease (in MWh) in the output of each Facility, by Trading Interval, as a result of an instruction from System Management in accordance with clause 7.6A.3(a), where this information has been either:~~

~~1. provided by System Management in accordance with clause 7.13.1C(b) for the Trading Intervals that were excluded under step (a)(ii)(2), where actual data for the site of the Facility has been provided to System Management under clause 7.7.5B; or~~

~~2. determined by the IMO in accordance with the Reserve Capacity Procedure for all the Trading Intervals that were excluded under step (a)(ii)(2), where actual data for the site of the Facility has not been made available to System Management under clause 7.7.5B; and~~

~~ii. the amount of electricity (in MWh) sent out for the Facility determined from Meter Data Submissions received by the IMO in accordance with clause 8.4 for all the Trading Intervals that were excluded under step (a)(ii)(2),~~

~~to estimate the amount of electricity (in MWh) that would have been sent out by the Facility had it not complied with System Management's instruction for all the Trading Intervals that were excluded under step (a)(ii)(2); and~~

~~(d) set the Relevant Level as double the sum of the quantities determined in steps (b), (c), (cA) and (cB) divided by the total number of Trading Intervals identified in steps (a), (cA) and (cB).~~

4.11.3B. The Required Level (which for an upgraded Facility is calculated for the Facility as a whole):

- (a) for Facilities assigned Certified Reserve Capacity under clause 4.11.1(a), is calculated by the IMO using the Capacity Credits assigned to the Facility and temperature dependence information submitted to the IMO under clause 4.10.1(e)(i) or provided in Standing Data (where available) and converted to a sent out basis to 41 °C;
- (b) for Facilities assigned Certified Reserve Capacity under clause 4.11.2(b), is either:

- i. the value, expressed in MW as a sent out value, that equals the 5 percent probability of exceedance of expected generation output for the Facility, submitted to the IMO in the report described in clause 4.10.3A(b); or
  - ii. the proposed alternative value, expressed in MW as a sent out value, provided in the report described in clause 4.10.3A(c), where the IMO has accepted the proposed alternative value under clause 4.11.2A; and
- (c) for Demand Side Programmes, is calculated by the IMO using the Facility's Relevant Demand minus the Capacity Credits assigned to the Facility.

4.11.3C. For each three year period, beginning with the period commencing on 1 January 2015, the IMO must, by 1 April of the first year of that period, conduct a review of the Relevant Level Methodology. In conducting the review, the IMO must:

- (a) examine the effectiveness of the Relevant Level Methodology in meeting the Wholesale Market Objectives; and
- (b) determine the values of the parameters K and U in step 17 of the Relevant Level Methodology to be applied for each of the three Reserve Capacity Cycles commencing in the period,

and the IMO may examine any other matters that the IMO considers to be relevant.

4.11.3D. In conducting a review under clause 4.11.3C, the IMO must publish a draft report and invite submissions from Rule Participants and any other stakeholders the IMO considers should be consulted.

4.11.3E. At the conclusion of a review under clause 4.11.3C, the IMO must publish a final report containing:

- (a) details of the IMO's review of the Relevant Level Methodology;
- (b) a summary of the submissions received during the consultation period;
- (c) the IMO's response to any issues raised in those submissions;
- (d) the values of the parameters K and U determined under clause 4.11.3C; and
- (e) any recommended amendments to the Relevant Level Methodology which the IMO intends to progress as a Rule Change Proposal.

6.17.6 The Dispatch Instruction Payment,  $DIP(p,d,t)$ , for Market Participant  $p$  and Trading Interval  $t$  of Trading Day  $d$  equals either:

- (a) zero, if Market Participant  $p$ :
  - i is the Electricity Generation Corporation; or
  - ii was issued no Dispatch Instructions for Trading Interval  $t$ ;

or the sum of:

...

(c) the sum over all Non-Scheduled Generators registered by the Market Participant of the amount that is the product of:

- i. the quantity, defined as a negative value, by which the Non-Scheduled Generator was instructed by System Management to reduce its output, as provided to the IMO by System Management under clause 7.13.1(eB) (where for the purpose of this calculation a Loss Factor adjustment is to be applied to the quantity specified by System Management so that the result is measured at the Reference Node); and
- ii. the Standing Data price defined in Appendix 1(e)(v) that was current at the time of the Trading Interval for the Non-Scheduled Generator for a decrease in generation, (accounting for whether the Trading Interval is a Peak Trading Interval or an Off-Peak Trading Interval) less MCAP for the Trading Interval; and

...

~~7.7.5A. For the purpose of determining the quantity described in clause 6.17.6(c)(i) for each Trading Interval, the quantity is:~~

- ~~(a) where System Management has been provided with information in accordance with clause 7.7.5B, System Management's estimate of the MWh reduction in output, by Trading Interval, of the Non-Scheduled Generator as a result of System Management's Dispatch Instruction; or~~
- ~~(b) in the case of a Non-Scheduled Generator included in a Resource Plan, for which System Management has not been provided with information in accordance with clause 7.7.5B, the greater of zero and the MWh difference between the Resource Plan MWh quantity of the Non-Scheduled Generator less the MWh output of the Non-Scheduled generator over the Trading Interval implied by its Dispatch Instruction.~~

System Management must develop, in a Power System Operation Procedure, the information that must be provided by a Market Participant to System Management for each of the Market Participant's Non-Scheduled Generators for each Trading Interval to enable an estimation of the output of each Facility (in MWh) to be undertaken by:

(a) System Management, as required under clauses 7.7.5B(a) and 7.13.1C(e); and

(b) the IMO, as required by the Relevant Level Methodology.

~~7.7.5B. A Market Participant may provide System Management with information specified in the Power System Operation Procedure to support the calculation of the quantity described in clause 7.7.5A(a) and 7.7.5E.~~

The quantity reduction in the output of a Non-Scheduled Generator as a result of a Dispatch Instruction from System Management (in MWh) for each Trading Interval to be used in clause 6.17.6(c)(i) is:

(a) where information has been made available to System Management in accordance with the Power System Operation Procedure developed under clause 7.7.5A, System Management's estimate, determined in accordance with the Power System Operation Procedure, of the decrease in output of the Non-Scheduled Generator (in MWh) during the Trading Interval; or

(b) in the case of a Non-Scheduled Generator included in a Resource Plan, for which System Management has not been provided with information in accordance with the Power System Operation Procedure developed under clause 7.7.5A, the greater of zero and the difference between the Resource Plan quantity of the Non-Scheduled Generator (in MWh) less the output of the Non-Scheduled Generator (in MWh) over the Trading Interval derived from its Dispatch Instruction.

~~7.7.5C. The Power System Operation Procedure must specify that actual wind data for the site of a wind farm and the number of turbines operating, if made available by a Market Participant to System Management, are sufficient to allow System Management to determine what the output of a wind farm would have been had no Dispatch Instruction been issued.~~

~~7.7.5D [Blank]~~

~~7.7.5E Where the Electricity Generation Corporation has made information available to System Management in accordance with clause 7.7.5B and the Power System Operation Procedure, System Management must estimate for each Trading Interval the decrease, in MWh, in the output of each Electricity Generation Corporation Non-Scheduled Generator as a result of an instruction~~

~~from System Management to deviate from the Dispatch Plan or change its commitment or output in accordance with clause 7.6.A.3(a).~~

7.7.9. System Management must ~~document~~ develop, in a Power System Operation Procedure, the procedure System Management and Market Participants must follow in forming, issuing, recording, receiving and confirming Dispatch Instructions and that System Management must follow in determining the quantities described in clause 7.7.5A(a), and 7.7.5D in the a Power System Operation Procedure, and:

~~(a) System Management must follow that documented Market Procedure when issuing, recording, and confirming a Dispatch Instruction and in determining the quantities described in clauses 7.7.5A(a) and 7.7.5D; and~~

~~(b) Market Participants must follow that documented Market Procedure when receiving and confirming a Dispatch Instruction and in providing information to support the calculation of the quantity described in clause 7.7.5A.~~

7.13.1. System Management must provide the IMO with the following data for a Trading Day by noon on the first Business Day following the day on which the Trading Day ends:

...

~~(eB) the estimated decrease, in MWh, in the output of each Non-Scheduled Generator, by Trading Interval, as a result of System Management Dispatch Instructions, as determined in accordance with clause 7.7.5AB; where this is to be used in settlement as the quantity described in clause 6.17.6(e)(i).~~

...

(g) details of the instructions provided to:

i. Demand Side Programmes that have Reserve Capacity Obligations; and

ii. providers of Supplementary Capacity;

on the Trading Day; and

(h) the identity of the Facilities ~~which that~~ were subject to either a Commissioning Test or a test of Reserve Capacity for each Trading Interval of the Trading Day.

7.13.1C The IMO may request, and System Management must provide, within 10 Business Days of receipt of a request from the IMO, provide the IMO with the following information:

- (a) for each Facility, all information made available to System Management under the Power System Operation Procedure developed under clause 7.7.5A;
- (b) an estimate of the total quantity of energy not served (in MWh) due to involuntary load shedding (manual and automatic);
- (c) an estimate of the reduction in energy consumption (in MWh) of any Interruptible Loads in accordance with the terms of an Ancillary Service Contract;
- (d) a schedule of all instructions provided to the Electricity Generation Corporation's Non-Scheduled Generators to deviate from the Dispatch Plan or change their commitment or output in accordance with clause 7.6A.3; and
- (e) an estimate of the decrease in the output (in MWh) of each Electricity Generation Corporation Non-Scheduled Generator as a result of an instruction from System Management to deviate from the Dispatch Plan or change their commitment or output in accordance with clause 7.6A.3(a).

for each Trading Interval during the time period specified by the IMO in its request.

- ~~(a) a schedule of all instructions provided to the Electricity Generation Corporation's Non-Scheduled Generators to deviate from the Dispatch Plan or change their commitment or output in accordance with clause 7.6A.3(a) for each Trading Interval during the time period specified by the IMO in its request; and~~
- ~~(b) where the Electricity Generation Corporation has made actual wind data available in accordance with clause 7.7.5B, the estimated decrease, in MWh, in the output of each Electricity Generation Corporation Non-Scheduled Generator as a result of an instruction from System Management to deviate from the Dispatch Plan or change their commitment or output in accordance with clause 7.6A.3(a), as determined in accordance with clause 7.7.5E, for each Trading Interval during the time period specified by the IMO in its request, where this is to be used in the calculation of the Relevant Level described in clause 4.11.3A.~~

10.5.1. The IMO must set the class of confidentiality status for the following information under clause 10.2.1, as Public and the IMO must make each item

of information available from the Market Web-Site after that item of information becomes available to the IMO:

(a) the following Market Rule and Market Procedure information and documents:

...

(f) the following Reserve Capacity information (if applicable):

i. Requests for Expressions of Interest described in clause 4.2.3 for the previous five Reserve Capacity Cycles;

...

ix. The following annually calculated and monthly adjusted ratios:

1. NTDL\_Ratio as calculated in accordance with Appendix 5, STEP 8;

2. TDL\_Ratio as calculated in accordance with Appendix 5, STEP 8; and

3. Total\_Ratio as calculated in accordance with Appendix 5, STEP 10; and

x. The following information identified for a Reserve Capacity Cycle under the Relevant Level Methodology:

1. the Existing Facility Load for Scheduled Generation for each Trading Interval in the five year period determined under step 1(a) of the Relevant Level Methodology; and

2. the 12 Trading Intervals occurring on separate Trading Days with the highest Existing Facility Load for Scheduled Generation for each 12 month period in the five year period.

## Glossary

**Existing Facility Load for Scheduled Generation:** Means the MWh quantity determined for a Trading Interval under step 7 of the Relevant Level Methodology.

**New Facility Load for Scheduled Generation:** Means, for a new or upgraded Facility that has applied to be assigned Certified Reserve Capacity under clause 4.11.2(b), the MWh quantity determined for a Trading Interval under step 11 of the Relevant Level Methodology for that Facility and the relevant Reserve Capacity Cycle.

**Relevant Level:** Means the MW quantity determined by the IMO in accordance with the Relevant Level Methodology.

**Relevant Level Methodology:** Means the method of determining the Relevant Level specified in Appendix 9.

### **Appendix 9: Relevant Level Determination**

This Appendix presents the methodology for determining the Relevant Levels for Facilities that have applied for certification of Reserve Capacity under clause 4.11.2(b) for a given Reserve Capacity Cycle (“Candidate Facility”).

For the purposes of the Relevant Level determination in this Appendix 9:

- the full operation date of a Candidate Facility for the Reserve Capacity Cycle (“Full Operation Date”) is:
  - the date provided under clause 4.10.1(c)(iii)(7) or revised in accordance with clause 4.27.11A or clause 4.27.11B, where at the time the application for certification of Reserve Capacity is made the Facility, or part of the Facility (as applicable) is yet to enter service; or
  - the date most recently provided for a Reserve Capacity Cycle under clause 4.10.1(k) otherwise; and
- a Candidate Facility will be considered to be:
  - a new candidate Facility, if the five year period identified in step 1(a) of this Appendix commenced before 8:00 AM on the Full Operation Date for the Facility (“New Candidate Facility”); or
  - an existing Candidate Facility (“Existing Candidate Facility”), otherwise.

The IMO must perform the following steps to determine the Relevant Level for each Candidate Facility:

#### **Determining Existing Facility Load for Scheduled Generation**

Step 1: Identify:

- (a) the five year period ending at 8:00 AM on 1 April of Capacity Year 1 of the relevant Reserve Capacity Cycle;
- (b) any 12 month period, from 1 April to 31 March, occurring during the five year period identified in step 1(a), where the 12 Trading Intervals with the highest Existing Facility Load for Scheduled Generation in that 12 month period have not previously been determined under this Appendix 9; and
- (c) any 12 month period, from 1 April to 31 March, occurring during the five year period identified in step 1(a), where the 12 Trading Intervals with the highest Existing Facility Load for Scheduled Generation in

that 12 month period have previously been determined under this Appendix 9.

Step 2: Determine the quantity of electricity (in MWh) sent out by each Candidate Facility using Meter Data Submissions for each of the Trading Intervals in the period identified in step 1(b).

Step 3: For each Candidate Facility, identify any Trading Intervals in the period identified in step 1(b) where the Facility:

(a) was owned, controlled or operated by a Market Participant other than the Electricity Generation Corporation and was issued a Dispatch Instruction from System Management as notified under clause 7.13.1(c); or

(b) was owned, controlled or operated by the Electricity Generation Corporation and was issued an instruction from System Management to deviate from its Dispatch Plan or change its commitment or output as notified under clause 7.13.1C(d); or

(c) was affected by a Consequential Outage as notified by System Management to the IMO under clause 7.13.1A.

Step 4: For each Candidate Facility and Trading Interval identified in step 3(a) use:

(a) the estimate provided by System Management to the IMO under clause 7.13.1(eB); and

(b) the quantity determined for the Facility and Trading Interval in step 2, to estimate the quantity of energy (in MWh) that would have been sent out by the Facility had it not complied with the Dispatch Instruction during the Trading Interval.

Step 5: For each Candidate Facility and Trading Interval identified in step 3(b) use:

(a) the estimate provided by System Management to the IMO under clause 7.13.1C(e); and

(b) the quantity determined for the Facility and Trading Interval in step 2, to estimate the quantity of energy (in MWh) that would have been sent out by the Facility had it not complied with System Management's instruction to change its commitment or output during the Trading Interval.

Step 6: For each Candidate Facility and Trading Interval identified in step 3(c) use:

(a) the schedule of Consequential Outages provided by System Management to the IMO under clause 7.13.1A;

(b) the quantity determined for the Facility and Trading Interval in step 2; and

(c) the information provided by System Management under clause 7.13.1C(a),

to estimate the quantity of energy (in MWh) that would have been sent out by the Facility had it not been affected by the notified Consequential Outage during the Trading Interval.

Step 7: Determine for each Trading Interval in each 12 month period identified in step 1(b) the Existing Facility Load for Scheduled Generation (in MWh) as:

(Total Generation + DSP Reduction + Interruptible Reduction + Involuntary Reduction) – CF Generation

where

Total Generation is the total sent out generation of all Facilities, as determined from Meter Data Submissions;

DSP Reduction is the total quantity by which all Demand Side Programmes reduced their consumption in response to a Dispatch Instruction, as determined under clause 6.17.6(d)(i)(3);

Interruptible Reduction is the total quantity by which all Interruptible Loads reduced their consumption in accordance with the terms of an Ancillary Service Contract, as provided by System Management to the IMO under clause 7.13.1C(c);

Involuntary Reduction is the total quantity of energy not served due to involuntary load shedding (manual and automatic), as provided by System Management to the IMO under clause 7.13.1C(b); and

CF Generation is the total sent out generation of all Candidate Facilities, as determined in step 2 or estimated in steps 4, 5 or 6 as applicable.

Step 8: Determine for each 12 month period identified in step 1(b) the 12 Trading Intervals, occurring on separate Trading Days, with the highest Existing Facility Load for Scheduled Generation.

Step 9: Identify, for each 12 month period identified in step 1(c), the following:

(a) the Existing Facility Load for Scheduled Generation previously determined under this Appendix 9 for each Trading Interval in the 12 month period;

- (b) the sent out generation (in MWh) for each Candidate Facility for each Trading Interval in the 12 month period that was used in the determination of the Existing Facility Load for Scheduled Generation for that Trading Interval; and
- (c) the 12 Trading Intervals occurring on separate Trading Days that were previously determined to have the highest Existing Facility Load for Scheduled Generation in the 12 month period.

**Determining New Facility Load for Scheduled Generation**

Step10: For each New Candidate Facility determine, for each Trading Interval in the period identified in step 1(a) that falls before 8:00AM on the Full Operation Date for the Facility, an estimate of the quantity of energy (in MWh) that would have been sent out by the Facility in the Trading Interval, if it had been in operation with the configuration proposed under clause 4.10.1(dA) in the relevant application for certification of Reserve Capacity. The estimates must reflect the estimates in the expert report provided for the Facility under clause 4.10.3, unless the IMO reasonably considers the estimates in the expert report to be inaccurate.

Step11: For each New Candidate Facility determine, for each Trading Interval in the period identified in step 1(a), the New Facility Load for Scheduled Generation (in MWh) as:

- (a) if the Trading Interval falls before 8:00 AM on the Full Operation Date for the Facility:

$$\underline{\text{EFLSG} + \text{Actual CF Generation} - \text{Estimated CF Generation}}$$

where

EFLSG is the Existing Facility Load for Scheduled Generation for the Trading Interval, determined in step 7 or identified in step 9(a) as applicable;

Actual CF Generation is the sent out generation of the New Candidate Facility for the Trading Interval, as identified in step 9(b), determined in step 2 or estimated in steps 4, 5 or 6 as applicable; and

Estimated CF Generation is the quantity determined for the New Candidate Facility and the Trading Interval in step 10;

or

- (b) the Existing Facility Load for Scheduled Generation for the Trading Interval, otherwise.

Step 12: For each New Candidate Facility determine, for each 12 month period identified in step 1(a), the 12 Trading Intervals, occurring on separate Trading Days, with the highest New Facility Load for Scheduled Generation.

**Determining the Facility Average Performance Level**

Step 13: For each Existing Candidate Facility, determine the 60 quantities comprising:

- (a) the MWh quantities determined in step 2 or estimated in steps 4, 5 or 6 as applicable for each of the Trading Intervals determined in step 8, multiplied by 2 to convert to units of MW; and
- (b) the MWh quantities determined in step 9(b) for each of the Trading Intervals identified in step 9(c), multiplied by 2 to convert to units of MW.

Step 14: For each New Candidate Facility, determine the 60 quantities comprising:

- (a) the MWh quantities identified in step 9(b), determined in step 2 or estimated in steps 4, 5 or 6 as applicable for each of the Trading Intervals identified in step 12 that fall after 8:00 AM on the Full Operation Date for the Facility, multiplied by 2 to convert to units of MW; and
- (b) the MWh quantities determined in step 10 for each of the Trading Intervals identified in step 12 that fall before 8:00 AM on the Full Operation Date of the Facility, multiplied by 2 to convert to units of MW.

Step 15: Determine the average performance level (in MW) for each Candidate Facility f ("Facility Average Performance Level") as the mean of the 60 quantities determined for Facility f in step 13 or step 14 as applicable.

**Determine the Facility Adjustment Factor**

Step 16: Determine the variance (in MW) for each Candidate Facility f ("Facility Variance") as the variance of the MW quantities determined for Facility f in step 13 or step 14 as applicable.

Step 17: Determine the facility adjustment factor (in MW) for each Candidate Facility f ("Facility Adjustment Factor") in accordance with the following formula:

Facility Adjustment Factor = min (G x Facility Variance (f), Facility Average Performance Level (f) /3 + K x Facility Variance (f))

Where

$$G = K + U/\text{Facility Average Performance Level (f)}$$

K is determined in accordance with the following table:

<u>Reserve Capacity Cycle</u>	<u>Capacity Year</u>	<u>K value</u>
<u>2012</u>	<u>2014/15</u>	<u>0.001</u>
<u>2013</u>	<u>2015/16</u>	<u>0.002</u>
<u>2014</u>	<u>2016/17</u>	<u>0.003</u>
<u>2015 onwards</u>	<u>From 2017/18 onwards</u>	<u>To be determined by the IMO in accordance with clause 4.11.3B.</u>

U is determined in accordance with the following table:

<u>Reserve Capacity Cycle</u>	<u>Capacity Year</u>	<u>U</u>
<u>2012</u>	<u>2014/15</u>	<u>0.211</u>
<u>2013</u>	<u>2015/16</u>	<u>0.422</u>
<u>2014</u>	<u>2016/17</u>	<u>0.635</u>
<u>2015 onwards</u>	<u>From 2017/18 onwards</u>	<u>To be determined by the IMO in accordance with clause 4.11.3B.</u>

**Determining the Relevant Level for a Facility**

Step 18: Determine the Relevant Level for each Candidate Facility f (in MW) in accordance with the following formula:

$$\text{Relevant Level (f)} = \max(0, \text{Facility Average Performance Level (f)} - \text{Facility Adjustment Factor (f)})$$

**Publication of information**

Step 19: Publish on the Market Web Site by 1 June of Year 1 of the relevant Reserve Capacity Cycle:

- (a) the Trading Intervals identified in step 8; and
- (b) the Existing Facility Load for Scheduled Generation quantities determined in step 7.

**APPENDIX 1: SUMMARY OF MAIN COMMENTS RAISED IN SECOND SUBMISSION PERIOD (RC\_2010\_25 & RC\_2010\_37)**

Submitter	Main Comments	
	RC_2010_25 (Modified Methodology 1)	RC_2010_37 (Methodology 2)
Alinta	<ul style="list-style-type: none"> <li>• Supports the principle that number of CCs be determined on both an equitable basis, and reflect a facility's ability to support the secure and reliable operation of the WEM. Also supports output whereby Facilities with output that is both more variable and less certain be assigned fewer CCs than those with predictable output with respect to periods of peak demand.</li> <li>• Welcomes further transparency around setting the K and U parameters</li> <li>• Peak LSG periods represent an inherently biased sample of the output of IGs. Unclear why absolute operation peaks not used</li> <li>• Where System Management issues Dispatch Instructions to a facility, metering data should be substituted with estimated data</li> <li>• Unclear how modified Methodology 1 would allocate CCs to new entrant facilities</li> <li>• Glide Path               <ul style="list-style-type: none"> <li>○ Concerned around continued perceived levels of risk associated with investing in the WEM, despite the proposed glide path.</li> <li>○ Sees no reason why IGs that have not yet been assigned CCs should not be fully exposed to the new methodology</li> <li>○ Significant merit in the IMO considering a longer transition period (or grandfathering) for existing facilities</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• No specific comments provided.</li> </ul>
APA Group	<ul style="list-style-type: none"> <li>• Prepared to support modified Methodology 1 subject to:               <ul style="list-style-type: none"> <li>○ Replacing LSG with peak demand</li> <li>○ Removing the U factor</li> </ul> </li> <li>• LSG concept</li> </ul>	<ul style="list-style-type: none"> <li>• Recommends that if the suggested modifications are not made the IMO Board reject modified Methodology 1 in favour of Methodology 2, or alternatively reject both proposals.</li> </ul>

Submitter	Main Comments	
	RC_2010_25 (Modified Methodology 1)	RC_2010_37 (Methodology 2)
	<ul style="list-style-type: none"> <li>○ Inconsistent with the treatment of other generation capacity under the Market Rules</li> <li>○ LSG has the potential to shift the top 12 intervals by demand into intervals that are not the super-peaks</li> <li>○ Impact of estimates for new entrants likely to alter LSG intervals used. Creates unnecessary volatility</li> <li>• U Factor <ul style="list-style-type: none"> <li>○ Is inappropriate and should be removed</li> <li>○ Better suited to a much larger number of TIs</li> <li>○ Will either double discount (if IGF output low during 1-in-10 year event) or unnecessarily discount (if IGF output high in 1-in-10 year event)</li> <li>○ Manifest discrimination against solar facilities as logic dictates that a solar facility would be at its greatest during periods of high temperature (opposite to assumption that wind farm output would be lower during these TIs)</li> </ul> </li> <li>• Suggests that the IMO discuss the issue of provision of data by new entrant facilities with the list of accredited experts to ensure modified Methodology 1 is capable of being implemented for new entrants</li> </ul>	
Collgar Wind Farm	<ul style="list-style-type: none"> <li>• Does not support, maybe better options for addressing issue i.e. block tariffs</li> <li>• Negative impacts associated with regulatory risk</li> <li>• Objects to the IMO's extension notice published on 13 October 2011</li> <li>• LSG concept <ul style="list-style-type: none"> <li>○ Discriminates against renewable generators and heavily favours scheduled and peaking generators</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• No specific comments provided.</li> </ul>

Submitter	Main Comments	
	RC_2010_25 (Modified Methodology 1)	RC_2010_37 (Methodology 2)
	<ul style="list-style-type: none"> <li>○ Fails to accurately recognise the contribution made by renewable energy generators to overall generation supply and capacity</li> <li>○ Will only serve to further increase overcapacity currently on the SWIS</li> <li>• U factor <ul style="list-style-type: none"> <li>○ Can be seemingly changed at a whim every three years (no regulatory certainty)</li> <li>○ Sapere reports fails to disclose the international benchmarks and standards that have been taken into account in determining the parameter</li> <li>○ Should be set at 0.001 or removed unless sufficient transparency can be achieved</li> </ul> </li> <li>• Existing facilities should have their existing regime protected by grandfathering</li> </ul>	
Infigen Energy	<ul style="list-style-type: none"> <li>• Supports subject to: <ul style="list-style-type: none"> <li>○ Removal of LSG concept (use of peak demand)</li> <li>○ Removal of U factor</li> <li>○ Transition to a rolling 10-year average from 5 years as data becomes available</li> </ul> </li> <li>• Considers the process has been extremely flawed and it is a stretch to call the introduction of a new methodology after the first submission period a modification</li> <li>• LSG concept <ul style="list-style-type: none"> <li>○ Creates additional and unavoidable volatility of outcomes when new entrant data is introduced</li> <li>○ Manifestly discriminates against IG by discounting TIs</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• No specific comments provided.</li> </ul>

Submitter	Main Comments	
	RC_2010_25 (Modified Methodology 1)	RC_2010_37 (Methodology 2)
	<p>where their output is greater</p> <ul style="list-style-type: none"> <li>○ Highest marginal value of CC's not used for other types of generation</li> <li>○ LSG methodology makes each independent IG dependent on the others for its contribution to the RCM. Not the case for other generation types</li> <li>○ No precedent in other markets and not accepted by REGWG</li> <li>○ Complex and creates administrative cost</li> <li>○ Means no Market Participant can independently calculate their CCs revenue without requesting LSG periods from the IMO.</li> <li>○ Assumptions around impacts of new entrants required</li> </ul> <ul style="list-style-type: none"> <li>• Rule change should be part of an overall review of system risk and the RCM.</li> </ul>	
LGP	<ul style="list-style-type: none"> <li>• Supports subject to reservations surrounding U factor and use of LSG</li> <li>• Perceive certification method likely to become a seminal contribution to the valuation of intermittent capacity and care should be taken in preserving its integrity.</li> <li>• U factor justified on grounds that there is little evidence of performance of large scale IG's during peak conditions. Appears to be a subjective fudge factor</li> <li>• Concerned pure LSG signal not possible because of interaction of DSM causing the 12 LSG peak intervals to be a random variable that delivers no signal to developers.</li> <li>• Integrity of modified Methodology 1 should be assessed by extending the analysis to include Collgar data</li> </ul>	<ul style="list-style-type: none"> <li>• No specific comments provided.</li> </ul>

Submitter	Main Comments	
	RC_2010_25 (Modified Methodology 1)	RC_2010_37 (Methodology 2)
Mid West Energy	<ul style="list-style-type: none"> <li>• Prepared to support modified Methodology 1 subject to: <ul style="list-style-type: none"> <li>○ Use of peak demand rather than LSG; and</li> <li>○ Removal of the U factor</li> </ul> </li> <li>• LSG concept <ul style="list-style-type: none"> <li>○ Inconsistent with treatment of other generators</li> <li>○ New entrants will potentially alter the LSG intervals through the use of their estimated data</li> <li>○ Creates volatility (less so if peak demand intervals are used)</li> </ul> </li> <li>• U factor <ul style="list-style-type: none"> <li>○ Arbitrary amendment to reduce CC's allocated to IG's</li> <li>○ Solar should have a positive U factor applied</li> <li>○ Discriminatory and should be removed or else adjusted so different U factors apply for different generation types</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• No specific comments provided.</li> </ul>
Pacific Hydro	<ul style="list-style-type: none"> <li>• Can support modified Methodology 1 subject to: <ul style="list-style-type: none"> <li>○ Modelling being adjusted to include Collgar</li> <li>○ Grater certainty and transparency around the formulation and setting of the adjustment factors being provided (otherwise capacity payments potentially will be heavily discounted by investors); and</li> <li>○ Use of operational load rather than LSG</li> </ul> </li> <li>• LSG concept <ul style="list-style-type: none"> <li>○ Creates an inherent bias against IG by removing high demand intervals when the IG fleet is operating at high capacity</li> <li>○ No confidence that original intention of introducing LSG (to</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• No submission made</li> </ul>

Submitter	Main Comments	
	RC_2010_25 (Modified Methodology 1)	RC_2010_37 (Methodology 2)
	<p>remove volatility) remains the case</p> <ul style="list-style-type: none"> <li>○ Creates another layer of complexity and uncertainty to the Market Rules</li> </ul>	
Perth Energy	<ul style="list-style-type: none"> <li>• Supports but consideration of the glide path is required (sovereign risk perceptions)</li> <li>• Agrees that an adjustment related to the variability of output is warranted but requests greater transparency around how the K and U parameters are set</li> <li>• Query whether intention is for peak LSG periods to be influenced by output of all IG's available in the Capacity Year in question, including new facilities with no historic metering data. Potentially severe consequences when a new large IG enters market</li> <li>• Substitutions for periods where a Dispatch Instruction has been issued to a IGF should be incorporated, there may be other situations where estimates would be appropriate under the new Balancing and Load Following market design</li> <li>• Inconsistency between the 12 peak system load intervals each year for IRCR and the use of 12 peak LSG intervals from separate days.</li> </ul>	<ul style="list-style-type: none"> <li>• Concerned with Sovereign Risk perception.</li> <li>• No further comments provided on Methodology 2</li> </ul>
SEA	<ul style="list-style-type: none"> <li>• Supports modified Methodology 1 subject to: <ul style="list-style-type: none"> <li>○ Use of peak demand rather than LSG</li> <li>○ The removal of the U factor</li> </ul> </li> <li>• LSG concept <ul style="list-style-type: none"> <li>○ Inconsistent with treatment of other generation capacity under the Market Rules</li> <li>○ Question whether use of different methodology is fair to non-wind IG.</li> <li>○ New entrants will alter the 12 LSG intervals when their estimated data is incorporated into the calculations (creates</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• No specific comments</li> </ul>

Submitter	Main Comments	
	RC_2010_25 (Modified Methodology 1)	RC_2010_37 (Methodology 2)
	<p>variability)</p> <ul style="list-style-type: none"> <li>• U Factor <ul style="list-style-type: none"> <li>○ Arbitrary amendment to reduce CCs</li> <li>○ Treating different technologies as being the same does not make sense. Perplexing why the IMO would apply an arbitrary discount factor to output of solar generation based on the performance of wind.</li> <li>○ Should be removed, but if retained different U factors should apply to different technology types</li> </ul> </li> </ul>	
SkyFarming	<ul style="list-style-type: none"> <li>• Study excluded Collgar data and should be redone incorporating this information along with Albany, Grasmere and the Mt Barker wind farms before any further decision making is undertaken or proposals are submitted.</li> </ul>	<ul style="list-style-type: none"> <li>• See comments for modified Methodology 1.</li> </ul>
System Management	<ul style="list-style-type: none"> <li>• Rule Change Process <ul style="list-style-type: none"> <li>○ Proposed amended methodology is a major departure from that initially proposed</li> <li>○ Believes major changes should only be made as a new rule change submission</li> </ul> </li> <li>• Supports concept that the capacity value of IG be based on a average value less a variability adjustment.</li> <li>• Prime concern is that actual output is less than half of the average output for 17% of the time and less than one third of the average output for 11% of the time.</li> <li>• Top 12 LSG TIs should be chosen based on an ambient condition based criteria. That is the TIs during the last 3 years between 11am and 7pm on days where the peak daily temperature in Perth is greater than or equal to 40 degrees Celsius are used. If less than a minimum number of days are selected (say 5) the number of years</li> </ul>	<ul style="list-style-type: none"> <li>• No specific comments</li> </ul>

Submitter	Main Comments	
	RC_2010_25 (Modified Methodology 1)	RC_2010_37 (Methodology 2)
	<p>would be extended.</p> <ul style="list-style-type: none"> <li>• Facility adjustment factor should be expressed as a coefficient multiplied by the standard deviation of output</li> <li>• Glide path values should be based on the final adjustment coefficients from the start.</li> <li>• Greater transparency over the determination of the U and K parameters is required.</li> <li>• The adjustment parameters need to be about twice those suggested in the proposed rule change.</li> <li>• Suggests that further consideration to including minimum quantities of the various types of generation and DSM that must be sourced be included.</li> </ul>	
Synergy	<ul style="list-style-type: none"> <li>• Does not support</li> <li>• Concerned that a change such as that proposed would create uncertainty that investor's assumptions could be overturned at a later date. The proposed transitional arrangements do little to remove this concern.</li> <li>• Sapere's analysis failed to include Collgar data</li> <li>• Demand is not simply driven by temperature but also humidity</li> <li>• U value arbitrarily set</li> <li>• LSG concept <ul style="list-style-type: none"> <li>○ REGWG did not adequately discuss LSG</li> <li>○ Difficult to predict maximum LSG in medium and long term thereby confusing investment signals. May discount development of facilities that would make their max contribution at times of maximum system load (counter-intuitive).</li> <li>○ Dynamic concept – Maximum LSG periods would change</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• No comments provided given IMO Board's decision to reject RC_2010_37, albeit noting that the time is not right to proceed with either modified Methodology 1 or Methodology 2.</li> </ul>

Submitter	Main Comments	
	RC_2010_25 (Modified Methodology 1)	RC_2010_37 (Methodology 2)
	<p>over time creating uncertainty around future valuations. Likely to be reflected in a premium being charged</p> <ul style="list-style-type: none"> <li>○ Recommends a workshop is held by IMO to explain benefits and risks to market associated with the concept.</li> <li>• RCM review may impact on valuations – Capacity Credit valuation methodology should be considered by new RCM working group.</li> <li>• Rule Change Process (Governance precedent) <ul style="list-style-type: none"> <li>○ Adoption of Sapere’s recommendations represents a major change which should be considered as a new Rule Change Proposal</li> <li>○ Adoption in draft report lessens governance surrounding the rule change process (only one round of consultation on the proposed amended methodology).</li> </ul> </li> </ul>	
Verve Energy	<ul style="list-style-type: none"> <li>• Supports modified Methodology 1</li> <li>• Considers the retention of Sapere to conduct additional analysis was an appropriate decision.</li> <li>• Quality and focus of Sapere’s review means there is now much greater clarity around the reasoning for the proposed resolution</li> <li>• Proposed solution appears to be a good compromise and provide an appropriate outcome for both wind and solar thermal generation</li> <li>• In the long term the approach of selecting TIs from different days should be reviewed when sufficient data has been collected to allow unconstrained selection of the top TIs</li> <li>• A date should be prescribed at which the continuing suitability of the methodology is formally reviewed</li> </ul>	<ul style="list-style-type: none"> <li>• No submission made</li> </ul>
Vestas Wind Systems	<ul style="list-style-type: none"> <li>• Does not support modified Methodology 1</li> <li>• Failure to incorporate Collgar data. IMO should consult further with</li> </ul>	<ul style="list-style-type: none"> <li>• Supports</li> <li>• No further comments provided on Methodology 2</li> </ul>

Submitter	Main Comments	
	RC_2010_25 (Modified Methodology 1)	RC_2010_37 (Methodology 2)
	<p>Collgar to obtain the necessary data</p> <ul style="list-style-type: none"> <li>• Rule Change Process <ul style="list-style-type: none"> <li>○ Methodology amended substantially from original proposal, should have been withdrawn and resubmitted as new proposal</li> <li>○ IMO Board should be clearer about the terms it engages expert consultants and should reconsider the manner in which it advances rule change where it is the proponent</li> </ul> </li> <li>• LSG concept <ul style="list-style-type: none"> <li>○ approach is only likely to be appropriate where a large number of TIs are considered</li> <li>○ inconsistent with approach applied for certifying other capacity types which under Market Rules do not have their capacity value affected by the output of their competitors</li> </ul> </li> <li>• U factor is inappropriate and should be removed as aside from having no clear basis it is also irrelevant, with its most fatal flaw being that it is based on temperature.</li> <li>• More appropriate to ensure the goal of security of supply is met through other mechanisms such as the reserve margin or investing in wind forecasting software.</li> </ul>	

**APPENDIX 2: IMO'S RESPONSE TO SUBMISSIONS RECEIVED DURING THE SECOND SUBMISSION PERIOD (RC\_2010\_25 & RC\_2010\_37)**

Modified Methodology 1					
	Proposal	Clause/Issue	Submitter	Comment/Change Requested	IMO's response
1	RC_2010_25	MMA original proposal	Pacific Hydro	Given the importance of certainty over price and simplicity over complexity PH supports the original proposal developed by McLennan Magasanik Associates (MMA) in January 2010. In our opinion the MMA approach was based on a systematic and well-resourced study and their methodology delivered credible and stable results. The MMA January 2010 proposal referred to above was not adopted by either the IMO or Griffin Energy under the Rule Change Proposals RC_2010_25 (IMO ) and RC_2010_37 (Griffin Energy) and so in our previous submission on this issue (4 February) we were recommending no change to the existing rule.	The IMO notes Pacific Hydro's opinion and reiterates its views that MMA's assessment does not sufficiently reflect the risk to reliability. Refer to section 6.4.3 of the Draft Rule Change Report for the IMO's comments on the view of the consultant engaged by the REGWG.
2.	RC_2010_25	MMA original proposal	Pacific Hydro	It is also worth noting System Management's concerns around the 2010 MMA proposal – in particular that the MMA methodology delivers capacity values above 35% of rated output for wind farms that showed good correlation to system demand. Pacific Hydro understand System Management prefers that the maximum capacity that should be awarded to wind energy is capped at 20% of rated output. While we hold a different view, we accept that System Management has a clear view on this issue based on operating experience.	The IMO notes Pacific Hydro's views.
3.	RC_2010_25	Modified Methodology 1	Pacific Hydro	In light of the clear rejection of the preferred MMA proposal, and in the interests of alleviating System Management's concerns and assisting the IMO Board resolve this	The IMO notes Pacific Hydro's support (and that of a number of other Market Participants) for modified methodology 1 subject to a number of similar amendments including the

Modified Methodology 1					
	Proposal	Clause/Issue	Submitter	Comment/Change Requested	IMO's response
				<p>issue, Pacific Hydro can support the methodology proposed in the Sapere Report, subject to the following changes:</p> <ol style="list-style-type: none"> <li>1. Modelling should include Collgar Wind Farm within the Sapere methodology (thereby allowing industry to consider the impacts);</li> <li>2. Provide greater certainty and transparency around the formulation and setting of the adjustment factors; and</li> <li>3. Change the methodology to use Operational Load instead of Load for Scheduled Generators when considering trade intervals.</li> </ol>	<p>removal of LSG and removal of the U factor (or greater transparency of how it is determined in a number of cases). Given the number of parties which raised these points in their second round submissions the IMO has further considered the rationale for using LSG vs. operational load and investigated options for improving certainty around the U-factor adjustment.</p> <p>The IMO notes that the adjustment factors have been formulated on the basis of achieving a non-biased estimate of the true capacity value. This will continue to be the basis in the future.</p> <p>Further details of the IMO's considerations are presented in section 6.3 of this report. In particular regarding:</p> <ul style="list-style-type: none"> <li>• the use of LSG refer to Section 6.3.1.1</li> <li>• the transparency of the adjustment factors refer to Section 6.3.2.2</li> <li>• modelling of Collgar Wind Farm, refer to Section 6.3.3</li> </ul> <p>of this report.</p>
4.	RC_2010_25 & RC_2010_37	Modified Methodology 1	LGP	Particularly welcome the innovations of basing the certification on the "Z Method" applied to the top 12 Daily Trading Intervals occurring over the previous 5 years, and treating each facility on a stand-alone basis. This is	The IMO notes LGP's support.

Modified Methodology 1					
	Proposal	Clause/Issue	Submitter	Comment/Change Requested	IMO's response
				especially meritorious as it is aligned with theory and international practice.	
5.	RC_2010_25 & RC_2010_37	Modified Methodology 1	LGP	On this basis, LGP perceive that there is no basis for proceeding in other than an orderly, considered manner based on theoretical foundations and international practice. LGP perceive that the certification method is destined to become a seminal contribution to the valuation of intermittent capacity and care should be taken in preserving its integrity.	The IMO appreciates LGP's views.
6.	RC_2010_25 & RC_2010_37	Modified Methodology 1	Synergy	Synergy has not previously encountered the "z-method", as discussed by Sapere, and so is unable to confirm or refute the proposition that it is internationally recognised or the extent to which it is used in similar jurisdictions. Although this is an issue, the greater concern for Synergy is that it does not fully comprehend or understand the capacity valuation implications arising from the market adopting this methodology or how much valuations will change year to year i.e. its underlying volatility or how valuations of new facilities will be impacted by existing facilities (and vice versa).	<p>The IMO notes Synergy's concerns. The capacity valuation will depend upon the facility's output and correlation with demand and other existing facilities during times of peak demand. The concerns raised around the underlying volatility or how valuations of new facilities will be impacted by existing facilities was raised in a number of submissions received during the second submission period. Details of the IMO's further consideration of these issues are presented in sections 6.3.2 and 6.3.1.2 respectively.</p> <p>Note that following this further analysis the IMO has decided to amend modified methodology 1 to ensure that new facilities with estimated data do not impact on the valuation of existing facilities and to cap the U-factor adjustment.</p>
7.	RC_2010_25 & RC_2010_37	Modified Methodology 1	Synergy	Sapere did not recommend the z-method per se but rather an untested variant on account of what it claims is an absence of representative 1-in-10 demand data and associated IGF	The IMO notes Synergy's view.

Modified Methodology 1					
	Proposal	Clause/Issue	Submitter	Comment/Change Requested	IMO's response
				generation data. In this regard, Synergy is not convinced that the SWIS of late has not experienced a 1-in-10 summer demand and considers for instance the most recent summer, which delivered high humidity, to be clearly one that consistently amplified the levels of customer demand, and Synergy submits that even if the temperature had been higher, and higher for more days, it would not have resulted in substantial extra MW of demand.	
8.	RC_2010_25 & RC_2010_37	Modified Methodology 1	Synergy	Taking these factors into consideration and reflecting on Synergy's experience with forecasting systems, such as those used by the IMO to produce the Reserve Capacity Target, and the temperature/IGF output analysis relied upon by Sapere, Synergy's view is that they tend to over-estimate demand as temperature increases, lacking a saturation factor which recognises that demand is finite as ultimately there is only so much load that can be brought to bear on the system. This weakness is particularly the case if regression methods are used.	The IMO notes Synergy's view. The IMO expects that a more detailed examination of how output varies with extreme temperatures and demand will be part of the next review.
9.	RC_2010_25 & RC_2010_37	Modified Methodology 1	Infigen Energy	The Sapere method is an attempt to produce a hybrid between ELCC and peak period methodologies. The use of the Z method is only identified in one jurisdiction that uses ELCC. This method does not reflect the methodologies used in the WEM to identify high risk periods.	The IMO notes Infigen's views.  The use of LSG to identify the periods in which additional capacity is most valuable is described in Section 6.3.1.1
10.	RC_2010_25 & RC_2010_37	Modified Methodology 1	Infigen Energy	Moving forward, it is perhaps the case that this average should be extended on a year-by-year basis to finally reach and sit at a rolling 10-	As noted in Section 6.3.6, the IMO considers that the length of the period under consideration in modified Methodology 1 to

Modified Methodology 1					
	Proposal	Clause/Issue	Submitter	Comment/Change Requested	IMO's response
				year average that is consistent with risk analysis of the system as a whole. New entrants without sufficient data could be allocated the fleet average capacity factor for the years they have no data.	be something that might be considered in future reviews.
11.	RC_2010_25 & RC_2010_37	Modified Methodology 1	Infigen Energy	The overall Capacity Credit methodology should reflect time weightings over the course of the year to capacity values, and this should be reflected in the methodologies for determining the capacity values for intermittent generators.	As noted in Section 6.3.6, the IMO considers that assigning weights to the Trading Intervals is something that should be considered for the next review.
12.	RC_2010_25	Modified Methodology 1	Alinta	<p>Supports the principle that the number of Capacity Credits assigned to an individual Facility be determined both on an equitable basis, and reflect the Facility's ability to support the secure and reliable operation of the WEM.</p> <p>Also supports an outcome whereby Facilities with output that is both more variable and less certain be assigned fewer Capacity Credits than Facilities with output that is less variable and more certain, particularly with respect to periods of peak demand.</p> <p>The proposed changes to the Market Rules for determining the number of Capacity Credits that maybe assigned to Intermittent Facilities contemplated by the modified IMO proposal outlined in the Draft Rule Change report for RC_2010_25 appear to represent a step along this path.</p>	The IMO also supports these principles and notes Alinta's assessment of the apparent alignment of modified Methodology 1 with these principles
13.	RC_2010_25 &	Modified Methodology 1	System Management	System Management supports the concept of that capacity value of Intermittent Generation	The IMO appreciates System Management's concern, however the IMO notes that the

Modified Methodology 1					
	Proposal	Clause/Issue	Submitter	Comment/Change Requested	IMO's response
	RC_2010_37			<p>be based on an average value less a variability adjustment.</p> <p>System Management previously put forward this concept during the Renewable Energy Generation Working Group (REGWG) deliberations, using a 90% Confidence Level for non scheduled generation.</p> <p>System Management's prime concern is the actual output is less than half of the average output (above 16% of the installed capacity) for 17% of the time and the actual output is less than one third of the average output (about 10% of the installed capacity) for 11% of the time.</p>	reliability value of Intermittent Generators depends not just on the Intermittent Generators' output but also how this output interacts with demand that is also volatile.
LSG Concept					
14.	RC_2010_25 & RC_2010_37	LSG	APA Group	Does not support the LSG methodology. It is inconsistent with the treatment of other generation capacity under the Market Rules. It is also inconsistent with the rationale used in the Sapere methodology itself.	The IMO notes APA's view. Refer to Section 6.3.1 for details of the IMO's analysis and subsequent response to this issue which was raised in a number of submissions.
15.	RC_2010_25 & RC_2010_37	LSG	APA Group	LSG has the potential to shift the top 12 intervals by demand into intervals that are not the super-peak intervals in a year. If this is considered beneficial, then it would follow that other non super-peak intervals should also be considered; or that many more than 12 peak intervals should be used (a point argued in RC_2010_37).	There is a trade-off in the number of Trading Intervals that are selected. The more Trading Intervals that are used the greater the risk that the Trading Intervals are not representative of the absolute peaks. Using too little a number of Trading Intervals leads to the risk of unwarranted variability in the results. The number of Trading Intervals selected reflects this balance. Refer also to Section 6.3.1.5
16.	RC_2010_25	LSG	APA Group	A more useful definition of an LSG super-peak	The IMO notes APA's view.

Modified Methodology 1					
	Proposal	Clause/Issue	Submitter	Comment/Change Requested	IMO's response
	& RC_2010_37			would be not when scheduled generation is at its highest, but when the available capacity cushion is at its lowest. Scheduled generation is likely to be highest in summer peaks.	The IMO considers that Peak LSG should be when the expected capacity cushion will be at its lowest; if this was not the case it would be expected that System Management will schedule additional generation at these times
17.	RC_2010_25 & RC_2010_37	LSG	APA Group	The LSG concept is inconsistent with using a small number of super-peak intervals to determine IGF capacity value. LSG should either be used with many more intervals, or should be abandoned if using a small number of peak demand intervals.	The IMO notes APA's view. Refer to Section 6.3.1.5 for details of the IMO's analysis and subsequent response to this issue which was raised in a number of submissions.
18.	RC_2010_25 & RC_2010_37	LSG	APA Group	The greatest problem with using the LSG concept in the modified RC_2010_25 methodology is that, by using only a small number of intervals for each year over 5 years, a new entrant IGF, by imposing its "estimated" output over the hot season of the last 5 years, is likely to alter the LSG intervals used. In fact, one would expect that a large wind or solar PV facility would be almost certain to do so. This introduces a level of volatility into the market that is neither welcome nor necessary.	The IMO appreciates this issue and has decided to adopt the amendment discussed in Section 6.3.1.2
19.	RC_2010_25 & RC_2010_37	LSG	APA Group	If it is deemed appropriate to use only a small number of intervals each year to calculate the capacity value of IGFs, then using peak demand intervals creates far less volatility than using LSG intervals.	Refer to the IMO's response to Issue 17
20.	RC_2010_25 & RC_2010_37	LSG	LGP	The issue seems intimately related to the valuation of Capacity Refunds for Scheduled Generation, which has been separately considered and deferred to another forum. We agree that developers should be given	The IMO notes LGP's view.

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				investment signals and that inverse-correlation with the existing Intermittent Generation Fleet is a desirable quality.	
21.	RC_2010_25 & RC_2010_37	LSG	LGP	LGP are also concerned that a "pure" LSG signal is not possible because of the interaction of the dispatch of Demand Side Management (DSM). The 12 LSG Peak Intervals will effectively be a random variable that delivers no signal to developers.	<p>The IMO considers that the actual level of peak demand in the WEM may be understated if curtailment of DSM and Interruptible Loads, and involuntary load shedding are ignored. That is in a contingency event (such as the restriction of gas supply to scheduled generators on a hot day) it is likely that total generation may not be reflective of the true level of demand in the system and therefore the marginal value of Intermittent Generation in those intervals would be understated. For further details of the IMO's analysis of the impacts of voluntary and involuntary load reductions in shifting the peak LSG intervals refer to section 6.3.1.3 of this report.</p> <p>The IMO has amended the calculation of LSG to be based on the sum of the level of generation of all Facilities, DSM and Interruptible Load curtailment and involuntary load shedding, minus the level of generation of Intermittent Generators.</p>
22.	RC_2010_25 & RC_2010_37	LSG	Perth Energy	With regard to the selection of the 60 LSG intervals under the Amended IMO Proposal Perth Energy queries whether this was intended to be influenced by the output of all Intermittent Facilities that will be available in the Capacity Year in question, including all the Intermittent Facilities with no historic metering output at all.	The IMO has chosen to amend the 60 LSG intervals as described in Section 6.3.1.2 so that for existing facilities LSG will only be calculated using historic metered data thereby removing any potential impact of new entrants' estimated data on the existing fleet of Intermittent Generators.

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23.	RC_2010_25 & RC_2010_37	LSG	Perth Energy	Intervals for the entire fleet of intermittent generators could be significantly influenced by non real life data points as the estimated output in the expert report would be utilised. This could have particular severe consequences when large facilities enter the system.	Refer to the IMO's response to Issue 22
24.	RC_2010_25 & RC_2010_37	LSG	Pacific Hydro	It appears that the LSG methodology acts to remove from the calculation high demand intervals when the intermittent fleet is operating at high capacity while keeping intervals of when the intermittent plant has low output. This acts to introduce an inherent bias against intermittent generation.	The selection of Trading Intervals using the LSG methodology may reflect the variability of Intermittent Generators. Refer to Section 6.3.1.1
25.	RC_2010_25 & RC_2010_37	LSG	Pacific Hydro	The LSG methodology was introduced by MMA to reduce volatility however there is no confidence that this remains the case with detailed modelling undertaken by industry participants using their operational data seeing that volatility remains in the methodology.	The IMO notes Pacific Hydro's views. Refer to Section 6.3.1.5 for details of the IMO's analysis and subsequent response to this issue which was raised in a number of submissions.
26.	RC_2010_25 & RC_2010_37	LSG	Pacific Hydro	LSG is unique to this calculation with no historic data (unlike Operational Load which is the Market standard and well documented) and so introduces another layer of complexity and uncertainty to the Market Rules.	The IMO notes Pacific Hydro's views. Refer to the IMO's response to Issue 41. Also refer to Section 6.3.1.2 for details of the IMO's analysis and subsequent response
27.	RC_2010_25 & RC_2010_37	LSG	Synergy	The market, even the relevant working group, did not adequately discuss LSG and so had not formed a robust opinion. Even Griffin, in proposing RC_2010_37, as confirmed at the recent workshop, were not recommending or agreeing to LSG.	The IMO notes that both the original proposals for RC_2010_25 and RC_2010_37 proposed the use of LSG in the respective methodologies they put forward.
28.	RC_2010_25 &	LSG	Synergy	Is concerned that such maximum LSG periods will be difficult or impossible to predict in the	The IMO accepts that LSG is slightly more difficult to predict in the long term than

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	RC_2010_37			medium to long term (in contrast with maximum system load, which is much more predictable), and so the resulting signals to IGF developers will be confused. The concept may therefore act to discourage the development of IGF that would make their maximum contribution to capacity at the time of maximum system load. This is counter-intuitive and would represent a significant change to the RCM as, in regards to IGF, it would no longer reward alignment with peak system load conditions, which is a fundamental tenet of the RCM.	operational load as it also reflects the output of Intermittent Generators. The IMO notes that this is consistent with the electricity market in that the price received depends output of other facilities. The IMO notes that peak LSG Trading Intervals are currently similar to the peak Operational Load Trading Intervals, even when selected on different Trading Days. The IMO has determined the 12 peak Trading Intervals on different days for the last five year, using both LSG and Operational Load. Over 60 % of the Trading Intervals were coincident for both LSG and Operational Load; and only 20% not adjacent. The peak Trading Intervals were on different days in only in 2 of 60 cases.  The IMO reiterates its view that additional capacity has its highest value during the peak LSG Trading Intervals. Refer to section 6.3.1.1 .
29.	RC_2010_25 & RC_2010_37	LSG	Synergy	The concept appears to be dynamic with maximum LSG periods likely to change over time as additional IGF capacity is brought to bear on the market. This means, in the absence of linking valuations to the LSG prevailing at commissioning (i.e. grandfathering), that investors will be uncertain of future valuations as they will, in part, reflect the impact of other IGF investments. To cover this risk, investors will include a premium which will increase the long term cost IGF capacity to the market.	Refer to the IMO's responses to Issues 6 and 22.
30.	RC_2010_25	LSG	Synergy	Recommends that the IMO consider	The IMO has presented further detail of the

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	& RC_2010_37			conducting a workshop to explain the benefits and risks of the market adopting the LSG concept as an input to IGF capacity valuations.	associated benefits (and costs) associated with using LSG in section 6.3.1.1 On balance the IMO considers that there is sufficient merit associated with proceeding to use LSG.
31.	RC_2010_25 & RC_2010_37	LSG	Mid West Energy Pty Ltd	MWE does not support the LSG methodology as it is inconsistent with the treatment of other generation capacity under the market rules which are allocated capacity credits based on their output at 41 degrees. The capacity credit methodology should encourage the installation of generation that reliably produces electricity at times of peak network demand (such as solar).	The IMO notes MWE's views. Refer to section 6.3.1.4 for details of the IMO's analysis and subsequent response
32.	RC_2010_25 & RC_2010_37	LSG	Mid West Energy Pty Ltd	The key issue with using the LSG concept in modified RC_2010_25 methodology is that by using a small number of peak intervals for each year over the past 5 years, a new intermittent generator will alter the LSG intervals used as its 'estimated' output over the past 5 years will be incorporated into the LSG calculations. This would introduce a level of variability into the reserve capacity allocation from one year to the next and is not in the interests of the reserve capacity market, nor is it in the interests of market participants.	The IMO notes MWE's concern. Refer to the IMO's response to Issue 22
33.	RC_2010_25 & RC_2010_37	LSG	Mid West Energy Pty Ltd	The LSG methodology is impacted by the output of installed and new intermittent generators which greatly increases the complexity and uncertainty of forecasting capacity credit revenue as it requires various assumptions to "predict" the installed intermittent generator fleet output in future periods of peak demand. Uncertainty when modelling revenues is an impediment to	The IMO notes MWE's concern. Refer to the IMO's response to Issue 22 and the analysis undertaken in Sections 6.3.1.2 and 6.3.1.5

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				developing renewable energy projects. Put simply, if financiers and power purchasers do not have comfort that the methodology assigning capacity credits to a project is stable and provides certainty from one period to another, they will discount or disregard this critical income stream, increasing the cost of intermittent generation.	
34.	RC_2010_25 & RC_2010_37	LSG	Mid West Energy Pty Ltd	Using peak demand intervals over each of the 5 years, rather than LSG intervals to calculate Capacity Credits for intermittent generators will create significantly less volatility.	The IMO notes MWE's views. Refer to Section 6.3.1.1 and 6.3.1.5 for details of the IMO's analysis and subsequent response.
35.	RC_2010_25 & RC_2010_37	LSG	Infigen Energy	Does not agree with the use of 12 peak intervals each year, and believes a more statistically robust approach would be to use all afternoon intervals in the hot season, however we can accept the use of 12 peak demand intervals over 5 years (selected without using LSG). This is also more aligned with international practice.	The IMO notes Infigen Energy's views but notes that the problem with using just afternoon intervals is that some afternoon intervals may not be high demand days because of weather patterns that also affect some technologies (like solar).
36.	RC_2010_25 & RC_2010_37	LSG	Infigen Energy	LSG introduces additional and unavoidable volatility of outcomes when new entrant data is introduced. LSG intervals for previous years (still used in calculations) will change with new entrant data, increasing uncertainty of revenues. This will make it almost impossible to rely on capacity credit revenue in financing new plant.	The IMO notes Infigen's concern. Refer to Section 6.3.1.2 for details of the IMO's analysis and subsequent response.
37.	RC_2010_25 & RC_2010_37	LSG	Infigen Energy	LSG manifestly discriminates against Intermittent Generation by discounting intervals where their generation is greater. For any two high load intervals with equal load, the interval where intermittent generation is least	The selection of Trading Intervals using the LSG methodology may reflect the variability of Intermittent Generators. Refer to Section 6.3.1.4

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				will be selected, thereby discounting its contribution. The argument that the system is at a higher risk during a higher LSG interval is spurious. Other generators are only judged on their performance during the identified high risk times, so the same should hold true for intermittent generators.	
38.	RC_2010_25 & RC_2010_37	LSG	Infigen Energy	The IMO Draft Rule Change Report states "there is a strong rationale for using LSG ...as LSG is highest in Trading Intervals when additional capacity has the highest value to the market." This is an additional criterion that would apply only to Intermittent Generators – the selection of the highest load trading intervals should already achieve this end. The highest marginal value of capacity credits is not used for other types of generation.	The IMO notes Infigen's views. Refer to Section 6.3.1.4 for details of the IMO's analysis and more detailed response to this issue.
39.	RC_2010_25 & RC_2010_37	LSG	Infigen Energy	The LSG methodology also makes each independent intermittent generator dependant on the others for its contribution to the capacity market. This is not the case with other forms of Capacity Classes (Scheduled Generation, DSM).	The LSG methodology reflects the benefit of diversity among Intermittent Generators. The capacity value of an Intermittent Generator depends on the correlation of its output with other Intermittent Generators. Refer to Section 6.3.1.4
40.	RC_2010_25 & RC_2010_37	LSG	Infigen Energy	Contrary to assertions in the Rule Change proposals and the Sapere report, LSG has not 'gained acceptance'. It was not an agreed outcome of the REGWG. It also has no precedent in international markets.	The IMO appreciates that, despite being central to both of the IMO and Griffin proposals, LSG had not 'gained acceptance' from the market. The IMO however considered there is value in the LSG concept and that if it were not used, some alternative to reflect the correlation with other Intermittent Generators (such as a covariance adjustment) would be required. Refer to Section 6.3.1.1 for further details.

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41.	RC_2010_25 & RC_2010_37	LSG	Infigen Energy	Determination of LSG intervals introduces complexity and administrative cost into the process that is unnecessary, and does not provide any tangible benefit in return.	The IMO considers that the administrative cost of LSG is negligible and that the concept itself is not complex. The IMO appreciates that there is some complexity in the implications of LSG. The IMO considers that LSG provides great benefit and is no more costly or complex than the alternative. Refer to Section 6.3.1.1 for further details.
42.	RC_2010_25 & RC_2010_37	LSG	Infigen Energy	No Market Participant (or potential participant) can independently calculate their Capacity Credit revenue without requesting the LSG intervals from the IMO. Even when intervals are provided, they are likely to change with new entrants, and therefore require assumptions to be made about which new generation will enter the market at which time, and what that effect may be. This is already a problem as existing facilities have not been able to model the impact of Collgar wind farm on their capacity credits using the proposed methodology.	The IMO notes that the relevant LSG values will be published on the IMO website to allow Market Participants to assess the likely impacts of their capacity valuation level. This was reflected in the proposed Amending Rules put forward in the Draft Rule Change Report.  The IMO notes its decision to amend modified methodology 1 to ensure that new facilities with estimated data do not impact on the valuation of existing facilities. Refer to Section 6.3.1.2 for details of the IMO's supporting analysis.
43.	RC_2010_25	LSG	Alinta	It is not clear why absolute operational peaks are not used if the intent is to assign Capacity Credits to Intermittent Facilities based on their ability to support the secure and reliable operation of the WEM during periods of peak demand. Peak LSG Trading Intervals represent an inherently biased sample of the output of Intermittent Facilities.	The IMO notes Alinta's views. Refer to Section 6.3.1 for details of the IMO's analysis and more detailed response to this issue.
44.	RC_2010_25 & RC_2010_37	LSG	Vestas Wind Systems	The LSG approach will only be so where a large number of Trading Intervals are considered, such as the options from the REGWG process where 250 and 750 of the	The IMO notes Vestas's views. Refer to Section 6.3.1.5 for details of the IMO's analysis and more detailed response to this issue.

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				top Trading Intervals were used.	
45.	RC_2010_25 & RC_2010_37	LSG	Vestas Wind Systems	The use of LSG also discriminates against Intermittent Generators because it is a different approach than that used for other kinds of generators such as gas and coal fired power stations, which under the Market Rules do not have their capacity value affected by the output of their competitors.	The IMO notes Vestas's views. Refer to Section 6.3.1.4 for details of the IMO's analysis and more detailed response to this issue.
46.	RC_2010_25 & RC_2010_37	LSG	Collgar Wind Farm	Load for Scheduled Generation is a relatively new concept being brought into the Market Rules which discriminates against renewable generators and heavily favours scheduled and peaking generators.	The IMO notes Collgar's views. Refer to Section 6.3.1.4 for details of the IMO's analysis and more detailed response to this issue.
47.	RC_2010_25 & RC_2010_37	LSG	Collgar Wind Farm	<p>The LSG methodology fails to accurately recognise the contribution made by renewable energy generators on the SWIS to overall generation supply and capacity.</p> <p>Collgar points to the forecast overcapacity currently on the SWIS and forthcoming years. LSG will only serve to increase this sub-economic position.</p>	The IMO disagrees with this view. Refer to Section 6.3.1.1 for details of the IMO's analysis and a more detailed response to this issue.
48.	RC_2010_25 & RC_2010_37	LSG	SEA	SEA does not support the LSG methodology as it is inconsistent with the treatment of other generation capacity under the market rules which are allocated capacity credits based on their output at 41 degrees. By utilising a different methodology in this instance, we question whether this is fair and equitable to non-wind intermittent generation. The capacity credit methodology should encourage the installation of generation that reliably provided electricity at times of peak network demand	<p>The IMO notes SEA's view. Refer to Section 6.3.1 for the IMO's more detailed response to the use of the LSG to measure performance during peak periods.</p> <p>The IMO considers that the proposed methodology is insensitive to technology. An Intermittent Generator that is less variable in its output (irrespective of technology) will achieve a valuation closer to its average output.</p>

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				(such as solar).	
49.	RC_2010_25 & RC_2010_37	LSG	SEA	By using a small number of peak intervals for each year over the past 5 years, a new Intermittent Generator will alter the LSG intervals used as its 'estimated' output over the past 5 years will be incorporated into the LSG calculations. This would introduce a level of variability into the reserve capacity allocation for one year to the next and is not in the interests of the reserve capacity market, nor is it in the interests of market participants.	The IMO notes SEA's views. Refer to Section 6.3.1.2 for details of the IMO's analysis and more detailed response to this issue.
Adjustment Factor					
50.	RC_2010_25 & RC_2010_37	Adjustment Factor	Perth Energy	With regard to the adjustment mechanism under the Amended IMO Proposal Perth Energy agrees with the principle that facilities with large variances in their LSG output should have a deduction against their assessed capacity credit level compared to similar facilities with more stable LSG output. Perth Energy therefore considers that an adjustment related to the variability in the output would be appropriate.	The IMO notes Perth Energy's support for the inclusion of an adjustment factor being incorporated into the methodology.
51.	RC_2010_25 & RC_2010_37	Adjustment Factor	Perth Energy	It is difficult for Perth Energy to pass comment on the level of the parameters "K" and "U" which together determine the level of reduction in the Capacity Credits flowing from variability in output. Perth Energy would welcome further transparency as to the setting of these parameters to make the methodology less of a "black box".	The IMO notes Perth Energy's request for greater transparency of how the values for these adjustment factors were determined. Dr Richard Tooth from Sapere has provided an explanatory note which outlines the basis under which he formed his views on an appropriate level to set the adjustment factors at.  Refer to Section 6.3.2 for further details.
52.	RC_2010_25	Adjustment	System	System Management believes it is better to	The IMO notes that the variance is simply the

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	& RC_2010_37	factor	Management	express the Facility Adjustment Factor as a coefficient multiplied by the standard deviation of the output. This because it is the more common form that can easily be translated to a confidence level for the variability adjustment. That is a coefficient of 1.00 indicates that the output would be better than given in the formulation 85% of the time.	square of the standard deviation. A confidence interval can only be generated once the distribution is also known. The example provided by System Management refers to the case where there is a normal distribution; the IMO however notes that this is rarely the case in with regard to a single facility's output. As such the IMO considers it inappropriate to incorporate System Management's suggested amendments.
53.	RC_2010_25 & RC_2010_37	Adjustment factor	System Management	System Management believes for capacity procurement that the final adjustment coefficients be used. Hence in determining whether there is sufficient capacity procured for 2014/15 and 2015/16 the adjustment factors are K=0.003 and U=0.635. System Management understands commercially that the facility Capacity Credits however will differ to these.	The IMO notes System Management's view. The IMO however considers that introducing one capacity value for payments for facilities and another value for reliability considerations is out of scope of RC_2010_25 and RC_2010_37.
54.	RC_2010_25 & RC_2010_37	Adjustment factor	System Management	<p>The proposed rule change is critical on the parameters K and U. it is unclear as to how these are determined or how these could be reviewed at a later date by a different consultant. It is surprising that the value of U is determined to 3 decimal places.</p> <p>System Management believes that any parameters be set to give a true representation of the contribution intermittent generation makes during the peak days in comparison with that of the capacity credit based generator being a 160MW open cycle gas turbine whose output availability is equal to its Reserve Capacity Credit with a 90+% confidence. To</p>	<p>The IMO notes System Management's request for greater transparency and agrees that failure to provide greater clarity over how the U-factor was determined would make setting this value in the future more difficult if another consultant is engaged to complete the review. It would also likely introduce unnecessary additional volatility into the modified Methodology 1.</p> <p>Refer to Section 6.3.2 for further details of how the U-factor was determined including Dr Tooth's explanatory note.</p>

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				this end System Management believes the parameters need to be about twice those suggested in the proposed rule change.	
55.	RC_2010_25 & RC_2010_37	Adjustment factor	Pacific Hydro	The adjustment factors are not explained in a sufficiently transparent manner that would enable them to be replicated.	The IMO notes Pacific Hydro's concerns. Refer to Section 6.3.2 for further details of how the U-factor was determined including Dr Tooths explanatory note.
56.	RC_2010_25 & RC_2010_37	Adjustment factor	Pacific Hydro	<p>An inability to replicate variables or methodology or to have important variables that can be calculated in a non-transparent, ad hoc way will lead to the value of Capacity payments being heavily discounted by potential investors. Wind farm developers need to be able to build a transparent capacity payment methodology into their models for two reasons:</p> <ul style="list-style-type: none"> <li>• At the development stage, it will help determine whether a wind farm is economically viable or whether another option should be pursued;</li> <li>• Once operating, it will enable the generator to check the accuracy of the capacity payments they are receiving.</li> </ul> <p>It is recommended that the adjustment factors contained in the proposed methodology be formulated in a way that allow them to be replicated going forward.</p>	The IMO notes Pacific Hydro's concerns. Refer to Section 6.3.2 for further details of how the U-factor was determined including Dr Tooths explanatory note.
57.	RC_2010_25	Adjustment factors	Alinta	It is difficult to assess the appropriateness of the values that have been determined for 'K' and 'U', and further transparency on the setting of these values would be welcomed so as to preclude any inaccurate perceptions about the process.	Refer to Section 6.3.2 for further details on how the adjustment factors were determined.

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58.	RC_2010_25 & RC_2010_37	Adjustment factor	Synergy	Is not convinced by Sapere's argument in respect of the magnitudes of the adjustment factors and suggests to the IMO Board that if it were to consider implementing the amended z-method that it should: either seek a more rigorous assessment of the relationship between IGF output and temperature, possibly by engaging a suitably qualified consultant with local experience in this field, or by removing U value at this juncture.	<p>The IMO considers that there will be more rigorous assessment of the relationship between IGF output and temperature that can be completed as part of the next review. Until that time, the IMO considers it appropriate that the current estimate is used given that:</p> <ul style="list-style-type: none"> <li>• it is an unbiased best efforts estimate</li> <li>• the risk of any error is mitigated by the transition period</li> <li>• deferring a more rigorous review until the next period allows for additional data to be collected and more time devoted to analysis.</li> </ul> <p>The IMO views that removing the U-factor adjustment would result in a biased estimate.</p>
59.	RC_2010_25 & RC_2010_37	U Factor	APA Group	Is adamant in its position that the U-factor is inappropriate and should be removed from the methodology.	The IMO notes APA's view. Refer to Section 6.3.2
60.	RC_2010_25 & RC_2010_37	U Factor	APA Group	If only 12 specific intervals are to be used each year, as is contemplated by modified RC_2010_25, then this level of inaccuracy is inappropriate. A U-factor is better suited to a much larger number of intervals.	<p>The IMO notes APA's view. Refer to Section 6.3.1.5 for discussion on the number of Trading Intervals selected.</p> <p>The U-factor is based on the variance and the average of the facility's output at peak. The expected value of these factors does not depend materially on the number of observations used.</p> <p>The more Trading Intervals used, the greater the risk that the Trading Intervals used are not representative of the peaks.</p>
61.	RC_2010_25	U Factor	APA Group	When a 1-in-10 year hot season is encountered, then the U-factor becomes	The IMO has stated that the U-factor would be reviewed should a 1-in-10 year event be

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	& RC_2010_37			redundant. The fact is, in a 1-in-10 year hot season, just as in any other hot season, if an IGF is not producing in the peak intervals, then the number of capacity credits it receives will be commensurately reduced. To embed the U-Factor in the methodology would be either a double discount (if the IGF had low output in a 1-in-10 year hot season) or an unnecessary discount (if the IGF showed it was capable of high output in a 1-in-10 year hot season).	encountered.
62.	RC_2010_25 & RC_2010_37	U Factor	APA Group	The U-factor also uses a probability of exceedance based on the 95th percentile. The market itself bases its probability of lost load on a 1-in-10 year assessment. Additionally, the modified RC_2010_25 uses 5 years' worth of peak interval data (rather than 10 years – consistent with a 1-in-10 year assessment, or 20 years – consistent with the 95th percentile assessment). The U-factor is an inconsistent and unnecessary measure.	The IMO notes APA's view.
63.	RC_2010_25 & RC_2010_37	U Factor	APA Group	By far the largest problem with the U-factor however is its manifest discrimination against solar facilities, and a likely discrimination against wave and between individual wind farms. The U-Factor was specifically based on the assumed probability that wind farm output would be lower during periods of very high temperature. Logic dictates that the output of a solar facility would be at its greatest during periods of very high temperature. A solar facility should in fact have a positive U-factor. To <i>discount</i> the capacity output of a solar facility based on its assumed output during times of extreme temperature is nonsensical	The IMO does not agree with this view.  The U-factor adjustment was established to address the concern identified in the Sapere Report that Intermittent Generator may be lower during extreme peaks associated with very hot days. Refer to Section 6.3.2.1 Refer to Section 6.3.2.1

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				and clearly discriminates against that technology.	
64.	RC_2010_25 & RC_2010_37	U Factor	LGP	This is justified on the grounds that there is little evidence of the performance of large-scale Intermittent Generators during peak conditions. LGP perceive this position to be an interpretation of a graph which for the period 2007 to 2011 is unclear whether the peaks refer to load or Load for Scheduled Generation. 5 data points above 41C indicate an increasing trend, rather than decreasing, albeit from a low base. The graph gives no indication of the year or years in which the >40C data points occur, or of the size of the IGF Fleet at that time. In effect, the U-Factor appears to be only a subjective fudge factor.	The IMO notes LGP's concerns. Refer to Section 6.3.2.2
65.	RC_2010_25 & RC_2010_37	U Factor	Synergy	It is also worth noting that demand is not simply temperature driven but also dependent upon the level of humidity. It is often forgotten that demand is also largely determined not by the maximum temperature but the minimum temperature and the residual heat in housing stock: a high overnight minimum in summer will always result in a high demand the following day. The reverse is the case in winter. These points are made to challenge the notion that maximum temperature alone drives demand and that establishing a simple linkage between peak temperature and demand is inaccurate and not a sufficient basis of itself for creating a second correction factor for IGF production. Strangely, the Sapere paper sets the U value based upon the RC_2010_25 method opening it up to the criticism that its	That temperature is not the only factor driving demand is understood. Refer to Section 6.3.2.2 The IMO expects that there will be more detailed examination of the extreme demand scenarios as part of the three year review.

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				determination is arbitrary.	
66.	RC_2010_25 & RC_2010_37	U factor	Mid West Energy Pty Ltd	The U factor is not central to the revised Rule Change Proposal RC_2010_25 methodology and is an arbitrary amendment to reduce the Capacity Credits allocated to Intermittent Generators. The U factor calculated in the Sapere report only used the actual output of existing wind farms, yet the revised Rule Change Proposal RC_2010_25 methodology will apply to all Intermittent Generators, including solar.	The IMO notes that the U –factor is required to account for the significant risk that the output of Intermittent Generators is materially less during conditions when demand is likely to be at its peak.  Refer to section 6.3.2.
67.	RC_2010_25 & RC_2010_37	U factor	Mid West Energy Pty Ltd	Solar generators have a very high correlation between high temperatures and generator output and it is incomprehensible that the IMO would apply an arbitrary discount factor to the output of solar generation. In fact, solar should receive a positive U factor.	The IMO notes that the U-factor will make an adjustment proportional to the variance of a Facility.  Refer to section 6.3.2.
68.	RC_2010_25 & RC_2010_37	U factor	Mid West Energy Pty Ltd	MWE strongly believes the U factor is discriminatory and should be removed from the RC_2010_25 methodology. If the IMO was to retain the U factor, then different U factors should be applied to different technology types, and solar generation should receive a positive U factor given its close correlation with peak demand.	The IMO disagrees and notes that the method is designed to reward facilities that have an output with a close correlation to when additional capacity is most needed.
69.	RC_2010_25 & RC_2010_37	U factor	Synergy	The rationale for the inclusion of the U value relies upon a degree of correlation between IGF output and increased or high temperatures. Sapere's report only provides two charts to justify this point, one being Figure 3 which visually does not appear to suggest any particular relationship between IGF output and temperature and Figure 4	Refer to Section 6.3.2.1

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				<p>which is inconclusive. Importantly, the text of the report under Figure 4 states:</p> <p><i>"These results themselves are based upon a small number of TIs and should not be considered as strong evidence of IGF output during extreme demand/temperature scenarios."</i></p> <p>It is therefore difficult, if the evidence is not considered "strong", to understand why the report concludes the need for a U value adjustment or how it can propose a particular value for U. In Synergy's view, it is also premature, without at least an analysis of the impact of Collgar's data, to reach such a conclusion.</p>	
70.	RC_2010_25 & RC_2010_37	U factor	Infigen Energy	The U Factor should be removed from adjustment formula.	The IMO notes Infigen's view.
71.	RC_2010_25 & RC_2010_37	U factor	Vestas Wind Systems	The "U-factor" used in the revised RC_2010_25 is also inappropriate and should be removed. Aside from having no clear basis, the "U-factor" is also irrelevant to valuing capacity. Its most fatal flaw is that it is based on temperature.	The IMO notes Vestas's view. Refer to Section 6.3.2.1
72.	RC_2010_25 & RC_2010_37	U factor	Collgar Wind Farm	<p>The "U" parameter in the Sapere methodology is a "balancing" factor applied to achieve a compromised result between the prior methodologies proposed.</p> <p>This parameter can seemingly be changed at whim every three years hence providing no regulatory certainty on how intermittent</p>	The U-factor adjustment was established to address the concern identified in the Sapere Report that Intermittent Generator may be lower during extreme peaks associated with very hot days. Refer to Section 6.3.2.1

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				generation capacity will be valued.	
73.	RC_2010_25 & RC_2010_37	U factor	Collgar Wind Farm	The Sapere report justifies its use of the "U" parameter by making reference to "international standards" and "benchmarks" while failing to disclose those benchmarks and hence preventing proper analysis and scrutiny. Given the unique nature of the Western Australian energy market any such "international standard" must be disclosed to determine whether they can be applicable.	The IMO disagrees with Collgar's comments. The U parameter is not based on "international standards". Refer to Section 6.3.2.2
74.	RC_2010_25 & RC_2010_37	U factor	Collgar Wind Farm	Unless the "U" parameter is clearly transparent and can be reliably used for forecasting and modelling well into the future, Collgar believes its value as proposed in RC_2010_25 should be set to 0.001 or removed from the formula completely until such time that its relevance is necessary.	The IMO notes Collgar's view. Refer to Section 6.3.2.
75.	RC_2010_25 & RC_2010_37	U factor	SEA	The new Capacity Credit calculation include an uncertainty measurement (the "U" factor) which is not central to the revised Rule Change Proposal RC_2010_25 methodology and appears to be an arbitrary amendment to reduce the capacity credits allocated to intermittent generators. The "U" factor calculated in the Sapere report only used the actual output of existing wind farms, yet the revised Rule Change Proposal RC_2010_25 methodology will apply to all intermittent generators, including solar PV and similar technologies. We do not believe that this is arbitrary capacity amendment for uncertainty is appropriate. Treating different technologies as being essentially the same makes no sense in either technical performance or economic	The IMO notes SEA's view. Refer to Section 6.3.2.1

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				measures. Incorporating the "U" factor in the revised Rule Change Proposal RC_2010_25 methodology is an unnecessary discount.	
76.	RC_2010_25 & RC_2010_37	U factor	SEA	It is perplexing that the IMO would apply an arbitrary discount factor to the output of solar generation based on the performance of wind generation.	Refer to Section 6.3.2.1
77.	RC_2010_25 & RC_2010_37	U factor	SEA	SEA strongly believes the "U" factor is discriminatory and should be removed from the RC_2010_25 methodology. If the IMO was to retain the "U" factor, then different "U" factors should be applied to different technology types, and solar-based generation should receive a high discounted "U" factor given its close correlation with peak demand.	The IMO appreciates SEA concerns. The structure of the U-factor will be considered as part of the 3 year review.
Collgar Data					
78.	RC_2010_25	Collgar data	APA Group	The issue, arising late in the second submission process, relating to the provision of data by Collgar and the inability of the IMO to use this data in the analysis of peak trading intervals, raises some questions over the implementation of the modified RC_2010_25. Currently, new entrant IGFs are able to provide evidence from an accredited consultant as to their expected average capacity factors over a three year period. This is a fairly easy analysis. New entrant IGFs will typically have many years' worth of detailed data which is used in the development and financing process. A reputable consultant will be likely to be willing to provide an accurate assessment of average output. However, providing an accurate assessment on the	The IMO notes APA's views on this matter. Refer to section 6.3.3 of this report for details of the IMO's assessment and response.

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	Proposal	Clause/Issue	Submitter	Comment/Change Requested	IMO's response
				output of a facility based on 12 intervals (6 hours) in a year may not be so straight forward. APA suggests that the IMO discuss this issue with its list of accredited consultants to ensure that modified RC_2010_25, or any methodology using only a small number of intervals, is capable of being implemented for new entrant IGFs (including wind, solar and wave technologies)	
79.	RC_2010_25 & RC_2010_37	Collgar Data	SkyFarming Pty Ltd	<p>Concern is that the studies for both proposals focused on the output of windfarms in WA and the load on the SWIS, however, both excluded Collgar. This is a serious omission for two reasons;</p> <ol style="list-style-type: none"> <li>1. Collgar is as big as all the other windfarms on the grid put together.</li> <li>2. Collgar, unlike all the other windfarms, is NOT on the coast. It is 300km inland.</li> </ol> <p>It could be expected that these reasons would have a substantial impact on the results of the studies.</p>	Refer to section 6.3.3 of this report for details of the IMO's assessment and response.
80.	RC_2010_25 & RC_2010_37	Collgar Data	SkyFarming Pty Ltd	<p>Suggest that the studies be redone with Collgar data before any proposals are submitted and as the extension to Albany, Grasmere and the Mt Barker windfarm will be operating this summer, data from these two should also be included.</p>	<p>Refer to section 6.3.3 of this report for details of the IMO's assessment and response.</p> <p>The IMO notes that it was not provided with any appropriate data for the Grasmere or Mt Barker wind farms to incorporate into the analysis.</p> <p>The IMO notes its open offer to publish the Existing Facility LSG peak periods including Collgar Wind Farm if a completed data set that meets the requirements of new clause 4.10.3 is provided to the IMO.</p>

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81.	RC_2010_25 & RC_2010_37	Collgar data	LGP	Furthermore, with the best of intent, the supporting analysis of the new method is based on some 100MW of certified Intermittent Generation. However, a further 90MW has recently been commissioned, and this will inevitably impact on the LSG intervals. Assuming that the corresponding wind data is now obtainable, it would seem to be reasonably straightforward to assess the integrity of the new method by extending the analysis to include the new facility.	Refer to section 6.3.3 of this report for details of the IMO's assessment and response.
82.	RC_2010_25 & RC_2010_37	Collgar data	Pacific Hydro	The Sapere report did not consider the impact of the Collgar wind farm in its modelling. This is causing concern within the renewable energy industry as it is believed that the inclusion of the Collgar data will have a material impact on the modelled outcomes.	Refer to section 6.3.3 of this report for details of the IMO's assessment and response.
83.	RC_2010_25 & RC_2010_37	Collgar data	Pacific Hydro	<p>The Sapere report should be updated to include the Collgar projected generation outputs. Subsequent to this, industry should be granted time to review the new results before the IMO take a decision.</p> <p>Key reasons why the Sapere report should be updated include:</p> <ul style="list-style-type: none"> <li>• Collgar wind farm is now operational and the most dominant wind farm going forward. Collgar by itself represents 50% of the wind capacity in the SWIS.</li> <li>• Collgar is inland where all other wind capacity of significance is located in coastal environments. The coastal wind farms are dominated by local coastal effects (sea breeze) the drivers of the</li> </ul>	Refer to section 6.3.3 of this report for details of the IMO's assessment and response.

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	Proposal	Clause/Issue	Submitter	Comment/Change Requested	IMO's response
				<p>Collgar wind farm are not understood by the market participants as the wind data has not been included in the modelling. If the wind farm is operating in a complementary mode to the rest of the fleet this needs to be understood.</p> <ul style="list-style-type: none"> <li>The Collgar wind farm contains 50% of the installed wind generation in the SWIS in one wind farm. Geographic diversity amongst wind farms improves the likelihood that wind farms will be operating at different levels of output at different times of the day as wind changes both with time and location.</li> </ul>	
84.	RC_2010_25 & RC_2010_37	Collgar data	Synergy	<p>It is very important to note that information presented by Sapere did not allow for Collgar, which will double existing wind farm capacity when commissioned, and made no estimate regarding solar capacity crediting (an added weakness). Failure to include Collgar in the analysis creates considerable uncertainty regarding the accuracy of the figures presented in the Sapere report. The lack of any solar data is regrettable but at least the 10 MW Verve Energy facility could have been included and separately reported.</p>	<p>Refer to section 6.3.3 of this report for details of the IMO's assessment and response.</p> <p>The IMO notes that it has not been provided any appropriate data for the 10 MW Verve Energy solar facility with which to extend the analysis.</p>
85.	RC_2010_25	Collgar data	Alinta	<p>The manner in which the modified IMO proposal outlined in the Draft Rule Change report for RC_2010_25 would determine the number of Capacity Credits that may be assigned to new Intermittent Facilities remains unclear. Alinta would encourage the IMO to use the entry of the Collgar wind farm as an opportunity to work through the practical</p>	<p>Refer to section 6.3.3 of this report for details of the IMO's assessment and response.</p> <p>The IMO notes the amendments to determine LSG separately for new facilities which do not have Metered Data for five years. This will ensure that the impact of a new entrant on existing facilities is not realised until only</p>

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				application of the methodology well ahead of the capacity certification process for the 2014/15 Capacity Year.	Metered Data is being used for the calculations. Refer to Section 6.3.1.2 of this report for the IMO's assessment.
86.	RC_2010_25 & RC_2010_37	Collgar data	Vestas Wind Systems	When commissioned (very soon), Collgar will supply more than half of WA's renewable energy. Yet revised RC_2010_25 will not take into account any of the contribution that Collgar will make to WA's electricity supply, effectively making RC_2010_25 out of date before it has even been implemented.	<p>Refer to section 6.3.3 of this report for details of the IMO's assessment and response.</p> <p>The IMO notes that not including Collgar data in its analysis of the 12 LSG periods in no way results in the methodology becoming out of date. The analysis was simply conducted to provide transparency to the market around the likely impacts of modified Methodology 1 and thereby allow them to undertake an assessment of its implications to their business. The analysis also allowed the IMO to assess the practical application of the methodology.</p> <p>While inclusion of Collgar data (and any other new entrant data such as solar) would aid the IMO's assessment of the application of the methodology, the data provided by Collgar was unusable as it included a number of gaps during key periods. To have included this data would have potentially been misleading. The IMO also considers that the availability of this data is not imperative for implementation of this Rule Change Proposal.</p>
87.	RC_2010_25 & RC_2010_37	Collgar data	Vestas Wind Systems	The exclusion of the Collgar data from the Sapere methodology (and consequently for the purposes of the revised RC_2010_25) is inappropriate.	Refer to section 6.3.3 of this report for details of the IMO's assessment and response.

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				Collgar is not just a big wind farm – it is a big wind farm in an area of the SWIS with no other wind farms. Collgar's scale, together with its geographic location, means that the exclusion of its data from the RC_2010_25 process is a significant oversight and should be corrected.	
88.	RC_2010_25 & RC_2010_37	Collgar Data	Vestas Wind Systems	The IMO should consult further with Collgar to ensure that this data is considered if RC_2010_25 is to be implemented in any form.	Refer to section 6.3.3 of this report for details of the IMO's assessment and response.
89.	RC_2010_25 & RC_2010_37	Collgar data	Collgar Wind Farm	Collgar wishes to formally state its objection to the extension notice posted by the IMO on its website on 13 October 2011.	The IMO notes Collgar's objection.
90.	RC_2010_25 & RC_2010_37	Collgar data	Collgar Wind Farm	The Sapere report ignores the contribution from Collgar on the SWIS. Given the relative size of Collgar in the SWIS, Collgar believe any study conducted without our data cannot be representative and therefore should not be relied upon for such an important rule change.	Refer to section 6.3.3 of this report for details of the IMO's assessment and response.
91.	RC_2010_25 & RC_2010_37	Collgar data	Collgar Wind Farm	Given the late notice to provide the data, certain caveats were necessarily applied to the refined data set. With greater notice, Collgar would have been better positioned to provide a more refined data set with fewer caveats.	The IMO notes that Collgar was first requested to provide data during the REGWG process and had failed to provide relevant data. Following the public workshop for RC_2010_25 and RC_2010_37 Collgar approached the IMO and offered to provide the data. At this point the IMO declined the offer given its intention to not revise either the Sapere report or its draft report. However after further consideration the IMO determined there would be merit in obtaining the data and calculating the 12 peak LSG periods including Collgar so as to allow impacted parties to undertake their own

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					<p>assessments of the impacts of modified Methodology 1.</p> <p>The IMO acknowledges that its request to Collgar to provide the data was only 10 Business Days prior to the close of the public consultation period. However the IMO assumed Collgar already had obtained a refined data set with fewer caveats given its offer to provide this information after the public workshop.</p> <p>Refer also to section 6.3.3 of this report for details of the IMO's assessment and response.</p>
Other comments					
92.	RC_2010_25	Selection of top TIs	APA Group	Believes Intermittent Generators provide far greater capacity value than can be measured simply in the top 12 intervals per year. We would prefer to see a larger number of intervals used in determining peak output.	The IMO notes APA's views on this matter. Refer to section 6.3.1.5
93.	RC_2010_25	Selection of top TIs	Verve Energy	Sapere's solution of purposely selecting Trading Intervals from different days is a reasonable position to take in the short term but this aspect of the methodology should be reviewed when it is determined that sufficient data has been collected to allow unconstrained selection of the top Trading Intervals.	The IMO notes Verve Energy's views on this matter. The IMO however notes that unconstrained selection of the top Trading Intervals from the same days would reintroduce the issues associated with clustering identified in the Draft Rule Change Report.
94.	RC_2010_25 & RC_2010_37	Selection of top TIs	System Management	System Management does not fully support the proposed change due to the selection of the Trading Intervals as given in Step 7.	Refer to the IMO's response to Issue 93 and section 6.3.1.5

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				<p>The proposed rule change calculates the average and adjustment values based on a subset of 60 intervals during the past 5 years. The intervals chosen are 12 from each year based on the highest load interval in each of the highest 12 days.</p> <p>System Management believes the trading intervals chosen should be those during maximum system demand times. Ideally this would be based on conditions which would give close to a 10% POE peak conditions, being when the daily average temperature was greater than 34.6 degrees Celsius, as defined in the Statement of Opportunities. System Management notes that this has only occurred once since market start (16 January 2009) and therefore is not a practical option.</p>	
95.	RC_2010_25 & RC_2010_37	Selection of top TIs	System Management	System Management believes the proposed selection is not correct as it includes many non-peak intervals.	<p>The IMO notes that the selection of the 12 peak LSG intervals reflects the times when the value of Intermittent Generation to the system is the highest.</p> <p>Refer to the IMO's response to Issue 93 and section 6.3.1.5 .</p>
96.	RC_2010_25 & RC_2010_37	Selection of top TIs	System Management	System Management recommends as an alternative to the method proposed in the IMO's draft report, that an ambient condition based criteria be used for selecting the Trading Intervals for the average and adjustment values. It suggests selecting Trading Intervals during the last 3 years between 11 am and 7 pm on days where Perth peak daily temperature is greater than or equal	<p>Refer to the IMO's response to Issue 93 and section 6.3.1.5</p> <p>The IMO appreciates System Management's suggestion. The IMO considers that such a time based approach will result in selecting Trading Intervals (e.g. 6:00pm) which are extremely unlikely to be peaks and coincide with times when Intermittent Generator</p>

Modified Methodology 1					
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				to 40 degrees Celsius. System Management estimates there are 9 days or 144 Trading Intervals that would fall into this category. It understands that there may be a period of 3 years where this potentially could result in a small number of interval selected so a minimum numbers of days would be selected (say 5) where the number of years would be extended.	<p>facility's are producing more than at peaks (e.g. wind-farms at 6pm) or less (e.g. solar facilities at 6pm). Furthermore such an approach doesn't take into account the correlation of output between facilities.</p> <p>While the IMO see some merit in focussing on extremely hot days to the extent that these are the peak demand times, the IMO is also considering the risk that too few observations are used. The output of Intermittent Generator facilities tends to be highly correlated from one period to the next and so there is a reduced benefit from using multiple consecutive Trading Intervals from the same Trading Day.</p>
97.	RC_2010_25 & RC_2010_37	Substitutions for Dispatch Instructions	Perth Energy	The proposed legal text to implement the amended IMO Proposal specifically allows for substituting metering data with estimated output data in the event of Consequential Outages only. Perth Energy considers that this option should also be available for all scenarios where the Facility has followed an instruction from System Management that has led to less output from the facility than otherwise would have been the case. If the proposed new arrangements for balancing and ancillary services are introduced there may be other scenarios where actual metering data should be replaced by estimates for the purpose of calculating an Intermittent Facility's output during the LSG intervals.	<p>The IMO considers that an estimate of the output for a Facility which has received Dispatch Instructions should be included in the determination of the Relevant Level as it is likely that an Intermittent Generator will be curtailed precisely when output is very high This would mean that their metered output would not reflect the true ability of the Facility to deliver capacity to the market in that particular Trading Interval.</p> <p>As such the IMO has determined to incorporate amendments to the methodology to use an estimate of the decrease in output for a Facility that received Dispatch Instructions (based on metered output and System Management's estimated decrease in output provided in accordance with clause 7.13.1(eB)). The IMO has also incorporated</p>

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					an amendment to allow for instances where Verve Energy has been requested to vary from its Dispatch Plan.
98.	RC_2010_25	Substitution for Dispatch Instructions	Alinta	The modified IMO proposal would allow for output metering data to be substituted with estimated data in the event of Consequential Outages. Alinta considers that where System Management issues Dispatch Instructions to an Intermittent Generator (to reduce output), output metering data should also be allowed to be substituted with estimated data.	Refer to the IMO's response to Issue 97
99.	RC_2010_25	3 year review	Verve Energy	If a decision is taken to accept and proceed with the proposed methodology, IMO should prescribe a date at which the continuing suitability of the methodology is formally reviewed.	<p>The IMO notes that the drafting of clause 4.11.3B requires the IMO to undertake the review of the methodology prior to 1 April 2015. In the case that a one in ten year event occurs prior to that date the IMO is not precluded from undertaking an earlier review.</p> <p>The IMO does not consider any further description of the date for the formal review is required.</p>

Regulatory Risk					
	Proposal	Clause/Issue	Submitter	Comment/Change Requested	IMO's response
100.	RC_2010_25 & RC_2010_37	Glide Path	Perth Energy	<p>Welcomes the proposed inclusion of a three year glide path introduction of the Amended IMO Proposal and believe this would go some way towards addressing the sovereign risk issues. However, Perth Energy still considers there may be merit in considering a longer period of grandfathering current rules for those projects where financial commitments have already been made to minimise sovereign risk arising from these change proposals.</p>	<p>The IMO recognises that regulatory risk is an important consideration and as such has signalled that there would be amendments to the capacity valuation methodology for Intermittent Generators in the past 4 Statements of Opportunities.</p> <p>Prior to making its proposed decision the IMO Board engaged Sapere to consider the options for transitional arrangements for new and existing facilities. Based on the advice of Sapere the IMO Board considered a glide path of 3 years (for the 2012-14 Reserve Capacity Cycles) using a straight line basis was appropriate.</p> <p>Refer to section 6.3.5 for further details of the IMO's assessment.</p>
101.	RC_2010_25 & RC_2010_37	Glide Path	Synergy	<p>Our concern is not simply related to viability considerations for existing facilities but that a change, such as the one being proposed in the Draft Rule Change Report, will cast a wider shadow over the market in the minds of investors that their assumptions pre-investment could be overturned by a rule change at a later date – particularly, where rule changes are made without full and proper scrutiny by the industry forum set up for that purpose. This broader point is Synergy's primary concern and the proposed transitional arrangements suggested in the draft report do little to remove this concern.</p>	<p>The IMO considers that the inclusion of a rule change process in the Market Rules by its very nature implies that the market will be subject to evolution via amendments to the Market Rules over time.</p> <p>To ensure the market would have sufficient opportunity to scrutinise the proposed modified Methodology 1, including the associated financial impacts the IMO extended the second submission period and held a public workshop (with a presentation by Dr Tooth). The Rule Change Proposals were also noted on the Rule Change Overview at both the 14 September and 5 October 2011 MAC meetings, during which members had the opportunity to request further discussion.</p>

Regulatory Risk					
	Proposal	Clause/Issue	Submitter	Comment/Change Requested	IMO's response
					Refer also to section 6.3.5 and section 6.3.4
102.	RC_2010_25 & RC_2010_37	Glide Path	Synergy	It is noted in the IMO's Draft Rule Change Report that the IMO Board has already decided that the correct balance between efficiency and regulatory risk is to be a transitional arrangement over three years, though under a comparable situation (related to IGFs) the Australian Energy Market Operator ( <b>AEMO</b> ) quarantined (grandfathered) existing facilities and only applied revised arrangements to new facilities, arriving at a different balance than that proposed by the IMO Board. Synergy therefore suggests that the IMO Board reconsider its determination to eschew grandfathering and opt for a transitional arrangement, for at least diligence purposes, by seeking input from AEMO as to why, after taking into account the interests of stakeholders, they arrived at their decision to grandfather the existing facilities from the requirements of the amended rules.	<p>The IMO has previously discussed with the Australian Energy Market Commission (AEMC) the criteria in the NEM for determining whether grandfathering provisions are required.</p> <p>The IMO notes that AEMC's decision to grandfather the registration arrangements as part of the "Central Dispatch and Integration of Wind and Other Intermittent Generation" rule change does not represent a comparable situation given the needs for grandfathering were driven predominantly by technology restrictions. Further, the AEMC generally provides a clear and practical trigger to end any grandfathering provisions rather than creating an open ended arrangement.</p> <p>Refer also to section 6.3.5 and section 6.3.4</p>
103.	RC_2010_25	Glide Path	Alinta	To the extent that the modified IMO proposal outlined in the Draft Rule Change report for RC_2010_25 accurately reflects an Intermittent Facility's ability to support the secure and reliable operation of the WEM, Alinta sees no reason why intermittent projects that have not yet been assigned Capacity Credits should not be fully exposed to this new methodology.	<p>The IMO notes that the development timeline for a generation project can significantly exceed the two years between the allocation of Capacity Credits and the commencement of operation for the facility. A number of projects may be advance in their development but yet to be assigned Capacity Credits. As such, the IMO considers it appropriate that the transitional arrangements apply to all Intermittent Generators.</p> <p>Refer also to section 6.3.5</p>
104.	RC_2010_25	Glide Path	Alinta	For existing Intermittent Facilities, Alinta	Refer to section 6.3.5

Regulatory Risk					
	Proposal	Clause/Issue	Submitter	Comment/Change Requested	IMO's response
				welcomes the 3-year transition period contemplated by the modified IMO proposal outlined in the Draft Rule Change report for RC_2010_25. However, Alinta considers there is significant merit in the IMO considering a longer transition period (or 'grandfathering') for existing Intermittent Facilities in order to minimise increases in the perceived level of risk associated with investing in the WEM.	
105.	RC_2010_25 & RC_2010_37	Glide Path	Collgar Wind Farm	<p>Firmly believes that existing facilities should have their existing regimes protected and grandfathered.</p> <p>Changes such as the one proposed can materially diminish the value of such investment which may in turn lead to lesser funds being available to maintain the asset into the future.</p> <p>For existing wind farms that made their investment decision on the basis of the existing methodology, there is no protection or grandfathering of the existing regime to protect the investment nor can they now renegotiate off-take contracts to account for this.</p> <p>New renewable energy generators may be able to mitigate the risk associated with this rule change via negotiation with relevant counterparties but this will likely require higher off-take prices to be negotiated which would ultimately flow through to the end user.</p>	Refer to section 6.3.5
106.	RC_2010_25 & RC_2010_37	Investment Impacts	Collgar Wind Farm	Collgar believes that the rule change has a good chance of leading to lower investment by the private sector into the Western Australian	The IMO considers it is most appropriate that any investment risk associated with a particular technology type is borne by

Regulatory Risk					
	Proposal	Clause/Issue	Submitter	Comment/Change Requested	IMO's response
				renewable energy landscape. This needs to be carefully considered given the forecast financial investment required for generation assets in the state in coming years. The increased regulatory risk embedded within RC_2010_25 may potentially impact negatively on investor sentiment towards investment in renewable energy projects within WA and hence investors may consider other jurisdictions more desirable for investment.	<p>investors, as it is not appropriate for the market to bear this risk. The role of the market is to ensure that the capacity valuation methodology for Intermittent Generators is robust and reflective of their actual contribution to peak output so as to ensure the correct market signals are provided and so efficient investment decisions can be made.</p> <p>The IMO reiterates that the 3 year glide path provides an appropriate length of transition given it strikes an appropriate balance between mitigating financial impacts to existing Intermittent Generators and removing an inefficient market signal.</p> <p>Refer also to section 6.3.5</p>
107.	RC_2010_25	Impact on Investment	Alinta	Given the significant value change associated with RC_2010_25, even after the modifications proposed by the IMO in the Draft Rule Change Report, Alinta remains concerned about the impact the rule change proposal has on the perceived levels of risk associated with investing in the WEM. The perceived increase in risk may extend to potential investments in conventional generation projects, rather than being limited to intermittent projects.	Refer to the IMO's response to Issues 106 and the IMO's assessment in section 6.3.5
108.	RC_2010_25 & RC_2010_37	Impacts on Investment	Perth Energy	Continues to be concerned with the potential impact on sovereign risk perception in the WEM flowing from these proposed changes as both the Griffin and the Amended IMO Proposals would significantly impact on the value of the existing Intermittent Facilities. An increased perception of Sovereign risk in the	Refer to the IMO's response to Issues 106 and the IMO's assessment in section 6.3.5

Regulatory Risk					
	Proposal	Clause/Issue	Submitter	Comment/Change Requested	IMO's response
				WEM will also have negative flow-on effects for the other projects, including "conventional" generation projects.	
109.	RC_2010_25 & RC_2010_37	Impacts on investment	Synergy	Is concerned that a change to the capacity crediting of existing Intermittent Generation Facilities (IGF) would send to investors (and not just intermittent generation investors) a signal that the Wholesale Electricity Market, at its core, will implement changes that expose Market Participants to significant regulatory risk. This is a strongly held view and one that, if not handled well, will result in significant investor uncertainty and cost implications for future capacity investments.	Refer to the IMO's response to Issues 106 and the IMO's assessment in section 6.3.5
110.	RC_2010_25	Investment Impacts	Pacific Hydro	Wind, despite being intermittent, can and does provide reliable capacity. With this in mind capacity payments have historically represented a reasonably predictable and stable cash flow and have been equitable. Any change to the current methodology has the potential to have a disproportionate impact on project financing and delivery.	Refer to the IMO's response to Issue 106
111.	RC_2010_25	Investment Impacts	Pacific Hydro	Unless the proposed changes are made), the rule change currently under consideration will result in an unfair bias against investment in renewable energy technologies.	Refer to the IMO's assessment.
112.	RC_2010_25	Investment Impacts	Pacific Hydro	The lack of transparency in the proposed methodology and subsequent lack of predictability around the capacity payments will result in a limited retail market for wind generated energy.	The IMO disagrees that there is a lack of transparency around modified Methodology 1.

Rule Change Process					
	Proposal	Clause/Issue	Submitter	Comment/Change Requested	IMO's response
113.	RC_2010_25 & RC_2010_37	Rule Change process	LGP	Welcomes the IMO's appointment of an Independent Expert to seek to improve the accuracy and simplicity of the original two proposals. This has resulted in an apparently middle-ground outcome that is close to System Management's acceptable position of a 20% capacity allocation. Furthermore, the Capacity value in dollar terms is reasonably contiguous with historical values.	The IMO notes LGP's comments.
114.	RC_2010_25	Rule Change Process	Synergy	<p>Contends that modifying rule change proposal RC_2010_25 by adopting the Sapere recommendations represents a major change to the initial proposal such that it should be considered to be new Rule Change Proposal in which case Market Participants would be afforded two rounds of consultation to provide feedback on decisions made by the IMO.</p>	<p>The IMO considers that the amendments to the IMO's original methodology (Methodology 1) do not represent a major change. Sapere was engaged to examine modifications to the methodologies. Following from Saperes considerations :</p> <ul style="list-style-type: none"> <li>the intention of the methodology (to produce an unbiased estimate of the value of capacity) has not changed</li> <li>the key concept and structure of using the average output at peak LSG less an adjustment was retained</li> <li>the changes were achieved with some minor modifications.</li> </ul> <p>The IMO notes that to ensure the market was provided sufficient opportunity to scrutinise the proposed modified Methodology 1, including the associated financial impacts, the IMO extended the second submission period and held a public workshop (with presentation by Dr Tooth).</p>
115.	RC_2010_25	Rule Change	Synergy	Introducing a major change in the draft rule	The IMO notes Synergy's suggestion.

Rule Change Process					
	Proposal	Clause/Issue	Submitter	Comment/Change Requested	IMO's response
		Process		change report with Market Participants restricted to one round of consultations lessens the governance surrounding the rule change process. These concerns could be addressed by the IMO Board rejecting RC_2010_25 and if it wished resubmitting it as a new proposal into the rule change process allowing Market Participants the two formal rounds of consultation needed to review and provide views on a rule change impacting investment values of existing facilities and the investment plans for future facilities.	Refer to the IMO's response to Issue 114
116.	RC_2010_25 & RC_2010_37	Rule Change Process	Infigen Energy	Given the IMO position in its draft report, it is clear that the proposed methodology based on the Sapere report will be generally accepted by the IMO. The process has been extremely flawed, and it is a stretch to call the introduction of a new methodology after the first submission period a "modification". Even with an extended second submission period and presentation, this is a poor precedent to set for future Rule Changes.	The IMO notes Infigen's concerns. Refer to the IMO's response to Issue 114
117.	RC_2010_25	Rule Change Process	Verve Energy	Considers the retention of Sapere Research Group to conduct additional analysis to be an appropriate decision. In addition, the quality and focus of Sapere's review was such that there is now much greater clarity around the reasoning behind the proposed resolution.	The IMO notes Verve Energy's views.
118.	RC_2010_25	Rule Change Process	Verve Energy	The proposed solution, hopefully coincidentally, appears to be a good compromise and provides an appropriate outcome for both wind and solar thermal generation.	The IMO notes Verve Energy's views.
119.	RC_2010_25	Rule Change	Vestas Wind	In terms of progress, Vestas considers that	The IMO notes Vestas' views.

Rule Change Process					
	Proposal	Clause/Issue	Submitter	Comment/Change Requested	IMO's response
	& RC_2010_37	Process	Systems	RC_2010_25 has been amended so substantially from its original wording that it should be withdrawn and resubmitted as a new Rule Change, and therefore be subject to a proper consultation process.	Refer to the IMO's response to Issue 114
120.	RC_2010_25 & RC_2010_37	Rule Change Process	Vestas Wind Systems	If the IMO Board wishes to retain the confidence of private sector investors then it should be clearer about the terms upon which it engages so-called expert consultants and it should reconsider the manner in which it advances Rule Changes where it is also the proponent.	The IMO notes Vestas' suggestions and considers that the direction provided by the IMO Board to Dr Richard Tooth was clearly articulated in both the Draft Rule Change Report (section 5.1.4) and the Sapere Report (section 1).  Refer also to the IMO's response to Issue 114
121.	RC_2010_25 & RC_2010_37	Rule Change Process	System Management	System Management believes the proposed rules are a major departure from that initially proposed by the IMO in RC_2010_25.  System Management is concerned that this sets a precedent for using the IMO's draft report as a mechanism to introduce major changes to an original rule change proposal. System Management believes major changes should only be made as a new rule change submission.  In this instance System Management's comments on the Sapere proposal will not be available to the Public to consider in making their second round submissions.  System Management believes these changes should be submitted as a new rule change proposal.	Refer to the IMO's response to Issue 114

General Comments					
	Proposal	Clause/Issue	Submitter	Comment/Change Requested	IMO's response
122.	RC_2010_25 & RC_2010_37	Wider review of market required	Perth Energy	It will be important to continue to develop the WEM in accordance with the Market Objectives. This means ensuring that the market continues to strive for economic efficiency whilst accommodating renewable technologies and at the same time without compromising system security. It will be necessary to review all aspects of the capacity market and also the wider market to ensure that the right incentives are in place to entice the right combination of generation technologies in the market.	<p>While the IMO notes that this wider review is outside of scope of either RC_2010_25 or RC_2010_37, the recent review of the RCM undertaken by The Lantau Group found that while there is excess reserve capacity 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.</p> <p>Given the findings of The Lantau Group the IMO does not consider that wider review of this issue is required at this time.</p> <p>For a copy of The Lantau Group's report refer to the following website:  <a href="http://www.imowa.com.au/MAC_43">http://www.imowa.com.au/MAC_43</a></p>
123.	RC_2010_25 & RC_2010_37	Consideration during RCM review	Synergy	<p>Also suggests that it is not timely to consider changes to capacity crediting IGF given the certainty that the RCM will be modified and that the consequences of any modifications are not yet understood. It is also noted that the IMO Board's consultant engaged to review the RCM paid serious consideration to ensuring all the capacity elements were integrated.</p> <p>Synergy therefore recommends that the IMO Board resist the temptation to approve a rule change and implement a new methodology simply because this discussion has been protracted, but instead reject both RC_2010_25 and RC_2010_37 and bring this discussion into the scope of the new RCM Working Group, expected to be established</p>	<p>The IMO notes Synergy's position but considers that:</p> <ul style="list-style-type: none"> <li>• The valuation of the capacity of Intermittent Generators is a separate issue to the elements being considered in the review of the RCM;</li> <li>• There is sufficient demonstrable benefits to the market associated with modified Methodology 1 (refer to the IMO's assessment);</li> <li>• It is unlikely that the RCM Working Group could reach either consensus or compromise on this long standing issue; and</li> </ul>

General Comments					
	Proposal	Clause/Issue	Submitter	Comment/Change Requested	IMO's response
				under the auspices of the IMO in the new year.	<ul style="list-style-type: none"> <li>Delaying a decision further on how to value the capacity of Intermittent Generators would create continued investment uncertainty</li> </ul>
124.	RC_2010_25 & RC_2010_37	Review of IRCR determination	Perth Energy	The reason for selecting the 12 peak LSG intervals from each year from separate Trading Days was to overcome the clustering problem that was identified in the data. Perth Energy notes that the mechanism for calculating the Individual Reserve Capacity Requirements (IRCR) for loads is centred around the 12 peak system load intervals each year, being the three peak Trading Intervals on four separate Trading Days. Perth Energy considers this apparent inconsistency should be investigated and assessed further in a review of the entire capacity market.	<p>The IMO notes that The Lantau Group recommended adjustments to the IRCR mechanism in its review of the RCM, the recommendations of which will be considered by a Working Group. The IMO will ensure that matter will be reviewed by that Working Group when it considers the IRCR mechanism.</p> <p>For a copy of The Lantau Group's report refer to the following website: <a href="http://www.imowa.com.au/MAC_43">http://www.imowa.com.au/MAC_43</a></p>
125.	RC_2010_25 & RC_2010_37	Alternative solutions more appropriate	Collgar Wind Farm	While Collgar understands the rationale behind the rule change it believes that the implementation of this rule change is unfairly punitive on renewable energy generators, in particular those with established facilities. Collgar believes that the issue at hand (namely the ability for generators in the SWIS to meet peak demand) may be addressed through other methodology changes (eg. the introduction of block pricing tariffs).	The IMO notes Collgar's suggestion but considers that there is considerable demonstrable benefit with proceeding with modified Methodology 1. The IMO notes that other methodology changes such as the introduction of block pricing tariffs are outside the scope of RC_2010_25 and RC_2010_37. Refer to the IMO's assessment section.
126.	RC_2010_25 & RC_2010_37	Consistency of treatment with other generation types	Infigen Energy	The highest risk times over the last few years have not all been high temperature events, but rather the Varanus Island explosion, and for the last year, the tropical cyclone interrupting supply during the hot season. There have	The IMO notes Infigen Energy's comments and considers that further changes to the treatment of Scheduled Generators during fuel restricted conditions (or other contingency events) is outside the scope of this Rule

General Comments					
	Proposal	Clause/Issue	Submitter	Comment/Change Requested	IMO's response
				been no calls to adjust the capacity values for gas generators due to heightened supply risks that have far more dire consequences for the system than wind intermittency. It is also the case that at times when scheduled maintenance is taking place, there is also elevated risk to the system.	Change Proposal.  Additionally, the IMO notes that the recent review of the Outage Planning process did not highlight any concerns with the available capacity cushion during summer months when peak events will occur.
127.	RC_2010_25 & RC_2010_37	Availability of solar generation data	SEA	These rule changes acknowledge that Intermittent Generation has a degree of uncertainty involved with their connection to the grid. However, it utilises only wind data to allocate develop a new capacity credit model. As yet, there is no commercial scale solar PV or solar thermal generation attached to the grid and the lack of data has caused the potential of solar contributions to be ignored. However, with the new solar generation coming on line and other proposed projects by various proponents, we believe that the lack of addressing solar generation in this rule change may act as a barrier/disincentive to the development of new solar projects by independent power producers.	The IMO notes SEA's concerns.  Although there has been no opportunity to examine data on solar generation, the IMO does not expect that the methodology would disadvantage solar. In particular, the IMO expects that the solar output during peaks: <ul style="list-style-type: none"> <li>• to be uncorrelated with existing facility output; and</li> <li>• to have a relatively low variance.</li> </ul>
128.	RC_2010_25 & RC_2010_37	Consistency of treatment with other generation types	SEA	The modified Capacity Credit calculation is a significant improvement over the previously suggested IMO rule change but it is in itself not without issues. The single greatest problem in the new formula is to effectively treat all Intermittent Generation as wind power, even if it is not, and this issue is covered in subsequent sections.	The IMO disagrees that modified Methodology 1 treats all types of Intermittent Generators as wind farms. The IMO notes that to the extent that an Intermittent Generator's output is volatile their capacity allocation will be reduced accordingly (through the interaction of the U-factor and variance terms).
129.	RC_2010_25 & RC_2010_37	Reliability criterion.	Infigen Energy	The current methodologies provide zero value to capacity contributions beyond a single 1 in 10 year event, however this has clearly been	The IMO notes Infigen's view however to date the application of the test in clause 4.5.10(b)(i) of the Market Rules has resulted

General Comments					
	Proposal	Clause/Issue	Submitter	Comment/Change Requested	IMO's response
				shown to be only one element of system risk, and not the major one in the last several years.	in the first element of the Planning Criterion (defined event scenario) being determinative in setting the Reserve Capacity Target. Modified Methodology 1 aligns with this criterion.
130.	RC_2010_25	Capacity valuation of DSM	Alinta	The number of Capacity Credits assigned to an individual Facility are to reflect the Facility's ability to support the secure and reliable operation of the WEM in peak Trading Intervals across twelve days, Alinta considers it appropriate that the basis on which Capacity Credits may be assigned to Demand Side Programmes be reviewed to ensure this occurs on an equitable basis.	<p>The IMO notes Alinta's concerns but considers that this is outside the scope of either RC_2010_25 or RC_2010_37.</p> <p>The Lantau Group recommended changes to the Market Rules related to Demand Side Programmes in its review of the RCM, the recommendations of which will be considered by a Working Group.</p> <p>For a copy of The Lantau Group's report refer to the following website: <a href="http://www.imowa.com.au/MAC_43">http://www.imowa.com.au/MAC_43</a></p>
131.	RC_2010_25 & RC_2010_37	Security of Supply	Vestas Wind Systems	Understands the importance that the IMO, OOE and System Management places on the issue of security of supply. However, Vestas strongly disagrees that the RCM is the best measure to achieve this. Rather than damage the business case for renewable energy investors in WA by implementing RC_2010_25, the goal of security of supply could be better met, for example, by revising WA's system reserve margins or investing in wind forecasting software as has been done by the AEMO with significant success.	<p>The IMO notes that the RCM was specifically designed to ensure supply adequacy and considers that it is the appropriate mechanism to consider the capacity valuation of Intermittent Generators.</p> <p>The IMO notes that the issue at hand is how to accurately value the capacity of Intermittent Generator and ensure that efficient investment decisions are encouraged. Consideration of other options for ensuring system security are outside the scope of these rule change proposals.</p>
132.	RC_2010_25 & RC_2010_37	Security of Supply	System Management	System Management wishes to add that the major concern is not the capacity credits assigned to a facility but rather the contribution	The IMO notes that this issue is outside the scope of RC_2010_25 & RC_2010_37.

General Comments					
	Proposal	Clause/Issue	Submitter	Comment/Change Requested	IMO's response
				<p>that the various types of generation that is procured during reserve capacity cycle make to system security.</p> <p>It is understood that this idea was previously discussed at MAC meetings.</p> <p>System Management believes that the contributions can not be influenced in realtime however it can be done as part of the Reserve Capacity procurement process.</p> <p>This can be facilitated by predetermining the minimum quantities of various types of generation and demand side resources that must be sourced. This is already taken into account for Demand Side options in development of the availability curve.</p> <p>System Management can also make an estimate for Non-scheduled Generation contributions for the purposes of outage planning.</p> <p>Under this alternative the market objective of system security can be achieved whilst allowing capacity credit evaluations to meet other market objectives as is currently done for Demand Side Responses.</p>	

### APPENDIX 3: ADDITIONAL AMENDMENTS MADE BY THE IMO FOLLOWING THE SECOND SUBMISSION PERIOD AND FURTHER CONSULTATION PERIOD

The IMO has made some amendments to the Amending Rules following the second submission period and further consultation period. These changes are as follows (~~deleted text~~, added text):

- 4.10.1. Each Market Participant must ensure that information submitted to the IMO with an application for certification of Reserve Capacity pertains to the Reserve Capacity Cycle to which the certification relates, is supported by documented evidence and includes, where applicable, the following information:
- ...
- (dA) a description and a configuration of the main components of the Facility;
- ...
- (i) whether the applicant wishes to nominate the use of the methodology described in clause 4.11.2(b), in place of the methodology ~~that~~ described in clause 4.11.1(a), in assigning the Certified Reserve Capacity or Conditional Certified Reserve Capacity to apply to a Scheduled Generator or a Non-Scheduled Generator; ~~and~~
- (j) whether the Facility will be subject to a Network Control Service contract; and
- (k) where an applicant nominates to use the methodology described in clause 4.11.2(b) and the Facility is already in full operation under the configuration for which certification is being sought (as outlined in clause 4.10.1(dA)), the date on which the Facility became fully operational under this configuration, unless this date has already been provided to the IMO in a previous application for certification of Reserve Capacity.
- 4.10.3. An application for certification of Reserve Capacity that includes a nomination to use the methodology described in clause 4.11.2(b) for a Facility that:
- (a) is yet to enter service;
- (b) is to re-enter service after significant maintenance;
- (c) is to re-enter service after having been upgraded; or
- (d) has not operated with the configuration outlined in clause 4.10.1(dA) for the full period of performance assessment identified in step 1(a) of the Relevant Level Methodology ~~under 4.11.2(b),~~

-must include a report prepared by an expert accredited by the IMO in accordance with clause 4.11.6. The IMO will use the report to assign Certified Reserve Capacity for the Facility and to determine the Required Level for that Facility. The report must include:

- ~~(a) — an estimate of what the expert considers the Certified Reserve Capacity of the Facility would have been for the purposes of clause 4.11.2(b) had the history of performance been available;~~
- ~~(b) — a value, expressed in MW as a sent out value, which equals the 5 percent probability of exceedance of expected generation output for the Facility for all the Trading Intervals that occurred within the last three years up to, and including, the last Hot Season, where this value is to be used in the calculation of the Required Level in clause 4.11.3B;~~
- ~~(c) — a proposed alternative value to that specified in clause 4.10.3(b), expressed in MW as a sent out value, to apply for the purposes of the Required Level, if in the opinion of the expert the value provided under clause 4.10.3(b) would not be a reasonable representation of the Facility's 5 percent probability of exceedance of expected generation output during its first year of operation;  
and~~
- ~~(d) — the reasons for any proposed alternative value provided under clause 4.10.3(c); and;~~
- ~~(e) — an estimate of the expected electricity sent out by the Facility that would have been sent out for the full period of performance assessment under clause 4.11.2(b).~~

The applicant may provide the same report until the Facility has been in operation for the full period of performance assessment under clause 4.11.2(b).

4.10.3A. A report provided under clause 4.10.3 must include:

- (a) for each Trading Interval during the period identified in step 1(a) of the Relevant Level Methodology, a reasonable estimate of the expected energy that would have been sent out by the Facility had it been in operation with the configuration proposed under clause 4.10.1(dA) in the relevant application for certification of Reserve Capacity;
- (b) a value, expressed in MW as a sent out value, which equals the 5 percent probability of exceedance of expected generation output for the Facility for all the Trading Intervals that occurred within the last three years up to, and including, the last Hot Season, where this value is to be used in the calculation of the Required Level in clause 4.11.3B;

- (c) a proposed alternative value to that specified in clause 4.10.3A(b), expressed in MW as a sent out value, to apply for the purposes of the Required Level, if in the opinion of the expert the value provided under clause 4.10.3A(b) would not be a reasonable representation of the Facility's 5 percent probability of exceedance of expected generation output during its first year of operation; and
- (d) the reasons for any proposed alternative value provided under clause 4.10.3A(c).

4.11.2. Where an applicant submits an application for Certified Reserve Capacity, in accordance with ~~section clause~~ 4.10, and nominates under clause 4.10.1(i) to have the IMO use the methodology described in clause 4.11.2(b) to apply to a Scheduled Generator or a Non-Scheduled Generator, the IMO:

- (a) may reject the nomination if the IMO reasonably believes that the capacity of the Facility has permanently declined, or is anticipated to permanently decline prior to or during the Reserve Capacity Cycle to which the Certified Reserve Capacity relates;
- (aA) if it the IMO rejects such a nomination under clause 4.11.2(a), the IMO must process the application as it would if the application had nominated to use the methodology described in clause 4.11.1(a) no nomination to use rather than the methodology described in clause 4.11.2(b) had been made; and
- (b) if it has not rejected the nomination under ~~paragraph clause~~ 4.11.2(a), must assign a quantity of Certified Reserve Capacity to the relevant Facility for the Reserve Capacity Cycle equal to the Relevant Level as determined in accordance with the Relevant Level Methodology ~~determined in accordance with clause 4.11.3A~~, but subject to clauses 4.11.1(b), 4.11.1(c), 4.11.1(f), 4.11.1(g), 4.11.1(h) and 4.11.1(i).

4.11.2A. Where an applicant nominates under clause 4.10.3A(c) to have the IMO use an alternative value to that specified in clause 4.10.3A(b) the IMO:

- (a) may reject the proposed alternative value if it does not consider the reasons provided in accordance with clause 4.10.3A(d) provide sufficient evidence that an alternative value is required; and
- (b) must use the alternative value in the calculation of the Required Level if it does not reject the proposed alternative value under clause 4.11.2A(a).

4.11.3A. ~~[Blank] In order to determine the Relevant Level for a Facility under clause 4.11.2(b), the IMO must apply the methodology described in Appendix 9.~~

4.11.3B. The Required Level (which for an upgraded Facility is calculated for the Facility as a whole):

- (a) for Facilities assigned Certified Reserve Capacity under clause 4.11.1(a), is calculated by the IMO using the Capacity Credits assigned to the Facility and temperature dependence information submitted to the IMO under clause 4.10.1(e)(i) or provided in Standing Data (where available) and converted to a sent out basis to 41 °C;
- (b) for Facilities assigned Certified Reserve Capacity under clause 4.11.2(b), is either:
  - i. the value, expressed in MW as a sent out value, that equals the 5 percent probability of exceedance of expected generation output for the Facility, submitted to the IMO in the report described in clause 4.10.3A(b); or
  - ii. the proposed alternative value, expressed in MW as a sent out value, provided in the report described in clause 4.10.3A(c), where the IMO has accepted the proposed alternative value under clause 4.11.2A; and
- (c) for Demand Side Programmes, is calculated by the IMO using the Facility's Relevant Demand minus the Capacity Credits assigned to the Facility.

4.11.3BC. For each three year period, beginning with the period commencing on 1 January 2015, the IMO must, by 1 April of the first year of that period, conduct a review of the Relevant Level ~~Methodology described in Appendix 9~~. In conducting the review, the IMO must:

- (a) examine the effectiveness of the Relevant Level ~~Methodology~~ in meeting the Wholesale Market Objectives; and
- (b) determine the values of the parameters K and U used in step 17 of the Relevant Level ~~Methodology~~ to be applied for each of the three Reserve Capacity Cycles commencing in the period,

and the IMO may examine any other matters that the IMO considers to be relevant.

4.11.3CD. In conducting a review under clause 4.11.3BC, the IMO must publish a draft report and invite submissions from Rule Participants and any other stakeholders the IMO considers should be consulted.

4.11.3DE. At the conclusion of a review under clause 4.11.3BC, the IMO must publish a final report containing:

- (a) details of the IMO's ~~examination~~ review of the Relevant Level ~~Methodology~~;
- (b) a summary of the submissions received during the consultation period;
- (c) the IMO's response to any issues raised in those submissions;
- (d) the values of the parameters K and U determined under clause 4.11.3C(b) ~~to be applied for each of the Reserve Capacity Cycles commencing during the relevant period~~; and
- (e) any recommended amendments to the Relevant Level ~~Methodology described in Appendix 9~~, which the IMO intends to progress as a Rule Change Proposal.

7.7.5A. System Management must ~~document~~ develop, in a Power System Operation Procedure, the information that must required to be provided by a Market Participant to System Management for each of its the Market Participant's Non-Scheduled Generators for each Trading Interval to allow-enable an estimation of the output of each Facility (in MWh) to be undertaken by:

- (a) System Management, as required under clauses 7.7.5B(a) and 7.13.1C(e); and
- (b) the IMO, as required by the Relevant Level Methodology, ~~under Appendix 9,~~

~~and System Management and Market Participants must follow that documented Market Procedure.~~

7.7.5B. The quantity reduction in the output of a Non-Scheduled Generator as a result of a Dispatch Instruction from System Management (in MWh) for each Trading Interval to be used in clause 6.17.6(c)(i) is:

- (a) where information has been made available to System Management in accordance with under the Power System Operation Procedure developed under referred to in clause 7.7.5A, System Management's estimate, determined in accordance with the Power System Operation Procedure, of the decrease in output of the Non-Scheduled Generator (in MWh) during the Trading Interval; or
- (b) in the case of a Non-Scheduled Generator included in a Resource Plan, for which System Management has not been provided with information in accordance with under the Power System Operation Procedure developed under referred to in clause 7.7.5A, the greater of zero and the difference between the Resource Plan quantity of the Non-Scheduled Generator (in

MWh) less the output of the Non-Scheduled Generator (in MWh) over the Trading Interval ~~implied by~~ derived from its Dispatch Instruction.

7.7.9. System Management must ~~document~~ develop, in a Power System Operation Procedure, the procedure System Management and Market Participants must follow in forming, issuing, recording, receiving and confirming Dispatch Instructions and that System Management must follow in determining the quantities described in clause 7.7.5A(a), and 7.7.5D in the Power System Operation Procedure, and:

- ~~(a) System Management must follow that documented Market Procedure when issuing, recording, and confirming a Dispatch Instruction and in determining the quantities described in clauses 7.7.5A and 7.7.5D; and~~
- ~~(b) Market Participants must follow that documented Market Procedure when receiving and confirming a Dispatch Instruction and in providing information to support the calculation of the quantity described in clause 7.7.5A.~~

The IMO notes that System Management has provided advice that it is unable to retrospectively determine estimates for the total reduction in the energy consumption of Interruptible Loads. This information has not previously been required to be kept under the Market Rules. These estimates will only be included in the methodology for determining the Relevant Level for a Facility (as outlined in Appendix 9) going forward.

7.13.1C The IMO may request, and System Management must provide, within 10 Business Days of receipt of a request from the IMO;

- ~~(a) for each Facility, all information made available to System Management under the Power System Operation Procedure referred to in developed under clause 7.7.5A for each Facility and each Trading Interval during the time period specified by the IMO in its request;~~
- ~~(b) an estimate of the total quantity of energy not served (in MWh) due to involuntary load shedding (manual and automatic);~~
- ~~(c) an estimate of the reduction in energy consumption (in MWh) of any Interruptible Loads in accordance with the terms of an Ancillary Service Contract;~~
- ~~(d) a schedule of all instructions provided to the Electricity Generation Corporation's Non-Scheduled Generators to deviate from the Dispatch Plan or change their commitment or output in accordance with clause 7.6A.3; and~~
- ~~(e) an estimate of the decrease in the output (in MWh) of each Electricity Generation Corporation Non-Scheduled Generator as a result of an instruction from System Management to deviate from the Dispatch Plan or change their commitment or output in accordance with clause 7.6A.3(a).~~

for each Trading Interval during the time period specified by the IMO in its request.

10.5.1. The IMO must set the class of confidentiality status for the following information under clause 10.2.1, as Public and the IMO must make each item of information available from the Market Web-Site after that item of information becomes available to the IMO:

(a) the following Market Rule and Market Procedure information and documents:

...

(f) the following Reserve Capacity information (if applicable):

i. Requests for Expressions of Interest described in clause 4.2.3 for the previous five Reserve Capacity Cycles;

...

ix. The following annually calculated and monthly adjusted ratios:

1. NTDL\_Ratio as calculated in accordance with Appendix 5, STEP 8;

2. TDL\_Ratio as calculated in accordance with Appendix 5, STEP 8; and

3. Total\_Ratio as calculated in accordance with Appendix 5, STEP 10-; and

x. ~~Load for Scheduled Generation and the relevant Load for Scheduled Generation Trading Intervals as determined under Appendix 9.~~ The following information identified for a Reserve Capacity Cycle under the Relevant Level Methodology:

1. the Existing Facility Load for Scheduled Generation for each Trading Interval in the five year period determined under step 1(a) of the Relevant Level Methodology; and

2. the 12 Trading Intervals occurring on separate Trading Days with the highest Existing Facility Load for Scheduled Generation for each 12 month period in the five year period.

## Glossary

~~**Load for Scheduled Generation:** The total sent out generation of all Facilities minus the sent out generation (measured or estimated) of all Facilities that have applied to be assigned~~

Certified Reserve Capacity under clause 4.11.2(b) adjusted for the impact of Consequential Outages on those Facilities, as determined in accordance with Appendix 9, step 6.

**Existing Facility Load for Scheduled Generation:** Means the MWh quantity determined for a Trading Interval under step 7 of the Relevant Level Methodology.

**New Facility Load for Scheduled Generation:** Means, for a new or upgraded Facility that has applied to be assigned Certified Reserve Capacity under clause 4.11.2(b), the MWh quantity determined for a Trading Interval under step 11 of the Relevant Level Methodology for that Facility and the relevant Reserve Capacity Cycle.

**Relevant Level:** Means the MW quantity determined by the IMO in accordance with the Relevant Level Methodology.

**Relevant Level Methodology:** Means the method of determining the Relevant Level specified in Appendix 9.

### **Appendix 9: Relevant Level Determination**

This Appendix presents the methodology for determining the Relevant Levels for Facilities that have applied for certification of Reserve Capacity under clause 4.11.2(b) for a given Reserve Capacity Cycle (“eCandidate Facilities”).

For the purposes of the Relevant Level determination in this Appendix 9:

- the full operation date of a Candidate Facility for the Reserve Capacity Cycle (“Full Operation Date”) is:
  - the date provided under clause 4.10.1(c)(iii)(7) or revised in accordance with clause 4.27.11A or clause 4.27.11B, where at the time the application for certification of Reserve Capacity is made the Facility, or part of the Facility (as applicable) is yet to enter service; or
  - the date most recently provided for a Reserve Capacity Cycle under clause 4.10.1(k) otherwise; and
- a Candidate Facility will be considered to be:
  - a new candidate Facility, if the five year period identified in step 1(a) of this Appendix commenced before 8:00 AM on the Full Operation Date for the Facility (“New Candidate Facility”); or
  - an existing Candidate Facility (“Existing Candidate Facility”), otherwise.

The IMO must perform the following steps to determine the Relevant Level for each eCandidate Facility:

**Determining the Facility Average Performance Level Existing Facility Load for Scheduled Generation**

Step 1: Identify:

- (a) the five year period ending at 8:00 AM on 1 April of Capacity Year 1 of the relevant Reserve Capacity Cycle;
- (b) any 12 month period, from 1 April to 31 March, occurring during the five year period identified in step 1(a), where the 12 Trading Intervals with the highest Existing Facility Load for Scheduled Generation in that 12 month period have not previously been determined under this Appendix 9; and
- (c) any 12 month period, from 1 April to 31 March, occurring during the five year period identified in step 1(a), where the 12 Trading Intervals with the highest Existing Facility Load for Scheduled Generation in that 12 month period have previously been determined under this Appendix 9.

Step 2: Determine the quantity of electricity (in MWh) sent out by each eCandidate Facility using Meter Data Submissions for each of the Trading Intervals in the period identified in step 1(b).

Step 3: For each eCandidate Facility, identify any Trading Intervals in the period identified in step 1(b) where the Facility:

- (a) was owned, controlled or operated by a Market Participant other than the Electricity Generation Corporation and was issued a Dispatch Instruction from System Management as notified by System Management to the IMO under clause 7.13.1(c);
- (b) was owned, controlled or operated by the Electricity Generation Corporation and was issued an instruction from System Management to deviate from its Dispatch Plan or change its commitment or output as notified by System Management to the IMO under clause 7.13.1C(d); or
- (c) was affected by a Consequential Outage as notified by System Management to the IMO under clause 7.13.1A.

Step 4: For each Candidate Facility and Trading Interval identified in step 3(a) use:

- (a) the estimate provided by System Management to the IMO under clause 7.13.1(eB); and
- (b) the quantity determined for the Facility and Trading Interval in step 2,

to estimate the quantity of energy (in MWh) that would have been sent out by the Facility had it not complied with the Dispatch Instruction during the Trading Interval.

Step 5: For each Candidate Facility and Trading Interval identified in step 3(b) use:

(a) the estimate provided by System Management to the IMO under clause 7.13.1C(e); and

(b) the quantity determined for the Facility and Trading Interval in step 2,

to estimate the quantity of energy (in MWh) that would have been sent out by the Facility had it not complied with System Management's instruction to change its commitment or output during the Trading Interval.

Step 46: For each eCandidate Facility and Trading Interval identified in step 3(c) use:

(a) the schedule of Consequential Outages provided by System Management to the IMO under clause 7.13.1A;

(b) the quantity determined for the candidate Facility and Trading Intervals identified in step 2; and

(c) the information provided by System Management under clause 7.13.1C(a),

to estimate the quantity of energy (in MWh) that would have been sent out by the Facility had it not experienced a been affected by the notified Consequential Outage during the Trading Interval.

Step 57: ~~If a candidate Facility was not in service for one or more of the Trading Intervals in the period identified in step 1, then determine, for each Trading Interval in the period during which the Facility was not in service, an estimate of the quantity of electricity (in MWh) that would have been sent out by the Facility had it been in service. The estimates must reflect the estimates in the expert report provided for the Facility under clause 4.10.3, unless the IMO reasonably does not consider the expert report to be accurate.~~

Determine for each Trading Interval in each 12 month period identified in step 1(b) the Existing Facility Load for Scheduled Generation (in MWh) as:

(Total Generation + DSP Reduction + Interruptible Reduction + Involuntary Reduction) – CF Generation

where

Total Generation is the total sent out generation of all Facilities, as determined from Meter Data Submissions;

DSP Reduction is the total quantity by which all Demand Side Programmes reduced their consumption in response to a Dispatch Instruction, as determined under clause 6.17.6(d)(i)(3);

Interruptible Reduction is the total quantity by which all Interruptible Loads reduced their consumption in accordance with the terms of an Ancillary Service Contract, as provided by System Management to the IMO under clause 7.13.1C(c);

Involuntary Reduction is the total quantity of energy not served due to involuntary load shedding (manual and automatic), as provided by System Management to the IMO under clause 7.13.1C(b); and

CF Generation is the total sent out generation of all Candidate Facilities, as determined in step 2 or estimated in steps 4, 5 or 6 as applicable.

~~Step 68: For each Trading Interval in the period identified in step 1 determine Load for Scheduled Generation (in MWh) as:~~

- ~~(a) — the total sent out generation of all Facilities, as determined from Meter Data Submissions; minus~~
- ~~(b) — the total sent out generation of all the candidate Facilities, as determined in step 2 or as estimated under steps 4 or 5 as applicable.~~

Determine for each 12 month period identified in step 1(b) the 12 Trading Intervals, occurring on separate Trading Days, with the highest Existing Facility Load for Scheduled Generation.

~~Step 79: Identify, for each 12 month year during the period identified in step 1(c), the 12 Trading Intervals occurring on separate Trading Days with the highest Load for Scheduled Generation as determined under step 6 the following:~~

- ~~(a) — the Existing Facility Load for Scheduled Generation previously determined under this Appendix 9 for each Trading Interval in the 12 month period;~~
- ~~(b) — the sent out generation (in MWh) for each Candidate Facility for each Trading Interval in the 12 month period that was used in the determination of the Existing Facility Load for Scheduled Generation for that Trading Interval; and~~
- ~~(c) — the 12 Trading Intervals occurring on separate Trading Days that were previously determined to have the highest Existing Facility Load for Scheduled Generation in the 12 month period.~~

**Determining New Facility Load for Scheduled Generation**

Step 810: ~~For each candidate Facility and each of the 60 Trading Intervals identified in step 7, multiply the sent out generation (in MWh) of the Facility in the Trading Interval, as determined in step 2 or as estimated under steps 4 or 5 (as applicable) by 2 to convert to units of MW. For each New Candidate Facility determine, for each Trading Interval in the period identified in step 1(a) that falls before 8:00AM on the Full Operation Date for the Facility, an estimate of the quantity of energy (in MWh) that would have been sent out by the Facility in the Trading Interval, if it had been in operation with the configuration proposed under clause 4.10.1(dA) in the relevant application for certification of Reserve Capacity. The estimates must reflect the estimates in the expert report provided for the Facility under clause 4.10.3, unless the IMO reasonably considers the estimates in the expert report to be inaccurate.~~

Step 911: ~~Determine the **Facility Average Performance Level** for each candidate Facility. The Facility Average Performance Level Facility f (in MW) is the mean of the MW quantities determined for the Facility in step 8 for the 60 Trading Intervals identified under step 7.~~

For each New Candidate Facility determine, for each Trading Interval in the period identified in step 1(a), the New Facility Load for Scheduled Generation (in MWh) as:

(a) if the Trading Interval falls before 8:00 AM on the Full Operation Date for the Facility:

$$\text{EFLSG} + \text{Actual CF Generation} - \text{Estimated CF Generation}$$

where

EFLSG is the Existing Facility Load for Scheduled Generation for the Trading Interval, determined in step 7 or identified in step 9(a) as applicable;

Actual CF Generation is the sent out generation of the New Candidate Facility for the Trading Interval, as identified in step 9(b), determined in step 2 or estimated in steps 4, 5 or 6 as applicable; and

Estimated CF Generation is the quantity determined for the New Candidate Facility and the Trading Interval in step 10;

or

(b) the Existing Facility Load for Scheduled Generation for the Trading Interval, otherwise.

### **Determining the Facility Adjustment Factor**

Step 10~~12~~: Determine the **Facility Variance** for each candidate Facility. The Facility Variance for Facility f (in MW) is the variance of the MW quantities determined for the Facility in step 8 for the 60 Trading Intervals identified in step 7.

For each New Candidate Facility determine, for each 12 month period identified in step 1(a), the 12 Trading Intervals, occurring on separate Trading Days, with the highest New Facility Load for Scheduled Generation.

### **Determining the Facility Average Performance Level**

Step 13: For each Existing Candidate Facility, determine the 60 quantities comprising:

- (a) the MWh quantities determined in step 2 or estimated in steps 4, 5 or 6 as applicable for each of the Trading Intervals determined in step 8, multiplied by 2 to convert to units of MW; and
- (b) the MWh quantities determined in step 9(b) for each of the Trading Intervals identified in step 9(c), multiplied by 2 to convert to units of MW.

Step 14: For each New Candidate Facility, determine the 60 quantities comprising:

- (a) the MWh quantities identified in step 9(b), determined in step 2 or estimated in steps 4, 5 or 6 as applicable for each of the Trading Intervals identified in step 12 that fall after 8:00 AM on the Full Operation Date for the Facility, multiplied by 2 to convert to units of MW; and
- (b) the MWh quantities determined in step 10 for each of the Trading Intervals identified in step 12 that fall before 8:00 AM on the Full Operation Date of the Facility, multiplied by 2 to convert to units of MW.

Step 15: Determine the average performance level (in MW) for each Candidate Facility f (“Facility Average Performance Level”) as the mean of the 60 quantities determined for Facility f in step 13 or step 14 as applicable.

### **Determine the Facility Adjustment Factor**

Step 16: Determine the variance (in MW) for each Candidate Facility f (“Facility Variance”) as the variance of the MW quantities determined for Facility f in step 13 or step 14 as applicable.

Step 1~~4~~17: Determine the facility adjustment factor (in MW) **Facility Adjustment Factor** for each Candidate Facility f (~~in MW~~) (“Facility Adjustment Factor”) in accordance with the following formula:

~~Facility Adjustment Factor = G x Facility Variance (f)~~

Facility Adjustment Factor = min (G x Facility Variance (f), Facility Average Performance Level (f) /3 + K x Facility Variance (f))

Where

$G = K + U/\text{Facility Average Performance Level (f)}$

K is determined in accordance with the following table:

Reserve Capacity Cycle	Capacity Year	K value
2012	2014/15	0.001
2013	2015/16	0.002
2014	2016/17	0.003
2015 onwards	From 2017/18 onwards	To be determined by the IMO as part of the review required under <u>in accordance with</u> clause 4.11.3B.

U is determined in accordance with the following table:

Reserve Capacity Cycle	Capacity Year	U
2012	2014/15	0.211
2013	2015/16	0.422
2014	2016/17	0.635
2015 onwards	From 2017/18 onwards	To be determined by the IMO as part of the review required under <u>in accordance with</u> clause 4.11.3B.

### ***Determining the Relevant Level for a Facility***

Step ~~12~~18: Determine the Relevant Level for each eCandidate Facility f (in MW) in accordance with the following formula:

Relevant Level (f) = max(0, Facility Average Performance Level (f) - Facility Adjustment Factor (f))

### ***Publication of information***

Step ~~13~~19: Publish on the Market Web Site by 1 June of Year 1 of the relevant Reserve Capacity Cycle ~~the Trading Intervals identified in step 7 and:~~

(a) the Trading Intervals identified in step 8; and

(b) the Existing Facility Load for Scheduled Generation quantities determined in step 7.

~~on the Market Web Site by 1 August of the relevant Reserve Capacity Cycle.~~

## APPENDIX 4: DISCUSSION AT THE MARKET ADVISORY COMMITTEE

The MAC discussed the proposals at the 10 November 2010 (RC\_2010\_25) and 15 December 2010 (RC\_2010\_25 and RC\_2010\_37) MAC meetings. An overview of the discussion is presented in below. Further details are available in the MAC meeting minutes available on the IMO website: <http://www.imowa.com.au/market-advisory-committee>

### November 2010 Meeting (Discussion of PRC 2010 25)

The IMO noted that the Pre Rule Change Discussion Paper proposes to implement Proposal 1 from the REGWG's Work Package 2. The IMO noted that there were likely to be competing views on the IMO's proposal as there had been neither a compromise nor consensus regarding a potential solution at the REGWG. The Chair noted that the issues around the valuation of capacity from Intermittent Generators had been discussed at many levels, noting the large amount of work done by the REGWG.

The following points were raised during the meeting:

- Mr Stephen MacLean noted that the REGWG had not agreed for a Rule Change Proposal to be developed at this stage. Mr Corey Dykstra noted that it was agreed that the IMO would present a recommendation to the MAC for discussion. Mr Shane Cremin said that the recommendation to progress the proposed solution is not appropriate at this point in time. Dr Steve Gould disagreed stating that he had anticipated that a Rule Change Proposal would be presented to the MAC. Mr Troy Forward clarified that the minutes from the REGWG reflected the agreement that IMO would present a solution to the MAC for consideration, noting that a Pre Rule Change Discussion Paper is not inconsistent with this. Mr Forward noted that the recommendation presented in the cover paper was intended to represent the fact that the IMO considered it would be unlikely that consensus would be achieved at the MAC. Mr Dykstra stated that the IMO should be more mindful to not imply that a decision had already been made. Mr Andrew Everett disagreed that this was an issue.
- Mr Cremin questioned the imperative to push forward with a proposal given the polarised opinion on what capacity valuation methodology should be adopted. Mr Dykstra noted that further consideration of any movement from the status quo is required.
- Mr Dykstra questioned what the deficiencies were in MMA's proposed approach. Mr Forward noted that there was a shortage of data and that System Management had a serious concern about system security under the outcomes of MMA's proposed methodology. Mr Phil Kelloway noted that this had been discussed in detail at REGWG meetings. Dr Gould noted System Management's concern had been with Capacity Credits being allocated at greater than 20 percent of nameplate capacity as this would not represent the capacity that could be made available reliably. Mr MacLean thought that System Management had some concern about wind farms not performing. Mr Dykstra stated that the available data set had generated certain results and other than "gut feelings" about appropriate valuation levels there was no reason to not adopt MMA's approach. Mr Kelloway clarified that System Management had undertaken its own assessment which had informed its position on this. Mr Dykstra noted that the intent of the RCM is to ensure sufficient energy as well as sufficient peak capacity. Mr Cremin noted that if an Intermittent Generator was to be unavailable during peak periods the methodology presented by MMA would take this into account in assigning Capacity

Credits to the facility. Mr Forward clarified that under MMA's proposed methodology the Facility's availability would be determined based on 750 Trading Intervals.

- The Chair noted that the data set used does not include a one in ten year event and the lack of core data around these extreme events has had a powerful influence on the IMO's considerations.
- Mr Dykstra noted that the analysis undertaken by ROAM Consulting (ROAM) around the capacity for Load Following services indicates that there is enough plant on the system to deal with a greater penetration of Intermittent Generators. Mr Kelloway noted that the mix of plant on the system has an impact on whether this is the case. Mr Kelloway noted that if the value of Intermittent Generators overstates their ability to deliver then System Management will not be able to ensure that the available supply of energy can meet peak demand.
- Mr Dykstra noted that after MMA had delivered its original report significant discussions on the proposal had been held among the IMO, System Management and the Office of Energy (OoE), and yet MMA was not persuaded to move away from its proposed solution. Mr Forward noted that MMA had no experience in operating a power system. Mr Dykstra considered that this may encourage MMA to take a more conservative approach.
- Mr Dykstra suggested that from a system security and reliability perspective System Management would prefer to have a situation of no Intermittent Generators on the system. Mr Kelloway responded that this would not be in the best interests of the market.
- The Chair noted that it is difficult to ignore the system operator when it notes that there may be potential impacts on system security. The Chair noted that during the discussions at the REGWG System Management had moved towards the less conservative proposal.
- Mr MacLean noted that the MMA's proposed methodology, which was based on system security and reliability criteria, was being rejected in favour of an arbitrary alternative approach.
- Mr Cremin noted that at one of the first REGWG meetings chaired by the IMO, Ms Anne Hill had noted the OoE's position as being conservative on this issue. Mr Cremin noted that this position had no regard for the Market Objectives and appeared to be politically motivated. Mr Cremin noted that the proposal would need to meet the Market Objectives if it was progressed, and that the IMO would have to take into account any comments raised in submissions. Mr Cremin considered that to contradict MMA's recommendation would require strong justification. Ms Nerea Ugarte clarified that Ms Hill's view had related to the security of supply. Mr Cremin noted that previous statements from the OoE around encouraging renewable energy sources is at odds with the Minister's previous advice to the MAC that only commercial incentives should be taken into account.
- Mr Cremin questioned why there was the need to change the current commercial mechanisms when it is in fact the reliability criteria that should be reviewed. Mr Forward questioned who should bear the costs of changes to the reliability criteria. Mr Cremin considered that end users should bear the costs of generation where inefficient generation is incentivised by Federal Law.
- Mr Dykstra noted the volatility of the results from Proposals 1 and 3 over time, noting that investors would be unlikely to enter the market with such volatile potential Capacity

Credit allocations. Mr Dykstra stated that the 3 year averaging approach currently provides a much smoother option, as does MMA's proposed solution.

- Mr Dykstra questioned whether there would be a different methodology applied for determining the capacity valuation for DSM during the 12 peak periods or for Scheduled Generators. Mr Dykstra noted that currently there is no certainty over DSM's availability during these times. Mr Cremin noted that these issues have been discussed by the REGWG previously. The proposal is likely to result in inconsistent treatment of Scheduled and Non-Scheduled Generators.
- Mr MacLean noted that the proposed changes would more correctly allocate Capacity Credits to solar facilities.
- Mr Cremin noted that an existing weakness in the rule change assessment process will be re-highlighted in this case as the IMO's assessment of the proposal will not take into account other potential methodologies that could be alternatively implemented.
- Mr Everett noted that REGWG had been provided with an opportunity to put forward a recommendation to the MAC but had been unable to do so. Mr Dykstra noted that the commercial views of the REGWG had not made this possible. Mr Dykstra noted that the MAC is required to act in the best interests of the market and not according to the individual commercial interests of its members. Mr Dykstra considered that, irrespective of the resultant capacity valuations, moving away from progressing MMA's proposed approach would be inconsistent with the best interests of the market.
- Mr MacLean questioned if a bias should be applied, noting that it is important to supply customers during the majority of the year. Mr Forward noted that generally the whole RCM is geared towards delivering energy for the peak especially when peak demand is the dominant factor in the reliability criterion.
- The Chair noted that no matter the reason for the lights going out, there will be a large problem if the market had insufficient capacity to service load. Dr Gould noted that the impact of these situations is compounded during the Hot Season.
- Mr Dykstra noted that the IMO's proposal would change the economics of developing an Intermittent Generator considerably. The Chair agreed, noting that the IMO had been conscious of signalling potential changes in the Reserve Capacity allocations to Intermittent Generators in the last three Statement of Opportunities Reports.
- Mr Cremin noted that existing Intermittent Generators should not be exposed to regulatory risk due to the "gut feelings" of the system operator. Any decision to progress with a solution needs to account for the impacts on existing Intermittent Generators. The Chair noted that the system operator's opinion is of vital importance with regard to system security.
- Mr Forward noted that the IMO is required to review the reliability criteria by the end of 2012. Dr Gould suggested that reviewing the reliability criteria and ensuring that the costs are correctly allocated to Market Customers would be a preferable outcome.
- Dr Gould noted that Mr Greg Thorpe's previous comments that Capacity Credits are in effect a pre-payment for energy. The Capacity Credit factor is a representation of the amount of energy that will be available from a wind farm. MMA's concept of Load for Scheduled Generation effectively treats a wind farm as a negative load which ultimately drives down the need for energy from the Balancer, resulting in lower balancing prices. Mr Kelloway agreed with Dr Gould's synopsis.

- Dr Gould considered that a significant regulatory risk would be introduced by the proposed amendments.
- The Chair noted that the OoE had advised the IMO that there are a number of wind investors looking at entering the market despite this proposal being considered.
- Mr Cremin noted that customers will be the parties that ultimately pay for the amendments.
- Mr Alastair Craib noted that the proposed changes would impact on the viability of constructing a wind farm in the WEM. Mr Everett noted that Verve Energy was considering building a wind farm and that the proposed amendments have not resulted in an adjustment to their decision.
- Mr Forward noted that the decision around the capacity valuation for Intermittent Generators is one of the hardest decisions the market has faced since market start. Mr Forward noted that he was unsure that the market would be in any better position in a year's time to reconsider this issue and so there was no reason to not progress a solution now. Dr Gould agreed, stating that it would be best to progress the IMO's solution through the Rule Change Process, flush out all the issues, appoint an expert to consider these issues further and then the IMO can make a final decision on the proposal.
- Mr Cremin noted that the methodology for assigning Capacity Credits to Intermittent Generators needs to make some better allowances for solar as the current Market Rules are not appropriate for this technology. However, Mr Cremin noted that he was concerned that a non-optimal solution was being progressed. Mr Dykstra suggested that maybe the IMO should be considering a solution simply for solar facilities. Mr Forward noted that solar technologies are not the main issue needing attention as there is less penetration of these technologies and less potential penetration in the near future.
- The Chair noted that the IMO has an obligation to move forward with proposing a solution to this issue and that the process forward would provide sufficient opportunities for Market Participants to provide their comments. The MAC agreed, although Mr Andrew Sutherland questioned how much progressing through the Rule Change Process would cost the market.
- Mr Cremin agreed with the IMO that the data available is limited but considered that MMA's proposed methodology would ensure that if the relationship between peak periods and output has been incorrectly identified due to the data restrictions, this will be reflected in the Capacity Credit allocations to these facilities in time. Mr Dykstra noted his concern that progressing with the IMO's proposed solution would set a bad precedent as this would ignore the available evidence and would result in a solution being progressed based purely on the system operator's "gut feel". Mr Dykstra noted that if the IMO is not going to progress with MMA's proposal then Market Participants will need to clearly understand why the IMO's proposed solution is a better approach. Mr Kelloway agreed to provide details of System Management's modelling to assist the MAC in understanding its position. Mr Kelloway noted that System Management is taking no position on the further development of renewable energy options in the WEM.
- The Chair questioned whether MAC members would have a different position on the IMO's proposal if there was no existing wind generation on the system. Mr Dykstra considered that there would be nothing to gain from considering this hypothetical view.

Mr Huxtable questioned what the impact of allowing for grandfathering would be. The Chair noted that he did not support the introduction of grandfathering provisions.

- Mr Pablo Campillos questioned if System Management had considered the impacts of improving the reliability criteria. Mr Kelloway noted that it had not to date but that it would do so moving forward.
- Mr Dykstra suggested that the IMO progress the Rule Change Proposal and simply note that it was discussed at the MAC. Mr Cremin noted that it is unlikely that different views will be raised and it will be a costly process.

The IMO agreed to progress the proposal, noting that it is likely that a number of issues will be raised during the consultation process.

#### December 2011 Meeting (Discussion of RC 2010\_25 and RC 2010\_37)

The Chair noted that the IMO had received a Rule Change Proposal from Griffin Energy (RC\_2010\_37) proposing an alternative approach to calculating the capacity value for Intermittent Generators to that proposed by the IMO in RC\_2010\_25. The Chair noted that the IMO had sought external advice on how to proceed with the two proposals with the prospect of joining the two rule changes. This was not possible under the Market Rules and the IMO had subsequently aligned the two consultation timelines to allow participants to have an opportunity consider both proposals.

Mr Cremin noted that the process undertaken by the IMO in progressing the two Rule Change Proposals at the same time appears reasonable and well constructed. Mr Cremin noted that progressing the proposals together will allow interested parties to compare the proposals. Mr Cremin noted that the Griffin Energy Rule Change Proposal had the support of a number of members of the REGWG.

The Chair welcomed a discussion from the MAC on both proposals. The following points were raised:

- Mr Sutherland expressed concern around having two rule changes in the formal process which would have significant impacts on new and existing projects. Mr Sutherland stated that the IMO needs to be conscious of the regulatory risks being created and the signals that are being provided to the market. Mr Sutherland also noted a higher level concern that existing assets will be devalued. Mr Sutherland was uncertain which of the proposed methodologies was the right one to implement.
- Mr Paul Biggs considered that any delay in addressing this issue would lock in the current arrangements as more wind farms continue to enter the market and that this would be an investment concern.
- Mr Sutherland suggested that the IMO consider grandfathering of these Market Rules. Mr MacLean noted that although the IMO was not in favour of grandfathering, the current proposal sends a signal that any investment could be subject to changed market conditions in the future. The Chair noted that the construct of the WEM is currently based around the possibility that the Market Rules would change, noting the IMO signals this in advance where possible. Specifically, this change had been signalled in the past three Statement of Opportunities.

- Mr Dykstra questioned the driver of the change and the solution being proposed. Mr Dykstra reiterated his concerns around the IMO's independent expert's proposed solution being rejected in favour of another methodology. In response, the Chair noted that the IMO had proposed a methodology on the basis that that the independent expert's solution was based on modelling using a limited data set which did not reflect a one in ten year event. The Chair also noted that System Management had raised concerns around the security associated with allocations of Capacity Credits to Intermittent Generators at the current levels. Mr Ken Brown noted that system security is paramount, stating that comparatively other electricity markets (with and without capacity markets) make much lower capacity allowances to wind farms.
- Mr Cremin noted that the REGWG process had continued to look at the outcome from a reliability perspective. Mr Cremin noted that the fundamentals are that federal legislation is driving investments in renewables and that these will be built in Western Australia. Mr Cremin considered that a lower capacity valuation for this would mean that additional gas turbines would need to be built to cover existing wind farms. Mr Cremin noted that this would result in the same outcome as changing the reliability criteria - that is a bigger capital base would be required to meet the IMO's forecast capacity requirements. Mr Cremin questioned why the path of changing the capacity valuation for Intermittent Generators was being pursued when the same outcome could be achieved using a different process. Mr Cremin stated that the current path would result in disincentives for wind farms.
- Mr Brown noted that even if the reliability criteria were changed there would still be a number of wind farms who would claim to be able provide a large amount of the required capacity. Mr Brown stated that it was perverse that Western Australia wanted to make capacity payment of 40 percent to Intermittent Generators when other markets recognise that they are less reliable and so make reduced payments. Mr Cremin noted that he was suggesting that Intermittent Generators should be certified at 40 percent and that additional generation should then be procured to meet the reliability criteria. Mr Cremin suggested that the additional capacity would be naturally restricted to not coming from other Intermittent Generators. Mr Cremin suggested that this would result in the same outcome without distorting the investment signals to Intermittent Generators.
- Mr Kelloway noted that Mr Cremin's suggestion would result in the market paying a larger amount to a wind farm than the true value of its capacity. Mr Cremin responded that he was unsure whether the macro implications of what was being done were considered. Mr Kelloway noted that the data available now shows some trends that the capacity contribution of wind farms during peak periods is quite variable. Mr Kelloway noted that taking an averaging approach when determining their contribution hides these peak periods.
- Mr Brown agreed with Mr Cremin that there should be separate security and capacity payments but noted that this is inconsistent with the current market design. Mr Brown noted that he is not aware of any other power system that uses averages to value the capacity of Intermittent Generators. Mr Kelloway reiterated that there is a lot of variance in the output of wind farms that even on a given day can range between 5 and 45 percent. Furthermore, the average from one year to the next can vary significantly.
- Mr Cremin considered that the decision being made around the valuation of capacity from Intermittent Generators will have significant impacts at a policy level and that this should have been more consciously considered through the REGWG deliberations.

- Mr Everett noted that it is not the MAC's role to decide what types of technology should be installed but rather the job of policy makers. The Chair noted that the requirement is for 20 percent of capacity to be from renewable sources by 2020 and noted the previous advice the MAC had received from the Minister on this. Mr Biggs noted that other mechanisms existed to incentivise the development of renewable technologies and stressed the importance of providing transparency on costs. Mr Biggs noted that if the Market Rules provide this transparency then it is a policy decision as to what incentives are required to achieve the targets for renewables.
- Mr Campillos noted that if the policy setting is fundamentally changed then a transition process should be considered. The Chair noted that he would support a transition process.
- The Chair noted that grandfathering a range of provisions could result in a different set of Market Rules applying to each Market Participant. This creates distortions in the market and results in Market Participants finding it difficult to determine what their risks are as any costs are allocated differently to each Market Participant. Mr Cremin noted that there may however be cases where grandfathering of clauses is warranted. The Chair suggested that the MAC consider the timing of implementation of any Amending Rules rather than the introduction of grandfathering provisions. The Chair noted that the Reserve Capacity Cycle creates a natural timeframe for the implementation of any Amending Rules.
- Mr Brown expressed his surprise with the large allocations of Capacity Credits to be made to Photovoltaic (PV) technologies under both of the proposed methodologies. Mr Brown noted that modelling of the impacts of PV are starting to indicate that if the proposed incentives were put in place, then the system peak would be likely to no longer occur in summer. Mr MacLean noted that neither of the proposed methodologies would impact on household investment in PV. The Chair noted that the 12 peak periods may have a significant impact on this clarifying that if the peak periods move away from the periods when solar is experiencing its peak output then this would be accounted for in the Load for Scheduled Generation calculation.
- Mr Dykstra questioned whether it would make sense to defer a decision around the capacity valuation methodology to the broader review of the RCM process. Mr Dykstra noted that the level of capacity from Intermittent Generators currently in the market is much lower than for DSM which also has restricted availability. The Chair noted that it is important to resolve the current issues around the capacity valuation methodology from an investment perspective. Mr Forward noted that there was benefit in pursuing an amended capacity valuation methodology as it is arguable that the current mechanism was a manifest error at market start.
- Mr Dykstra questioned how the IMO would consider two competing proposals designed to achieve the same outcome as both may be considered consistent with the Market Objectives. The Chair responded that the IMO was likely to compare how well the two proposals served the Market Objectives.